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A Catalogue of Dinoflagellate Cysts from India

Diamond Jubilee Special Publication

Birbal Sahni Institute of Palaeobotany
Lucknow
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FOREWORD

The task to collate, edit, update and create a systematic inventory of fossil plants known from the Indian sedimentary successions was first initiated by scientists of the Birbal Sahni Institute of Palaeobotany after the Silver Jubilee Celebrations in November, 1971. Though it was a daunting task as the information was scattered in various journals and many other publications, this effort materialized with the publication of "A Catalogue of Indian Fossil Plants" (Lakhanpal et al., 1976). This single volume Catalogue included all plant mega- and microfossil records published from 1821 to 1970. As enormous data had subsequently been generated in the next two decades, another Catalogue was released during the Birbal Sahni Birth Centenary Celebrations in 1991. However, due to the wealth of the available data impossible to be incorporated in a single compendium, 11 Fascicules on different fossil groups and/or geologic time span were prepared, each authored by subject expert from the Institute.

In connection with the Diamond Jubilee Celebrations of the Institute this year, the idea to again update the information came up during discussions in our group meetings surfaced sometimes in January, 2006. Despite the short notice and a tall order, several of my Institute colleagues readily volunteered to take up the uphill task. It is indeed heartening to see that these Catalogues/ Atlas have been completed in record time. I wish to express my most sincere appreciation to all those who contributed their energy and skill in giving shape to these compilations.

The present "A Catalogue of Dinoflagellate Cysts from India" by Khowaja-Ateequzzaman et al. is a welcome addition to the list of Institute publications. In this Catalogue information on synonymies, nomenclatural types, nomenclatural status and history along with geographic and geologic occurrences within Indian sedimentaries is provided. This compilation will facilitate the active researchers, engaged in palynological studies, in synthesizing the stratigraphic ranges of dinoflagellate cyst taxa, as well as basinal occurrences, and their proper use in future biostratigraphic analysis. I believe this compendium would prove equally useful for researchers and scholars in Academia and Industry.

October 16, 2006

Dr. N. C. Mehrotra
Director
Birbal Sahni Institute of Palaeobotany

PREFACE

Living dinoflagellates (division Dinoflagellata) are unicellular microorganisms (protists). They are characterized by the presence of distinctive pigments and nuclear structure. Chromosomes, in almost all dinoflagellates, remain condensed between cell divisions and histones are lacking. The nuclear membrane does not break down during mitosis. Living dinoflagellates exhibit a great diversity in form, habit, and habitat. Two distinct but intimately related structures produced by most dinoflagellates are the theca and the cyst. The theca is part of the cell covering during the motile stage of their life cycle. It is constructed of thecal plates, fitted together closely along linear junctions termed sutures. The pattern of plate arrangement constitutes the tabulation and is characteristic for a genus and species. Motility of the thecate cell results from the two flagella: a transverse flagellum which is ribbon-like, that encircles the body in cingulum (except in Prorocentrales) and a longitudinal flagellum which is thread-like, located in the linear groove (the longitudinal furrow or sulcus) on the ventral surface of the cell. The two flagella impart a characteristic spiral motion to the swimming cell. Most dinoflagellates go through moderately complex life cycles involving several steps, both sexual and asexual. The biflagellate motile stage which is usually dominant lasts only a few minutes in some. Although these motile cells are abundant and wide ranging, it is the resting cyst which leaves a fossil record. The motile stage is quickly destroyed after death by bacterial action, but the cyst is composed of highly resistant and geologically long lived organic material (sporopollenin). Even after one or two hundred million years, the thin and still flexible walls of many fossil cysts, retain delicate surficial relief and their apparently original three-dimensional shape. Because of the resistant nature of their wall and the almost ubiquitous presence of an excystment opening, the archaeopyle, most fossil dinoflagellates are presumably hypnozygote cysts (fossilizable resting cyst developed within the zygotic theca). Often the tabulation of the cell wall is somehow expressed in the shape and/or ornamentation of the cyst.

Dinoflagellates are a major component of the modern phytoplankton, and are found in all aqueous environments from freshwater to marine. Marine species may be euryhaline (tolerant of wide ranges of salinity or stenohaline (tolerant of only narrow fluctuations of salinity). They may prefer oceanic or shelfal (neritic) environments, or occur in brackish or estuarine settings. Other dinoflagellates may be psammophytes (sand dwellers), snow or ice dwellers, symbionts, or parasites. About 90% are marine, with the remaining 10% primarily inhabiting freshwater niches. They show greatest diversity in the tropics and are most abundant in neritic temperate waters. As a whole, the dinoflagellates have a wide temperature tolerance 1-35° C. Most are autotrophic (reproducing their own food through photosynthesis) in the motile stage or heterotrophic gen-

erally phagotrophic (obtaining their food by ingestion, as animals); a few are parasitic or symbiontic.

In the dinoflagellate assemblages both gonyaulacoid and peridinioid species can be found. The ecology of the gonyaulacoids is controlled by salinity and temperature in the upper layers of the water column. Changes in the assemblage provide information about the circulation patterns of the oceans. The peridinioids are generally heterotrophic; they feed mostly on diatoms; their occurrence is related to high productivity areas like upwelling systems, ice margins and estuaries. Their abundance can provide information about the sea surface productivity. Many dinoflagellates have a geographic distributions reflecting oceanic temperature zones and hence may be used as indicators of climatic oscillations.

Fossil dinoflagellates occur mostly in Mesozoic-Cenozoic rocks. They have proved to be of value as biostratigraphic index fossils and a good palaeoecologic and palaeoclimatic indicators. The significance of fossil dinoflagellates lies in their minute size, diversity, morphological complexity, rapid evolution, abundance and wide geographical distribution. These have made them a tool in resolving the problems of palaeoceanography and oil exploration through high resolution biostratigraphy, palaeoecology, palaeogeography and palaeoenvironment. Biostratigraphic zones, commonly abbreviated as biozones, most reliably used for determining age and for correlating rocks, can be of several types. However, all are dependent upon the stratigraphic ranges of taxa, individually or collectively. First appearance datums (FADs) and the last appearance datums (LADs) of dinoflagellate cysts when related to standard time scale (dinoflagellate biohorizons) also act as significant biostratigraphic controls. One of the most exciting recent developments in sedimentary geology has been the increasing use of sequence stratigraphy. It is the study of rock relationships within a chronostratigraphic framework of repetitive, genetically related strata bounded by surfaces of erosion or nondeposition, or their correlative conformities. It is essentially the relationship of biohorizons and biozones to depositional sequences. Biostratigraphy is a key component of the integrated studies necessary to recognize the third and lower order sequences and sequence boundaries in the subsurface and, hence to substantiate their correlation with surface sections, especially stratotypes. And of all fossil groups, dinoflagellates may prove to be best suited for characterizing individual system tracts, and correlating terrestrial shallow marine deposits.

Keeping in mind the significance of stratigraphic ranges of dinoflagellate cyst taxa and their basinal occurrences, all the published records of fossil organic walled dinoflagellate cyst genera, species and infraspecific taxa, described from

various sedimentary basins of India during the last three decades, are placed at one place. The objective of this compilation is to facilitate the active researchers, engaged in palynological research, in deciphering correct stratigraphic ranges and basinal occurrences of dinoflagellate cysts in India and their proper use in future biostratigraphic analysis.

All the reported dinoflagellate cysts taxa at and below the generic rank, known to the authors as on 31st December, 2005 are included. Taxa referred to as Forma, Dinoflagellate/Dinocyst type and Hystrichosphaerid, Acritarch as well as Prasinophyte are also included in this Catalogue. Information on synonymies, nomenclatural types, nomenclatural status and history along with geographic and geologic occurrences within Indian sedimentaries is also provided. Suprageneric classification has not been followed. Latest taxonomic status of a particular taxon (indicated by the originating author or the latest revision) in the published literature is accepted here. The Catalogue includes a total number of 1643 entries. In terms of current names of fossil dinoflagellate, acritarch and prasinophyte taxa as recorded in this Catalogue, there are 235 genera (out of which there are 225 organic walled dinoflagellate cyst genera, 9 acritarch genera and one prasinophyte genus) and 663 species.

As regards Format genera are arranged in alphabetical order, with the entry name given in boldface all caps. Immediately following the generic name is the authorship citation and emendation(s), if any. Other comment like Acritarch / Prasinophyte genus etc. is given in brackets.

e.g.: **ACHILLIODINIUM** Eaton, 1976.
ADNATOSPHAERIDIUM Williams & Downie, 1966 emend. Stancliffe & Sarjeant, 1990.
ARTEMISIOCYSTA Benedek, 1972 (Acritarch genus).
PTEROSPERMALLA Eisenack, 1972 (Prasinophyte genus).

Invalid/incorrect names of genera are arranged within the same aforesaid alphabetical order with the entry name given in non bold all caps within inverted commas. Immediately following the generic name is the authorship citation and emendation, if any. Comments, if any, are given within brackets. Latest taxonomic status is indicated by (boldface all caps) **NOW**. Valid/current ("correct" sensu ICBN) generic name is given in all caps bold, immediately followed by authorship citation, emendation, if any, comment on taxonomic synonymy and reference.

e.g.: "AREOSPHAERA" (in Khanna *et al.*, 1985; name not validly published).

"BACCHIDINIUM" Davey, 1979b. **NOW KIOKANSIUM** Stover & Evitt, 1978 emend. Duxbury, 1983. Taxonomic senior synonym, according to Below, 1982c, p. 13-15 and Davey, 1982a, p. 377).

Species, subspecies and varities attributed to a particular genus are listed as formal entries under it. Specific and infraspecific epithets are inset, in bold, and ordered alphabetically under the appropriate generic name. Each specific epithet (including infraspecific epithets) is followed by citations for original and, where appropriate, validating and combining authors and emendation(s), if any. Information on questionable assignment statements and other comments are given within brackets.

e.g.: **Achomosphaera triangulata** (Gerlach, 1961) Davey & Williams, 1969 emend. Sarjeant, 1984b

Aldorfia dictyota subsp. **papillata** (Gitmez, 1970) Jan du Chene *et al.*, 1986a.

Such specific and infraspecific citations are followed by the details of their records from India sequentially including author, date, page number, plate and figure numbers, age, litho-unit, locality, basin and state, starting with *In*:

e.g.: **Achilleodinium biformoides** (Eisenack, 1954b) Eaton, 1976. *In*: Sarkar, 1991: 2, pl. I, figs 4, 10, EARLY EOCENE (Kakara Series, Lesser Himalaya), Kakara-Chapla group of villages, Simla, Himachal Pradesh; Sarkar & Prasad, 2000b: 141, LATE YPRESIAN – EARLY LUTETIAN (Subathu Formation, Morni Hills), Haryana; Mehrotra *et al.*, 2005: 61, YPRESIAN (53 – 51 Ma), Mumbai Offshore.

Invalid/incorrect names of species, subspecies and varieties or the names of species, subspecies and varieties which have been transferred are arranged within the same aforesaid alphabetical order with the entry name given in italics. Immediately following the specific or infraspecific name is the authorship citation for original and, where appropriate, validating and combining authors, emendation(s), if any, comment on taxonomic synonymy and reference. Latest taxonomic status is indicated by (boldface all caps) **NOW**. Valid/current ("correct" sensu ICBN) specific/ infraspecific name is given in bold, immediately followed by authorship citation for original and, where appropriate, validating and combining authors and emendation(s), if any. Comments on taxonomic status including synonymy and reference are given within brackets .

e.g.: *Achilleodinium palaeocenicus* Khanna, 1979. (Name not validly published).

Achomosphaera cambra Sah *et al*., 1970. **NOW** Spiniferites **twistringiensis** (Maier, 1959) Fensome *et al*., 1990. (Jain, 1982, p. 51 considered *Achomosphaera cambra* to be a taxonomic junior synonym of *Hystrichosphaera ramose* var. *multibrevis* **now** *Spiniferites twistringiensis*).

Apteodinium ?spinosum (Alberti, 1961) Stover & Evitt, 1978. **NOW Apteodinium ?albertii** Lentin & Williams, 1981. (Substitute name. Originally *Pareodinia spinosa*, subsequently *Apteodinium ?spinosum* (Alberti, 1961) Stover & Evitt, 1978. Combination illegitimate as *Apteodinium spinosum* Jain & Millepied, 1975 is senior homonym. Questionable assignment: Stover & Evitt, 1978).

Specimen other then holotype reassessed and reallocated is denoted by the sign **=** "is equal to"

e.g.: *Achomosphaera operculata* Sah *et al*., 1970. *In*: Salujha & Kindra, 1981:51, pl.2, figs 43-44 = **Achomosphaera ramulifera** (Deflandre, 1937b) Evitt, 1963 (According to Jain & Garg, 1982).

To facilitate use of catalogue in assessing stratigraphic ranges and basinal occurrences of species, subspecies and varieties in Indian sedimentaries, the Indian records of such species, subspecies and varieties which have been transferred, as well as of reassessed specimens are given under the heads of their respective latest assignment, consequent upon reassessment.

e.g.: **Spiniferites twistringiensis** (Maier, 1959) Fensome *et al.*, 1990.

Achomosphaera cambra Sah *et al*., 1970.*In*: Sah *et al.*, 1970: 144, pl. 1, fig. 3, LATE CRETACEOUS (Langpar Formation), Meghalaya.

Spiniferites ramosus subsp. *multibrevis* (Davey & Williams, 1966a) Lentin & Williams, 1973. *In*: Dutta & Jain, 1980: 69, pl. 6, fig. 51, EARLY -MIDDLE EOCENE (Sylhet Formation), Jaintia Hills, Meghalaya; Jain & Garg, 1986b: 120, pl. 2, fig. 8, LATE PALAEOCENE, Vriddhachalam area, Cauvery Basin, Tamil Nadu; Jain & Garg, 1991: 70-71, pl. 4, fig. 6, MIOCENE (Khari Nadi Formation), Kutch, Gujarat (Restudy of Kar, 1985).

Spiniferites bulloideus (Deflandre & Cookson, 1955) Sarjeant, 1970. *In*: Kar, 1985: 209, pl. 50, figs 1,2, MIO-CENE (Khari Nadi Formation), Kutch, Gujarat (Reallocated by Jain & Garg, 1991)

At places there is slight deviation from the above sequence of details which is due to non availability of required data in the respective publication. Articles and recommendations of I.C.B.N. have been applied wherever required. Orthographic changes are also dealt with.

e.g.: *Batiacasphaera crassicingulata* (Burger, 1980b) Kumar, 1986a. **NOW Levisphaera crassicingulata** (Burger, 1980b) Davey, 1988. (Orthographic change: Kumar, 1986a listed *B. crassiangulata*)

Latest provincial (State) boundaries have been considered and the new names are maintained. The name "Kutch" has been maintained with reference to Basin instead of "Kachchh" which is in usage for the district name in Gujarat State. The Middle Eocene dinoflagellate cyst assemblage described by Jain & Tandon (1981) has been reproduced by Kar (1985) without mentioning the source, hence wherever required its reference is made "reproduction from Jain & Tandon 1981".

In the end, authors would like to thank Dr. H.P. Singh for critically reviewing the manuscript, providing helpful suggestions and P.K. Bajpai for drawing outline sketch for the cover photo.

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Rahul Garg
Naresh C. Mehrotra

ACHILLEODINIUM Eaton, 1976.

Achilleodinium biformoides (Eisenack, 1954b) Eaton, 1976. *In*: Sarkar, 1991: 2, pl. I, figs 4, 10, EARLY EOCENE (Kakara Series, Lesser Himalaya), Kakara-Chapla group of villages, Simla, Himachal Pradesh; Sarkar & Prasad, 2000b: 141, LATE YPRESIAN – EARLY LUTETIAN (Subathu Formation, Morni Hills), Haryana; Mehrotra *et al*., 2005: 61, YPRESIAN (53 – 51 Ma), Mumbai Offshore.

Achilleodinium latispinosum (Davey & Williams, 1966b) Bujak *et al.*, 1980.

Cordosphaeridium latispinosum Davey & Williams, 1966b. *In*: Jain & Tandon, 1981: 8, pl. 2, fig. 25, MIDDLE EOCENE (Harudi Formation), Kutch, Gujarat; Kar, 1985: 187-188, MIDDLE EOCENE (Harudi Formation), Kutch, Gujarat.

Achilleodinium palaeoeocenicum Khanna & Singh, 1981b. *In*: Khanna & Singh, 1981b: 400, 402, pl. 3, fig. 1, text-fig. 13, LATE PALAEOCENE-EOCENE (Subathu Formation), Simla Hills, Punjab Basin, Himachal Pradesh.

Achilleodinium palaeocenicus Singh *et al.*, 1979. *In*: Singh *et al.*, 1979: 35-36, text-fig. 1, LATE PALAEOCENE - LATE EOCENE (Subathu Formation), Simla Hills, Punjab Basin, Himachal Pradesh.(Name not validly published)

Achilleodinium palaeoeocenicus Khanna, 1979. *In*: Khanna, 1979: 218, LATE PALAEOCENE - LATE EOCENE (Subathu Formation), Simla Hills, Punjab Basin, Himachal Pradesh. (Name not validly published)

Achilleodinium sp. *In*: Singh & Khanna, 1980: 471, pl. 2, fig. 3, LATE PALAEOCENE-LATE EOCENE (Subathu Formation), Punjab Basin, Himachal Pradesh.

ACHOMOSPHAERA Evitt, 1963.

Achomosphaera alcicornu (Eisenack, 1954b) Davey & Williams, 1966a. *In*: Jain & Garg, 1986b: 106, pl. 4, fig. 6, LATE PALAEOCENE, Vriddhachalam area, Cauvery Basin, Tamil Nadu; Jain & Garg, 1991: 70-71, pl. 2, fig. 9, MIOCENE (Khari Nadi Formation), Kutch, Gujarat (Restudy of Kar, 1985); Saxena & Sarkar, 2000: 256, 263, MIDDLE EOCENE (Siju Formation), Simsang River near Siju, South Garo Hills, Meghalaya; Mehrotra & Kamla Singh, 2003: 10, pl. 12, figs 1 & 2, MIDDLE MIOCENE (ONGC well SSY- A, 1655 – 1680m), Krishna-Godavari Basin, Andhra Pradesh; MIDDLE MIOCENE – LATE OLIGOCENE (ONGC well GS- 15- D, 2050 – 2845m), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 61-62, THANETIAN – PRIABONIAN TOP (56,8 – 33.7 Ma) ex Mehrotra *et al*., 2003, Mumbai Offshore; LATE OLIGOCENE – MIDDLE MIOCENE ex Mehrotra & Kamla Singh, 2003, Krishna-

Godavari Basin, Andhra Pradesh; MIDDLE EOCENE ex Saxena & Sarkar, 2000, Assam-Arakan Basin, Northeastern India.

Cordosphaeridium cantharellum (Brosius, 1963) Gocht, 1969. *In*: Kar, 1985: 70, pl. 48, fig. 2, MIOCENE (Khari Nadi formation), Kutch, Gujarat. (Reallocated by Jain & Garg, 1991)

Cordosphaeridium exilimurum Davey & Williams, 1966b. *In*: Kar, 1985: 203, pl. 48, fig. 4, MIOCENE (Khari Nadi Formation), Kutch, Gujarat (Reallocated by Jain & Garg, 1991)

Achomosphaera cambra Sah *et al.*, 1970. **NOW Spiniferites twistringiensis** (Maier, 1959) Fensome *et al.*, 1990. (Jain, 1982, p. 51 considered *A. Cambra* to be a taxonomic junior synonym of *Hystrichosphaera ramosa* var *multibrevis* **now** *Spiniferites twistringiensis*)

Achomosphaera ?convexa Sah *et al.*, 1970. *In*: Sah *et al.*, 1970: 145, pl. 1, figs 12-13, LATE CRETACEOUS (Langpar Formation), Meghalaya.

Achomosphaera crassipellis (Deflandre & Cookson, 1955) Stover & Evitt, 1978.

Spiniferites crassipellis (Deflandre & Cookson, 1955) Sarjeant, 1970. *In*: Jain, 1977b: 177, pl. 3, fig. 38, EARLY ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

Spiniferites membranosus (Archangelsky, 1969) Lentin & Williams, 1973. *In*: Saxena & Sarkar, 2000: 256, pl. 1, fig. 4, MIDDLE EOCENE (Siju Formation), Simsang River near Siju, South Garo Hills, Meghalaya.

Achomosphaera ?delicata Sah *et al.*, 1970. *In*: Sah *et al.*, 1970: 144, pl. 1, figs 4-5, LATE CRETACEOUS (Langpar Formation), Meghalaya. (Questionable assignment: Stover & Evitt, 1978)

Achomosphaera ?globata Sah *et al.*, 1970. *In*: Sah *et al.*, 1970 : 145, pl. 1, figs 10-11, LATE CRETACEOUS (Langpar Formation), Meghalaya. (Questionable assignment: Stover Evitt, 1978)

Achomosphaera microreticulata Salujha & Kindra, 1981. *In*: Salujha & Kindra, 1981: 51, pl. 2, figs 47-48, DANIAN (Langpar Formation), Meghalaya. (Jain & Garg, 1982 reassessed the age of this assemblage to be Latest Cretaceous-Danian)

Achomosphaera microtriaina (Klumpp, 1953) Sarjeant, 1981 **NOW Operculodinium microtriainum** (Klumpp, 1953) Islam, 1983 emend Sarjeant, 1981.

Achomosphaera multifurcata Jain & Tandon, 1981. *In*: Jain & Tandon, 1981: 7, pl. 1, fig. 10, MIDDLE EOCENE (Harudi Formation), Kutch, Gujarat; Kar. 1985: 185, MIDDLE EOCENE (Harudi Formation), Kutch, Gujarat, (reproduction from Jain & Tandon, 1981); Sarkar & Prasad, 2000b: 141, pl. I, fig. 6, LATE YPRESIAN – MIDDLE LUTETIAN (Subathu Formation, Morni Hills), Haryana.

Achomosphaera neptuni (Eisenack1958a) Davey & Williams, 1966a. *In*: Kumar, 1986a: 27 (with questionable assignment), VALANGINIAN - HAUTERIVIAN (ONGC bore core nos. 1&3). Krishna--Godavari Basin, Andhra Pradesh. (Garg *et al.*, 1988 reassessed the age of this assemblage to be Hauterivian-Barremian); Khowaja-Ateequzzaman & Jain, 1992: 139, pl. 4, fig. 10; pl. 6, fig. 11; pl. 11, figs 13, 15, HAUTERIVIAN - BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu; Mehrotra & Aswal, 1993: 12, pl. 32, figs 1-2, pl. 34, figs 3 & 5, APTIAN – OXFORDIAN (ONGC well RCPM– A, 2040 – 3045m, Golapalli and Raghavapuram formations), Krishna-Godavari Basin, Andhra Pradesh; TITHONIAN – VALANGINIAN (ONGC well DRK– A, 2045 – 2160m, Raghavapuram Shale), Krishna-Godavari Basin, Andhra Pradesh; TITHONIAN – LATE APTIAN (ONGC well MVD– A, 1855 – 2305m, Golapalli & Raghavapuram formations), Krishna-Godavari Basin, Andhra Pradesh:

Mehrotra *et al*., 2005: 41, OXFORDIAN – APTIAN *ex* Mehrotra & Aswal, 2003, Krishna-Godavari Basin, Andhra Pradesh.

Achomosphaera operculata Sah *et al.*, 1970 **NOW Operculodinium operculatum** (Sah *et al.*,1970) Jain, 1982.

Achomosphaera operculata Sah *et al.*, 1970. *In*: Salujha & Kindra, 1981: 51, pl. 2. figs 43-44 = **Achomosphaera ramulifera** (Deflandre, 1937b) Evitt. 1963. (According to Jain & Garg, 1982)

Achomosphaera ramulifera (Deflandre, 1937b) Evitt. 1963. *In*: Jain & Tandon, 1981: 7, pl. 1. fig. 8, MIDDLE EOCENE (Harudi Formation), Kutch. Gujarat; Saxena & Rao, 1984: 56, pl. 2, fig. 17, LOWER MIOCENE (Bhuban Formation), Jaintia Hills, Meghalaya & Assam; Kar, 1985: 185, MIDDLE EOCENE (Harudi Formation), Kutch, Gujarat. (reproduction from Jain & Tandon. 1981); Kar, 1985: 202, pl. 48, fig. 1, MIOCENE (Khari Nadi Formation) , Kutch, Gujarat ; Jain & Garg, 1986b: 107, LATE PALAEOCENE, Vriddhachalam area, Cauvery Basin, Tamil Nadu; Kumar, 1986a: 27, VALANGINIAN-HAUTERIVIAN (ONGC bore core no. 3), Krishna-Godavari Basin, Andhra Pradesh, (Garg *et al.,* 1988 reassessed the age of this assemblage to be Hauterivian-Barremian); Singh & Sarkar, 1992: 185, pl. 1, fig. 5, LATE PALAEOCENE?-EOCENE (Subathu Formation), Garkhal area, Punjab Basin, Himachal Pradesh; Mehrotra *et al*., 1996: 685, RUPELIAN - BERDIGALIAN (ONGC well Gulf- 1, Tarapur Shale, Babaguru and Post Babaguru formations), Gulf of Cambay, Gujarat; Sarkar, 1997: 102, pl. 2, fig. 10, LATE YPRESIAN – LUTETIAN (Subathu Formation, Bilaspur area), Punjab Basin, Himachal Pradesh; Sarkar & Prasad, 2000b: 141, LATE YPRESIAN – MIDDLE LUTETIAN (Subathu Formation, Morni Hills), Haryana; Saxena & Sarkar, 2000: 256, 263, MIDDLE EOCENE (Siju Formation), Simsang River near Siju, South Garo Hills, Meghalaya; Khowaja-Ateequzzaman & Garg, 2002: 136, MIDDLE - LATE TURONIAN (Kulakkalnattam Sandstone Member, Garudamangalam Formation), Cauvery Basin, southern India; Mehrotra & Kamla Singh, 2003: 9, pl. 12, figs 3 – 6, PLIOCENE – EARLY EOCENE (ONGC well MGP- A, 120 – 3025m), Krishna-Godavari Basin, Andhra Pradesh; PLIOCENE AND YOUNGER – MIDDLE EOCENE (ONGC well SSY- A, 40 – 2100m, Godavari and Ravva formations), Krishna-Godavari Basin, Andhra Pradesh; LATE MIOCENE AND YOUNGER TO PALAEOCENE (ONGC well MNP- A, 325 – 2855m), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 61, OLIGOCENE – EARLY MIOCENE *ex* Mehrotra *et al*., 1996, Cambay Basin, Gujarat; PALAEOCENE – PLIOCENE *ex* Mehrotra & Kamla Singh, 2003, Krishna-Godavari Basin, Andhra Pradesh; MIDDLE EOCENE *ex* Saxena & Sarkar, 2000, Assam-Arakan Basin, North-eastern India.

Achomosphaera operculata Sah *et al.*, 1970. *In*: Salujha & Kindra. 1981: 51, pl. 2, figs 43-44, DANIAN (Langpar Formation), South Shillong Front, Meghalaya. (Jain & Garg, 1982, reassessed the age of this assemblage to be Latest Cretaceous-Danian).

Homotryblium distinctum Salujha & Kindra, 1981. *In*: Salujha & Kindra, 1981: 51. pl. 2. fig. 46, DANIAN (Langpar Formation), South Shillong Front. Meghalaya, (Jain & Garg, 1982 reassessed the age of this assemblage to be Latest Cretaceous-Danian).

Hystrichosphaeridium ramuliferum Deflandre, 1937. *In*: Banerjee & Misra, 1972, pl. 2, fig. 23, EOCENE- MIOCENE, Assam and Tripura.

Achomosphaera sp. cf. **A, ramulifera** (Deflandre, 1937b) Evitt, 1963. *In*: Jain, 1978: 149, pl. I, fig. 4, LATEST MAASTRICHTIAN (Kallankurchi Formation), Vriddhachalam area, Cauvery Basin, Tamil Nadu.

Achomosphaera regiensis Corradini, 1973. *In*: Mehrotra & Sarjeant 1987: 154, pl. 3, figs 1-2, 5, MAASTRICHTIAN (Narsapur well- I), Krishna- Godavari Basin, Andhra Pradesh.

Achomosphaera ?robusta Sah *et al.*, 1970. *In*: Sah *et al.*, 1970: 145, pl. 1, figs 6-7, LATE CRETACEOUS (Langpar Formation), Meghalaya. (Questionable assignment: Stover & Evitt, 1978)

Achomosphaera sagena Davey & Williams, 1966a. *In*: Saxena & Rao, 1984: 56-57, pl. 2, figs 18-19, EARLY MIOCENE (Renji Formation), Jaintia Hills, Meghalaya and Assam.

Achomosphaera cf. **A. sagena** Davey & Williams, 1966a. *In*: Mehrotra & Sarjeant, 1986: 717, pl. 3, figs 1-2, 4, 5; pl. 4, figs 3-5, HAUTERIVIAN-APTIAN (Periyavadavadi shallow well- I), Cauvery Basin, Tamil Nadu.

Achomosphaera recurvata Jain *et al.*, 1975. *In*: Jain *et al.*, 1975: 8, pl. 3, figs 36-37, 39, MAASTRICHTIAN (Jadukata Formation), Meghalaya.

Achomosphaera transculenta (Sah *et al.*, 1970) Jain, 1982.

Hystrichosphaeridium transculentum Sah *et al.*, 1970. *In*: Sah *et al.*, 1970: 147, pl. 2, figs 18-19, LATE CRETACEOUS (Langpar Formation), Meghalaya.

Achomosphaera triangulata (Gerlach, 1961) Davey & Williams, 1969 emend. Sarjeant, 1984b. *In*: Saxena & Sarkar, 2000: 256, 263, pl. 1, fig. 9, MIDDLE EOCENE (Siju Formation), Simsang River near Siju, South Garo Hills, Meghalaya.

Achomosphaera tridactylites (Valensi, 1955a) Deflandre & Sarjeant, 1970 **NOW Florentinia tridactylites** (Valensi, 1955a) Duxbury, 1980.

Achomosphaera valianta Sah *et al.*,1970. **NOW Cordosphaeridium exilimurum** Davey & Williams, 1966b, (Taxonomic senior synonym, according to Jain, 1982, p. 52).

Achomosphaera sp. *In*: Sah *et al.*, 1970: 146, pl. 1, fig. 14, LATE CRETACEOUS (Langpar Formation), Meghalaya.

Achomosphaera sp. *In*: Salujha & Kindra, 1981: 57, pl. 2. fig. 51, DANIAN (Langpar Formation), Meghalaya, (Jain & Garg, 1982 reassessed the age of this assemblage to be Latest Cretaceous-Danian).

Achomosphaera sp. *In*: Jain & Garg, 1982.

Hystrichokolpoma robusta Salujha & Kindra, 1981: 52, pl. 3, fig. 56, DANIAN (Langpar Formation), Meghalaya, (Jain & Garg, 1982 reassessed the age of this assemblage to be Latest Cretaceous-Danian).

Achomosphaera sp. *In*: Sarkar & Singh, 1988: 37, pl. 1, figs 15-16, EOCENE (Subathu Formation), Simla Hills, Himachal Pradesh.

Achomosphaera sp. *In*: Nandi, 1990: 126, pl. 5, figs 5-6, LATE MAASTRICHTIAN-DANIAN, Meghalaya.

Achomosphaera sp. *In*: Rao, 1990: 249, pl. 3, fig. 20, OLIGOCENE (Arthangal borehole), Alleppy, Kerala.

Achomosphaera sp. *In*: Garg & Khowaja-Ateequzzaman, 2000: 471, LATE THANETIAN (Lakadong Sst Member, Sylhet Limestone Formation), Cherrapunji area, Khasi Hills, Meghalaya.

Achomosphaera sp. *In*: Khowaja-Ateequzzaman & Garg, 2002: 136, EARLY - LATE TURONIAN (Kulakkalnattam Sandstone Member, Garudamangalam Formation), Cauvery Basin, southern India.

Achomosphaera sp. *In*: Mandal *et al.*, 2003: 104, EARLY EOCENE (Baratang Formation), Andaman-Nicobar Islands.

Achomosphaera sp. A. *In*: Khowaja-Ateequzzaman & Jain, 1992: 139-140, pl. 10, figs 7, 8; pl. 11, figs 1, 4, HAUTERIVIAN-BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu.

Achomosphaera sp. B. *In*: Khowaja-Ateequzzaman & Jain, 1992: 140, pl. 11, fig. 3; pl. 12. fig. 12, HAUTERIVIAN-BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu.

ADNATOSPHAERIDIUM Williams & Downie, 1966 emend. Stancliffe & Sarjeant, 1990.

Adnatosphaeridium aemulum (Deflandre, 1939a) Williams & Downie, 1969. **NOW Rigaudella aemula** (Deflandre) Below, 1982 emend. Below, 1982b.

Adnatosphaeridium cf. **A. caulleryi** (Deflandre, 1939a) Williams & Downie, 1969 emend. Stancliffe & Sarjeant, 1990.

Cannosphaeropsis cf. C. *caulleryi* (Deflandre, 1939a) Sarjeant, 1961a. *In*: Banerjee & Misra, 1972: 208, pl. 2, fig. 25, TERTIARY, Assam and Tripura.

Adnatosphaeridium filamentosum (Cookson & Eisenack, 1958) Williams & Downie, 1969. **NOW Rigaudella filamentosa** (Cookson & Eisenack, 1958) Below, 1982b.

Adnatosphaeridium multispinosum Williams & Downie, 1966c. *In*: Jain & Garg, 1986: 107, pl. 4, fig. 7, LATE PALAEOCENE, Vriddhachalam area, Cauvery Basin, Tamil Nadu: Singh & Sarkar, 1987: 208, pl. 1, fig. 23, EOCENE (Subathu Formation), Banethi Bagthan area, Simla Hills, Himachal Pradesh; Sarkar & Singh, 1988: 38, pl. 1, figs 5-6, EOCENE (Subathu Formation), Banethi-Bagthan area, Himachal Pradesh; Jain & Garg, 1991: 60-61, pl. 1, fig. 7, EARLY EOCENE (restudy of Lakhpat bore-hole 1 described by Kar, 1985), Kutch, Gujarat; Sarkar, 1991: 3, pl. I, fig. 14, EARLY EOCENE (Kakara Series, Lesser Himalaya), Kakara-Chapla group of villages, Simla, Himachal Pradesh; Singh & Sarkar, 1992: 185, pl. 1, fig. 4, LATE PALAEOCENE?-EOCENE (Subathu Formation), Garkhal area, Punjab Basin, Himachal Pradesh; Aswal & Pundeer, 1996: 636, pl. 2, figs 6 & 8, THANETIAN – LUTETIAN-BARTONIAN (ONGC Mori well-A, 3200 – 1600m), Krishna-Godavari Basin, Andhra Pradesh; Sarkar, 1997: 102, LATE YPRESIAN – LUTETIAN (Subathu Formation, Bilaspur area), Punjab Basin, Himachal Pradesh; Garg & Khowaja-Ateequzzaman, 2000: 471, pl. 3, fig. 3, LATE THANETIAN (Lakadong Sst Member, Sylhet Limestone Formation), Cherrapunji area, Khasi Hills, Meghalaya; Sarkar & Prasad, 2000a: 170, LATE YPRESIAN (Subathu Formation, Koshalia Nala Section), Shimla Hills; Sarkar & Prasad, 2000b: 141, pl. II, fig. 7, EARLY - MIDDLE LUTETIAN (Subathu Formation, Morni Hills), Haryana; Mehrotra & Kamla Singh, 2003:12, pl. 20, figs 4 & 6, EARLY OLIGOCENE – LATE PALAEOCENE (ONGC well, Mori- A, 1500 – 3145m, Matsyapuri Sandstone, Bhimapalli Limestone and Pasarlapudi Formation), Krishna-Godavari Basin, Andhra Pradesh; PRIABONIAN – THANETIAN (ONGC well RZL- A, 1310 – 2960m, Matsyapuri Sandstone, Bhimapalli Limestone, Pasarlapudi Formation and Palakollu Shale), Krishna-Godavari Basin, Andhra Pradesh; BARTONIAN (ONGC well KSP- A, 2520 – 2525m), Krishna-Godavari Basin, Andhra Pradesh; BARTONIAN – THANETIAN (ONGC well MGP- A, 2045 – 3130m), Krishna-Godavari Basin, Andhra Pradesh; YPRESIAN (ONGC well MNP- A, 1425 – 3030m, Bhimapalli Limestone, Pasarlapudi Formation and Palakollu Shale), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 62, YPRESIAN – RUPELIAN 952 – 33 Ma) ex Mehrotra *et al*., 2003, Mumbai Offshore; SELANDIAN – THANETIAN ex Mehrotra *et al*., 2002, Cauvery Basin, Tamil Nadu; LATE PALAEOCENE (SELANDIAN) – EARLY OLIGOCENE ex Mehrotra & Kamla Singh, 2003, Krishna-Godavari Basin, Andhra Pradesh.

Glaphyrocysta pastielsii (Deflandre & Cookson) Stover & Evitt, 1978. *In*: Kar, 1985, Kar. 1985: 182, 189-190, pl. 40, fig. 7, EARLY EOCENE (Lakhpat bore-hole 1), Kutch, Gujarat. (Reallocated by Jain & Garg, 1991)

Nematosphaeropsis densiradiata (Cookson & Eisenack, 1962b) Stover & Evitt, 1978. *In*: Kar, 1985: 184-185, pl. 40, figs 11-12, EARLY EOCENE (Lakhpat bore hole- 1), Kutch, Gujarat. (Reallocated by Jain & Garg, 1991) .

Adnatosphaeridium paucispinum (Klement, 1960) Gitmez & Sarjeant, 1972. **NOW Rigaudella aemula** (Cookson & Eisenack, 1958) Below, 1982b.

Adnatosphaeridium robustum (Morgenroth,1960) de Coninck, 1975. *In*: Tripathi & Singh, 1984, text-fig. 3, PALAEOCENE (Therria Formation), Jaintia Hills, Meghalaya; Jain & Garg, 1986: 107, pl. 6, fig. 13, LATE PALAEOCENE, Vriddhachalam area, Cauvery Basin, Tamil Nadu; Singh & Tripathi, 1986: 303, PALAEOCENE (Therria Formation), Meghalaya.

Adnatosphaeridium vittatum Williams & Downie, 1966c. *In*: Jain & Tandon, 1981: 7, pl. 3, fig. 48, MIDDLE EOCENE (Harudi Formation), Kutch, Gujarat; Saxena & Rao, 1984: 54-55, pl. I, figs 5, 7, OLIGOCENE (Laisong Formation), Jaintia Hills, Meghalaya; Tripathi & Singh, 1984, text-fig. 3, PALAEOCENE- EOCENE (Therria and Kopili formations), Jaintia Hills, Meghalaya; Kar, 1985: 185-186, MIDDLE EOCENE (Harudi Formation), Kutch, Gujarat, (reproduction from Jain & Tandon, 1981); Jain & Garg, 1986: 108, pl. 4, figs 5, 8, LATE PALAEOCENE, Vriddhachalam area, Cauvery Basin, Tamil Nadu; Saxena, Rao & Singh, 1987: 152, pl. 1, fig. 1, OLIGOCENE (Laisong Formation), Jaintia Hills, Meghalaya; Singh & Sarkar, 1987: 208, EOCENE (Subathu Formation), Banethi Bagthan area, Himachal Pradesh; Singh & Tripathi, 1987: 303, PALAEOCENE-EOCENE (Therria, Sylhet and Kopili formations), Meghalaya; Sarkar & Singh, 1988: 38, pl. 1, figs 18-19, EOCENE (Subathu Formation), Banethi-Bagthan area, Himachal Pradesh; Tripathi, 1989: 72, pl. 2, fig. 1, PALAEOCENE-EOCENE (Therria & Kopili formations), Meghalaya; Sarkar, 1997: 102, pl. 1, fig. 2, LATE YPRESIAN – LUTETIAN (Subathu Formation, Bilaspur area), Punjab Basin, Himachal Pradesh; Sarkar & Prasad, 2000a: 170, LATE YPRESIAN (Subathu Formation, Koshalia Nala Section), Shimla Hills; Sarkar & Prasad, 2000b: 141, pl. I, fig. 9, LATE YPRESIAN – MIDDLE LUTETIAN (Subathu Formation, Morni Hills), Haryana; Saxena & Sarkar, 2000: 256, 263, MIDDLE EOCENE (Siju Formation), Simsang River near Siju, South Garo Hills, Meghalaya; Mehrotra & Kamla Singh, 2003: 11, pl. 13, figs 1 & 2, DANIAN (ONGC well MNP- A, 2950 – 2955m), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 62, DANIAN ex Mehrotra & Kamla Singh, 2003, Krishna-Godavari Basin, Andhra Pradesh; MIDDLE EOCENE ex Saxena & Sarkar, 2000, Assam-Arakan Basin, Northeastern India.

Adnatosphaeridium sp. Mehrotra & Sinha, 1981 = **Dinocyst type A**, (According to Jain & Garg, 1986a).

AIORA Cookson & Eisenack, 1960a.

Aiora fenestrata (Deflendre & Cookson, 1955) Cookson & Eisenack, 1960a. *In*: Khowaja-Ateequzzaman & Garg, 2002: 136, pl. 3, figs 5, 12, MIDDLE - LATE TURONIAN (Kulakkalnattam Sandstone Member, Garudamangalam Formation), Cauvery Basin, southern India.

ALDORFIA Stover & Evitt, 1978.

Aldorfia aldorfensis (Gocht, 1970b) Stover & Evitt, 1978. *In*: Garg *et al*., 2003: 52-53, pl, II, fig. 8, EARLY LOWER TITHONIAN (*Uhligites* Ammonite, Lower part of Middle Division of Spiti Shale Formation, Laptal Section); LATE LOWER TITHONIAN (*Hildoglochiceras* Ammonite, Middle part of the Middle Division, Spiti Shale Formation, Laptal Section); LATE LOWER TITHONIAN (*Paraboliceras* Ammonite, Upper part of the Middle Division, Spiti Shale Formation, Kibber Section); LATE UPPER TITHONIAN (*Blanfordiceras* Ammonite); LATE UPPER TITHONIAN – BERRIASIAN-EARLY VALANGINIAN (*Pterolytoceras* Ammonite,

Upper levels of the Upper Division, Spiti Shale Formation), Malla Johar area, Kumaon Himalaya.

Aldorfia dictyophora (Deflendre, 1939a ex Sarjeant, 1967b) Stover & Evitt, 1978. **NOW Scriniodinium dictyophorum** (Deflandre, 1939a ex Sarjeant, 1967b) Brenner, 1988.

Aldorfia dictyota (Cookson & Eisenack, 1960b) Davey, 1982b. *In*: Garg *et al.*, 2003: 52-53, pl, V, fig. 13, LATE LOWER TITHONIAN (*Kosmatia* Ammonite, Middle Division, Spiti Shale Formation, Kibber Section of Spiti Valley), Malla Johar area, Kumaon Himalaya.

Aldorfia dictyota subsp. **papillata** (Gitmez, 1970) Jan du Chêne *et al.,* 1986a.

Scriniodinium dictyotum subsp. *papillatum* Gitmez, 1970. *In*: Jain *et al.*, 1986: 80, pl. 2, fig. 29; pl. 3, figs 40; 47, LATE JURASSIC, Kutch, Gujarat.

ALISOCYSTA Stover & Evitt, 1978

Alisocysta margarita (Harland, 1979a) Harland 1979a. *In*: Mehrotra *et al.*, 2005: 62, THANETIAN (54.8 Ma) ex Mehrotra *et al.*, 2002, Mumbai Offshore; THANETIAN (54.8 Ma) ex Mehrotra *et al.*, 2002, Assam-Arakan Basin, Northeastern India.

Alisocysta reticulate Damassa, 1979b. *In*: Mehrotra *et al.*, 2005: 62, YPRESIAN (52.0 Ma), Mumbai Offshore.

ALISOGYMNIUM Lentin & Vozzhennikova, 1990

Alisogymnium assamicum Lentin & Vozzhennikova, 1990. *In*: Mehrotra *et al.*, 2005 : 41, MAASTRICHTIAN ex Mehrotra *et al.*, 2002, Assam-Arakan Basin.

Dinogymnium assamicum Jain *et al.*, 1975. *In*: Jain *et al.*, 1975: 4, pl. 2, figs 28-29, LATE MAASTRICHTIAN (Mahadeo Formation), Meghalaya.

Alisogymnium sphaerocephalum (Vozzhennikova, 1967) Lentin & Vozzhennikova, 1990.

Dinogymnium sphaerocephalum (Vozzhennikova, 1967) Lentin & Williams, 1990. *In:* Kumar *et al.*, 1996: 150, LATE MAASTRICHTIAN (Upper part of Mahadeo Formation, Um Sohryngkew River Section), Meghalaya.

ALTERBIDINIUM Lentin & Williams, 1985.

Alterbidinium acutulum (Wilson, 1967b) Lentin & Williams, 1985 emend. Khowaja-Ateequzzaman *et al.*, 1991. *In*: Khowaja-Ateequzzaman *et al.*, 1991: 41-42, pl. 2, figs 1-4, 7-9; text fig. 4 A-B, TURONIAN – SANTONIAN (Trichinopoly Formation, Cauvery Basin, Tamil Nadu. (Khowaja-Ateequzzaman & Garg, 2002 reassessed the age to be Middle Turonian); Khowaja-Ateequzzaman & Garg, 2002: 136, MIDDLE TURONIAN (Kulakkalnattam Sandstone Member, Garudamangalam Formation), Cauvery Basin, southern India.

Alterbidinium minus (Alberti, 1959b) Lentin & Williams, 1985 emend. Khowaja-Ateequzzaman *et al.*, 1991. *In*: Khowaja-Ateequzzaman *et al.*, 1991: 44-45, pl. 1, figs 8 -9, TURONIAN – SANTONIAN (Trichinopoly Formation, Cauvery Basin, Tamil Nadu. (Khowaja-Ateequzzaman & Garg, 2002 reassessed the age to be EARLY -MIDDLE TURONIAN); Khowaja-Ateequzzaman & Garg, 2002: 136, pl. 3, figs 5, 12, EARLY - MIDDLE TURONIAN (Kulakkalnattam Sandstone Member, Garudamangalam Formation), Cauvery Basin, southern India.

Alterbidinium papillatum Khowaja-Ateequzzaman *et al.*, 1991. *In*: Khowaja-Ateequzzaman *et al.*, 1991: 38, 41-42, pl. 1, figs 1-7; pl. 2, figs 5-6; text figs 1 A-B, 2A-B, 3A-B, TURONIAN – SANTONIAN (Trichinopoly Formation, Cauvery Basin, Tamil Nadu. (Khowaja-Ateequzzaman & Garg, 2002 reassessed the age of this assemblage to be MIDDLE TURONIAN); Khowaja-Ateequzzaman & Garg, 2002: 136, pl. 3, fig. 1, MIDDLE TURONIAN

(Kulakkalnattam Sandstone Member, Garudamangalam Formation), Cauvery Basin, southern India.

"AMPHIDINIUM" Claparede & Lachmann. 1859, (modern genus defined from the motile stage).

Amphidinium sibericum Vozzhennikova, 1965. (name not validly published). *In*: Jain *et al.*,1975: 7. pl. 1, figs 15-16, MAESTRICHTIAN (Jadukata Formation). Meghalaya.

AMPHOROSPHAERIDIUM Davey, 1969.

Amphorosphaeridium ?multispinosum (Davey & Williams, 1966b) Sarjeant, 1981. *In*: Jain & Garg, 1986: 108, pl. 1, fig. 8, LATE PALAEOCENE, Vriddhachalam area. Cauvery Basin, Tamil Nadu; Singh & Sarkar, 1992: 185, LATE PALAEOCENE?-EOCENE (Subathu Formation), Garkhal area, Punjab Basin, Himachal Pradesh; Garg & Khowaja-Ateequzzaman, 2000: 471, pl. 3, fig. 2, LATE THANETIAN (Lakadong Sst Member, Sylhet Limestone Formation), Cherrapunji area, Khasi Hills, Meghalaya. (Questionable assignment: Sarjeant, 1981)

Cordosphaeridium multispinosum Davey & Williams, 1966b. *In*: Dutta & Jain, 1980: 67, pl. 3, fig. 24, LATE PALAEOCENE (Sylhet Formation), Meghalaya; Khanna & Singh, 1981a, pl. 4, fig. 10, LATE PALAEOCENE- - LATE EOCENE (Subathu Formation), Simla Hills, Himachal Pradesh; Khanna *et al.*, 1981: 261, pl. 3, fig. 4, (Subathu Formation), Simla Hills. Himachal Pradesh; Saxena & Rao, 1984: 55, pl. 1, fig. 11, OLIGOCENE (Laisong Formation), Jaintia Hills, Meghalaya; Khanna *et al.*, 1985: 100, pl. 2, fig. 11, PALAEOGENE (Subathu Formation), Jammu Hills; Singh & Tripathi, 1987: 303. PALAEOCENE-EOCENE (Therria and Kopili formations). Meghalaya; Saxena. Rao & Singh. 1987; 152, pl. 1. fig. 10, OLIGOCENE (Laisong Formation), Jaintia Hills, Meghalaya.

Amphorosphaeridium cf. **A. ?multispinosum** (Davey & Williams, 1966b) Sarjeant, 1981. (Questionable assignment: Sarjeant, 1981)

Cordosphaeridium cf. C. *multispinosum* Davey & Williams, 1966b. *In*: Venkatachala & Kumar. 1980: 95, pl. 2, fig. 4, ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

Amphorosphaeridium ?robustum (Salujha & Kindra) Jain & Garg, 1982. (Questionable assignment: Jain & Garg, 1982)

Hystrichokolpoma robusta Salujha & Kindra, 1981. *In*: Salujha & Kindra, 1981: 52, pl. 3, fig. 55, DANIAN (Langpar Formation), Meghalaya, (Jain & Garg, 1982 re-assessed the age of this assemblage to be Latest Cretaceous-Danian).

Amphorosphaeridium sp. A *In*: Jain & Garg, 1986b: 108, pl. 5, fig. 6; pl. 6, figs 2, 3, LATE PALAEOCENE, Vriddhachalam area, Cauvery Basin, Tamil Nadu.

Amphorosphaeridium sp. *In*: Singh & Sarkar, 1992: 185, pl. 1, fig. 11, LATE PALAEOCENE?-EOCENE (Subathu Formation), Garkhal area, Punjab Basin, Himachal Pradesh.

AMPHORULA Dodekova, 1969 emend. Zotto *et al.*, 1987 emend. Monteil, 1990.

?Amphorula sp. *In*: Garg *et al.*, 2003: 52-53, pl, IV, figs 1, 6, LATE LOWER TITHONIAN (*Kosmatia* Ammonite, Middle Division, Spiti Shale Formation, Kibber Section of Spiti Valley); LATE LOWER TITHONIAN (*Paraboliceras* Ammonite, Upper part of the Middle Division, Spiti Shale Formation, Kibber Section), Malla Johar area, Kumaon Himalaya.

ANDALUSIELLA Reigel, 1974 emend. Reigel & Sarjeant, 1982 emend. Masure *et al.*, 1996.

Andalusiella polymorpha (Malloy, 1972) Lentin & Williams, 1977b. *In*: Kumar *et al.*, 1996: 150, pl. 1, figs 10, 11, LATE

MAASTRICHTIAN – DANIAN (Upper part of Mahadeo Formation, Um Sohryngkew River Section), Meghalaya.

Andalusiella sp. *In*: Mehrotra & Sarjeant, 1987: 168-169, pl. 1, fig. 1, pl. 2, fig. 3, pl. 6, fig. 4, MAASTRICHTIAN (Narsapur well-1), Krishna-Godavari Basin, Andhra Pradesh; Aswal & Pundeer, 1996: 636, pl. 1, figs 10, THANETIAN (ONGC Mori well-A, 3200 – 3120m), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra & Aswal, 2003:11, pl. 10, fig. 5, pl. 26, figs 5 & 6, MAASTRICHTIAN (ONGC well NSP- A, 3643 – 3649m, Chintalapalli Formation), Krishna-Godavari Basin, Andhra Pradesh; DANIAN (ONGC well Mori- A, 3195 – 3200m, Chintalapalli Formation), Krishna-Godavari Basin, Andhra Pradesh.

Andalusiella sp. *In*: Kumar *et al.*, 1996: 150, pl. 1, fig. 6a-b, 7; pl. 2, fig. 9, LATE MAASTRICHTIAN – DANIAN (Upper part of Mahadeo Formation, Um Sohryngkew River Section), Meghalaya.

APECTODINIUM (Costa & Downie, 1976) Lentin & Williams, 1977b.

Apectodinium augustum (Harland, 1979c) Lentin & Williams, 1981. *In*: Mehrotra & Kamla Singh, 2003:14, pl. 33, figs 1–3; pl. 35, fig. 4, THANETIAN (ONGC well NSP-A, 2703 – 2706m, Pasarlapudi Formation), Krishna-Godavari Basin, Andhra Pradesh; YPRESIAN (ONGC well RZL- A, 2705 – 2710m), Krishna-Godavari Basin, Andhra Pradesh; THANETIAN (ONGC well MNP-A, 2550 – 2900m), Krishna-Godavari Basin, Andhra Pradesh; THANETIAN TOP (ONGC well CTP- A, 3100 – 3105, Palakollu Shale), Krishna-Godavari Basin, Andhra Pradesh; THANETIAN (ONGC well BMP-A, 2700 – 2775m, Palakollu Shale), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 63, SELANDIAN - YPRESIAN ex Mehrotra & Kamla Singh, 2003, Krishna-Godavari Basin, Andhra Pradesh; SELANDIAN - THANETIAN ex Mehrotra *et al*., 2002, Assam-Arakan Basin, Northeastern India.

Apectodinium cf. **A. augustum** (Harland, 1979c) Lentin & Williams, 1981. *In*: Garg & Khowaja-Ateequzzaman, 2000: 471, pl. 1, figs 7, 8, LATE THANETIAN (Lakadong Sst Member, Sylhet Limestone Formation), Cherrapunji area, Khasi Hills, Meghalaya.

Apectodinium homomorphum (Deflandre & Cookson, 1955) Lentin & Williams, 1977b emend. Harland, 1979c. *In*: Mathur. 1986: 200. LUTETIAN-BARTONIAN (Kalol Formation. well no. 109). Cambay Basin. Gujarat; Aswal & Pundeer, 1996: 636, pl. 1, figs 19 & 22; pl. 2, fig. 3, THANETIAN - YPRESIAN (ONGC Mori well- A, 3200 – 2640m), Krishna-Godavari Basin, Andhra Pradesh; Garg & Khowaja-Ateequzzaman, 2000: 471, pl. 1, figs 10-12, LATE THANETIAN (Lakadong Sst Member, Sylhet Limestone Formation), Cherrapunji area, Khasi Hills, Meghalaya; Mehrotra & Kamla Singh, 2003: 13, pl. 34, fig. 5; pl. 35, fig. 6, YPRESIAN (ONGC well RZL- A, 2625 – 2920m, Palakollu Shale and Razole formations), Krishna-Godavari Basin, Andhra Pradesh; BARTONIAN (ONGC well BMP-A, 1950 – 1955m, Pasarlapudi Formation)Krishna-Godavari Basin, Andhra Pradesh; EARLY BARTONIAN (ONGC well GS- 21- A, 2800 – 2005m),Krishna-Godavari Basin, Andhra Pradesh; EARLY EOCENE (ONGC well Mori, A 2580 – 2625m, Pasarlapudi Formation), Krishna-Godavari Basin, Andhra Pradesh; BARTONIAN – LUTETIAN (ONGC well KSP- A, 2645 – 2790m), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 63, THANETIAN – BARTONIAN (55 – 41 Ma) ex Mehrotra *et al*., 2003, Mumbai Offshore; SELANDIAN – THANETIAN ex Mehrotra *et al*., 2002, Cauvery Basin, Tamil Nadu; YPRESIAN - BARTONIAN ex Mehrotra & Kamla Singh, 2003, Krishna-Godavari Basin, Andhra Pradesh; SELANDIAN - THANETIAN ex Mehrotra *et al*., 2002, Assam-Arakan Basin, Northeastern India.

Apectodinium hyperacanthum (Cookson & Eisenack, 1965b) Lentin & Williams, 1977b.

In: Garg & Khowaja-Ateequzzaman, 2000: 471, pl. 1, figs 2, 3, LATE THANETIAN (Lakadong Sst Member, Sylhet Limestone Formation), Cherrapunji area, Khasi Hills, Meghalaya; Mehrotra & Kamla Singh, 2003: 15, pl. 35, fig. 1, YPRESIAN (ONGC well RZL- A, 2500 – 2800m, Palakollu Shale), Krishna-Godavari Basin, Andhra Pradesh; THANETIAN (ONGC well RZL- A, 3110 – 3115m), Krishna-Godavari Basin, Andhra Pradesh; YPRESIAN TOP (ONGC well KSP-A, 2785 – 2790m), Krishna-Godavari Basin, Andhra Pradesh; THANETIAN – DANIAN TOP (ONGC well CTP- A, 3300 – 3600m), Krishna-Godavari Basin, Andhra Pradesh; YPRESIAN – THANETIAN (ONGC well BMP- A, 1980 – 2900m, Pasarlapudi and Palakollu formations), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 63, SELANDIAN - THANETIAN ex Mehrotra *et al*., 2002, Cauvery Basin, Tamil Nadu; SELANDIAN - YPRESIAN ex Mehrotra & Kamla Singh, 2003, Krishna-Godavari Basin, Andhra Pradesh; SELANDIAN - THANETIAN ex Mehrotra *et al*., 2002, Assam-Arakan Basin, Northeastern India.

Apectodinium sp. cf. **A. hyperacanthum** (Cookson & Eisenack, 1965b) Lentin & Williams, 1977b. *In*: Singh & Tripathi, 1987: 302. PALAEOCENE (Therria Formation). Meghalaya; Tripathi, 1988: 66, pl. 1, fig. 15, PALAEOCENE, (Therria Formation), Meghalaya.

Apectodinium longispinosum (Wilson, 1968) Bujak & Davies, 1983. *In*: Garg & Khowaja-Ateequzzaman, 2000: 471, pl. 2, fig. 4, LATE THANETIAN (Lakadong Sst Member, Sylhet Limestone Formation), Cherrapunji area, Khasi Hills, Meghalaya.

Apectodinium paniculatum (Costa & Downie. 1976) Lentin & Williams, 1977b. *In*: Jain & Garg, 1986b: 109, pl. 4, figs 1-2; pl. 5, figs 2.3, LATE PALAEOCENE, Vriddhachalam area, Cauvery Basin, Tamil Nadu; Garg & Khowaja-Ateequzzaman, 2000: 471, pl. 1, figs 1, 4, LATE THANETIAN (Lakadong Sst Member, Sylhet Limestone Formation), Cherrapunji area, Khasi Hills, Meghalaya; Mehrotra & Kamla Singh, 2003: 16, pl. 33, fig. 4; pl. 34, fig. 6, THANETIAN (ONGC well NSP- A, 2703 – 2706m, Pasarlapudi Formation), Krishna-Godavari Basin, Andhra Pradesh; THANETIAN (ONGC well MNP- A, 2575 – 2825m), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 63, SELANDIAN - THANETIAN ex Mehrotra *et al*., 2002, Cauvery Basin, Tamil Nadu; SELANDIAN - THANETIAN ex Mehrotra & Kamla Singh, 2003, Krishna-Godavari Basin, Andhra Pradesh; SELANDIAN - THANETIAN ex Mehrotra *et al*., 2002, Assam-Arakan Basin, Northeastern India.

Apectodinium parvum (Alberti, 1961) Lentin & Williams, 1977b emend. Harland, 1979. *In*: Dutta & Jain, 1980: 69, pl. 8, figs 68-73, EARLY MIDDLE EOCENE (Sylhet Formation), Meghalaya; Jain & Garg, 1986b: 109, pl. 4, figs 9, 13; pl. 5, fig. 4, LATE PALAEOCENE, Vriddhachalam area, Cauvery Basin, Tamil Nadu; Singh & Tripathi, 1987: 302, PALAEOCENE (Therria Formation), Meghalaya; Tripathi, 1989: 66, PALAEOCENE (Therria Formation), Meghalaya; Garg & Khowaja-Ateequzzaman, 2000: 471, pl. 1, fig. 9, LATE THANETIAN (Lakadong Sst Member, Sylhet Limestone Formation), Cherrapunji area, Khasi Hills, Meghalaya; Mehrotra & Kamla Singh, 2003: 17, pl. 34, figs 3 & 4; pl. 35, fig. 2, THANETIAN (ONGC well NSP- A, 2703 – 2706m, Pasarlapudi Formation), Krishna-Godavari Basin, Andhra Pradesh; THANETIAN (ONGC well MGP- A, 3125 – 3200m), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 64, SELANDIAN - THANETIAN ex Mehrotra & Kamla Singh, 2003, Krishna-Godavari Basin, Andhra Pradesh; SELANDIAN - THANETIAN ex Mehrotra *et al*., 2002, Assam-Arakan Basin, Northeastern India.

Apectodinium quinquelatum (Williams & Downie, 1966b) Costa & Downie, 1979. *In*: Jain & Garg 1986b: 110. pl. 4, figs 10, II, LATE PALAEOCENE, Vriddhachalam area,

Cauvery Basin, Tamil Nadu; Garg & Khowaja-Ateequzzaman, 2000: 471, pl. 1, figs 5, 6, LATE THANETIAN (Lakadong Sst Member, Sylhet Limestone Formation), Cherrapunji area, Khasi Hills, Meghalaya.

Apectodinium summissum (Harland, 1966b) Lentin & Williams, 1981. *In*: Jain & Garg, 1986b: 110, pl. 4, fig. 12, LATE PALAEOCENE, Vriddhachalam area, Cauvery Basin, Tamil Nadu.

Apectodinium sp. *In*: Mehrotra *et* al., 1996: 686, RUPELIAN - BERDIGALIAN (ONGC well Gulf- 2, Tarapur Shale and Babaguru formations), Gulf of Cambay, Gujarat.

Apectodinium sp. A *In*: Jain & Garg, 1986b: 110, pl. 3, fig. 10, LATE PALAEOCENE, Vriddhachalam area, Cauvery Basin, Tamil Nadu.

Apectodinium sp. A. *In*: Garg & Khowaja-Ateequzzaman, 2000: 471, pl. 2, figs 1-3, 5, LATE THANETIAN (Lakadong Sst Member, Sylhet Limestone Formation), Cherrapunji area, Khasi Hills, Meghalaya.

Apectodinium sp. B. *In*: Garg & Khowaja-Ateequzzaman, 2000: 471, pl. 2, figs 6, 9, LATE THANETIAN (Lakadong Sst Member, Sylhet Limestone Formation), Cherrapunji area, Khasi Hills, Meghalaya.

Apectodinium sp. 1. *In*: Mehrotra & Kamla Singh, 2003: 18, pl. 35, figs 3 & 5, THANETIAN (ONGC well NSP- A, 2600 – 2700m), Pasarlapudi Formation), Krishna-Godavari Basin, Andhra Pradesh.

Apectodinium sp. 2. *In*: Mehrotra & Kamla Singh, 2003: 19, pl. 34, figs 1 & 2, THANETIAN (ONGC well NSP- A, 2703 – 2706m, Pasarlapudi Formation), Krishna-Godavari Basin, Andhra Pradesh.

Apectodinium sp. 3. *In*: Mehrotra & Kamla Singh, 2003: 20, pl. 33, figs 5 & 6, THANETIAN (ONGC well NSP- A, 2703 – 2706m, Pasarlapudi Formation), Krishna-Godavari Basin, Andhra Pradesh; THANETIAN (ONGC well NSP- A, 3060 – 3065m, Palakollu Shale), Krishna-Godavari Basin, Andhra Pradesh.

APROBOLOCYSTA Duxbury, 1977 emend. Duxbury, 1980 emend. Mehrotra & Sarjeant, 1986 emend. Pourtoy, 1988.

Aprobolocysta alata Backhouse, 1987. *In*: Khowaja-Ateequzzaman & Jain, 1992: 140, pl. 10, figs 6, 9, HAUTERIVIAN-BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu.

Aprobolocysta eilema Duxbury, 1977. *In*: Khowaja-Ateequzzaman & Jain, 1992: 140, pl. 7, figs 11, 12, HAUTERIVIAN-BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu.

Aprobolocysta sp. *In*: Mehrotra & Sarjeant, 1986: 721, pl. 9, figs 4. 5, text-fig. 6, APTIAN (Periyavadavadi shallow well- I), Cauvery Basin, Tamil Nadu.

APTEA Eisenack, 1958a emend. Davey & Verdier, 1974 emend. Dörhöfer & Davies, 1980.

Aptea anaphrissa (Sarjeant, 1966c) Sarjeant & Stover, 1978. **NOW Pseudoceratium anaphrissum** (Sarjeant, 1966c) Bint, 1986 emend. Harding, 1990 b.

Aptea polymorpha Eisenack, 1958a emend. Dörhöfer & Davies, 1980.

Pseudoceratium polymorphum (Eisenack, 1958a) Bint, 1986. *In*: Mehrotra & Aswal, 2003: 90, pl. 19, figs 5 & 6, LATE APTIAN – BARREMIAN (ONGC well RCPM-A, 2075 – 2365m, Raghavapuram and Golapalli formations), Krishna-Godavari Basin, Andhra Pradesh; LATE ALBIAN – CENOMANIAN (ONGC well MVD- A, 1440 – 1585m, Raghavapuram Formation), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 58, BARREMIAN - CENOMANIAN *ex* Mehrotra & Aswal, 2003, Krishna-Godavari Basin, Andhra Pradesh.

Aptea sp. *In*: Kumar, 1982: 173, pl. 1. fig 3, NEOCOMIAN, Krishna-Godavari Basin, Andhra Pradesh.

APTEODINIUM Eisenack, 1958a emend. Sarjeant, 1985 emend. Lucas- Clark. 1987.

Apteodinium cf. **A. albertii** Lentin & Williams, 1981.

Apteodinium cf. *A. spinosum* (Alberti, 1961) Stover & Evitt, 1978. *In*: Kumar, 1986a: 27, pl. 1, fig. 1, VALANGINIAN-HAUTERIVIAN (ONGC bore core no. 4), Krishna-Godavari Basin, Andhra Pradesh. (Garg *et al.,* 1988 reassessed the age of this assemblage to be Hauterivian - Barremian).

Apteodinium conjunctum Eisenack & Cookson, 1960. **NOW Apteodinium maculatum** Eisenack & Cookson, 1960.

Apteodinium grande Cookson & Hughes, 1964. **NOW Apteodinium maculatum** subsp. **grande** (Cookson & Hughes, 1964) Below, 1981.

Apteodinium granulatum Eisenack, 1958 emend. Sarjeant, 1985 emend. Lucas-Clark, 1987. *In*: Venkatachala & Kumar, 1980: 101, ALBIAN (Dalmiapuram Formation), Cauvery Basin. Tamil Nadu; Jain *et al.*,1986: 76, pl. 2, fig. 31, LATE JURASSIC, Kutch, Gujarat: Kumar, 1986a: 27, VALANGINIAN-HAUTERIVIAN (ONGC bore core no. 8), Krishna-Godavari Basin, Andhra Pradesh, (Garg *et al.,* 1988 reassessed the age of this assemblage to be Hauterivian-Barremian); Khowaja-Ateequzzaman & Jain, 1992: 140, 142, pl. 4, fig. 6, HAUTERIVIAN-BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu.

Apteodinium maculatum Eisenack & Cookson, 1960. *In*: Jain *et al.*,1975: 7, 8, pl. 3, figs 42,44, MAASTRICHTIAN (Jadukata Formation), Meghalaya; Jain, 1978: 149, pl. 2, figs 17-18, LATEST MAASTRICHTIAN (Kallankurchi Formation), Vriddhachalam area, Cauvery Basin, Tamil Nadu; Kumar 1986a: 27, VALANGINIAN--HAUTERIVIAN (ONGC bore core nos. 1, 7), Krishna-Godavari Basin, Andhra Pradesh, (Garg *et al.,* 1988 reassessed the age of this assemblage to be Hauterivian-Barremian); Khowaja-Ateequzzaman & Jain, 1992: 142, pl. 12, fig. 7, HAUTERIVIAN-BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu; Mehrotra *et al*., 2005: 42, MAASTRICHTIAN ex Mehrotra *et al*., 2002, Cauvery Basin, Tamil Nadu.

Apteodinium conjunctum Eisenack & Cookson, 1960. *In*: Kumar, 1986a: 27, VALANGINIAN-HAUTERIVIAN (ONGC bore core no. 1), Krishna-Godavari Basin, Andhra Pradesh, (Garg *et al.,* 1988 reassessed the age of this assemblage to be Hauterivian-Barremian).

Apteodinium maculatum subsp. **grande** (Cookson & Hughes, 1964) Below, 1981a.

Apteodinium grande Cookson & Hughes, 1964. *In*: Kumar, 1986a: 31, VALANGINIAN-HAUTERIVIAN (ONGC bore core no. 5), Krishna-Godavari Basin, Andhra Pradesh, (Garg *et al.,* 1988 reassessed the age of this assemblage to be Hauterivian-Barremian).

Apteodinium nuciforme (Deflandre) Stover & Evitt, 1978 **NOW Cribroperidinium nuciforme** (Deflandre, 1939a ex Sarjeant, 1962°) Courtinat, 1989.

Apteodinium reticulatum Singh, 1971. *In*: Venkatachala & Kumar, 1980: 101, pl. 6, fig. 4, ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

Apteodinium spinosum Jain & Millepied, 1975. **NOW Apteodinium albertii** Lentin & Williams, 1981. (Substitute name. Originally *Pareodinia spinosa*, subsequently *Apteodinium spinosum*. Combination illegitimate as *Apteodinium spinosum* Jain & Millepied, 1971 is senior homonym).

Apteodinium spiridoides Benedek, 1972 emend. Benedek & Sarjeant, 1981. *In*: Mehrotra & Kamla Singh, 2003: 21, pl. 30, fig. 2, SERRAVALLIAN – PRIABONIAN

(ONGC well MGP- A, 1135 – 1750m), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 64, PRIABONIAN - SERRAVALLIAN ex Mehrotra & Kamla Singh, 2003, Krishna-Godavari Basin, Andhra Pradesh.

Apteodinium unicornum (Kar, 1985) Jain & Garg, 1991.

Milloudodinium unicornum Kar, 1985: 206, pl. 49, fig. 8, MIOCENE, (Khari Nadi Formation), Kutch, Gujarat.

Apteodinium ustraliense. *In*: Aswal & Pundeer, 1996: 636, pl. 1, fig. 4, LUTETIAN-BARTONIAN – EARLY MIOCENE (ONGC Mori well- A, 1800 – 1200m), Krishna-Godavari Basin, Andhra Pradesh. (Authorship not cited, name not validly published)

cf. **Apteodinium** Eisenack, 1958 emend. Sarjeant, 1985 emend. Lucas-Clark, 1987. *In*: Jain *et al.*, 1984: 78, pl. 5, fig. 105, KIMMERIDGIAN - -TITHONIAN (Spiti Shale Formation), Malla Johar area, Kumaon-Himalaya, Uttar Pradesh.

?Apteodinium sp. *In*: Jain, 1978: 149, pl. 3, fig. 23, LATEST CRETACEOUS (Kallankurchi Formation), Vriddhachalam area, Cauvery Basin, Tamil Nadu.

?Apteodinium sp. *In*: Venkatachala & Kumar, 1980: 101, pl. 6. fig. 8, ALBIAN (Dalmiapuram Formation) , Cauvery Basin, Tamil Nadu.

Apteodinium sp. *In*: Kumar, 1982: 171, pl.' I, fig. 10. NEOCOMIAN, Krishna-Godavari Basin, Andhra Pradesh.

Apteodinium sp. *In*: Singh & Tripathi, 1987: 302, LATE EOCENE (Kopili Formation), Meghalaya.

Apteodinium sp. *In*: Tripathi, 1989: 64, pl. 2, fig. 5, LATE EOCENE (Kopili Formation). Meghalaya.

Apteodinium sp. *In*: Mehrotra Kamla Singh, 2003: 22, pl. 3, figs 3 & 4, EARLY OLIGOCENE (ONGC well Mori- A, 1495 – 1500m, Matsyapuri Sandstone), Krishna-Godavari Basin, Andhra Pradesh; SERRAVALLIAN – CHATTIAN (ONGC well GS- 15- D, 2150 – 2950m, Ravva Formation), Krishna-Godavari Basin, Andhra Pradesh.

Apteodinium sp. **A** *In*: Jain, 1977b: 175, pl. 5. fig. 58, EARLY ALBIAN (Dalmiapuram Formation). Cauvery Basin, Tamil Nadu.

Apteodinium sp. A *In*: Jain *et al.*, 1984: 78, pl. 4, fig. 87, KIMMERIDGIAN-TITHONIAN (Spiti Shale Formation), Malla Johar area. Kumaon Himalaya, Uttar Pradesh.

Apteodinium sp. A *In*: Jain *et al.*, 1986: 76, pl. 1, fig. 9, LATE JURASSIC, Kutch, Gujarat.

Apteodinium sp. A. *In*: Khowaja-Ateequzzaman & Jain, 1992: 142, pl. 5, fig. 17, HAUTERIVIAN-BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu.

ARANEOSPHAERA Eaton, 1976.

Araneosphaera araneosa Eaton, 1976. *In*: Sarkar & Prasad, 2000b: 141, pl. I, fig. II, EARLY LUTETIAN (Subathu Formation, Morni Hills), Haryana.

Araneosphaera sp. cf. **A. araneosa** Eaton, 1976. *In*: Dutta & Jain, 1980: 66, pl. 7, fig. 64, EARLY-MIDDLE EOCENE (Sylhet Formation), Meghalaya.

Araneosphaera consociata Jain & Tandon, 1981. *In*: Jain & Tandon, 1981: 7, pl. 2, figs 36,37; pl. 3, fig. 47, MIDDLE EOCENE (Harudi Formation), Kutch, Gujarat; Kar, 1985: 186, pl. 44, figs 7-8, MIDDLE EOCENE (Harudi Formation), Kutch, Gujarat, (reproduction from Jain & Tandon, 1981).

Araneosphaera minuta Khanna & Singh, 1981b. *In*: Khanna & Singh, 1981b: 399-400, pl. 3, fig. 2, text-fig. 11, EARLY EOCENE (Subathu Formation), Simla Hills, Himachal Pradesh.

Araneosphaera sp. Singh & Khanna, 1980. *In*: Singh & Khanna, 1980: 471, pl. 2, fig. I, LATE PALAEOCENE-LATE EOCENE (Subathu Formation), Simla Hills, Himachal Pradesh.

ARCHEOTECTATUM Habib, 1972

Archeotectatum reticulatum Khowaja-Ateequzzaman & Jain, 1992. *In*: Khowaja-Ateequzzaman & Jain, 1992: 142, pl. 4, fig. 5; pl. 6, fig. 8, HAUTERIVIAN-BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu.

AREOLIGERA Lejeune-Carpentier, 1938a emend. Williams & Downie, 1966

Areoligera coronata (O.Wetzel) Lejeune-Carpentier, 1938. *In*: Jain & Tandon, 1981: 8, pl. 4, fig. 78, MIDDLE EOCENE (Harudi Formation), Kutch, Gujarat; Kar, 1985: 186, MIDDLE EOCENE (Harudi Formation), Kutch, Gujarat, (reproduction from Jain & Tandon. 1981); Jain & Garg, 1986b: 111, pl. 1, figs 3-5, LATE PALAEOCENE, Vriddhachalam area, Cauvery Basin, Tamil Nadu; Mehrotra & Sarjeant, 1987: 161, pl. 9, fig. 5, MAASTRICHTIAN (Narsapur well-1), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra & Aswal, 2003: 16, pl. 20, fig. 6, MAASTRICHTIAN (ONGC well NSP- A, 3643 – 3649m, Chintalapalli Formation), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 64, MAASTRICHTIAN ex Mehrotra & Kamla Singh, 2003, Krishna-Godavari Basin, Andhra Pradesh.

Areoligera digitata Kar, 1985. **NOW Homotryblium plectilum** Drugg & Loeblich Jr., 1967. (Taxonomic senior synonym, according to Jain & Garg, 1991, p. 77)

Areoligera lemniscata (Stanley, 1965) Stover & Evitt, 1978.

Cyclonephelium lemniscatum Stanley, 1965. *In*: Jain, 1978: 150, pl. 3, fig. 24. LATEST MAASTRICHTIAN (Kallankurchi Formation), Vriddhachalam area, Cauvery Basin, Tamil Nadu.

Areoligera senonensis Lejeune-Carpentier, 1938. *In*: Jain, 1978: 150, pl. 2, fig. 16, LATEST MAASTRICHTIAN (Kallankurchi Formation), Vriddhachalam area, Cauvery Basin. Tamil Nadu; Khanna *et al.*, 1985: 100, pl. 1, fig. 6, PALAEOGENE (Subathu Formation), Jammu Hills; Jain & Garg, 1986b: 111-112, pl. 1, figs 6-7; pl. 2, figs 1-2, 9, LATE PALAEOCENE, Vriddhachalam area, Cauvery Basin, Tamil Nadu; Mehrotra & Sarjeant, 1987: 162, pl. 8, figs 1-2,5, MAASTRICHTIAN (Narsapur well- 1), Krishna--Godavari Basin, Andhra Pradesh; Sarkar, 1991: 2, pl. I, fig. 12, EARLY EOCENE (Kakara Series, Lesser Himalaya), Kakara-Chapla group of villages, Simla, Himachal Pradesh; Aswal & Pundeer, 1996: 636, pl. 2, figs 4 & 11, YPRESIAN (ONGC Mori well- A, 2800 – 2640m), Krishna-Godavari Basin, Andhra Pradesh; Sarkar, 1997: 102, LATE YPRESIAN – LUTETIAN (Subathu Formation, Bilaspur area), Punjab Basin, Himachal Pradesh; Mehrotra & Aswal, 2003: 15, pl. 9, figs 3 & 4, pl. 20, figs 1, 2 & 5, MAASTRICHTIAN (ONGC well NSP- A, 3643 – 3649m, Chintalapalli Formation), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 64, THANETIAN – YPRESIAN TOP (58 – 49 Ma) ex Mehrotra *et al*., 2002, Mumbai Offshore; MAASTRICHTIAN - THANETIAN ex Mehrotra *et al*., 2002, Cauvery Basin, Tamil Nadu; MAASTRICHTIAN ex Mehrotra & Kamla Singh, 2003, Krishna-Godavari Basin, Andhra Pradesh; YPRESIAN (54 – 49 Ma) ex Mehrotra *et al*., 2002, Assam-Arakan Basin, Northeastern India.

Areoligera sp. cf. A. **senonensis.** Lejeune-Carpentier, 1938a. *In*: Jain & Garg, 1986b: 112, pl. 5, figs 7-8, LATE PALAEOCENE, Vriddhachalam area, Cauvery Basin, Tamil Nadu.

Areoligera sentosa Eaton, 1976. *In*: Sarkar, 1991: 2, pl. I, fig. 1, EARLY EOCENE (Kakara Series, Lesser Himalaya), Kakara-Chapla group of villages, Simla, Himachal Pradesh; Sarkar & Prasad, 2000b: 141, EARLY - MIDDLE LUTETIAN (Subathu Formation, Morni Hills), Haryana.

Areoligera tenuicapillata (0. Wetzel, 1933b) Lejeune--Carpentier, 1938a. *In*: Jain & Garg, 1986b: 112, pl. 2, figs 17-18, LATE

PALAEOCENE, Vriddhachalam area, Cauvery Basin, Tamil Nadu.

Areoligera undulata Eaton, 1976. *In*: Saxena & Sarkar, 2000: 256, 263, MIDDLE EOCENE (Siju Formation), Simsang River near Siju, South Garo Hills, Meghalaya.

Areoligera volata Drugg, 1967. *In*: Jain 1978: 150, pl. I, figs 6-7; pl. 3, figs 27-28, LATEST MAASTRICHTIAN (Kallankurchi Formation), Vriddhachalam area, Cauvery Basin, Tamil Nadu; Jain & Garg, 1986b: 112, pl. 5, figs 10-11, LATE PALAEOCENE, Vriddhachalam area, Cauvery Basin, Tamil Nadu; Mehrotra *et al*., 2005: 42, MAASTRICHTIAN – THANETIAN ex Mehrotra *et al*., 2002, Krishna-Godavari Basin, Andhra Pradesh.

Areoligera cf. **A. volata** Drugg, 1967. *In*: Mehrotra & Sarjeant, 1987: 162-163, pl. 8, figs 3, 6, MAASTRICHTIAN (Narsapur well-1), Krishna--Godavari Basin, Andhra Pradesh; Mehrotra & Aswal, 2003: 17, pl. 20, figs 3 & 4, MAASTRICHTIAN (ONGC well NSP- A, 3643 – 3649m, Chintalapalli Shale), Krishna-Godavari Basin, Andhra Pradesh.

Areoligera sp. Sarkar & Singh, 1988. *In*: Sarkar & Singh, 1988: 38, pl. I, figs 12-13, EOCENE (Subathu Formation), Banethi--Bagthan area, Himachal Pradesh.

Areoligera sp. A Jain & Tandon, 1981. *In*: Jain & Tandon, 1981: 8, pl. 4, fig. 58, MIDDLE EOCENE (Harudi Formation), Kutch, Gujarat.

Areoligera sp. A *In*: Kar, 1985: 186, MIDDLE EOCENE (Harudi Formation), Kutch, Gujarat, (reproduction from Jain & Tandon, 1981).

?Areoligera sp. A *In*: Jain & Garg. 1986b: 112-113, pl. 3, fig, 8, LATE PALAEOCENE, Vriddhachalam area, Cauvery Basin, Tamil Nadu.

Areoligera sp. *In*: Singh & Sarkar, 1992: 185, LATE PALAEOCENE?-EOCENE (Subathu Formation), Garkhal area, Punjab Basin, Himachal Pradesh.

"AREOSPHAERA" (in Khanna *et al.*, 1985; name not validly published)

AREOSPHAERIDIUM Eaton, 1971 emend. Stover & Williams, 1995.

Areosphaeridium arcuatum Eaton, 1971. **NOW Enneadocysta arcuata** (Eaton, 1971) Stover & Williams, 1995.

Areosphaeridium arcuatum Eaton, 1971. *In*: Mehrotra & Sinha, 1981: 152, pl. 2, fig. 2 = **Oligosphaeridium complex** (White, 1842) Davey & Williams, 1966, (According to Jain & Garg, 1986a).

Areosphaeridium dictyoplokum (Klumpp, 1953, pl. 18, figs 3-7 not pl. 18, figs 8-10, which are now *Cordosphaeridium latum*) Eaton, 1971 emend. Eaton, 1971 emend. Stover & Williams, 1995. *In*: Mehrotra & Sinha, 1980: 1003, LATE CRETACEOUS-EOCENE (Sangchamalla Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh; Aswal & Pundeer, 1996: 636, pl. 1, fig. 13, LATE EOCENE (ONGC Mori well-A, 1600 – 1500m), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et* al., 1996: 685-688, LUTETIAN – PRIABONIAN (ONGC well Gulf- 1, well Gulf- 3 and well Gulf-4, Tarapur Shale Formation), LUTETIAN – RUPELIAN (ONGC well Gulf-2, Tarapur Shale Formation), Gulf of Cambay, Gujarat; Mehrotra & Kamla Singh, 2003: 23, pl. 16, figs 1 & 2; pl. 19, figs 1, 6 & 7, EARLY OLIGOCENE (ONGC well Mori- A, 1495 – 1500m, Matsyapuri Sandstone), Krishna-Godavari Basin, Andhra Pradesh. (Orthographic change: Mehrotra & Kamla Singh, 2003 listed *A. dictyoplokus*); Mehrotra *et al*., 2005: 64-65, YPRESIAN - PRIABONIAN ex Mehrotra *et al*., 1996, Cambay Basin, Gujarat; EARLY OLIGOCENE ex Mehrotra & Kamla Singh, 2003, Krishna-Godavari Basin, Andhra Pradesh.

Areosphaeridium dictyoplokus (Klumpp, 1953) Eaton, 1971. *In*: Mehrotra & Sinha, 1981: 152, pl. 2, fig. 1 = **Oligosphaeridium pulcherrimum** (Deflandre & Cookson, 1955) Davey & Williams, 1966b, (According to Jain & Garg, 1986a).

Areosphaeridium sp. *In*: Sarkar, 1991: 2, pl. I, fig. 7, EARLY EOCENE (Kakara Series, Lesser Himalaya), Kakara-Chapla group of villages, Simla, Himachal Pradesh.

Areosphaeridium sp. *In*: Singh & Sarkar, 1992: 185, pl. 1, fig. 19, LATE PALAEOCENE?-EOCENE (Subathu Formation), Garkhal area, Punjab Basin, Himachal Pradesh.

Areosphaeridium sp. A. *In*: Jain & Garg, 1991: 60-61, pl. 1, fig. 12, EARLY EOCENE (Lakhpat bore hole- 1), Kutch Gujarat. (Restudy of Kar, 1985)

Heterosphaeridium heteracanthum (Deflandre & Cookson, 1955) Eisenack & Kjellström. 1972. *In*: Kar, 1985: 182-183, pl. 41, fig. 6, EARLY EOCENE (Lakhpat bore hole- 1), Kutch, Gujarat (Reallocated by Jain & Garg, 1991)

ARTEMISIOCYSTA Benedek, 1972 (Acritarch genus)

Artemisiocysta cladodichotoma Benedek, 1972. *In:* Aswal & Pundeer, 1996: 636, pl. 2, fig. 12, LUTETIAN-BARTONIAN – OLIGOCENE (ONGC Mori well- A, 1700 – 1400m), Krishna-Godavari Basin, Andhra Pradesh. (Orthographic change: Aswal & Pundeer, 1996 listed *Artimisiocysta cladodichotoma*)

ASCODINIUM Cookson & Eisenack, 1960a emend. Helenes, 1983.

Ascodinium acrophorum Cookson & Eisenack, 1960. *In*: Kumar, 1982: 172, pl. 2, fig. 8, NEOCOMIAN, Krishna-Godavari Basin, Andhra Pradesh; Kumar 1986a: 27, pl. I, fig. 10, VALANGINIAN--HAUTERIVIAN (ONGC bore core nos. 1, 2, 8), Krishna-Godavari Basin, Andhra Pradesh, (Garg et at, 1988 reassessed the age of this assemblage to be Hauterivian - Barremian).

Ascodinium scabrosum Cookson & Hughes, 1964. **NOW Ovoidinium scabrosum** (Cookson & Hughes) Davey, 1970.

Ascodinium sp. *In*: Jain *et al.*, 1975: 9, pl. 6, fig. 70, MAASTRICHTIAN (Jadukata Formation), Dawki area, Meghalaya.

Ascodinium sp. *In*: Venkatachala & Kumar, 1980: 99, pl. 3, fig. 3, ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

ASCOSTOMOCYSTIS Drugg & Loeblich Jr., 1967. (Acritarch genus)

Ascostomocystis granulata Châteauneuf, 1980. **NOW Cyclopsiella ?chateuuneufii** Head *et al*., 1989c.

"ASTROCYSTA" Davey, 1970. **NOW PALAEOPERIDINIUM** Deflandre, 1934 ex. Sarjeant, 1967b. (Taxonomic senior synonym, according to Lentin & Williams, 1976, p. 150)

Astrocysta cretacea Pocock, 1962 ex Davey, 1970. **NOW Palaeoperidinium cretaceum (**Pocock, 1962 ex Davey, 1970) Lentin & Williams, 1976 emend. Harding, 1990a

ATOPODINIUM Drugg, 1978 emend. Masure, 1991.

Atopodinium prostatum Drugg, 1978 emend. Masure, 1991. *In*: Kumar, 1987: 599, pl. 1, fig. 4, LATE BATHONIAN-CALLOVIAN (Jhurio Formation), Kutch, Gujarat.

AVELLODINIUM Duxbury, 1977 emend. Backhouse, 1988.

Avellodinium falsificum Duxbury, 1977. *In*: Khowaja-Ateequzzaman & Jain, 1992: 144, pl. 2, figs 5, 7; pl. 5, fig. 12, HAUTERIVIAN-BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu; Mehrotra & Aswal, 2003: 18, pl. 32, figs 3 & 4, OXFORDIAN (ONGC well RCPM- A, 2565 – 3025m, Golapalli Formation), Krishna-Godavari Basin, Andhra Pradesh; HAUTERIVIAN – TITHONIAN (ONGC well MVD- A, 2060 – 2240m, Golapalli Formation), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 42, OXFORDIAN – HAUTERIVIAN ex Mehrotra & Aswal, 2003, Krishna Godavari Basin, Andhra Pradesh.

Avellodinium flagellatum Davey, 1988. *In*: Garg *et al*., 2003: 52-53, pl, II, figs 3-4, LATE LOWER TITHONIAN (*Kosmatia* Ammonite, Middle Division, Spiti Shale Formation, Kibber Section of Spiti Valley); LATE LOWER TITHONIAN (*Virgatosphinctes* Ammonite, Upper level of the Middle Division, Spiti Shale Formation, Gate Section of Spiti Valley), Malla Johar area, Kumaon Himalaya.

"BACCHIDINIUM" Davey, 1979b. **NOW KIOKANSIUM** Stover & Evitt, 1978 emend. Duxbury, 1983. Taxonomic senior synonym, according to Below, 1982c, p. 13-15 and Davey, 1982a, p. 377)

Bacchidinium polypes (Cookson & Eisenack, 1962b) Davey, 1979b. **NOW Kiokansium unituberculatum** (Tasch in Tasch *et al.*, 1964) Stover & Evitt, 1978. (By implication in Duxbury, 1983, p. 49)

BALTISPHAERIDIUM Eisenack, 1958 emend. Eisenack, 1969. (Acritarch genus).

Baltisphaeridium multispinosum Singh, 1964, (in Kar *et al.*, 1972). **NOW Downiesphaeridium multispinosum** (Singh, 1964) Islam, 1983a.

BARBATACYSTA Courtinat, 1989.

Barbatacysta cereberbata Courtinat, 1989.

Sentusidinium cereberbarbatum Erkman & Sarjeant, 1980. *In*: Kumar, 1986b: 400, pl. 4, fig. 8, EARLY KIMMERIDGIAN-TITHONIAN (Jhuran Formation), Kutch, Gujarat; Kumar, 1987a: 598, EARLY KIMMERIDGIAN-TITHONIAN (Jhuran Formation), Kutch, Gujarat.

Barbatacysta pelionensis (Fensome, 1979) Courtinat, 1989.

Sentusidinium pelionense Fensome, 1979. *In*: Kumar, 1986b: 401, pl. 4, fig. 5, EARLY KIMMERIDGIAN-TITHONIAN (Jhuran Formation), Kutch, Gujarat; Kumar, 1987a: 598, EARLY KIMMERIDGIAN-TITHONIAN (Jhuran Formation), Kutch, Gujarat.

BATIACASPHAERA Drugg, 1970 emend Morgan, 1975 emend. Dörhöfer & Davies, 1980.

Batiacasphaera aptiensis (Burger, 1980a) Kumar 1986a. *In*: Kumar, 1986a: 32, VALANGINIAN- HAUTERIVIAN (ONGC bore core no. 5), Krishna-Godavari Basin, Andhra Pradesh, (Garg *et al.*, 1988 reassessed the age of this assemblage to be Hauterivian-Barremian).

Sentusidinium aptiense (Burger, 1980a) Burger, 1980b. *In*: Khowaja-Ateequzzaman & Jain, 1992: 174, pl. 12, fig. 3, HAUTERIVIAN-BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu.

Batiacasphaera asperata Backhouse, 1987. *In*: Khowaja-Ateequzzaman & Jain, 1992: 144, pl. 6, fig. 1, HAUTERIVIAN-BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu.

Batiacasphaera compta Drugg, 1970b. *In*: Mehrotra & Kamla Singh, 2003: 25, pl. 4, fig. 6, THANETIAN (ONGC well NSP- A, 2754 – 2757m, Pasarapudi Formation), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 65, THANETIAN – PRIABONIAN (54.8 – 33.7 Ma) ex Mehrotra *et al*., 2002, Mumbai Offshore; SELANDIAN - THANETIAN ex Mehrotra & Kamla Singh, 2003, Krishna-Godavari Basin, Andhra Pradesh; PRIABONIAN ex Mehrotra *et al*., 2002, Assam-Arakan Basin, Northeastern India.

Batiacasphaera crassicingulata (Burger, 1980b) Kumar, 1986a. **NOW Levisphaera crassicingulata** (Burger, 1980b) Davey, 1988. (Orthographic change: Kumar, 1986a listed *B. crassiangulata*)

Batiacasphaera echinata (Gitmez & Sarjeant, 1972) Dörhöfer & Davies, 1980 **NOW Pilosidinium echinatum** (Gitmez & Sarjeant, 1972) Courtinat, 1989.

Batiacasphaera kutharensis (Khanna & Singh, 1981b) Lentin & Williams, 1993.

Tenua kutharensis Khanna, 1979. *In*: Khanna, 1979: 216, LATE

PALAEOCENE-LATE EOCENE (Subathu Formation), Simla Hills, Himachal Pradesh, (name not validly published)

Tenua kutharensis Singh *et al*., 1979. *In*: Singh *et al,*, 1979: 35-36, text-fig. 1, LATE PALAEOCENE-LATE EOCENE (Subathu Formation), Simla Hills, Punjab Basin, Himachal Pradesh. (name not validly published)

Tenua kutharensis Khanna & Singh, 1981b. *In*: Khanna & Singh, 1981b: 389-390, pl. 1, figs, 3, 5, text-fig. 1, LATE PALAEOCENE--EOCENE (Subathu Formation), Simla Hills, Himachal Pradesh.

Batiacasphaera cf. **B. macrogranulata** Morgan, 1975. *In*: Mehrotra & Sarjeant, 1986: 720, pl. 9, figs 1,3, VALANGINIAN (Periyavadavadi shallow well- I), Cauvery Basin, Tamil Nadu.

Batiacasphaera micropapillata Stover, 1977. *In*: Mehrotra & Kamla Singh, 2003: 26, pl. 30, fig. 3, PLEISTOCENE (ONGC well SRP- A, 595 – 600m, Narasapur Claystone and Rajahmundry Sandstone; Mehrotra *et al*., 2005: 65, PLIOCENE ex Mehrotra & Kamla Singh, 2003, Krishna-Godavari Basin, Andhra Pradesh.

Batiacasphaera norvickii (Burger, 1980a) Lentin & Williams, 1989.

KalIosphaeridium norvickii (Burger, 1980a) Lentin & Williams, 1981. *In*: Kumar, 1986a: 31, VALANGINIAN-HAUTERIVIAN (ONGC bore core nos. 3-8), Krishna-Godavari Basin, Andhra Pradesh, (Garg *et al.,* 1988 reassessed the age of this assemblage to be Hauterivian-Barremian).

Batiacasphaera scrobiculata (Deflandre & Cookson, 1955) Burger, 1980b. **NOW Pyxidiella scrobiculata** (Deflandre & Cookson, 1955) Cookson & Eisenack. 1958.

Batiacasphaera simlaensis (Khanna & Singh, 1981b) Lentin & Williams, 1993.

Tenua simlaensis Khanna, 1979. *In*: Khanna, 1979: 216, LATE PALAEOCENE-LATE EOCENE (Subathu Formation), Simla Hills, Himachal Pradesh, (name not validly published)

Tenua simlaensis Singh *et al*., 1979. *In*: Singh *et al.*, 1979: 35-36, text-fig. 1, LATE PALAEOCENE-LATE EOCENE (Subathu Formation), Simla Hills, Punjab Basin, Himachal Pradesh, (name not validly published)

Tenua simlaensis Khanna & Singh, 1981b. *In*: Khanna & Singh, 1981b: 390, pl. 1, figs, 8-9, text-fig. 2, EARLY EOCENE (Subathu Formation), Simla Hills, Himachal Pradesh.

Batiacasphaera spumosa (Brideaux, 1977) Below, 1981.

Batiacasphaera spumosa (Brideaux, 1977) Kumar, 1986a. *In*: Kumar, 1986a: 32, VALANGINIAN-HAUTERIVIAN (ONGC bore core no. 4), Krishna-Godavari Basin, Andhra Pradesh, (Garg et at, 1988 reassessed the age of this assemblage to be Hauterivian - Barremian).

Batiacasphaera spumosa (Brideaux) Kumar, 1986a. **NOW Batiacasphaera spumosa** (Brideaux) Below, 1981.

Batiacasphaera sp. *In*: Kumar, 1986a: 27, pl. I, fig. 4, VALANGINIAN-HAUTERIVIAN (ONGC bore core no. 6), Krishna-Godavari Basin, Andhra Pradesh. (Garg et at, 1988 reassessed the age of this assemblage to be Hauterivian-Barremian).

Batiacasphaera sp. *In*: Mehrotra *et* al., 1996: 687, LUTETIAN-PRIABONIAN – RUPELIAN-BERDIGALIAN (ONGC well Gulf- 3, Tarapur Shale, Babaguru and Post Babaguru formations), Gulf of Cambay, Gujarat.

BATIOLADINIUM Brideaux, 1975 emend. Pourtoy, 1988.

Batioladinium imbatodinense (Vozzhennikova, 1967) Lentin & Williams, 1985. **NOW Protbatioladinium imbatodinense** (Vozzhennikova, 1967) Lentin & Williams, 1985 emend. Lentin & Vozzhennikova, 1990.

Batioladinium Jaegeri (Alberti, 1961) Brideaux, 1975 emend. Below, 1990. *In*: Khowaja-Ateequzzaman & Jain, 1992: 144, pl. 7, fig. 15, HAUTERIVIAN-BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu.

Necrobroomea Jaegeri (Alberti, 1961) Wiggins, 1975 emend. Below, 1990. *In*: Jain, 1977b: 179. pl. 4, fig. 53, EARLY ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

Batioladinium micropodum (Eisenack & Cookson, 1960) Brideaux, 1975 emend. Below, 1990. *In*: Kumar, 1986a: 27, pl. 1, figs 5-7, VALANGINIAN - HAUTERIVIAN (ONGC bore core nos. 3, 6), Krishna-Godavari Basin, Andhra Pradesh, (Garg *et al*., 1988 reassessed the age of this assemblage to be Hauterivian-Barremian).

Broomea micropoda Eisenack & Cookson, 1960. *In*: Kumar, 1982: 171, pl. 2, fig. 1, NEOCOMIAN, Krishna-Godavari Basin, Andhra Pradesh.

Batioladinium varigranosum (Duxbury, 1977) davey, 1982. *In*: Khowaja-Ateequzzaman & Jain, 1992: 144, pl. 12, fig. 7, HAUTERIVIAN - BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu.

Batioladinium sp. *In*: Garg *et al*., 2003: 52-53, LATE UPPER TITHONIAN (*Blanfordiceras* Ammonite), Malla Johar area, Kumaon Himalaya.

BELODINIUM Cookson & Eisenack, 1960b emend. Dodekova, 1975 emend. Stover & Helby, 1987d.

Belodinium dysculum Cookson & Eisenack, 1960b emend. Stover & Helby, 1987d. *In*: Garg *et al*., 2003: 52-53, pl, V, fig. 9, LATE LOWER TITHONIAN (*Kosmatia* Ammonite, Middle Division, Spiti Shale Formation, Kibber Section of Spiti Valley), Malla Johar area, Kumaon Himalaya.

Belodinium nereidis Stevens & Helby, 1987. *In*: Mehrotra & Aswal, 2003: 19, pl. 7, fig. 6, BERRIASIAN – OXFORDIAN (ONGC well RCPM- A, 2565 – 3025m, Golapalli Formation), Krishna-Godavari Basin, Andhra Pradesh; HAUTERIVIAN – TITHONIAN (ONGC well MVD- A, 2060 – 2240m, Golapalli Formation), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 42, OXFORDIAN – HAUTERIVIAN ex Mehrotra *et al*., 2003, Krishna-Godavari Basin, Andhra Pradesh.

BOSEDINIA He Chengquan, 1984b emend. Chen *et al.*, 1988.

Bosedinia microgranulosa (Jain, 1977b) Jansoneus, 1989.

Fromea microgranulosa Jain, 1977b. *In*: Jain, 1977b: 176, pl. 6, fig. 74, EARLY ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

BROOMEA Cookson & Eisenack, 1958 emend. Lentin & Williams, 1976.

Broomea micropoda Eisenack & Cookson, 1960. **NOW Batioladinium micropodum** (Eisenack & Cookson, 1960) Brideaux, 1975.

Broomea ramosa Cookson & Eisenack, 1958. *In*: Jain *et al.*,1986: 80, pl. 3, figs 41, 49, LATE JURASSIC, Kutch, Gujarat; Garg *et al*., 2003: 52-53, pl, V, fig. 14, LATE LOWER TITHONIAN (*Kosmatia* Ammonite, Middle Division, Spiti Shale Formation, Kibber Section of Spiti Valley); LATE UPPER TITHONIAN – BERRIASIAN-EARLY VALANGINIAN (*Pterolytoceras* Ammonite, Upper levels of the Upper Division, Spiti Shale Formation), Malla Johar area, Kumaon Himalaya.

Broomea simplex Cookson & Eisenack, 1958. *In*: Jain *et al.*, 1984: 78, pl. 3, fig. 62, TITHONIAN (Spiti Shale Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh; *In*: Garg *et al*., 2003: 52-53, pl, I,

fig. 5, LATE LOWER TITHONIAN (*Hildoglochiceras* Ammonite, Middle part of the Middle Division, Spiti Shale Formation, Laptal Section); LATE LOWER TITHONIAN (*Kosmatia* Ammonite, Middle Division, Spiti Shale Formation, Kibber Section of Spiti Valley); LATE LOWER TITHONIAN (*Paraboliceras* Ammonite, Upper part of the Middle Division, Spiti Shale Formation, Kibber Section), Malla Johar area, Kumaon Himalaya.

Broomea sp. *In*: Kumar, 1982: 171. pl. 2, fig. 7, NEOCOMIAN, Krishna-Godavari Basin, Andhra Pradesh.

Broomea sp. **A** *In*: Jain *et al.*, 1984: 78, pl. 3, fig. 48, EARLY-MIDDLE TITHONIAN (Spiti Shale Formation), Malla Johar area, Kumaon Himalaya. Uttar Pradesh.

CALIGODINIUM Drugg, 1970b emend. Manum & Williams, 1995.

Caligodinium amiculum Drug, 1970b. *In*: Mehrotra & Kamla Singh, 2003: 27, pl. 4, fig. 5, MIOCENE (ONGC well NSP- A, 733 – 736m, Matsyapuri Sandstone), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 65, LUTETIAN – LATE BARTONIAN, Mumbai Offshore; MIDDLE MIOCENE ex Mehrotra & Kamla Singh, 2003, Krishna-Godavari Basin, Andhra Pradesh.

CALLAIOSPHAERIDIUM Davey & Williams, 1966b emend. Duxbury, 1980 emend. Below, 1981a.

Callaiosphaeridium asymmetricum (Deflandre & Courteville, 1939) Davey & Williams, 1966b emend. Clarke & Verdier, 1967. *In*: Jain, 1977b: 184, pl. 2, figs 23 & 24. EARLY ALBIAN (Dalmiapuram Formation), Cauvery Basin. Tamil Nadu; Khowaja-Ateequzzaman & Garg, 2002: 136, pl. 1, figs 17, 18, EARLY TURONIAN (Kulakkalnattam Sandstone Member, Garudamangalam Formation), Cauvery Basin, southern India.

Cordosphaeridium sp. *In*: Jain & Taugourdeau--Lantz, 1973: 61, pl. 2, fig. 17, ?APTIAN--EARLY ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

Callaiosphaeridium sp. cf. **C. asymmetricum** (Deflandre & Courteville, 1939) Davey & Williams, 1966b emend. Clarke & Verdier, 1967.

Hexasphaera sp. cf. *H. asymmetricum* (Deflandre & Courteville, 1939) Clarke & Verdier, 1967. *In*: Jain *et al.*,1975: 8, pl. 3, figs 32-34, 38, MAASTRICHTIAN (Jadukata Formation), Meghalaya.

Callaiosphaeridium scabratum Khowaja-Ateequzzaman & Garg, 2004. *In*: Khowaja-Ateequzzaman & Garg, 2004: 97-103, figs 1 – 8, EARLY TURONIAN (Kulakkalnattam Sandstone Member, Garudamangalam Formation), Cauvery Basin, southern India.

CANNINGIA Cookson & Eisenack. 1960 emend. Dörhöfer & Davies, 1980 emend. Below, 1981a emend. Helby, 1987.

Canningia apiculata Jain & Garg in Jain *et al.*, 1984. *In*: Jain *et al.*, 1984: 71, pl. 2, figs 27-29, MIDDLE TITHONIAN (Spiti Shale Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh.

Canningia colliveri Cookson & Eisenack, 1960b. **NOW Canninginopsis colliveri** (Cookson & Eisenack, 1960b) Backhouse, 1988.

Canningia ?microciliata Jain, 1977b. *In*: Jain, 1977b: 178, pl. 3, fig. 25; pl. 6, fig. 78, EARLY ALBIAN (Dalmiapuram Formation). Cauvery Basin. Tamil Nadu. (Questionable assignment: Helby, 1987)

Canningia reticulata Cookson & Eisenack, 1960b emend. Below, 1981a emend. Helby, 1987. *In*: Jain *et al.*, 1984: 78, pl. 2, figs 25-26. KIMMERIDGIAN-EARLY UPPER TITHONIAN (Spiti Shale Formation). Malla Johar area. Kumaon Himalaya. Uttar Pradesh; Kumar, 1986a: 27. VALANGINIAN-HAUTERIVIAN (ONGC bore core nos. 7, 8), Krishna-Godavari Basin. Andhra Pradesh, (Garg *et* al., 1988 reassessed the age of this assemblage to be Hauterivian-Barremian); Mehrotra & Aswal, 2003: 20, pl. 18, figs 1 & 5, EARLY CAMPANIAN – BERRIASIAN (ONGC well END- A, 1120 – 1900, Raghavapuram

Shale), Krishna-Godavari Basin, Andhra Pradesh; EARLY LATE CAMPANIAN – EARLY APTIAN (ONGC well RCPM- A, 1255 – 2125m, Tirupati Formation and Raghavapuram Shale), Krishna-Godavari Basin, Andhra Pradesh; LATE APTIAN - TITHONIAN-BERRIASIAN (ONGC well MVD- A, 1775 - 2305m, Raghavapuram Shale and Golapalli Formation), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 43, TITHONIAN – LATE CAMPANIAN ex Mehrotra & Aswal, 2003, Krishna-Godavari Basin, Andhra Pradesh .

Canningia sp. *In*: Sah *et al.*, 1970: 148. pl. 2, fig. 29. LATE CRETACEOUS (Langpar Formation), Meghalaya.

Canningia sp. *In*: Kar *et al.*,1972: 147. pl. 1, fig. 3, (Tura Formation), Garo Hills, Meghalaya.

Canningia sp. *In*: Jain *et al.*, 1982: 25, pl. 1. figs 5-6. LATE JURASSIC, Kutch, Gujarat.

Canningia sp. A. *In*: Venkatachala & Kumar, 1980: 94. pl. 1. fig. 2. ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

Canningia sp. A. *In*: Jain *et al.*, 1984: 78. KIMMERIDGIAN-TITHONIAN (Spill Shale Formation). Malla Johar area, Kumaon Himalaya.Uttar Pradesh.

Canningia sp. A. *In*: Khowaja-Ateequzzaman & Jain, 1992: 144, 146, pl. 5, fig. 6, HAUTERIVIAN-BARREMIAN (CGWB borehole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu.

CANNINGINOPSIS Cookson & Eisenack. 1962.

Canninginopsis colliveri (Cookson & Eisenack, 1960b) Backhouse. 1988. *In*: Khowaja-Ateequzzaman & Jain, 1992: 146, pl. 4, fig. 13, HAUTERIVIAN-BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu; Mehrotra & Aswal, 2003: 21, pl. 22, fig. 5, MAASTRICHTIAN (ONGC well NSP- A, 3643 – 3649m, Chintalapalli Shale), Krishna Godavari-Basin, Andhra Pradesh; Mehrotra *et al*., 2005; 43, MAASTRICHTIAN ex Mehrotra & Aswal, 2003, Krishna-Godavari Basin, Andhra Pradesh.

Canningia colliveri Cookson & Eisenack, 1960b. *In*: Kumar, 1982: 171. pl. 2. fig. 10, NEOCOMIAN, Krishna- Godavari Basin. Andhra Pradesh; Kumar. 1986a: 27, VALANGINIAN-HAUTERIVIAN (ONGC bore core nos. 4. 7. 8). Krishna-Godavari Basin. Andhra Pradesh, (Garg *et al.,* 1988 reassessed the age of this assemblage to be Hauterivian-Barremian); Mehrotra & Sarjeant, 1987: 152.154, MAASTRICHTIAN (Narsapur shallow well-1), Krishna-Godavari Basin. Andhra Pradesh, Krishna Godavari Basin, Andhra pradesh.

Canninginopsis sp. A *In*: Venkatachala & Kumar, 1980: 104, pl. 5. fig. 1. ALBIAN (Dalmiapuram Formation). Cauvery Basin, Tamil Nadu.

Canninginopsis sp. B *In*: Venkatachala & Kumar, 1980: 104, pl. 5, fig. 4, ALBIAN (Dalmiapuram Formation). Cauvery Basin, Tamil Nadu.

CANNOSPHAEROPSIS O. Wetzel. 1933b emend. Williams & Downie. 1966c emend. Duxbury. 1980 emend. Marheinecke, 1992.

Cannosphaeropsis caulleryi (Deflandre, 1939a) Sarjeant, 1961. **NOW Adnatosphaeridium caulleryi** (Deflandre, 1939a) Williams & Downie, 1969 emend. Stancliffe & Sarjeant, 1990.

Cannosphaeropsis peridictya Eisenack & Cookson, 1960. **NOW Hapsocysta peridictya** (Eisenack & Cookson, 1960) Davey, 1979b emend Davey, 1979b.

Cannosphaeropsis ?scaffoldii (Baksi, 1962) Downie & Sarjeant, 1965. (Questionable assignment: Stover & Evitt, 1978)

Hystrichosphaeridium scaffoldii Baksi, 1962. *In*: Baksi, 1962: 17. pl. 2. fig. 25. Tertiary, Assam.

Cannosphaeropsis sp. cf. **C. scaffoldii** (Baksi, 1962) Downie & Sarjeant. 1965.

Hystrichosphaeridium sp. cf. H. *scaffoldii* Baksi, 1962. *In*: Srivastava & Banerjee. 1969: 103. pl 1. figs 9-11. EOCENE-OLIGOCENE. Assam.

Cannosphaeropsis utinensis O. Wetzel, 1933b emend. May, 1980 emend. Sarjeant, 1985b emend. Marheinecke, 1992. *In*: Mehrotra & Aswal, 2003: 22, pl. 30, figs 3 & 4, LATE MAASTRICHTIAN – BERRIASIAN (ONGC well DRK- A, 1250 – 2035m, Chintalapalli and Raghavapuram formations), Krishna-Godavari Basin, Andhra Pradesh; EARLY MAASTRICHTIAN – CAMPANIAN (ONGC well RCPM- A, 1055 – 1165m, Tirupati Formation), Krishna-Godavari Basin, Andhra Pradesh; LATE CAMPANIAN – LATE MAASTRICHTIAN (ONGC well MVD- A, 805 – 845m, Tirupati Formation), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al.*, 2005: 43, BERRIASIAN – LATE MAASTRICHTIAN ex Mehrotra & Aswal, 2003, Krishna-Godavari Basin, Andhra Predesh.

CARPODINIUM Cookson & Eisenack. 1962b emend. Leffingwell & Morgan. 1977.

Carpodinium sp. *In*: Kumar, 1982: 170, pl 1, fig. 14, NEOCOMIAN, Krishna-Godavari Basin, Andhra Pradesh.

CASSICULOSPHAERIDIA Davey, 1969a.

Cassiculosphaeridia magna Davey, 1974 emend. Harding, 1990b. *In*: Kumar. 1986a: 27. VALANGINIAN-HAUTERIVIAN (ONGC bore core no. 7). Krishna-Godavari Basin. Andhra Pradesh, (Garg *et al.*. 1988 reassessed the age of this assemblage to be Hauterivian-Barremian); Mehrotra & Aswal, 2003: 23, pl. 34, fig. 6; pl. 35, figs 4 – 6, BARREMIAN – CAMPANIAN (ONGC well RCPM- A, 1159 – 2200m, Raghavapuram Shale and Tirupati Formation), Krishna-Godavari Basin, Andhra Pradesh; TITHONIAN – VALANGINIAN (ONGC well DRK- A, 2090 – 2160m, Raghavapuram Formation), Krishna-Godavari Basin, Andhra Pradesh; KIMMERIDGIAN – BARREMIAN (ONGC well MVD- A, 1905 – 2420m, Golapalli and Raghavapuram formations), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al.*, 2005: 43, KIMMERIDGIAN – SANTONIAN ex Mehrotra & Aswal, 2003, Krishna-Godavari Basin, Andhra Pradesh.

Cassiculosphaeridia pygmaeus Stevens, 1987. *In*: Khowaja-Ateequzzaman & Jain, 1992: 146, pl. 12, fig. 2, 4, HAUTERIVIAN-BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu.

Cassiculosphaeridia reticulata Davey. 1969. *In*: Kumar, 1986a: 27, VALANGINIAN-HAUTERIVIAN (ONGC bore core nos. 7. 8), Krishna-Godavari Basin, Andhra Pradesh, (Garg *et al.*,1988 reassessed the age of this assemblage to be Hauterivian--Barremian); Khowaja-Ateequzzaman & Jain, 1992: 146, pl. 5, fig. 14, HAUTERIVIAN-BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu; Khowaja-Ateequzzaman & Garg, 2002: 136, pl. 1, fig. 15, MIDDLE TURONIAN (Kulakkalnattam Sandstone Member, Garudamangalam Formation), Cauvery Basin, southern India.

Cassiculosphaeridia sp. *In*: Khowaja-Ateequzzaman & Garg, 2002: 136, MIDDLE TURONIAN (Kulakkalnattam Sandstone Member, Garudamangalam Formation), Cauvery Basin, southern India.

CAUVERIDINIUM Khowaja-Ateequzzaman & Jain, 1990.

Cauveridinium indicum Khowaja-Ateequzzaman & Jain, 1990. *In*: Khowaja-Ateequzzaman & Jain, 1990: 174-176, pl. 1, figs 1-6; pl. 2, fig. 6; pl. 3, figs 5-6, text-fig. 1 A-D. TURONIAN-SANTONIAN (Trichinopoly Formation), Cauvery Basin, Tamil Nadu. (Age revised to be Early to Late Turonian in Khowaja-Ateequzzaman & Garg, 2002); Khowaja-Ateequzzaman & Garg, 2002: 136, pl. 2, fig. 6, EARLY - LATE TURONIAN (Kulakkalnattam Sandstone Member, Garudamangalam Formation), Cauvery Basin, southern India.

Cauveridinium intermedium Khowaja-Ateequzzaman & Jain, 1990. *In*: Khowaja-Ateequzzaman & Jain, 1990: 178, pl. 2, figs 1-5, text-fig. 2 A-B, TURONIAN-SANTONIAN (Trichinopoly Formation), Cauvery Basin, Tamil Nadu. (Khowaja-Ateequzzaman & Garg, 2002 reassessed the age to be Late Turonian); Khowaja-Ateequzzaman & Garg, 2002: 136, pl. 1, fig. 10, EARLY - LATE TURONIAN (Kulakkalnattam Sandstone Member, Garudamangalam Formation), Cauvery Basin, southern India.

Cauveridinium longispinosum Khowaja-Ateequzzaman & Jain. 1990. *In*: Khowaja-Ateequzzaman & Jain, 1990: 178-179. pl 3. figs 1-4. text-fig. 3. TURONIAN-SANTONIAN (Trichinopoly Formation), Cauvery Basin. Tamil Nadu. (Khowaja-Ateequzzaman & Garg, 2002 reassessed the age to be Late Turonian); Khowaja-Ateequzzaman & Garg, 2002: 136, LATE TURONIAN (Kulakkalnattam Sandstone Member, Garudamangalam Formation), Cauvery Basin, southern India.

"CERATIOPSIS" Vozzhennikova. 1963 emend. Bujak *et al.*, 1980 (Name illegitimate, senior homonym: CERATIOPSIS de Wildeman, 1896). **NOW CERODINIUM** Vozzhennikova 1963 emend. Lentin & Williams. 1987. (Senior synonym by implications in Lentin & Williams, 1977b, p. 20)

Ceratiopsis diebelii (Alberti, 1959b) Vozzhennikova. 1967. **NOW Cerodinium diebelii** (Alberti, 1959b) Lentin & Williams, 1987.

Ceratiopsis leptoderma Vozzhennikova. 1963. **NOW Cerodinium leptodermum** (Vozzhennikova, 1963) Lentin & Williams, 1987.

Ceratiopsis sp. In: Mehrotra & Sarjeant, 1987 = **Cerodinium sp**.

"CERBIA" Below, 1981a. **NOW TENUA** Eisenack, 1958a emend. Sarjeant, 1968 emend. Pocock, 1972 emend. Sarjeant, 1985a. Taxonomic senior synonym, by implications in Sarjeant, 1985a, p. 93-94; 1992, p. 678)

Cerbia tabulata (Davey & Verdier, 1974) Below, 1981a. **NOW Tenua hystrix** Eisenack, 1958a emend. Sarjeant, 1985a emend. Sarjeant, 1992b. (Taxonomic senior synonym, by implications in Sarjeant, 1985a, p. 93-94; 1992, p. 678)

CEREBROCYSTA Bujak *in* Bujak *et al.,* 1980.

Cerebrocysta bartonensis Bujak *in* Bujak *et al.*. 1980. *In*: Mathur, 1986: 195-198, LUTETIAN-BARTONIAN (Kalol Formation. well no. 109), Cambay Basin, Gujarat.

CERODINIUM Vozzhennikova, 1963 emend. Lentin & Williams, 1987.

Cerodinium crassistriatum (Jain *et al*., 1975) Lentin & Williams, 1987. *In*: Mehrotra *et al*., 2005: 66, DANIAN ex Mehrotra *et al*., 2002, Assam-Arakan Basin, Northeastern India

Deflandrea crassistriata Jain *et al.*, 1975. *In*: Jain *et al.*, 1975: 8-9, pl. 6, figs 64-65, DANIAN (Langpar Formation), Meghalaya.

Cerodinium diebelii (Alberti, 1959b) Lentin & Williams, 1987. *In*: Kumar *et al.*, 1996: 150, LATE MAASTRICHTIAN (Upper part of Mahadeo Formation, Um Sohryngkew River Section), Meghalaya; Mehrotra & Aswal, 2003: 25-26, pl. 10, fig. 2; pl. 23, figs 2 & 4, LATE MAASTRICHTIAN – EARLY CAMPANIAN (ONGC well END- A, 920 – 1105m, Tirupati Formation), Krishna-Godavari Basin, Andhra Pradesh; LATE MAASTRICHTIAN (ONGC well DRK- A, 1250 – 1280m, Chintalapalli Formation), Krishna-Godavari Basin, Andhra Pradesh; LATE MAASTRICHTIAN – LATE CAMPANIAN (ONGC well MVD- A, 805 – 845m, Tirupati Formation), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 44, MAASTRICHTIAN ex Mehrotra *et al*., 2002, Cambay Basin, EARLY CAMPANIAN – LATE MAASTRICHTIAN ex Mehrotra & Aswal, 2003, Krishna-Godavari Basin, Andhra Pradesh.

Ceratiopsis diebelii (Alberti, 1959b) Vozzhennikova, 1967. *In*: Jain,

1978: 149, pl. 2, fig. 21; pl. 3, fig. 34, LATEST MAASTRICHTIAN (Kallankurchi Formation), Vriddhachalam area, Cauvery Basin, Tamil Nadu.

Cerodinium leptodermum (Vozzhennikova, 1963) Lentin & Williams, 1987. *In*; Mehrotra & Aswal, 2003: 27, pl. 23, fig. 3, MAASTRICHTIAN (ONGC well NSP- A, 3621 – 3624m, Chintalapalli Formation), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al.*, 2005: 44, MAASTRICHTIAN *ex* Mehrotra & Aswal, 2003, Krishna-Godavari Basin, Andhra Pradesh, DANIAN *ex* Mehrotra *et al.*, 2002, Asam-Arakan Basin.

Ceratiopsis leptoderma Vozzhennikova, 1963. *In*: Jain *et al.*, 1975: 8, pl. 4, fig. 49; pl. 6, fig. 67, DANIAN (Langpar Formation), Meghalaya; Mehrotra & Sarjeant, 1987:165--166, pl. 2, fig. 4, text-fig. 2, MAASTRICHTIAN (Narsapur well-1), Krishna-Godavari Basin, Andhra Pradesh.

Cerodinium speciosum (Alberti, 1959b) Lentin & Williams, 1987. *In*: Kumar *et al.*, 1996: 150, pl. 1, fig. 5; pl. 2, fig. 8, LATE MAASTRICHTIAN (Upper part of Mahadeo Formation, Um Sohryngkew River Section), Meghalaya.Mehrotra & Aswal, 2003: 28, pl. 24, fig. 1, MAASTRICHTIAN (ONGC well NSP- A, 3621 – 3624m, Chintalapalli Formation), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al.*, 2005: 44, MAASTRICHTIAN *ex* Mehrotra & Aswal, 2003, Krishna-Godavari Basin, Andhra Pradesh.

Deflandrea speciosa Alberti, 1959b. *In*: Mehrotra & Sinha, 1981: 153, pl. 3, fig. 9, LATE CRETACEOUS-MIDDLE EOCENE (Sangchamalla Formation), Kumaon Himalaya, Uttar Pradesh. (Jain & Garg, 1986a suggested it to be the *junior synonym* of *Endoceratium ludbrookiae* (Cookson & Eisenack) Loeblich & Loeblich, 1966 emend. Morgan, 1980. They also revised the age of this assemblage to be LATE CRETACEOUS).

Cerodinium speciosum subsp. **elongatum** (Mao Shaozhi & Norris, 1988) Lentin & Williams, 1989. *In*: Kumar *et al.*, 1996: 150, pl. 1, figs 4, 8, LATE MAASTRICHTIAN (Upper part of Mahadeo Formation, Um Sohryngkew River Section), Meghalaya.

Cerodinium striatum (Drugg, 1967) Lentin & Williams, 1987.

Deflandrea striata Drugg, 1967. *In*: Venkatachala & Sharma, 1982, pl. 2, fig. 20, LATE SENONIAN (Narsapur well- 1), Krishna-Godavari Basin, Andhra Pradesh.

Cerodinium sp.

Ceratiopsis sp. *In*: Mehrotra & Sarjeant, 1987: 166, pl. 2, fig. I, MAASTRICHTIAN (Narsapur well-1), Krishna-Godavari Basin, Andhra Pradesh.

Cerodinium sp. 1. *In*; Mehrotra & Aswal, 2003: 29, pl. 23, fig. 1, MAASTRICHTIAN (ONGC well NSP- A, 3621 – 3624m, Chintalapalli Formation), Krishna-Godavari Basin, Andhra Pradesh.

Cerodinium sp. 2. *In*: Mehrotra & Aswal, 2003; 30, pl. 24, fig. 4, MAASTRICHTIANA (ONGC well NSP- A, 3621 – 3624m, Chintalapalli Formation), Krishna-Godavari Basin, Andhra Pradesh.

CHARLESDOWNIEA Lentin & Vozzhennikova, 1989.

Charlesdowniea tenuivirgula (Williams & Downie, 1966b) Lentin & Vozzhennikova, 1989.

Kisselevia tenuivirgu1a (Williams & Downie, 1966b) Lentin & Williams, 1976. *In*: van Erve *et al.*, 1980: 627-628, pl.. 2, figs 5-7, EARLY EOCENE (Subathu Formation) , Simla Hills, Himachal Pradesh. (Orthographic Change: van Erve *et al.*, 1980 cited *Kisselovia tenuivirgula*)

CHATANGIELLA Vozzhennikova, 1967 emend. Lentin & Williams, 1976 emend. N.G. Marshal, 1988.

Chatangiella ditissima (McIntyre, 1975) Lentin & Williams, 1976. *In*: Mehrotra & Aswal, 2003: 31-32, pl. 16, figs 4 & 5, CENOMANIAN – EARLY VALANGINIAN (ONGC well END- A, 1120 = 1185, Tirupati Formation), Krishna-Godavari Basin, Andhra Pradesh; EARLY-LATE CAMPANIAN – BARREMIAN (ONGC well RCPM- A, 1220 – 2185, Tirupati and Raghavapuram Formations), Krishna-Godavari Basin, Andhra Pradesh; CAMPANIAN – CENOMANIAN (ONGC well MVD- A, 880 – 1055m, Tirupati Formation), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 44-45, EARLY VALANGINIAN – LATE CAMPANIAN ex Mehrotra & Aswal, 2003, Krishna-Godavari Basin, Andhra pradesh.

Chatangiella verrucosa (Manum, 1963) Lentin & Williams, 1976. *In*: Mehrotra & Aswal, 2003: 33, pl. 25, figs 2 & 4, LATE MAASTRICHTIAN – EARLY CAMPANIAN (ONGC well DRK- A, 1275 – 1480m, Chintalapalli Formation), Krishna-Godavari Basin, Andhra Pradesh; EARLY MAASTRICHTIAN – BARREMIAN (ONGC well RCPM- A, 1055 – 2185, Tirupati and Raghavapuram formations), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 45, BARREMIAN – LATE MAASTRICHTIAN ex Mehrotra & Aswal, 2003, Krishna-Godavari Basin, Andhra Pradesh. .

Chatangiella sp. *In*: Nandi, 1990: 124, pl. 4, fig. 23, CENOMANIAN - EARLY SENONIAN, Meghalaya.

Chatangiella sp. A. *In*: Khowaja-Ateequzzaman & Garg, 2002: 136, pl. 1, fig. 14, EARLY TURONIAN (Kulakkalnattam Sandstone Member, Garudamangalam Formation), Cauvery Basin, southern India.

Chatangiella sp. B. *In*: Khowaja-Ateequzzaman & Garg, 2002: 136, pl. 2, fig. 7, EARLY TURONIAN (Kulakkalnattam Sandstone Member, Garudamangalam Formation), Cauvery Basin, southern India.

CHIROPTERIDIUM Gocht, 1960.

Chirpteridium galea (Maier, 1959) Sarjeant, 1983 emend. Sarjeant, 1983.

Chiropteridium mespilanum (Maier, 1959) Lentin & Williams, 1973. *In*: Mehrotra & Kamla Singh, 2003: 28, pl. 19, figs 3 & 5, MIDDLE MIOCENE (ONGC well MGP- A, 1180 – 1185m), Krishna-Godavari Basin, Andhra Pradesh; MIDDLE MIOCENE (ONGC well KSP- A, 1475 – 1480m), Krishna-Godavari Basin, Andhra Pradesh; MIDDLE MIOCENE (ONGC well SSY- A, 1655 – 1685m), Krishna-Godavari Basin, Andhra Pradesh; MIDDLE MIOCENE (ONGC well GS- 15-D, 2260 – 2265m), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 66, LUTETIAN – LATE BARTONIAN ex Mehrotra *et al*., 2003, Mumbai Offshore; MIDDLE MIOCENE ex Mehrotra & Kamla Singh, 2003, Krishna-Godavari Basin, Andhra Pradesh.

Chiropteridium mespilanum (Maier, 1959) Lentin & Williams, 1973. **NOW Chiropteridium galea** (Maier, 1959) Sarjeant, 1983 emend. Sarjeant, 1983. (Taxonomic senior synonym according to Sarjeant, 1983, p. 108-109)

Chiropteridium sp. **A** *In*: Jain & Tandon, 1981: 8, pl. 4, fig. 64, MIDDLE EOCENE (Harudi Formation), Kutch, Gujarat.

Chiropteridium sp. A *In*: Kar, 1985: 186, MIDDLE EOCENE (Harudi Formation), Kutch, Gujarat, (reproduction from Jain & Tandon, 1981).

CHLAMYDOPHORELLA Cookson & Eisenack, emend. Duxbury, 1983.

Chlamydophorella ambigua (Deflandre, 1937b) Stover & Helby, 1987d **NOW Gorgonisphaeridium ambiguum** (Deflandre, 1937b) Sarjeant & Stancliffe, 1994. (Acritarch)

Chlamydophorella fenestrata Jain & Garg *in* Jain *et al.*, 1984. *In*: Jain *et al.*, 1984:

72, pl. 1, figs 18,19, EARLY LATE TITHONIAN (Spiti Shale Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh.

Chlamydophorella cf. **C. nyei** Cookson & Eisenack, 1958. *In*: Mehrotra & Sarjeant, 1986: 723-724, pl. 8, figs 3-6, text-fig. 7c-d, VALANGINIAN-APTIAN (Periyavadavadi shallow well- I), Cauvery Basin, Tamil Nadu.

Chlamydophorella raritubula Dodekova, 1975. *In*: Garg *et al.*, 2003: 52-53, pl, IV, fig. 10; pl. V, fig. 5, EARLY LATE LOWER TITHONIAN (*Kosmatia* Ammonite, Middle Division, Spiti Shale Formation, Kibber Section of Spiti Valley); LATE LOWER TITHONIAN (*Paraboliceras* Ammonite, Upper part of the Middle Division, Spiti Shale Formation, Kibber Section), Malla Johar area, Kumaon Himalaya.

Chlamydophorella wallala Cookson & Eisenack, 1960b. *In*: Jain *et al.*, 1986: 80, pl. 3, fig. 48, LATE JURASSIC, Kutch, Gujarat; Garg *et al.*, 2003: 52-53, pl, III, figs 9-10; pl. IV, fig. 2, LATE LOWER TITHONIAN (*Kosmatia* Ammonite, Middle Division, Spiti Shale Formation, Kibber Section of Spiti Valley); LATE LOWER TITHONIAN (*Paraboliceras* Ammonite, Upper part of the Middle Division, Spiti Shale Formation, Kibber Section), Malla Johar area, Kumaon Himalaya.

?Chlamydophorella sp. *In*: Jain & Taugourdeau-Lantz, 1973: 65, pl. 4, fig 9, ?APTIAN-EARLY ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

CHYTROEISPHAERIDIA (Sarjeant, 1962a) Downie & Sarjeant, 1965 emend. Pocock, 1972 emend. Davey, 1979d.

Chytroeisphaeridia chytroeides (Sarjeant, 1962a) Downie & Sarjeant, 1965 emend. Davey, 1979d. *In*: Kumar, 1987a: 594, pl. 2, figs 5, 6, LATE BATHONIAN-CALLOVIAN (Jhurio Formation), Kutch, Gujarat; Kumar, 1987b: 240, pl. 1, fig. 4, EARLY KIMMERIDGIAN--TITHONIAN (Jhuran Formation), Kutch, Gujarat.

Chytroeisphaeridia ?scabrata Pocock, 1972. *In*: Kumar, 1987a: 599, LATE BATHONIAN-CALLOVIAN (Jhurio Formation), Kutch, Gujarat. (Questionable assignment: Stover & Evitt, 1978)

Chytroeisphaeridia sp. A *In*: Jain *et al.*, 1984: 78, pl. 3. figs 43, 46, KIMMERIDGIAN (Spiti Shale Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh.

Chytroeisphaeridia sp. B *In*: Jain *et al.*, 1984: 78, pl. 4, fig. 73, EARLY LATE TITHONIAN (Spiti Shale Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh.

CIRCULODINIUM Alberti, 1961.

Circulodinium distinctum (Deflandre & Cookson, 1955) Jansonius, 1986. *In*: Khowaja-Ateequzzaman & Jain, 1992: 148, pl. 3, figs 5, 7, 8, 10; pl. 8, fig. 10; pl. 13, fig. 9, HAUTERIVIAN-BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu; Khowaja-Ateequzzaman & Garg, 2002: 136, pl. 3, figs 7, 8, EARLY - LATE TURONIAN (Kulakkalnattam Sandstone Member, Garudamangalam Formation), Cauvery Basin, southern India; Mehrotra & Aswal, 2003: 35, pl. 18, figs 2 & 4; pl. 19, figs 1 – 4, SANTONIAN – BERRIASIAN (ONGC well END- A, 1160 – 1900m, Tirupati and Raghavapuram formations), Krishna-Godavari Basin, Andhra Pradesh; LATE MAASTRICHTIAN – BARREMIAN (ONGC well RCPM- A, 960 – 2200m, Tirupati and Raghavapuram formations), Krishna-Godavari Basin, Andhra Pradesh; CENOMANIAN – TITHONIAN (ONGC well MVD- A, 1355 – 2285m, Tirupati, Raghavapuram and Golapalli formations), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al.*, 2005: 66, YPRESIAN (51.0 Ma), Mumbai Offshore; NEOCOMIAN - APTIAN ex Mehrotra *et al.*, 2002, Cauvery Basin, Tamil Nadu; TITHONIAN – LATE MAASTRICHTIANex Mehrotra & Kamla Singh, 2003, Krishna-Godavari Basin, Andhra Pradesh.

Circulodinium deflandrei Alberti, 1961. *In*: Khowaja-Ateequzzaman & Jain, 1992: 146, pl. 9, fig. 14, HAUTERIVIAN-BARREMIAN

(CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu.

Cyclonephelium distinctum Deflandre & Cookson, 1955. *In*: Jain & Subbaraman, 1969: 549, EARLY CRETACEOUS (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu; Jain & Taugourdeau-Lantz, 1973: 63, pl. 3, fig. 12, ?APTIAN-EARLY ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu; Jain, 1977b: 186, pl. 3, fig. 34, EARLY ALBIAN (Dalmlapuram Formation), Cauvery Basin, Tamil Nadu; Kumar, 1986a: 31, VALANGINIAN-HAUTERIVIAN (ONGC bore core nos. 4, 5, 7), Krishna-Godavari Basin, Andhra Pradesh, (Garg *et al.,* 1988 reassessed the age of this assemblage to be Hauterivian-Barremian).

Circulodinium distinctum subsp. **Laevigatum** (Mehrotra & Sarjeant) Lentin & Williams, 1989.

Cyclonephelium distinctum subsp. *laevigatum* Mehrotra & Sarjeant, 1986. *In*: Mehrotra & Sarjeant, 1986: 719-720, pl. 8, figs 1-2; pl. 9, fig. 2, text-fig. 7a, VALANGINIAN-APTIAN (Periyavadavadi shallow well- 1), Cauvery Basin, Tamil Nadu.

Circulodinium indicum Mehrotra & Sarjeant, 1987 ex Lentin & Williams, 1989.

Cyclonephelium indicum Mehrotra & Sarjeant, 1987 *(non* Khanna & Singh, 1981 b). *In*: Mehrotra & Sarjeant, 1987: 163, pl. 2, fig. 2; pl. 7, fig. 7, PALAEOCENE (Narsapur well- 1), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra & Kamla Singh, 2003: 36, pl. 20, fig. 3, THANETIAN (ONGC well NSP- A, 2703 – 2706m, Pasarlapudi Formation), Krishna-Godavari Basin, Andhra Pradesh.

CLADOPYXIDIUM McLean, 1972 emend. Stover & Evitt, 1978 emend. Below, 1987b.

Cladopyxidium saeptum (Morgenroth, 1968) Stover & Evitt, 1978. *In*: Mehrotra & Kamla Singh, 2003: 29, pl. 31, figs 2 & 4, THANETIAN (ONGC well RZL- A, 3060 – 3065m, Palakollu Shale), Krishna-Godavari Basin, Andhra Pradesh; MAASTRICHTIAN (ONGC well NSP- A, 3621 – 3649m, Razole Formation), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 66, MAASTRICHTIAN - THANETIAN ex Mehrotra & Kamla Singh, 2003, Krishna-Godavari Basin, Andhra Pradesh.

CLEISTOSPHAERIDIUM Davey *et al*., 1966.

Cleistosphaeridium aciculare Davey, 1969a. **NOW Downiesphaeridium aciculare** (Davey, 1969a) Islam, 1993.

Cleistosphaeridium brevispinosum Jain & Millepied, 1975. **NOW Sentusidinium brevispinosum** (Jain & Millepied, 1975) Islam, 1993.

Cleistosphaeridium cephalum Kar, 1985. **NOW Operculodinium israelianum** (Rossignol, 1962) Wall, 1967. (Reallocated by Jain & Garg, 1991)

Cleistosphaeridium disjunctum Davey, et al., 1966. **NOW Lingulodinium machaerophorum** (Deflandre & Cookson, 1955) Wall, 1967.

Cleistosphaeridium diverispinosum Davey, *et al*., 1966. **NOW Systematophora diverispinosa** (Davey *et al.*, 1966) Islam, 1993.

Cleistosphaeridium diverispinosum Davey, *et al*., 1966 *In* : Kar, 1985: 181, pl. 40, figs 4,5, EARLY EOCENE (Lakhpat bore hole-1), Kutch, Gujarat. **= Polysphaeridium subtile** Davey & Williams, 1966b emend. Bujak *et al*., 1980. (According to Jain & Garg, 1991)

Cleistosphaeridium echinoides (Maier, 1959) Davey *et al.,* 1969. **NOW Spiniferites ramosus** (Ehrenberg, 1838) Mantell, 1854.

Cleistosphaeridium flexuosum Davey, *et a*l., 1966. **NOW Downiesphaeridium flexuosum** (Davey *et al.*, 1966) Islam, 1993.

Cleistosphaeridium granulatum Burger, 1980a. **NOW Impletosphaeridium granulatum** (Burger, 1980a) Islam, 1993.

Cleistosphaeridium heteracanthum (Deflandre & Cookson, 1955) Davey *et al.*, 1966. **NOW Heterosphaeridium ?heteracanthum** (Deflandre & Cookson, 1955) Eisenack & Kjellstrom, 1971.

Cleistosphaeridium huguoniotii (Valensi, 1955a) Davey, 1969. **NOW Sepispinula huguoniotii** (Valensi, 1955a) Islam, 1993.

Cleistosphaeridium mediterraneum Corradini, 1973. **NOW Impletosphaeridium mediterraneum** (Corradini, 1973) Islam, 1993.

Cleistosphaeridium microcystum Bujak *in* Bujak *et aI.,* 1980. **NOW Sentusidinium microcystum** (Bujak *in* Bujak *et aI.,* 1980) Islam, 1993..

Cleistosphaeridium mikirii Mehrotra, 1981. **NOW Lingulodinium machaerophorum** (Deflandre & Cookson, 1955) Wall, 1967, (Taxonomic senior synonym, according to Jain & Garg, 1983).

Cleistosphaeridium multispinosum (Singh, 1964) Brideaux, 1971. **NOW Downiesphaeridium multispinosum** (Singh, 1964) Islam, 1993.

Cleistosphaeridium polypes (Cookson & Eisenack, 1962b) Davey, 1969a. **NOW Kiokansium unituberculatum** (Tasch in Tasch *et al.*, 1964) Stover & Evitt, 1978.

Cleistosphaeridium polytrichum (Valensi, 1947) Davey et al., 1969. **NOW Impletosphaeridium polytrichum** (Valensi, 1947) Islam, 1993.

Cleistosphaeridium sijuensis Saxena & sarkar, 2000. *In*: Saxena & Sarkar, 2000: 256, 263, pl. 1, figs 7-8, MIDDLE EOCENE (Siju Formation), Simsang River near Siju, South Garo Hills, Meghalaya.

Cleistosphaeridium ?tribuliferum (Sarjeant) Davey *et aI.,* 1969. **NOW Impletosphaeridium tribuliferum** (Sarjeant, 1962a) Islam, 1993.

Cleistosphaeridium varispinosum (Sarjeant, 1959) Woollam & Riding, 1983. **NOW Impletosphaeridium varispinosum**.

Cleistosphaeridium sp. *In*: Singh & Khanna, 1980: 471, pl. 2, fig. 11, LATE PALAEOCENE-LATE EOCENE (Subathu Formation), Simla Hills, Himachal Pradesh.

Cleistosphaeridium sp. *In*: Kumar, 1986a: 27, VALANGINIAN-HAUTERIVIAN (ONGC bore core no. 2), Krishna-Godavari Basin, Andhra Pradesh. (Garg *et al.,* 1988 reassessed the age of this assemblage to be Hauterivian-Barremian).

Cleistosphaeridium sp. *In*: Sarkar, 1991: 3, pl. I, fig. 8, EARLY EOCENE (Kakara Series, Lesser Himalaya), Kakara-Chapla group of villages, Simla, Himachal Pradesh;

Cleistosphaeridium sp. *In*: Singh & Sarkar, 1992: 185, LATE PALAEOCENE?-EOCENE (Subathu Formation), Garkhal area, Punjab Basin, Himachal Pradesh.

Cleistosphaeridium sp. *In*: Mehrotra *et* al., 1996: 687, LUTETIAN-PRIABONIAN – RUPELIAN-BERDIGALIAN (ONGC well Gulf- 3, Tarapur Shale, Babaguru and Post Babaguru formations), Gulf of Cambay, Gujarat.

Cleistosphaeridium sp. A *In*: Venkatachala & Kumar, 1980: 95, pl. 1, fig. 10, ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

Cleistosphaeridium sp. A *In*: Jain & Tandon, 1981: 8, pl. 4, fig. 61, MIDDLE EOCENE (Harudi Formation) , Kutch, Gujarat.

Cleistosphaeridium sp. A *In*: Kar. 1985: 187. pl. 44. fig. 3. MIDDLE EOCENE (Harudi Formation), Kutch, Gujarat. (reproduction from Jain & Tandon. 1981).

Cleistosphaeridium sp. A. *In*: Khowaja-Ateequzzaman & Jain, 1992: 150, pl. 5, fig. 16, HAUTERIVIAN-BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu.

Cleistosphaeridium sp. A. *In*: Garg *et al*., 2003: 52-53, pl, IV, fig. 8, LATE LOWER TITHONIAN (*Kosmatia* Ammonite, Middle Division, Spiti Shale Formation, Kibber Section of Spiti Valley), Malla Johar area, Kumaon Himalaya.

Cleistosphaeridium sp. B *In*: Venkatachala & Kumar, 1980: 95, pl. 1, fig. 11, ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

Cleistosphaeridium sp. B. *In*: Garg *et al*., 2003: 52-53, pl, III, fig. 15, LATE LOWER TITHONIAN (*Paraboliceras* Ammonite, Upper part of the Middle Division, Spiti Shale Formation, Kibber Section), Malla Johar area, Kumaon Himalaya.

Cleistosphaeridium sp. C *In*: Venkatachala & Kumar, 1980: 95, pl. 1, fig. 5, ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

Cleistosphaeridium sp. D *In*: Venkatachala & Kumar, 1980: 95, pl. 2, fig. 3, ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

CODONIELLA Cookson & Eisenack, 1961a emend. Davey, 1979b.

Codoniella ?langparensis Jain *et al.*,1975. *In*: jain *et al.*, 1975: 12, pl. 4, fig. 56, pl. 5, figs 57-58, DANIAN (Langpar Formation), Meghalaya; Singh & Tripathi, 1987: 303, PALAEOCENE (Therria Formation), Meghalaya; Tripathi, I989: 72, pl. 2, figs 2, 9, PALAEOCENE (Therria Formation), Meghalaya. (Questionable assignment: Stover & Evitt, 1978)

COLLUMOSPHAERA Jain & Dutta in Dutta & Jain, 1980. (Acritarch genus)

Collumosphaera fruticosa Jain & Dutta in Dutta & Jain, 1980. (Acritarch) *In*: Saxena & Sarkar, 2000: 256, 263, pl. 2, fig. 13, MIDDLE EOCENE (Siju Formation), Simsang River near Siju, South Garo Hills, Meghalaya.

Collumosphaera cf. **C. Fruticosa** Jain & Dutta in Dutta & Jain, 1980. *In*: Garg & Khowaja-Ateequzzaman, 2000: 471, pl. 3, fig. 10, LATE THANETIAN (Lakadong Sst Member, Sylhet Limestone Formation), Cherrapunji area, Khasi Hills, Meghalaya.

Collumosphaera garoensis Saxena & Sarkar, 2000. (Acritarch) *In*: Saxena & Sarkar, 2000: 256, pl. 1, figs 5-6, MIDDLE EOCENE (Siju Formation), Simsang River near Siju, South Garo Hills, Meghalaya.

CONOSPHAERIDIUM Cookson & Eisenack, 1969.

Conosphaeridium striatoconus (Deflandre & Cookson, 1955) Cookson & Eisenack, 1969. *In*: Khowaja-Ateequzzaman & Garg, 2002: 136, pl. 1, fig. 4, EARLY - LATE TURONIAN (Kulakkalnattam Sandstone Member, Garudamangalam Formation), Cauvery Basin, southern India.

CONNEXIMURA May, 1980 emend. Marheinecke, 1992.

Conneximura fimbriata (Morgenroth, 1968) May, 1980 emend. May, 1980 emend. Marheinecke, 1992. *In*: Mehrotra *et al*., 2005: 67, THANETIAN ex Mehrotra *et al*., 2002, Mumbai Offshore; THANETIAN, Assam-Arakan Basin, Northeastern India.

CORDOSPHAERIDIUM Eisenack, 1963 emend. Morgenroth, 1968 emend. Davey, 1969c emend. Sarjeant, 1981 emend. He Chengquan, 1991.

Cordosphaeridium cantharellum (Brosius, 1963) Gocht, 1969. **NOW Tityrosphaeridium cantharellus** (Brosius, 1963) Sarjeant, 1981.

Cordosphaeridium cantharellum (Brosius, 1963) Gocht, 1969. *In*: Kar, 1985, pl. 48, fig. 2, = **Achomosphaera alcicornu** (Eisenack, 1954b) Davey & Williams, 1966a. (According to Jain & Garg, 1991)

Cordosphaeridium cantharellum (Brosius, 1963) Gocht, 1969. *In*: Kar, 1985, pl. 48, fig. 3, = **Glaphyrocysta indica** Jain & Garg, 1991. (According to Jain & Garg, 1991)

Cordosphaeridium cantharellum (Brosius, 1963) Gocht, 1969. **NOW Tityrosphaeridium cantharellus** (Brosius, 1963) Sarjeant, 1981.

Cordosphaeridium ?cracenospinosum Davey & Williams, 1966b. *In*: Kar, 1985, pl. 48, figs 5--6 = **Glaphyrocysta indica** Jain & Garg, 1991 (According to Jain & Garg, 1991; Questionable assignment: Stover & Evitt, 1978)

Cordosphaeridium exilimurum Davey & Williams, 1966b. *In*: Sah *et al.*, 1970: 145, pl. 1, figs 8-9, LATE CRETACEOUS (Langpar Formation), Meghalaya; Jain, 1978: 149-150, pl. I, fig. 1, LATEST MAASTRICHTIAN (Kallankurchi Formation), Vriddhachalam area, Cauvery Basin, Tamil Nadu; Dutta & Jain, 1980: 66, pl. 2, fig. 18; pl. 6, figs 47-48, EARLY-MIDDLE EOCENE (Sylhet Formation), Meghalaya; Mehrotra & Sinha, 1980: 1003, EOCENE (Sangchamalla Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh; Mehrotra & Sinha, 1981: 153, pl. 2, fig. 6,LATE CRETACEOUS-MIDDLE EOCENE (Sangchamalla Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh; (Jain & Garg, 1986a reassessed the age of this assemblage to be Late Cretaceous); Singh & Tripathi, 1987: 303, PALAEOCENE - EOCENE (Therria and Kopili formations), Meghalaya; Tripathi, 1989: 68, pl. 1, fig. 1, PALAEOCENE - EOCENE Therria & Kopili formations), Meghalaya; Sarkar, 1991: 3, pl. III, fig. 2, EARLY EOCENE (Kakara Series, Lesser Himalaya), Kakara-Chapla group of villages, Simla, Himachal Pradesh; Sarkar & Prasad, 2000a: 170, LATE YPRESIAN – EARLY LUTETIAN (Subathu Formation, Koshalia Nala Section), Shimla Hills; Sarkar & Prasad, 2000b: 141, EARLY LUTETIAN (Subathu Formation, Morni Hills), Haryana;.

Achomosphaera valianta Sah *et al.*, 1970. *In*: Sah *et al.*, 1970: 145, pl.1, figs 8-9, LATE' CRETACEOUS (Langpar Formation). Meghalaya.

Cordosphaeridium valiantum (Sah *et al.*, 1970) Stover & Evitt. 1978. *In*: Singh & Tripathi. 987: 303, PALAEOCENE (Therria Formation), Meghalaya; Tripathi, 1989: 68, pl. 1, fig. 11, PALAEOCENE (Therria Formation), Meghalaya.

?Tityrosphaeridium exilimurum (Davey & Williams, 1966b) Jain & Garg, 1986a. *In*: Jain & Garg, 1986b: 120-121, pl. 1, fig. 11; pl. 5, fig. 5; pl. 6, fig. 15, LATE PALAEOCENE, Vriddhachalam area, Cauvery Basin, Tamil Nadu.

Cordosphaeridium exilimurum Davey & Williams, 1966b. *In*: Kar, 1985, pl. 41, figs 4-5 = **?Cordosphaeridium sp. A.** (According to Jain & Garg, 1991)

Cordosphaeridium exilimurum Davey & Williams, 1966b. *In*: Kar, 1985, pl. 48, fig. 4 = **Achomosphaera alsicornu** (Eisenack, 1954b) Davey & Willams, 1966a (According to Jain & Garg, 1991)

Cordosphaeridium fibrospinosum Davey & Williams,1966b. *In*: Jain, 1978: 150, pl. 2, fig. 15, LATEST MAASTRICHTIAN (Kallankurchi Formation), Vriddhachalam area, Cauvery Basin,Tamil Nadu; Jain & Tandon, 1981: 8, pl. 3, fig. 45, MIDDLE EOCENE (Harudi Formation), Kutch, Gujarat; Khanna *et al.*, 1981: 261, pl. 3, fig. 6, (Subathu Formation), Simla Hills, Himachal Pradesh; Mehrotra & Sinha, 1981: 153, pl. 2, fig. 6, LATE CRETACEOUS-MIDDLE EOCENE (Sangchamalla Formation), Kumaon Himalaya. (Jain & Garg. 1986a reassessed the age of this assemblage to be Late Cretaceous); Saxena & Rao. 1984: 55-56, pl. 1, figs 12-14, OLIGOCENE and EARLY MIOCENE (Laisong, Jenam and Bhuban formations), Jaintia Hills, Meghalaya and Cachar, Assam; Kar. 1985: 187, pl. 43, fig. 8; pl. 44, fig. 9, MIDDLE EOCENE (Harudi Formation), Kutch, Gujarat, (reproduction from Jain & Tandon, 1981); Kar. 1985: 203, pl. 49, fig. 6, MIOCENE, (Khari Nadi Formation), Kutch, Gujarat; Khanna *et al*., 1985: 106, pl.1, fig. 9, PALAEOCENE (Subathu Formation), Jammu Hills; Saxena *et al.*, 1987: 152, pl. 1, fig. 11, OLIGOCENE (Laisong Formation), Jaintia Hills, Meghalaya and Cachar, Assam; Mathur, 1986: 201, LUTETIAN--

BARTONIAN (Kalol Formation, well no. 109), Cambay Basin, Gujarat; Sarkar & Singh, 1988: 40, pl. 2, fig. 6, EOCENE (Subathu Formation), Banethi Bagthan area, Himachal Pradesh; Sarkar, 1991: 3, pl. I, fig. 6, EARLY EOCENE (Kakara Series, Lesser Himalaya), Kakara-Chapla group of villages, Simla, Himachal Pradesh; Singh & Sarkar, 1992: 185, LATE PALAEOCENE?-EOCENE (Subathu Formation), Garkhal area, Punjab Basin, Himachal Pradesh; Aswal & Pundeer, 1996: 636, pl. 1, fig. 20, YPRESIAN –LUTETIAN-BARTONIAN (ONGC Mori well- A, 2700 – 2500m), Krishna-Godavari Basin, Andhra Pradesh; Sarkar, 1997: 102, pl. 2, fig. 5, LATE YPRESIAN – LUTETIAN (Subathu Formation, Bilaspur area), Punjab Basin, Himachal Pradesh; Garg & Khowaja-Ateequzzaman, 2000: 471, pl. 3, figs 9, 12, LATE THANETIAN (Lakadong Sst Member, Sylhet Limestone Formation), Cherrapunji area, Khasi Hills, Meghalaya; Sarkar & Prasad, 2000a: 170, LATE YPRESIAN – EARLY LUTETIAN (Subathu Formation, Koshalia Nala Section), Shimla Hills; Sarkar & Prasad, 2000b: 141, LATE YPRESIAN – EARLY LUTETIAN (Subathu Formation, Morni Hills), Haryana; Saxena & Sarkar, 2000: 256, 263, pl. 1, figs 7-8, MIDDLE EOCENE (Siju Formation), Simsang River near Siju, South Garo Hills, Meghalaya; Mehrotra & Kamla Singh, 2003: 32, pl. 14. figs 1 & 2, EARLY OLIGOCENE (ONGC well MGP- A, 1545 – 1600m), Krishna-Godavari Basin, Andhra Pradesh; OLIGOCENE – EOCENE (ONGC well KSP- A, 2450 – 2525m), Krishna-Godavari Basin, Andhra Pradesh; EARLY OLIGOCENE – EARLY EOCENE (ONGC well CTP- a, 1100 – 2800m, Matsyapuri Sandstone, Bhimanapalli Limestone and Pasarlapudi Formation), Krishna-Godavari Basin, Andhra Pradesh; EARLY OLIGOCENE – MIDDLE EOCENE (ONGC well RZL- A, 1250 – 1750m, Matsyapuri Sandstone and Bhimanapalli Limestone), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 67, EOCENE ex Mehrotra *et al*., 1996, Cambay Basin, Gujarat; THANETIAN - RUPELIAN ex Mehrotra *et al*., 2003, Mumbai Offshore; EARLY EOCENE - OLIGOCENE ex Mehrotra & Kamla Singh, 2003, Krishna-Godavari Basin, Andhra Pradesh; MIDDLE EOCENE ex Saxena & Sarkar, 2000, Assam-Arakan Basin, Northeastern India.

?Tityrosphaeridium fibrospinosum (Davey & Williams, 1966b) Jain & Garg, 1986b. *In*: Jain & Garg, 1986b: 121. pl. 2, fig. 10; pl. 3, fig. 14, LATE PALAEOCENE, Vriddhachalam area, Cauvery Basin, Tamil Nadu.

Cordosphaeridium funiculatum Morgenroth, 1966a emend. Brinkhuis, 1992. *In*: Mehrotra & Kamla Singh, 2003: 33, pl. 9, fig. 2, BARTONIAN (ONGC well KSP- A, 2395 – 2400m), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 67, YPRESIAN – PRIABONIAN (49 – 33.2 Ma) ex Mehrotra *et al*., 2002, Mumbai Offshore; BARTONIAN ex Mehrotra & Kamla Singh, 2003, Krishna-Godavari Basin, Andhra Pradesh; YPRESIAN - PRIABONIAN ex Mehrotra *et al*., 2002, Assam-Arakan Basin, Northeastern India..

Tityrosphaeridium ?funiculatum (Morgenroth, 1966a) Sarjeant, 1981. *In*: Jain & Garg, 1986b: 121--122, pl. 1, figs 1-2, LATE PALAEOCENE, Vriddhachalam area, Cauvery Basin, Tamil Nadu.

Cordosphaeridium cf. **C**. **funiculatum** Morgenroth, 1966a emend. Brinkhuis, 1992. *In*: Dutta & Jain, 1980: 67. pl. 6, figs 55-56, EARLY-MIDDLE EOCENE (Sylhet Formation), Meghalaya.

Cordosphaeridium gracile (Eisenack, 1954b) Davey & Williams, 1966b emend. Davey & Williams, 1966b. *In*: Kar & Saxena, 1981: 151-152, pl. 4, fig. 82, MIDDLE-LATE EOCENE (Rataria bore core no. 27), Kutch, Gujarat, (Orthographic change: Kar & Saxena, 1981 listed C. *gracilis*); Saxena & Rao, 1984: 56, pl. 2, fig. 5, EARLY MIOCENE (Bhuban Fonnation), Jaintia Hills, Meghalaya and Cachar, Assam; MID-

DLE EOCENE (Rataria bore core no. 27); MIOCENE (Khari Nadi Formation), Kutch, Gujarat, (Orthographic change: Saxena & Rao, 1984 and Kar, 1985 listed *Cordosphaeridium gracilis*); Sarkar, 1991: 3, pl. II, fig. 12, EARLY EOCENE (Kakara Series, Lesser Himalaya), Kakara-Chapla group of villages, Simla, Himachal Pradesh; Aswal & Pundeer, 1996: 636, pl. 2, fig. 5, LUTETIAN - BARTONIAN (ONGC Mori well- A, 2100 – 1600m), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 1996: 685-688, LUTETIAN-PRIABONIAN – RUPELIAN-BURDIGALIAN (ONGC well Gulf- 1 and well Gulf- 3 and well Gulf- 4, Tarapur Shale, Babaguru and Post Babaguru Shale formations), YPRESIAN - LUTETIAN–PRIABONIAN (ONGC well Gulf- 2, Bhavnagar and Tarapur Shale formations), Gulf of Cambay, Gujarat; Sarkar, 1997: 102, LATE YPRESIAN – LUTETIAN (Subathu Formation, Bilaspur area), Punjab Basin, Himachal Pradesh Garg & Khowaja-Ateequzzaman, 2000: 471, pl. 3, fig. 6, LATE THANETIAN (Lakadong Sst Member, Sylhet Limestone Formation), Cherrapunji area, Khasi Hills, Meghalaya.

Cordosphaeridium inodes gracile (Eisenack, 1954b) Eisenack, 1963. *In*: Jain, 1978: 150, pl. 2, figs 19-20, LATEST MAASTRICHTIAN (Kallankurchi Fonnation) , Vriddhachalam area. Cauvery Basin, Tamil Nadu. (Orthographic change: Jain, 1978c listed *Cordosphaeridium inodes gracilis*).

Tityrosphaeridium gracile (Eisenack, 1954b) Sarjeant, 1981. *In*: Jain & Garg, 1986b: 122, pl. 1, fig. 10; pl. 6, fig. 1, LATE PALAEOCENE, Vriddhachalam area, Cauvery Basin, Tamil Nadu, (Orthographic change: Jain & Garg, 1986b listed *T. gracilis*); Mehrotra & Kamla Singh, 2003: 88, pl. 28, fig. 1, THANETIAN (ONGC well NSP- A, 2703 – 2706m, Pasarlapudi Formation), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 81, YPRESIAN - RUPELIAN *ex* Mehrotra *et al*., 1996, Cambay Basin, Gujarat; LUTETIAN – BARTONIAN (44 – 38 Ma), Mumbai Offshore; SELANDIAN – THANETIAN *ex* Mehrotra & Kamla Singh, 2003, Krishna-Godavari Basin, Andhra Pradesh; SELANDIAN - THANETIAN *ex* Mehrotra *et al*., 2002, Assam-Arakan Basin, Northeastern India.

Cordosphaeridium gracilis (Eisenack) Davey & Williams, 1966. *In*: Kar, 1985, pl. 40, fig. 6; pl. 45, fig. 12; pl. 49, fig. 5 = *Homotryblium pallidum* Davey & Williams, 1966b (According to jain & Garg, 1991). **NOW Homotryblim tenuispinosum** Davey & Williams, 1966b.

Cordosphaeridium cf. **C. gracile** (Eisenack, 1954b) Davey & Williams, 1966b emend. Davey & Williams, 1966b.

Tityrosphaeridium cf. *T. gracile* (Eisenack, 1954b) Sarjeant, 1981. *In*: Mehrotra & Kamla Singh, 2003: 89, pl. 28, fig. 2, THANETIAN (ONGC well NSP- A, 2703 – 2706m, Pasarlapudi Formation), Krishna-Godavari Basin, Andhra Pradesh.

Cordosphaeridium granulatum Khanna & Singh, 1981b. *In*: Khanna & Singh, 1981b: 403, pl. 2. figs 11-12, text-fig. 14, MIDDLE EOCENE (Subathu Formation). Simla Hills, Himachal Pradesh.

Cordosphaeridium inodes (Klumpp, 1953) Eisenack, 1963b emend. Morgenroth, 1968 emend. Sarjeant, 1981. *In*: Jain *et al.*, 1975; 10, pl. 5, figs 59-60; pl. 4, fig. 55, DANIAN (Langpar Formation), Meghalaya; Dutta & Jain, 1980: 67, pl. 6, figs 49-49a, EARLY-MIDDLE EOCENE (Sylhet Formation), Meghalaya; van Erve *et al.*, 1980: 618-620, pl. 1, figs 2-4, EARLY EOCENE (Subathu Formation), Simla Hills, Himachal Pradesh; Mehrotra, 1981: 15, pl. I, fig. 12, MIDDLE EOCENE (Garampani Limestone Formation), North Cachar Hills, Assam; Saxena & Rao, 1984: 55, pl. 1, fig. 10, OLIGOCENE

and EARLY MIOCENE (Laisong, Jenam and Bhuban formations) , Jaintia Hills. Meghalaya and Cachar, Assam; Jain & Garg, 1986b: 113, pl. 1, figs 9, 12, LATE PALAEOCENE, Vriddhachalam area, Cauvery Basin, Tamil Nadu; Singh & Sarkar. 1987: 208, pl. 1, fig. 29, EOCENE (Subathu Formation), Banethi-Bagthan area, Himachal Pradesh; Saxena *et al.*, 1987: 152, pl. 1, figs 2-3; pl. 2, fig. 11, OLIGOCENE and EARLY MIOCENE (Laisong, Jenam, Renji and Bhuban formations), Jaintia Hills, Meghalaya and Cachar, Assam; Sarkar & Singh, 1988: 39-40, pl. 1, fig. 14, EOCENE (Subathu Formation), Banethi-Bagthan area, Himachal Pradesh; Sarkar, 1997: 102, LATE YPRESIAN – LUTETIAN (Subathu Formation, Bilaspur area), Punjab Basin, Himachal Pradesh; Garg & Khowaja-Ateequzzaman, 2000: 471, LATE THANETIAN (Lakadong Sst Member, Sylhet Limestone Formation), Cherrapunji area, Khasi Hills, Meghalaya; Sarkar & Prasad, 2000b: 141, LATE YPRESIAN – EARLY LUTETIAN (Subathu Formation, Morni Hills), Haryana; Saxena & Sarkar, 2000: 256, 263, pl. 2, fig. 4, MIDDLE EOCENE (Siju Formation), Simsang River near Siju, South Garo Hills, Meghalaya; Mehrotra & Kamla Singh, 2003: 30-31, pl. 9, figs 4-6, YPRESIAN – DANIAN (ONGC well MNP-A, 975 – 3155m, Matsyapuri Sandstone, Bhimanapalli Limestone, Pasarlapudi Formation, palakollu Shale and Razole Formation), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 67, SELANDIAN - THANETIAN ex Mehrotra *et al*., 2002, Cauvery Basin, Tamil Nadu; DANIAN - YPRESIAN ex Mehrotra & Kamla Singh, 2003, Krishna-Godavari Basin, Andhra Pradesh; LOWER – MIDDLE EOCENE ex Mehrotra *et al*., 2002, Assam-Arakan Basin, Northeastern India.

Hystrichosphaeridium inodes Klumpp, 1953. *In*: Banerjee & Misra, 1972: 207, pl. 2, fig. 24, EOCENE-MIOCENE. Assam and Tripura.

Cordosphaeridium inodes gracile (Eisenack, 1954b) Eisenack, 1963. **NOW Cordosphaeridium gracile** (Eisenack, 1954b) Davey & Williams, 1966.

Cordosphaeridium inodes subsp. *robustum* Gocht, 1969. **NOW Cordosphaeridium robustum** (Gocht, 1969) Sarjeant, 1981.

Cordosphaeridium latispinosum Davey & Williams, 1966b. **NOW Achilleodinium latispinosum** (Davey & Williams, 1966b) Bujak *et al.,* 1980.

Cordosphaeridium multispinosum Davey & Williams, 1966b. **NOW Amphorosphaeridium ?multispinosum** (Davey & Williams, 1966b) Sarjeant, 1981.

Cordosphaeridium ?multispinosum Davey & Williams, 1966b. **NOW Amphorosphaeridium multispinosum** (Davey & Williams, 1966b) Sarjeant, 1981.

Cordosphaeridium robustum (Gocht, 1969) Sarjeant, 1981. *In*: Jain & Garg, 1991: 60-61, pl. 1, fig. 14, EARLY EOCENE (Lakhpat bore hole- 1), Kutch, Gujarat.

Cordosphaeridium inodes subsp. *robustum* Gocht, 1969. *In*: Mathur, 1986: 201, LUTETIAN-BARTONIAN (Kalol Formation, well no. 109), Cambay Basin, Gujarat.

Litosphaeridium siphoniphorum (Cookson & Eisenack, 1958) Davey & Williams, 1966b emend. Lucas--Clark, 1984. *In*: Kar, 1985: 184, pl. 40, fig. 10, EARLY EOCENE (Lakhpat bore hole- 1), Kutch, Gujarat. (Reallocated by Jain & Garg, 1991)

Cordosphaeridium sangchamallae Mehrotra & Sarjeant, 1981. *In*: Mehrotra & Sarjeant, 1981: 153. pl. 2. figs 7-8. LATE CRETACEOUS-MIDDLE EOCENE (Sangchamalla Fonnation). Malla Johar area. Kumaon Himalaya, Uttar Pradesh, (Jain & Garg. 1986a reassessed the age of this assemblage to be Late Cretaceous).

Cordosphaeridium valiantum (Sah *et al.*,1970) Stover & Evitt, 1978. **NOW Cordosphaeridium exilimurum** Davey & Williams, 1966b.

Cordosphaeridium sp. Jain & Taugourdeau-Lantz, 1973 **= Callaiosphaeridium asymmetricum** (Deflandre & Courteville, 1939) Davey & Williams, 1966. (According to Jain, 1977b).

Cordosphaeridium sp. *In*: Singh *et al.*, 1980: 471, pl. 2, fig. 9, LATE PALAEOCENE-LATE EOCENE (Subathu Formation), Simla Hills, Himachal Pradesh.

Cordosphaeridium sp. *In*: Salujha & Kindra, 1981: 52, pl. 2, fig. 49, DANIAN (Langpar Formation), Meghalaya, (Jain & Garg, 1982 reassessed the age of this assemblage to be Latest Cretaceous-Danian).

Cordosphaeridium sp. *In*: Kar, 1985: 200, pl. 46, figs 9-11, OLIGOCENE (Rataria bore core), Kutch, Gujarat.

Cordosphaeridium sp. In: Kar, 1985: 204, pl. 49, fig. 7, MIOCENE (Khari Nadi Formation), Kutch, Gujarat = **Glaphyrocysta indica** Jain & Garg, 1991 (According to Jain & Garg, 1991)

Cordosphaeridium sp. *In*: Jain & Garg, 1986a.

Homotryblium tenuispinosum Davey & Williams, 1966b. *In*: Mehrotra & Sinha, 1981: 153, pl. 2, figs 3-5, LATE CRETACEOUS-MIDDLE EOCENE (Sangchamalla Formation), Kumaon Himalaya, Uttar Pradesh, (Jain & Garg, 1986a reassessed the age of this assemblage to be Late Cretaceous).

Cordosphaeridium sp. *In:* Jain & Garg, 1986a.

Hystrichokolpoma unispinum Williams & Downie, 1966b. *In*: Mehrotra & Sinha, 1981: 152, pl. 2, fig. 9, LATE CRETACEOUS-MIDDLE EOCENE (Sangchamalla Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh, (Jain & Garg, 1986a reassessed the age of this assemblage to be Late Cretaceous).

Cordosphaeridium sp.

Tityrosphaeridium sp. In: Mehrotra & Sarjeant, 1987: 158-159, pl. 7, figs 3, 5, MAASTRICHTIAN (Narsapur well I), Krishna-Godavari Basin, Andhra Pradesh.

Cordosphaeridium sp. *In*: Singh & Tripathi, 1987: 303, PALAEOCENE EOCENE (Sylhet Formation), Meghalaya.

Cordosphaeridium sp. *In*: Sarkar, 1991: 3, pl. III, fig. 5, EARLY EOCENE (Kakara Series, Lesser Himalaya), Kakara-Chapla group of villages, Simla, Himachal Pradesh.

Cordosphaeridium sp. *In*: Kumar *et al.*, 1996: 150, pl. 2, fig. 12, LATE MAASTRICHTIAN – DANIAN (Upper part of Mahadeo Formation, Um Sohryngkew River Section), Meghalaya.

Cordosphaeridium sp. A *In*: Jain, 1978: 150, pl. 2, fig. 13, LATEST MAASTRICHTIAN (Kallankurchi Formation), Vriddhachalam area, Cauvery Basin, Tamil Nadu.

Cordosphaeridium sp. A. *In*: Jain & Garg, 1991: 60-61, EARLY EOCENE (Lakhpat bore hole- 1), Kuch, Gujarat.

Cordosphaeridium exilimurum Davey & Williams, 1966b. *In*: Kar, 1985: 182, pl. 41, figs 4-5, EARLY EOCENE (Lakhpat bore hole- 1), Kutch. Gujarat. (Reallocated by Jain & Garg, 1991)

Cordosphaeridium sp. A *In*: Mathur, 1986: 195-198, LUTETIAN-BARTONIAN (Kalol Formation, well no. 109), Cambay Basin, Gujarat.

Cordosphaeridium sp. A *In*: Venkatachala & Kumar, 1980: 95, ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

Cordosphaeridium sp. B *In*: Mathur, 1986: 195-198, LUTETIAN-BARTONIAN (Kalol Formation, well no. 109), Cambay Basin, Gujarat.

Cordosphaeridium sp. B *In*: Venkatachala & Kumar, 1980: 96, pl. 3, fig. 10, ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

CORONIFERA Cookson & Eisenack. 1958 emend. Davey, 1974 emend. May, 1980 emend. Mao Shaozhi & Norris, 1988.

Coronifera albertii Millioud, 1969. *In*: Jain, 1977b: 184, pl. 2, fig. 18, EARLY ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

Coronifera oceanica Cookson & Eisenack, 1958 emend. May, 1980. *In*: Jain, 1977b: 184, pl. 2, fig. 20; pl. 6, fig. 79, EARLY ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu: Kumar, 1986a: 27, VALANGINIAN-HAUTERIVIAN (ONGC bore core no. 3), Krishna-Godavari Basin, Andhra Pradesh, (Garg *et* al., 1988 reassessed the age of this assemblage to be Hauterivian-Barremian); Khowaja-Ateequzzaman & Jain, 1992: 150, 152, pl. 5, fig. 1; pl. 9, fig. 7, pl. 11, fig. 7, HAUTERIVIAN-BARREMIAN (CGWB borehole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu; Khowaja-Ateequzzaman & Garg, 2002: 136, pl. 2, fig. 14, MIDDLE – LATE TURONIAN (Kulakkalnattam Sandstone Member, Garudamangalam Formation), Cauvery Basin, southern India; Mehrotra & Aswal, 2003: 36, pl. 4, figs 2 & 5; pl. 8, figs 1 & 2, LATE MAASTRICHTIAN – EARLY CAMPANIAN (ONGC well DRK- A, 1275 – 1480m, Chintalapalli Formation), Krishna-Godavari Basin, Andhra Pradesh; EARLY MAASTRICHTIAN – BARREMIAN (ONGC well CRPM- A, 1055 – 2185m, Tirupati and Raghavapuram formations), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 45, BARREMIAN – LATE MAASTRICHTIAN *ex* Mehrotra & Aswal, 2003, Krishna-Godavari Basin, Andhra Pradesh.

Diphyes colligerum (Deflandre & Cookson, 1955) Cookson, 1965a emend. Goodman & Witmer, 1985. *In*: Mehrotra & Sinha, 1981: 153-154, pl. 3, fig. 2, LATE CRETACEOUS-MIDDLE EOCENE (Sangchamalla Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh.

Hystrichosphaeridium monstruosum Tasch, 1964. *In*: Venkatachala & Kumar, 1980: 100, pl. 4, fig. 1, ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

Coronifera ?tubulosa Cookson & eisenack, 1974. *In*: Khowaja-Ateequzzaman & Garg, 2002: 136, pl. 2, fig. 9, EARLY TURONIAN (Kulakkalnattam Sandstone Member, Garudamangalam Formation), Cauvery Basin, southern India. (Questionable assignement: Stover & Evitt, 1978)

Coronifera sp. *In*: Kumar, 1982: 174, pl. 1, fig. I, NEOCOMIAN, Krishna-Godavari Basin, Andhra Pradesh.

Coronifera sp. A *In*: Jain, 1977b: 184-185, pl. 2, fig. 19, EARLY ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

Coronifera sp. B *In*: Jain, 1977b: 184-185, pl. 2, fig. 21, EARLY ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

CORRUDINIUM Stover & Evitt, 1978.

Corrudinium incompositium (Drugg, 1970b) Stover & Evitt, 1978. *In*: Mehrotra *et al*., 2005: 68, BARTONIAN - RUPELIAN *ex* Mehrotra *et al*., 2003., Mumbai Offshore.

CRIBROPERIDINIUM Neale & Sarjeant, 1962 emend. Davey, 1969a emend. Sarjeant, 1982b emend. Helenes, 1984.

Cribroperidinium aceras (Eisenack, 1958) Sarjeant, 1985a. *In*: Khowaja-Ateequzzaman & Garg, 2002: 136, pl. 3, fig. 19, MIDDLE TURONIAN (Kulakkalnattam Sandstone Member, Garudamangalam Formation), Cauvery Basin, southern India.

Cribroperidinium aichmetes (Sarjeant, 1966b) Helenes, 1984.

Gonyaulacysta aichmetes Sarjeant, 1966b. *In*: Jain & Taugourdeau-Lantz, 1973: 63, pl. 4, fig. 6, ?APTIAN-EARLY ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

Cribroperidinium apione (Cookson & Eisenack) Morgan, 1980. *In*: Kumar, 1986a: 27, pl. 2, fig. 5, VALANGINIAN-HAUTERIVIAN (ONGC bore core nos. I, 7),

Krishna-Godavari Basin, Andhra Pradesh, (Garg *et* al., 1988 reassessed the age of this assemblage to be Hauterivian-Barremian).

Cribroperidinium confossum (Duxbury,) Helenes, 1984. *In*: Khowaja-Ateequzzaman & Jain, 1992: 152, pl. 5, fig. 7, HAUTERIVIAN-BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu.

Cribroperidinium cooksoniae Norvick, 1976. *In*: Khowaja-Ateequzzaman & Garg, 2002: 136, EARLY - LATE TURONIAN (Kulakkalnattam Sandstone Member, Garudamangalam Formation), Cauvery Basin, southern India.

Cribroperidinium ?edwardsii (Cookson & Eisenack, 1958) Davey, 1969a. *In*: Khowaja-Ateequzzaman & Jain, 1992: 152, pl. 4, figs 7, 11; pl. 10, fig. 13, HAUTERIVIAN-BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu; Khowaja-Ateequzzaman & Garg, 2002: 136, pl. 3, fig. 17, EARLY TURONIAN (Kulakkalnattam Sandstone Member, Garudamangalam Formation), Cauvery Basin, southern India; Mehrotra & Aswal, 2003: 37, pl. 2, figs 1 – 4; pl. 16, fig. 6, TURONIAN – CONIACIAN (ONGC well RCPM- A, 1320 – 1400m, Tirupati Formation), Krishna-Godavari Basin, Andhra Pradesh; BERRIASIAN – HAUTERIVIAN (ONGC well END- A, 1865 – 1910m, Raghavapuram Formation), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 45-46, BERRIASIAN – TURONIAN ex Mehrotra & Aswal, 2003, Krishna-Godavari Basin, Andhra Pradesh. (Questionable assignment: Helenes, 1984)

Gonyaulacysta edwardsii (Cookson & Eisenack, 1958) Clarke & Verdier, 1967. *In*: Venkatachala & Kumar, 1980: pl. 3, fig. 1, ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

Cribroperidinium cf. **C. ?edwardsii** (Cookson & Eisenack, 1958) Davey, 1969a. *In*: Mehrotra & Aswal, 2003: 38, pl. 1, figs 1 & 2, EARLY MAASTRICHTIAN (ONGC well RCPM- A, 1040 – 1045m, Tirupati Formation), Krishna-Godavari Basin, Andhra Pradesh. (Questionable assignment: Helenes, 1984)

Cribroperidinium ?ehrenbergii (Gitmez, 1970) Helenes, 1984. (Questionable assignment: Helenes, 1984) *Gonyaulacysta ehrenbergii* Gitmez, 1970. *In*: Jain *et al.*, 1986: 75, pl. 2, figs 20, 30, LATE JURASSIC, Kutch, Gujarat.

Cribroperidinium cf. **C. fetchamense** (Sarjeant, 1966b) Helenes, 1984.

Gonyaulacysta cf. G. *fetchamensis* Sarjeant, 1966. *In*: Venkatachala & Kumar, 1986: 96-97, pl. 2, fig. 5, ALBIAN (Dalmiapuram Formation). Cauvery Basin. Tamil Nadu.

Cribroperidinium granulatum (Klement, 1960) Stover & Evitt. 1978 emend. Sarjeant, 1984a. *In*: Jain *et al.*, 1984: 78. pl. 4, fig. 74. LATE JURASSIC (Spiti Shale Formation). Malla Johar area, Kumaon Himalaya, Uttar Pradesh.

Cribroperidinium magnum (Jain, 1977b) Fensome & Williams, 2004.

Trichodinium magnum Jain, 1977b*In*: Jain, 1977b: 175-176, pl. 4, figs 40-42, EARLY ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu, (Orthographic change: Jain, 1977b listed *T. magnus*).

Cribroperidinium ?muderongense (Cookson & Eisenack, 1958) Davey. 1969a. *In*: Kumar, 1986a: 27, VALANGINIAN-HAUTERIVIAN (ONGC bore core nos. 1, 2, 7), Krishna-Godavari Basin. Andhra Pradesh (Garg *et al*., 1988 reassessed the age of this assemblage to be Hauterivian-Barremian); Khowaja-Ateequzzaman & Jain, 1992: 152, 154, pl. 7, figs 6, 9, 10, 13, HAUTERIVIAN-BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu. (Questionable assignment: Helenes, 1984)

Cribroperidinium cf. **C. muderongense** (Cookson & Eisenack, 1958) Davey, 1969a.

Gonyaulacysta cf. G. *diaphanis* Cookson & Eisenack, 1958. *In*: Venkatachala & Kumar. 1980: 96-97. pl. 3. fig. 8, ALBIAN (Dalmiapuram Formation), Cauvery Basin. Tamil Nadu.

Cribroperidinium nuciforme (Deflandre, 1939a ex Sarjeant, 1962a) Courtinat, 1989.

Apteodinium nuciforme (Deflandre, 1939a ex Sarjeant, 1962a) Stover & Evitt, 1978. *In*: Jain *et al.*,1984: 78, pl. 2, fig. 24, MIDDLE TITHONIAN (Spiti Shale Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh.

Cribroperidinium orthoceras (Eisenack, 1958a) Davey, 1969a emend. Sarjeant, 1985a.

Gonyaulacysta orthoceras (Eisenack, 1958a) Sarjeant, 1966b. *In*: Jain. 1977b: 174-175, pl. 6, fig. 69, EARLY ALBIAN (Dalmiapuram Formation). Cauvery Basin. Tamil Nadu.

Cribroperidinium cf. **C. orthoceras** (Eisenack, 1958a) Davey, 1969a emend. Sarjeant, 1985a. *In*: Mehrotra & Sarjeant. 1986: 708-711, pl. 1, figs 3-4; text-fig. 2, ALBIAN (Periyavadavadi shallow well- 1), Cauvery Basin, Tamil Nadu.

Gonyaulacysta cf. G. *orthoceras* (Eisenack, 1958a) Sarjeant. 1966b. *In*: Venkatachala & Kumar, 1980: 97, pl. 2, fig. 8, ALBIAN (Dalmiapuram Formation) , Cauvery Basin. Tamil Nadu.

Cribroperidinium ?perforans (Cookson & Eisenack, 1958) Morgan, 1980. *In*: Garg *et al.*, 2003: 52-53, pl, II, fig. 8, LATE LOWER TITHONIAN (*Paraboliceras* Ammonite, Upper part of the Middle Division, Spiti Shale Formation, Kibber Section); LATE UPPER TITHONIAN (*Blanfordiceras* Ammonite), Malla Johar area, Kumaon Himalaya.

Cribroperidinium sepimentum Neale & Sarjeant, 1962. *In*: Khowaja-Ateequzzaman & Jain, 1992: 154, pl. 6, fig. 13, HAUTERIVIAN-BARREMIAN (CGWB borehole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu.

Cribroperidinium tenuitabulatum (Gerlach, 1961) Helenes, 1984. *In*: Aswal & Pundeer, 1996: 636, pl. 1, fig. 18, LUTETIAN-BARTONIAN – OLIGOCENE (ONGC Mori well- A, 2600 – 1400m), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra & Kamla Singh, 2003: 34-35, pl. 1, figs 1-6; pl. 2, figs 1-6; pl. 3, figs 5 & 6, EARLY OLIGOCENE – LATE EOCENE (ONGC well Mori, A, 1495 – 1500m, Matsyapuri Sandstone), Krishna-Godavari Basin, Andhra Pradesh; MIDDLE MIOCENE – LATE EOCENE (ONGC well BMP- A, 660 – 950m, Matsyapuri Sandstone), Krishna-Godavari Basin, Andhra Pradesh; EARLY OLIGOCENE – LATE EOCENE (ONGC well CTP- A, 1200 – 1250m, Matsyapuri Sandstone), Krishna-Godavari Basin, Andhra Pradesh; TORTONIAN-SERRALLIAN – BARTONIAN (ONGC well KSP- A, 1355 – 2535m), Krishna-Godavari Basin, Andhra Pradesh; SERRAVALLIAN – BARTONIAN (ONGC well SSY- A, 1465 – 2090m, Ravva Formation), Krishna-Godavari Basin, Andhra Pradesh; SERRAVALLIAN-LANGHIAN – AQUITANIAN-CHATTIAN (ONGC well MGP- A, 1160 – 1470m), Krishna-Godavari Basin, Andhra Pradesh; SERRAVALLIAN – BARTONIAN-LUTETIAN (ONGC well MNP- A, 545 – 1175m, Matsyapuri sandstone), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al.*, 2005: 68, LUTETIAN (MIDDLE EOCENE) – PRIABONIAN TOP (44 – 33.7 Ma) ex Mehrotra *et al.*, 2003, Mumbai Offshore; BARTONIAN - SERRAVALLIAN ex Mehrotra & Kamla Singh, 2003, Krishna-Godavari Basin, Andhra Pradesh.

Cribroperidinium sp. *In*: Kumar, 1982: 170-171, pl. 2, fig. 16, NEOCOMIAN, Krishna-Godavari Basin, Andhra Pradesh.

Cribroperidinium sp. *In*: Mehrotra & Sarjeant, 1986: 711. pl. 1, figs 1-2, APT IAN (Periyavadavadi shallow well-1), Cauvery Basin, Tamil Nadu.

Cribroperidinium sp. *In*: Khowaja-Ateequzzaman & Garg, 2002: 136, pl. 3, fig.

4, MIDDLE – LATE TURONIAN (Kulakkalnattam Sandstone Member, Garudamangalam Formation), Cauvery Basin, southern India.

Cribroperidinium sp. A. *In*: Khowaja-Ateequzzaman & Jain, 1992: 154, pl. 8, fig. 12, HAUTERIVIAN-BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu.

CTENIDODINIUM Deflandre, 1939a emend. Sarjeant, 1966b emend. Sarjeant, 1975a emend. Woollam, 1983 emend. Benson, 1985.

Ctenidodinium continuum Gocht, 1970b. *In*: Mehrotra & Aswal, 2003: 39, pl. 27, figs 1, 2, 4 & 6, OXFORDIAN – KIMMERIDGIAN (ONGC well RCPM- A, 2969 – 3025m, Golapalli Formation), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 46, OXFORDONIAN KIMMERIDGIAN ex mehrotra & Aswal, 2003, Krishna-Godavari Basin, Andhra Pradesh.

Ctenidodinium culmulum (Norris, 1965) Lentin & Williams, 1973. **NOW Dichadogonyaulax culmula** (Norris, 1965) Loeblich Jr & Loeblich III, 1968.

Ctenididinium elegantulum Millioud, 1969 emend. Below, 1981a. *In*: Mehrotra & Aswal, 2003: 40, pl. 26, figs 1 & 2, NEOCOMIAN – BERRIASIAN (ONGC well END- A, 1795 – 1900m, Raghavapuram Shale), Krishna-Godavari Basin, Andhra Pradesh; BARREMIAN – TITHONIAN (ONGC well RCPM- A, 2300 – 2930m, Golapalli Formation), Krishna-Godavari Basin, Andhra Pradesh; APTIAN – TITHONIAN (ONGC well MVD- A, 1935 – 2380m, Raghavapuram Formation), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 46, TITHONIAN – APTIAN ex Mehrotra & Aswal, 2003, Krishna-Godavari Basin, Andhra Pradesh.

Ctenidodinium cf. **C. ornatum** (Eisenack, 1935) Deflandre, 1939a. *In*: Kumar, 1987a: 599. pl. 3, fig. 4, LATE BATHONIAN-CALLOVIAN (Jhurio Formation), Kutch. Gujarat.

Ctenidodinium cf. **C. tenellum** Deflandre. 1939a. *In*: Kumar, 1987a: 599. pl. 1, fig. 2, LATE BATHONIAN-CALLOVIAN (Jhurio Formation), Kutch, Gujarat.

"CYCLAPOPHYSIS" Benson, 1976. **NOW DISPHAEROGENA** O. Wetzel, 1933 emend. Sarjeant, 1985b (Taxonomic senior synonym, according to Sarjeant, 1985b, p. 140-141)

Cyclapophysis monmouthensis Benson, 1976. **NOW Disphaerogene carposphaeropsis** O. Wetzel, 1933b emend. Sarjeant, 1985b. (Taxonomic senior synonym, according to Sarjeant, 1985, p. 140-141)

CYCLONEPHELIUM Deflandre & Cookson, 1955 emend. Cookson & Eisenack, 1962b emend. Williams & Downie, 1966c emend. Ioannides *et al.,* 1977 emend. Sarjeant & Stover, 1978 emend. Stover & Evitt, 1978 emend Dörhöfer & Davies, 1980.

Cyclonephelium areolatum Cookson & Eisenack, 1960b. *In*: Kumar, I 986a: 28. pl. 1, fig. 9, VALANGINIAN-HAUTERIVIAN (ONGC bore core nos. 4. 7), Krishna-Godavari Basin. Andhra Pradesh, (Garg *et al*., 1988 reassessed the age of this assemblage to be Hauterivian-Barremian).

Cyclonephelium assamicum Jain *et al.*, 1975. **NOW Glaphyrocysta assamica** (Jain *et al.,* 1975) Jain, 1982.

Cyclonephelium chabaca Below, 1981. *In*: Khowaja-Ateequzzaman & Garg, 2002: 136, pl. 1, fig. 11, EARLY TURONIAN (Kulakkalnattam Sandstone Member, Garudamangalam Formation), Cauvery Basin, southern India.

Cyclonephelium compactum Deflandre & Cookson, 1955. *In*: Singh *et al.*, 1979: 35-36, pl. 2, fig. 1, text-fig. I, LATE PALAEOCENE-LATE EOCENE (Subathu Formation), Himachal Pradesh; Khanna *et al.*,1981: 259, pl. 2, fig. 5, (Subathu Formation), Simla Hills, Himachal Pradesh; Sarkar, 1991: 3, EARLY EOCENE (Kakara Series, Lesser Himalaya), Kakara-Chapla group of villages, Simla, Himachal Pradesh; Singh & Sarkar, 1992: 185, pl. 1, fig. 17, LATE

PALAEOCENE?-EOCENE (Subathu Formation), Garkhal area, Punjab Basin, Himachal Pradesh; Khowaja-Ateequzzaman & Garg, 2002: 136, EARLY - LATE TURONIAN (Kulakkalnattam Sandstone Member, Garudamangalam Formation), Cauvery Basin, southern India.

Cyclonephelium densebarbatum Cookson & Eisenack. 1960b. *In*: Kumar. 1986a: 31, pl. I, fig. 11, VALANGINIAN-HAUTERIVIAN (ONGC bore core nos 1, 2, 7). Krishna-Godavari Basin, Andhra Pradesh, (Garg *et al.,* 1988 reassessed the age of this assemblage to be Hauterivian-Barremian); *In*: Garg *et al*., 2003: 52-53, pl, II, fig. 2, EARLY LOWER TITHONIAN (*Uhligites* Ammonite, Lower part of Middle Division of Spiti Shale Formation, Laptal Section); LATE UPPER TITHONIAN – BERRIASIAN-EARLY VALANGINIAN (*Pterolytoceras* Ammonite, Upper levels of the Upper Division, Spiti Shale Formation), Malla Johar area, Kumaon Himalaya..

Cyclonephelium distinctum Deflandre & Cookson, 1955. **NOW Circulodinium distinctum** (Deflandre & Cookson, 1955) Jansonius, 1986.

Cyclonephelium distinctum subsp. *laevigatum* Mehrotra & Sarjeant, 1986. **NOW Circulodinium distinctum** subsp. **laevigatum** (Mehrotra & Sarjeant, 1986) Lentin & Williams, 1989.

Cyclonephelium divaricatum Williams & Downie. 1966c. **NOW Glaphyrocysta divaricata** (Williams & Downie, 1966c) Stover & Evitt. 1978.

Cyclonephelium exuberans Deflandre & Cookson, 1955. **NOW Glaphyrocysta exuberans** (Deflandre & Cookson, 1955) Stover & Evitt, 1978.

Cyclonephelium hystrix (Eisenack, 1958a) Davey, 1978. **NOW Tenua hystrix** Eisenack, 1958 emend. Sarjeant, 1985a.

Cyclonephelium indicum Khanna & Singh, 1981b. *In*: Khanna & Singh, 1981b: 405-406, pl. 4, figs 1-2, text-fig. 16, MIDDLE EOCENE (Subathu Formation), Simla Hills. Himachal Pradesh; Mehrotra *et al*., 2005: 68, SELANDIAN - THANETIAN ex Mehrotra & Kamla Singh, 2003, Krishna-Godavari Basin, Andhra Pradesh.

Cyclonephelium indicum Khanna. 1979. *In*: Khanna, 1979: 219, LATE PALAEOCENE - LATE EOCENE (Subathu Formation), Simla Hills, Himachal Pradesh. (name not validly published)

Cyclonephelium indicum Singh *et al.*, 1979. *In*: Singh *et al.*, 1979: 35, 36, text-fig. 1, pl. 2, fig. 8, LATE PALAEOCENE--LATE EOCENE (Subathu Formation). Himachal Pradesh. (name not validly published)

Cyclonephelium indicum Khanna & Singh, 1981a. *In*: Khanna & Singh, 1981a, pl. 4, fig. 11, LATE PALAEOCENE-LATE EOCENE (Subathu Formation), Simla Hills, Himachal Pradesh. (name not validly published)

Cyclonephelium indicum Mehrotra & Sarjeant, 1987. **NOW Circulodinium indicum** Mehrotra & Sarjeant, 1987 ex Lentin & Williams, 1989.

Cyclonephelium lemniscatum Stanley, 1965. **NOW Areoligera lemniscata** (Stanley, 1965) Stover & Evitt, 1978.

Cyclonephelium ordinatum Williams & Downie, 1966c. **NOW Glaphyrocysta ordinata** (Williams & Downie, 1966c), Stover & Evitt, 1978.

Cyclonephelium paucimarginatum Cookson & Eisenack, 1962b. *In*: Khowaja-Ateequzzaman & Garg, 2002: 137, pl. 1, fig. 8, LATE TURONIAN (Kulakkalnattam Sandstone Member, Garudamangalam Formation), Cauvery Basin, southern India.

Cyclonephelium vannophorum Davey, 1969a. *In*: Khowaja-Ateequzzaman & Garg, 2002: 136, pl. 2, figs 13, 19, MIDDLE TURONIAN (Kulakkalnattam Sandstone Member, Garudamangalam Formation), Cauvery Basin, southern India.

Cyclonephelium spinetum Eaton, 1976. **NOW Glaphyrocysta ?spineta** (Eaton, 1976) Stover & Evitt, 1978.

Cyclonephelium sp. *In*: Singh & Khanna, 1980: 470, pl. 1, figs 3-4, LATE PALAEOCENE-LATE EOCENE (Subathu Formation), Himachal Pradesh.

Cyclovephelium sp. *In*: Sarkar, 1991: 3, pl. III, fig. 8, EARLY EOCENE (Kakara Series, Lesser Himalaya), Kakara-Chapla group of villages, Simla, Himachal Pradesh.

Cyclonephelium sp. *In*: Mehrotra *et* al., 1996: 685, RUPELIAN – MIOCENE (ONGC well Gulf- 1, Tarapur Shal, Babaguru and Post Babaguru formations), Gulf of Cambay, Gujarat.

Cyclonephelium sp. A *In*: Jain *et al.*, 1975: 11, pl. 6, fig. 69, DANIAN (Langpar Formation), Meghalaya.

Cyclonephelium sp. A *In*: Kumar, 1982: 175, pl. 3, fig. 2, NEOCOMIAN, Krishna-Godavari Basin, Andhra Pradesh.

Cyclonephelium sp. A *In*: Jain *et al.*, 1984: 78, pl. 4, figs 72, 84, TITHONIAN (Spiti Shale Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh.

Cyclonephelium sp. A *In*: Jain & Garg, 1986b: 105, LATE PALAEOCENE, Vriddhachalam area, Cauvery Basin, Tamil Nadu.

Cyclonephelium sp. B *In*: Kumar, 1982: 175, pl. 3, fig. 1. NEOCOMIAN, Krishna-Godavari Basin, Andhra Pradesh.

Cyclonephelium sp. B *In*: Jain & Garg, 1986b: 105, LATE PALAEOCENE, Vriddhachalam area, Cauvery Basin, Tamil Nadu.

Cyclonephelium sp. C *In*: Kumar, 1982: 175, pl. 3. fig. 3. NEOCOMIAN, Krishna-Godavari Basin. Andhra Pradesh.

Cyclonephelium sp. *In*: Sarkar & Prasad, 2000a: 170, LATE YPRESIAN (Subathu Formation, Koshalia Nala Section), Shimla Hills;

CYCLOPSIELLA Drugg & Loeblich Jr., 1967. (Acritarch genus)

Cyclopsiella ?chateuuneufii Head *et al.*, 1989c.

Ascostomocystis granulata Châteauneuf, 1980. *In*: Saxena & Sarkar, 2000: 257, 263, MIDDLE EOCENE (Siju Formation), Simsang River near Siju, South Garo Hills, Meghalaya. (Orthographic change: Saxena & Sarkar, 2000 listed *Ascostmatocystis granulate*)

Cyclopsiella sp. *In*: Garg & Khowaja-Ateequzzaman, 2000: 471, LATE THANETIAN (Lakadong Sst Member, Sylhet Limestone Formation), Cherrapunji area, Khasi Hills, Meghalaya.

DAMASSADINIUM Fensome *et al.*, 1993b.

Damassadinium californicum (Drugg, 1967) Fensome *et al.*, 1993. *In*: Kumar *et al.*, 1996: 150, DANIAN (Upper part of Mahadeo Formation, Um Sohryngkew River Section), Meghalaya; Mehrotra & Kamla Singh, 2003: 37, pl. 5, figs 5 & 6; pl. 20, figs 1 & 2, DANIAN (ONGC well MNP- A, 3200 – 3205m), Krishna-Godavari Basin, Andhra Pradesh; YPRESIAN (ONGC well MGP- A, 2825 – 2830m), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 68, DANIAN ex Mehrotra & Kamla Singh, 2003, Krishna-Godavari Basin, Andhra Pradesh.

DAPCODINIUM Evitt, 1961a emend. Dörhöfer & Davies, 1980.

Dapcodinium priscus Evitt, 1961a emend. Below, 1987a. *In*: Mehrotra *et al*., 2005: 46, ANISIAN-LADINIAN – RHAETIAN-MID. SINEMURIAN ex Aswal & Mehrotra, 2002, Krishna-Godavari Basin, Andhra Pradesh

DAPSILIDINIUM Bujak *et al.,* 1980.

Dapsilidinium assamicum (Mehrotra, 1983) Lentin & Williams, 1985. *In*: Mehrotra *et* al., 1996: 685, DANIAN – RUPELIAN (ONGC well Gulf- 1 and well Gulf- 2, Olpad, Bhavnagar and Tarapur Shale formations), YPRESIAN – LUTETIAN-PRIABONIAN (ONGC well Gulf- 3, Olpad, Bhavnagar and Tarapur Shale formations), DANIAN – LUTETIAN-PRIABONIAN (Olpad,

Bhavnagar and Tarapur Shale formations), Gulf of Cambay, Gujarat; Mehrotra *et al*., 2005: 68-69, EOCENE ex Mehrotra *et al*., 1996, Cambay Basin, Gujarat; MAASTRICHTIAN - YPRESIAN, Assam-Arakan Basin, Northeastern India

Dapsilidinium asperum (Maier, 1959) Bujak *et* al., 1980. **NOW Polysphaeridium asperum** (Maier, 1959) Davey & Williams. 1969 emend. Sarjeant, 1983.

Dapsilidinium multispinosum (Davey, 1974) Bujak *et* al., 1980. *In*: Kumar, 1986a: 31, pl. 1, fig. 12; pl. 2, fig. 1. VALANGINIAN-HAUTERIVIAN (ONGC bore core nos. 4, 7). Krishna-Godavari Basin, Andhra Pradesh. (Garg *et al.,* 1988 re-assessed the age of this assemblage to be Hauterivian-Barremian).

Dapsilidinium pastielsii (Davey & Williams, 1966b) Bujak *et al.,* 1980. *In*: Mathur, 1986: 200, LUTETIAN-BARTONIAN (Kalol Formation, well no. 109). Cambay Basin, Gujarat; Singh & Sarkar, 1987, pl. 1. fig. 4. EOCENE (Subathu Formation), Banethi-Bagthan area, Himachal Pradesh; Aswal & Pundeer, 1996: 636, pl. 1, fig. 8, OLIGOCENE - MIOCENE (ONGC Mori well- A, 1500 – 1200m, *Areosphaeridium diktyoplokus-Impagidinium dispertitum* and *Impagidinium dispertitum-Sumatradinium* Interval zones), Krishna-Godavari Basin, Andhra Pradesh.

Polysphaeridium pastielsii Davey & Williams, 1966b. *In*: Jain & Tandon, 1981: 13. pl. 1, fig. 11, MIDDLE EOCENE (Harudi Formation), Kutch, Gujarat; Kar, 1985: 195. MIDDLE EOCENE (Harudi Formation), Kutch. Gujarat, (reproduction from Jam & Tandon, 1981).

Dapsilidinium pseudocolligerum (Stover, 1977) Bujak in Bujak *et al*., 1980. *In*: Mehrotra *et al*., 2005: 69, LUTETIAN – TORTONIAN (42 – 12 Ma), Mumbai Offshore; EARLY EOCENE - OLIGOCENE ex Mehrotra & Kamla Singh, 2003, Krishna-Godavari Basin, Andhra Pradesh; MIDDLE EOCENE Saxena & Sarkar, 2000, Assam-Arakan Basin, Northeastern India

Dapsilidinium sp. *In*: Mathur, 1986: 200, LUTETIAN-BARTONIAN (Kalol Formation, well no. 109), Cambay Basin, Gujarat.

Dapsilidinium sp. A *In*: Jain & Garg, 1986b: 113, pl. 2, fig. 12, LATE PALAEOCENE, Vriddhachalam area, Cauvery Basin, Tamil Nadu.

Dapsilidinium sp. B *In*: Jain & Garg, 1986b: 114. pl. 6. figs 7-8, LATE PALAEOCENE, Vriddhachalam area. Cauvery Basin, Tamil Nadu.

DEFLANDREA Eisenack, 1938b emend. Williams & Downie. 1966c emend. Stover, 1974 emend. Lentin & Williams, 1976.

Deflandrea crassistriata Jain *et al.*, 1975. **NOW Cerodinium crassistriatum** (Jain *et al*.) Lentin & Williams, 1987.

Deflandrea oebisfeldensis Alberti, 1959b. *In*: van Erve *et al.*, 1980: 621, pl. 1, fig. 3, EARLY EOCENE (Subathu Formation), Simla Hills, Himachal Pradesh; Aswal & Pundeer, 1996: 636, pl. 2, fig. 14, THANETIAN (ONGC Mori well- A, 3200 – 3120m), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra & Aswal, 2003: 41, pl. 24, figs 2 & 3, MAASTRICHTIAN (ONGC well NSP- A, 3621 – 3624m, Chintalapalli Shale), Krishna-Godavari Basin, Andhra Pradesh; DANIAN (ONGC well Mori- A, 3140 – 3145m, Palakollu Shale), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 46, MAASTRICHTIAN – DANIAN ex Mehrotra & Aswal, 2003, Krishna-Godavari Basin, Andhra Pradesh.

Deflandrea perlucida Alberti, 1959b. **NOW Subtilisphaera perlucida** (Alberti, 1959b) Jain & Millepied, 1973.

Deflandrea speciosa Alberti, 1959b. **NOW Cerodinium speciosum** (Alberti, 1959b) Lentin & Williams, 1987.

Deflandrea striata Drugg, 1967. **NOW Cerodinium striatum** (Drugg, 1967) Lentin & Williams, 1987.

Deflandrea sp. *In*: Banerjee & Misra, 1972: 211. pl. 1. fig. 2, EOCENE-MIOCENE, Assam & Tripura.

Deflandrea sp. *In*: Salujha & Kindra, 1981: 53, pl. 3, fig. 60, DANIAN (Langpar Formation), Meghalaya. (Jain & Garg. 1982 reassessed the age of this assemblage to be Latest Cretaceous-Danian).

Deflandrea sp. A *In*: Jain *et al.*, 1975: 9, pl. 4, fig. 50, MAASTRICHTIAN, Meghalaya.

Deflandrea spp. *In*: Nandi, 1990: 124, pl. 5, figs 1-2, CENOMANIAN-DANIAN, Meghalaya.

DIACANTHUM Habib, 1972 emend. Habib & Drugg, 1987.

Diacanthum sp. *In*: Venkatachala & Kumar, 1980: 104, pl. 6, fig. 3, ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu. (Orthographic change: Venkatachala & Kumar, 1980 listed *Dicanthum sp.*).

DICHADOGONYAULAX Sarjeant, 1966b emend. Sarjeant, 1975a *ex* Loeblich & Loeblich. 1968 emend. Woollam, 1983 emend. Benson, 1985.

Dichadogonyaulax culmula (Norris, 1965) Loeblich Jr & Loeblich III, 1968.

Ctenidodinium culmulum (Norris, 1965) Lentin & Williams, 1973. *In*: Jain *et al.*, 1986: 82, pl. 3, fig. 88, LATE JURASSIC, Kutch, Gujarat.

Dichadogonyaulax sp. *In*: Kumar, 1987a: 599, LATE BATHONIAN-CALLOVIAN (Jhurio Formation), Kutch, Gujarat.

DICONODINIUM Eisenack & Cookson, 1960 emend. Morgan, 1977.

Diconodinium multispinum (Deflandre & Cookson, 1955) Eisenack & Cookson, 1969. *In*: Khowaja-Ateequzzaman & Garg, 2002: 136, EARLY TURONIAN (Kulakkalnattam Sandstone Member, Garudamangalam Formation), Cauvery Basin, southern India.

Diconodinium pusillum Singh, 1971. *In*: Mehrotra & Aswal, 2003: 42, pl. 9, fig.1, LATE APTIAN – OXFORDIAN (ONGC well RCPM- A, 2055 – 3045m, Raghavapuram and Golapalli formations), Krishna-Godavari Basin, Andhra Pradesh; CENOMANIAN – TITHONIAN (ONGC well MVD- A, 1515 – 2205m, Raghavapuram and Golapalli formations) Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al.*, 2005: 47, OXFORDIAN – LUTETIAN *ex* Mehrotra & Aswal, 2003, Krishna-Godavari Basin, Andhra Pradesh.

Diconodinium sp. *In*: Mehrotra & Aswal, 2003: 43, pl. 21, fig. 3, EARLY TO LATE CAMPANIAN (ONGC well RCPM- A, 1180 – 1260m, Tirupati Formation), Krishna-Godavari Basin, Andhra Pradesh.

"DICTYOPYXIDIA" Eisenack, 1961 (Name illegitimate). **NOW ELLIPSOIDICTYUM** Klement, 1960. (Taxonomic senior synonym, according to Sarjeant, 1976, p. 23)

Dictyopyxidia imperfecta Brideaux & McIntyre, 1975. **NOW Ellipsoidictyum imperfectum** (Brideaux & McIntyre, 1975) Lentin & Williams, 1977b.

Dictyopyxidia punctata Jain, 1977b. **NOW Ellipsoidictyum punctatum** (Jain, 1977b) Below, 1981a.

DINGODINIUM Cookson & Eisenack. 1958 emend. Mehrotra Sarjeant. 1984b.

Dingodinium cerviculum Cookson & Eisenack. 1958 emend. Mehrotra & Sarjeant, 1984 emend. Khowaja-Ateequzzaman *et al.*, 1990. *In*: Kumar, 1986a: 31, VALANGINIAN-HAUTERIVIAN (ONGC bore core nos. 1-5, 7), Krishna-Godavari Basin, Andhra Pradesh. (Garg *et al.*, 1988 reassessed the age of this assemblage to be Hauterivian-Barremian); Khowaja-Ateequzzaman *et al.*, 1990: 274-– 275, pl. 1, figs 1-7; pl. 2, figs 1-7, text-figs 1-4, BARREMIAN (Puduvoyal bore hole) Palar Basin, Tamil Nadu (Khowaja-Ateequzzaman & Jain, 1992 reassessed the age to be Hauterivian-Barremian); Khowaja-Ateequzzaman & Jain, 1992: 154, pl. 5, fig. 8; pl. 6, fig. 10, HAUTERIVIAN-BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu; Mehrotra & Aswal, 2003: 44, pl. 29, fig. 4, NEOCOMIAN – BERRIASIANA

(ONGC well END- A, 1805 – 1900m, Raghavapuram Formation); EARLY APTIAN – OXFORDIAN (ONGC well RCPM- A, 2100 – 3025m, Raghavapuram and Golapalli formations); LATE APTIAN – BERRIASIAN (ONGC well MVD- A, 1795 – 2205m, Raghavapuram and Golapalli formations); Mehrotra *et al*., 2005: 47, APTIAN – LOWER ALBIAN ex Mehrotra *et al*., 2002, Cauvery Basin, Tamil Nadu; OXFORDIAN – APTIAN ex Mehrotra & Aswal, 2003, Krishna-Godavari Basin, Andhra Pradesh.

Dingodinium sp. *In*: Kumar. 1987a: 599, pl.1, fig. 5, LATE BATHONIAN- CALLOVIAN (Jhurio Formation), Kutch, Gujarat.

DINOGYMNIUM Evitt *et al*., 1967 emend. Vozzhennikova, 1990.

Dinogymnium acuminatum Evitt *et al*., 1967. *In*: Jain *et al.*,1975: 4. pl. 1. figs 2, 8--12. MAASTRICHTIAN (Jadukata and Mahadeo formations). Meghalaya; Mehrotra & Sarjeant. 1987: 169-170, pl. 4, figs 3-4, MAASTRICHTIAN (Narsapur well- 1), Krishna-Godavari Basin, Andhra Pradesh; Nandi. 1990: 124, pl. 4, fig. 27, MAASTRICHTIAN, Meghalaya; Kumar *et al.*, 1996: 150, pl. 1, fig. 2, LATE MAASTRICHTIAN (Upper part of Mahadeo Formation, Um Sohryngkew River Section), Meghalaya; Mehrotra & Aswal, 2003: 45, pl. 21, figs 1 & 2; pl. 22, figs 1 & 4, MAASTRICHTIAN (ONGC well NSP- A, 3643 – 3649m, Chintalapalli Formation), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 47, MAASTRICHTIAN ex Mehrotra *et al*., 2002, Cauvery Basin, Tamil Nadu; MAASTRICHTIAN ex Mehrotra & Aswal, 2003, Krishna-Godavari Basin, Andhra Pradesh.

Dinogymnium albertii Clarke & Verdier. 1967. *In*: Jain *et al.*, 1975: 5. pl. 2. fig. 31. MAASTRICHTIAN (Jadukata Formation). Meghalaya; Mehrotra *et al*., 2005: 47, MAASTRICHTIAN ex Mehrotra *et al*., 2002, Assam-Arakan Basin.

Dinogymnium assamicum Jain *et al.*, 1975. **NOW Alisogymnium assamicum** (Jain *et al*., 1975) Lentin & Vozzhennikova, 1990.

Dinogymnium denticulatum (Alberti, 1961) Evitt *et al*., 1967. *In*: Jain *et al.*, 1975: 5, pl. 1, fig.13, MAASTRICHTIAN (Mahadeo Formation), Meghalaya; Mehrotra *et al*., 2005: 47, MAASTRICHTIAN ex Mehrotra *et al*., 2002, assam-Arakan Basin.

Dinogymnium digitus var. **indicus** Jain *et al.*, 1975. *In*: Jain *et. al.*, 1975: 5, pl. 1, fig. 7; pl. 2. figs 18-19. MAASTRICHTIAN (Jadukata Formation). Meghalaya.

Dinogymnium hyalinum (Vozzhennikova, 1967) Lentin & Williams, 1973. **NOW Dinogymnium nelsonense** (Cookson, 1956) Evitt *et al*., 1967. (Taxonomic senior synonym, according to Lentin & Vozzhennikova, 1990, p. 21)

Dinogymnium longicornis (Vozzhennikova, 1967) Harland. 1973. *In*: Jain *et al.*, 1975: 4-5, pl. 1. figs 5-6. MAASTRICHTIAN (Jadukata Formation). Meghalaya ; Kumar *et al.*, 1996: 150, pl. 1, fig. 8, LATE MAASTRICHTIAN (Upper part of Mahadeo Formation, Um Sohryngkew River Section), Meghalaya.

Dinogymnium nelsonense (Cookson, 1956) Evitt et at. 1967.

Dinogymnium hyalinum (Vozzhennikova, 1967) Lentin & Williams, 1973. *In*: Jain *et al.*, 1975: 5, pl. 2, figs 22-23. MAASTRICHTIAN (Jadukata Formation). Meghalaya.

Gymnodinium nelsonense Cookson. 1956. *In*: Venkatachala & Sharma, 1974. pl. 3. fig. 39, CRETACEOUS, Cauvery Basin, Tamil Nadu. (orthographic change from *G. nelsonensis* listed by Venkatachala & Sharma. 1974).

Dinogymnium sp. cf. **D. sibericum** (Vozzhennikova, 1967) Lentin & Williams, 1973. *In*: Jain *et al.*, 1975: 5-6, pl. 2. figs 20-21, 27, MAASTRICHTIAN, Meghalaya.

Dinogymnium sphaerocephalum (Vozzhennikova, 1967) Lentin & williams, 1973. **NOW Alisogymnium sphaerocephalum** (Vozzhennikova, 1967) Lentin & Vozzhennikova, 1990.

Dinogymnium vozzhennikovae Lentin & Williams, 1973 emend. Lentin & Vozzhennikova, 1990. *In*: Jain *et al.*,1975: 4, pl. 1, figs 2-3, MAASTRICHTIAN (Mahadeo Formation), Meghalaya ; Kumar *et al.*, 1996: 150, LATE MAASTRICHTIAN (Upper part of Mahadeo Formation, Um Sohryngkew River Section), Meghalaya.

Dinogymnium westralium (Cookson & Eisenack, 1958) Evitt *et al*., 1967. *In*: Kumar *et al.*, 1996: 150, LATE MAASTRICHTIAN (Upper part of Mahadeo Formation, Um Sohryngkew River Section), Meghalaya.

Dinogymnium sp. *In*: Kumar, 1982: 175, pl. 2, fig. 12, NEOCOMIAN, Krishna-Godavari Basin, Andhra Pradesh.

Dinogymnium sp. *In*: Mehrotra & Sarjeant, 1987: 170, pl. 3, fig. 4, MAASTRICHTIAN (Narsapur well- 1), Krishna-Godavari Basin, Andhra Pradesh.

Dinogymnium sp. *In*: Mehrotra & Aswal, 2003: 46, pl. 22, fig.2, MAASTRICHTIAN (ONGC well NSP- A, 3643 – 3649m, Chintalapalli Formation), Krishna-Godavari Basin, Andhra Pradesh.

Dinogymnium sp. *In*: Nandi, 1990: 124, pl. 4, fig. 26, CENOMANIAN DANIAN, Meghalaya.

?Dinogymnium sp. A *In*: Jain *et al.*,1975: 6, pl. 1, fig. 4; pl. 6, fig. 72, MAASTRICHTIAN (Jadukata Formation), Meghalaya.

Dinogymnium sp. B *In*: Jain *et al.*, 1975: 6, pl. 2, fig. 26, MAASTRICHTIAN (Jadukata Formation), Meghalaya.

Dinogymnium sp. C *In*: Jain *et al.*, 1975: 6, pl. 1, fig. 14, MAASTRICHTIAN (Jadukata Formation), Meghalaya.

Dinogymnium sp. D *In*: Jain *et al.*, 1975: 6, pl. 2, fig. 17, MAASTRICHTIAN (Jadukata Formation), Meghalaya.

Dinogymnium sp. E *In*: Jain *et al.*, 1975: 6-7, pl. 2, fig. 25, MAASTRICHTIAN (Jadukata Formation), Meghalaya.

Dinogymnium sp. F *In*: Jain *et al.*,1975: 7, pl. 2, fig. 24, MAASTRICHTIAN (Jadukata Formation), Meghalaya.

Dinogymnium sp. 1

Gymnodinium sp. 1 *In*: Salujha & Kindra, 1981: 53, pl. 3, fig. 39, DANIAN (Langpar Formation), Meghalaya. (Jain & Garg, 1982 reassessed the age of this assemblage to be Latest Cretaceous-Danian).

Dinogymnium sp. 2

Gymnodinium sp. 2 *In*: Salujha & Kindra, 1981: 53, pl. 3, fig. 59, DANIAN (Langpar Formation), Meghalaya. (Jain & Garg, 1982 reassessed the age of this assemblage to be Latest Cretaceous-Danian).

?Dinogymnium Jain *et al.*, 1975. *In*: Jain *et al.*, 1975: 7, pl. 2, fig. 30. MAASTRICHTIAN, Meghalaya.

DINOPTERYGIUM Deflandre, 1935 emend. Stover & Evitt, 1978.

Dinopterygium tuberculatum (Eisenack & Cookson, 1960) Stover & Evitt, 1978. *In*: Mehrotra & Aswal, 2003: 47, pl. 34, figs 1 & 2, APTIAN - CENOMANIAN (ONGC well END- A, 1610 – 1755m, Raghavapuram Formation), Krishna-Godavari Basin, Andhra Pradesh; HAUTERIVIAN – CENOMANIAN (ONGC well MVD- A, 1515 – 2100m, Golapalli and Raghavapuram formations), Krishna-Godavari Basin, Andhra Pradesh ; Mehrotra *et al*., 2005: 48, HAUTERIVIAN – CENOMANIAN *ex* Mehrotra & Aswal, 2003, Krishna-Godavari Basin, Andhra Pradesh.

DIOXYA Cookson & Eisenack, 1958 emend. Morgan, 1977.

Dioxya armata Cookson & Eisenack, 1958. *In*: Khowaja-Ateequzzaman & Garg, 2002: 136, pl. 1, fig. 1, MIDDLE TURONIAN (Kulakkalnattam Sandstone Member,

Garudamangalam Formation), Cauvery Basin, southern India.

DIPHYES Cookson, 1965a emend. Davey & Williams. 1966b emend. Goodman & Witmer, 1985.

Diphyes colligerum (Deflandre & Cookson, 1955) Cookson, 1965a emend. Cookson, 1965a emend. Goodman & Witmer, 1985. *In*: Jain, 1978: 151, pl. 1, fig. 2, LATEST MAASTRICHTIAN (Kallankurchi Formation), Vriddhachalam area, Cauvery Basin, Tamil Nadu; Jain & Tandon, 1981: 8-9, pl. 3, fig. 49, MIDDLE EOCENE (Harudi Formation), Kutch, Gujarat; Kar, 1985: 188, MIDDLE EOCENE (Harudi Formation), Kutch, Gujarat. (reproduction from Jain & Tandon, 1981); Jain & Garg, 1986b: 114, pl. 6, fig. 12, LATE PALAEOCENE, Vriddhachalam area, Cauvery Basin, Tamil Nadu; Mathur, 1986: 200, LUTETIAN--BARTONIAN (Kalol Formation, well no. 109), Cambay Basin, Gujarat; Singh & Sarkar, 1986: 208, EOCENE (Subathu Formation), Himachal Pradesh; Sarkar & Singh, 1988: 41, pl. 1, figs 1-2, EOCENE (Subathu Formation), Himachal Pradesh; Singh & Sarkar, 1992: 185, LATE PALAEOCENE?-EOCENE (Subathu Formation), Garkhal area, Punjab Basin, Himachal Pradesh; Aswal & Pundeer, 1996: 636, pl. 1, fig. 21, THANETIAN (ONGC Mori well- A, 3200 – 3120m), Krishna-Godavari Basin, Andhra Pradesh; Kumar *et al.*, 1996: 150, DANIAN (Upper part of Mahadeo Formation, Um Sohryngkew River Section), Meghalaya; Garg & Khowaja-Ateequzzaman, 2000: 471, LATE THANETIAN (Lakadong Sst Member, Sylhet Limestone Formation), Cherrapunji area, Khasi Hills, Meghalaya; Sarkar & Prasad, 2000b: 141, LATE YPRESIAN – MIDDLE LUTETIAN (Subathu Formation, Morni Hills), Haryana; Mehrotra & Kamla Singh, 2003: 38, pl. 17, fig. 3; pl. 21, figs 5 & 6, PALAEOCENE (ONGC well NSP- A, 2802 – 2805m, Palakollu Shale), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al.*, 2005: 69, PALAEOCENE ex Mehrotra & Kamla Singh, 2003, Krishna-Godavari Basin, Andhra Pradesh.

Diphyes colligerum (Deflandre & Cookson, 1955) Cookson, 1965a emend. Cookson, 1965a emend. Goodman & Witmer, 1985. *In*: Mehrotra & Sinha, 1981: 153-154, pl. 3, fig. 3 = **Coronifera oceanica** Cookson & Eisenack, 1958 emend. May, 1980, (According to Jain & Garg, 1986a).

Diphyes ficusoides Islam, 1983b. *In*: Mathur, 1986: 200, LUTETIAN-BARTONIAN (Kalol Formation, well no. 109), Cambay Basin, Gujarat.

Diphyes spinula (Drugg, 1970b) Stover & Evitt, 1978. *In*: Mathur, 1986: 200, LUTETIAN-BARTONIAN (Kalol Formation, well no. 109), Cambay Basin, Gujarat.

Diphyes sp. A *In*: Mathur, 1986: 200, LUTETIAN-BARroNIAN (Kalol Formation, well no. 109), Cambay Basin, Gujarat.

Diphyes sp. B *In*: Mathur, 1986: 200, LUTETIAN--BARTONIAN (Kalol Formation, well no. 109), Cambay Basin, Gujarat.

DISCORSIA Duxbury, 1977 emend. Khowaja-Ateequzzaman et al., 1985.

Discorsia nanna (Davey, 1974) Duxbury, 1977 emend. Khowaja-Ateequzzaman *et al.*,1985. *In*: Khowaja-Ateequzzaman *et al.*, 1985: 98-103, pl. 1, figs 1-4; pl. 2, figs 1-4; pl. 3, figs 1-4, text- fig. 1, BARREMIAN (Puduvoyal bore hole), Palar Basin, Tamil Nadu (Khowaja-Ateequzzaman & Jain, 1992 reassessed the age to be Hauterivian-Barremian); Kumar, 1986a: 31, VALANGINIAN-HAUTERIVIAN (ONGC bore core no. 4), Krishna-Godavari Basin, Andhra Pradesh, (Garg *et al.,* 1988 reassessed the age of this assemblage to be Hauterivian-Barremian); Khowaja-Ateequzzaman & Jain, 1992: 154, 156, pl. 12, figs 6, 9, HAUTERIVIAN-BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu.

DISPHAERIA Cookson & Eisenack, 1960a emend. Norvick, 1973.

Disphaeria tesselata Srivastava, 1984. *In*: Khowaja-Ateequzzaman & Jain, 1992: 156, pl. 13, figs 7, 8, HAUTERIVIAN-BARREMIAN (CGWB bore-hole near

Puduvoyal), Palar Basin, Chingleput, Tamil Nadu.

Disphaeria sahnii (Khanna & Singh, 1980) Sarkar & Singh 1988. **NOW Thalassiphora patula** (Williams & Downie, 1966c) Stover & Evitt, 1978, *(in* Stover & Williams, 1987, p. 354).

Disphaeria sp. A *In*: Kumar, 1987b: 240, pl. I, fig. 10, text-fig. 2, EARLY KIMMERIDGIAN-TITHONIAN (Jhuran Formation), Kutch, Gujarat.

DISPHAEROGENA O. Wetzel, 1933 emend. 1985b.

Disphaerogena carposphaeropsis O. Wetzel, 1933b emend. Sarjeant, 1985b.

Cyclapophysis monmouthensis Benson, 1976. *In*: Kumar *et al.*, 1996: 150, pl. 1, fig. 1, LATEST MAASTRICHTIAN (Upper part of Mahadeo Formation, Um Sohryngkew River Section), Meghalaya.

DISTATODINIUM Eaton, 1976.

Distatodinium ellipticum (Cookson, 1965a) Eaton, 1976. *In*: Mathur, 1986: 200, LUTETIAN-BARTONIAN (Kalol Formation, well no. 109), Cambay Basin, Gujarat; Singh & Sarkar, 1986: 208, EOCENE (Subathu Formation) Himachal Pradesh; Sarkar & Singh, 1988 : 42, pl. 1, figs 21-22, EOCENE (Subathu Formation), Himachal Pradesh; Saxena & Sarkar, 2000: 256, MIDDLE EOCENE (Siju Formation), Simsang River near Siju, South Garo Hills, Meghalaya..

Distatodinium sp. *In*: Dutta & Jain, 1980: 65, pl. 2, figs 12-13, LATE EOCENE (Kopili Formation), Meghalaya.

DOLLIDINIUM Helby & Stover, 1987b.

Dollidinium sinuosum (Cookson & Eisenack, 1960b) Helby & Stover, 1987b emend. Helby & Stover, 1987b. *In*: Mehrotra *et al.*, 2005: 48, ANISIAN-LADINIAN – EARLY HAUTERIVIAN ex Aswal & Mehrotra, 2002, Krishna-Godavari Basin, Andhra Pradesh

DOWNIESPHAERIDIUM Islam, 1993

Downiesphaeridium aciculare (Davey, 1969a) Islam, 1993.

Cleistosphaeridium aciculare Davey, 1969a. *In*: Kumar, 1986a: 27, VALANGINIAN-HAUTERIVIAN (ONGC bore core nos 1, 6, 7), Krishna-Godavari Basin, Andhra Pradesh, (Garg et al., 1988 reassessed the age of this assemblage to be Hauterivian- Barremian).

Downiesphaeridium flexuosum (Davey *et al.*, 1966) Islam, 1993.

Cleistosphaeridium flexuosum Davey, *et a*l., 1966. *In*: Singh & Sarkar, 1987: 208, pl. 1, fig. 3, EOCENE (Subathu Formation), Banethi-Bagthan area, Himachal Pradesh; Sarkar & Singh, 1988: 39, pl. 1, figs 3, 4, EOCENE (Subathu Formation), Banethi-Bagthan area, Himachal Pradesh.

Downiesphaeridium multispinosum (Singh, 1964) Islam, 1993.

Cleistosphaeridium multispinosum (Singh, 1964) Brideaux, 1971. *In*: Khanna & Singh, 1981c; 204, fig. 9, LATE PALAEOCENE-EOCENE (Subathu Formation), Simla Hills, Himachal Pradesh.

Downiesphaeridium cf. **D. multispinosum** (Singh, 1964) Islam, 1993.

Baltisphaeridium cf. *B. multispinosum* Singh, 1964. *In*: Kar *et al*., 1972, pl. 1, fig. 1 (Tura Formation), Garo Hills, Meghalaya.

EATONICYSTA Stover & Evitt, 1978 emend. Stover & Williams, 1995.

Eatonicysta ursulae (Morgenroth, 1966a) Stover & Evitt, 1978 emend. Stover & Williams, 1995. *In*: Jain & Tandon, 1981: 9, pl. 3, fig. 39, MIDDLE EOCENE (Harudi Formation), Kutch, Gujarat; Kar, 1985: 188, MIDDLE EOCENE (Harudi Fonnation), Kutch, Gujarat, (reproduction from Jain & Tandon, 1981); Aswal & Pundeer, 1996: 636, pl. 1, fig. 20, THANETIAN – LUTETIAN-BARTONIAN (ONGC Mori well-A, 3200 – 2300m), Krishna-Godavari Basin, Andhra Pradesh; Sarkar & Prasad,

2000b: 141, EARLY LUTETIAN (Subathu Formation, Morni Hills), Haryana.

EGMONTODINIUM Gitmez & Sarjeant, 1972.

Egmontodinium minus Kumar, 1987a. *In*: Kumar, 1987: 240-241, pl. 2, figs 5-6, text-fig. 3, EARLY KIMMERIDGIAN-TITHONIAN (Jhuran Formation), Kutch, Gujarat.

Egmontodinium polyplacophorum Gitmez & Sarjeant, 1972. *In*: Jain *et al.*, 1986: 75, pl. 2, fig. 16; pl. 3, fig. 42, LATE JURASSIC, Kutch, Gujarat; Garg *et al.*, 2003: 52-53, pl, IV, fig. 9, LATE LOWER TITHONIAN (*Virgatosphinctes* Ammonite, Upper level of the Middle Division, Spiti Shale Formation, Gate Section of Spiti Valley), Malla Johar area, Kumaon Himalaya.

Egmontodinium cf. **E. polyplacophorum** Gitmez & Sarjeant, 1972. *In*: Kumar, 1986b: 382, pl. 1, fig. 4, EARLY KIMMERIDGIAN-TITHONIAN (Jhuran Fonnation), Kutch, Gujarat; Kumar, 1987: 598, EARLY KIMMERIDGIAN-TITHONIAN (Jhuran Formation), Kutch, Gujarat.

Egmontodinium toryna (Cookson & Eisenack, 1960b) Davey, 1979c. *In*: Kumar, 1986b: 382-383, pl. 3, fig. 4; pl. 4, fig. 1, EARLY KIMMERIDGIAN-TITHONIAN (Jhuran Formation), Kutch, Gujarat; Kumar, 1987a: 598, EARLY KIMMERIDGIAN-TITHONIAN (Jhuran Formation), Kutch, Gujarat; Garg *et al.*, 2003: 52-53, pl, IV, figs 12, 22, EARLY LOWER TITHONIAN (*Uhligites* Ammonite, Lower part of Middle Division of Spiti Shale Formation, Laptal Section); LATE LOWER TITHONIAN (*Kosmatia* Ammonite, Middle Division, Spiti Shale Formation, Kibber Section of Spiti Valley); LATE LOWER TITHONIAN (*Virgatosphinctes* Ammonite, Upper level of the Middle Division, Spiti Shale Formation, Gate Section of Spiti Valley); LATE UPPER TITHONIAN – BERRIASIAN-EARLY VALANGINIAN (*Pterolytoceras* Ammonite, Upper levels of the Upper Division, Spiti Shale Formation), Malla Johar area, Kumaon Himalaya. (Orthographic Change: Garg *et al.*, 2003 listed *E. torynum*); Mehrotra & Aswal, 2003: 48, pl. 33, fig. 4, BERRIASIAN (ONGC well END- A, 1805 - 1855m, Raghavapuram Shale), Krishna-Godavari Basin, Andhra Pradesh; BERRIASIAN – TITHONIAN (ONGC well MVD- A, 2205 – 2285, Golapalli Formation), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al.*, 2005: 48, TITHONIAN – BERRIASIAN ex Mehrotra & Aswal, 2003, Krishna-Godavari Basin, Andhra Pradesh.

Tanyosphaeridium torynum (Cookson & Eisenack, 1960b) Stover & Evitt, 1978. *In*: Jain *et al.*,1984: 79, pl. 1, figs 7-9, MIDDLE-EARLY LATE TITHONIAN (Spiti Shale Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh; Jain *et al.*, 1986: 80-82, pl. 3, fig. 36, LATE JURASSIC, Kutch, Gujarat.

Egmontodinium sp. cf. **E. toryna** (Cookson & Eisenack, 1960b) Davey, 1979c.

Prolixosphaeridium sp. cf. *P. torynum* (Cookson & Eisenack, 1960b) Eisenack & Kjellstrom, 1971. *In*: Jain *et al.*, 1978: 117, pl. 1, fig. 7, LATE JURASSIC (Spiti Shale Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh.

EISENACKIA Deflandre & Cookson, 1955 emend. Sarjeant, 1966b emend. McLean, 1973a.

Eisenackia sp. A *In*: Jain *et al.*,1975: 11, pl. 7, fig. 79, DANIAN (Langpar Formation), Meghalaya.

ELLIPSOIDICTYUM Klement, 1960.

Ellipsoidictyum cinctum Klement, 1960. *In*: Jain *et al.*,1984: 79, pl. 2, fig. 32, EARLY UPPER TITHONIAN (Spiti Shale Formation) , Malla Johar area, Kumaon Himalaya, Uttar Pradesh; Jain *et al.*, 1986: 76, pl. 2, figs 17, 24, LATE JURASSIC, Kutch, Gujarat; Kumar, 1986b: 383, pl. 1, fig. 2; pl. 2, fig. 8, EARLY KIMMERIDGIAN-TITHONIAN (Jhuran Formation), Kutch, Gujarat; Kumar, 1987a: 598, EARLY KIMMERIDGIAN-TITHONIAN (Jhuran Fonnation), Kutch, Gujarat; Garg *et al.*, 2003: 52-53, pl, IV, fig. 7, LATE UPPER TITHONIAN – BERRIASIAN-EARLY VALANGINIAN

(*Pterolytoceras* Ammonite, Upper levels of the Upper Division, Spiti Shale Formation), Malla Johar area, Kumaon Himalaya.

Ellipsoidictyum imperfectum (Brideaux & McIntyre, 1975) Lentin & Williams, 1977b.

Dictyopyxidia imperfecta Brideaux & McIntyre, 1975. *In*: Jain, 1977b: 187, pl. 4, fig. 50, EARLY ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

Ellipsoidictyum punctatum (Jain, 1977b) Below, 1981a.

Dictyopyxidia punctata Jain, 1977b. *In*: Jain, 1977b: 186-187, pl. 4, figs 55-56, EARLY ALBIAN (Dalmiapuram Formation) Cauvery Basin, Tamil Nadu.

?Ellipsoidictyum sp. A *In*: Jain *et al.*, 1984: 70. pl. 3, fig. 54, KIMMERIDGIAN (Spiti Shale Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh.

EMMETROCYSTA Stover. 1975.

Emmetrocysta sarjeantii (Gitmez, 1970) Stover & Evitt, 1978. **NOW Hystrichosphaerina sarjeantii** (Gitmez, 1970) Duxbury, 1980.

ENDOCERATIUM Vozzhennikova, 1965

Endoceratium ludbrooliae (Cookson & Eisenack, 1958) Loeblich Jr. & Loeblich III, 1966. *In*: Mehrotra & Aswal, 2003: 49, pl. 25, fig. 1, BERRIASIAN – TITHONIAN (ONGC well MVD- A, 2205 – 2285m, Golapalli Formation), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 48, TITHONIAN – BERRIASIAN ex Mehrotra & Aswal, 2003, Krishna-Godavari Basin, Andhra Pradesh.

ENDOSCRINIUM (Klement, 1960) Vozzhennikova, 1967 emend. Vozzhennikova, 1965 emend. Gocht, 1970b.

Endoscrinium galeritum (Deflandre, 1939a) Vozzhennikova, 1967. *In*: Garg *et al*., 2003: 52-53, pl, IV, fig. 17, LATE LOWER TITHONIAN (*Kosmatia* Ammonite, Middle Division, Spiti Shale Formation, Kibber Section of Spiti Valley); LATE LOWER TITHONIAN (*Virgatosphinctes* Ammonite, Upper level of the Middle Division, Spiti Shale Formation, Gate Section of Spiti Valley); LATE LOWER TITHONIAN (*Paraboliceras* Ammonite, Upper part of the Middle Division, Spiti Shale Formation, Kibber Section); LATE UPPER TITHONIAN (*Blanfordiceras* Ammonite), Malla Johar area, Kumaon Himalaya.

Scriniodinium galeritum (Deflandre, 1939a) Klement, 1960. *In*: Jain *et al.*, 1984: 78, pl. 4, fig. 76, EARLY TITHONIAN (Spiti Shale Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh.

Endoscrinium granulatum (Raynaud, 1978) Lentin & Williams, 1981. *In*: Garg *et al*., 2003: 52-53, LATE LOWER TITHONIAN (*Kosmatia* Ammonite, Middle Division, Spiti Shale Formation, Kibber Section of Spiti Valley); Malla Johar area, Kumaon Himalaya.

Endoscrinium luridum (Deflandre, 1939a) Gocht, 1970b. *In*: Kumar, 1986a: 31, VALANGINIAN-HAUTERIVIAN (ONGC bore core no. 5), Krishna-Godavari Basin, Andhra Pradesh, (Garg *et al.*, 1988 reassessed the age of this assemblage to be Hauterivian--Barremian).

Scriniodinium luridum (Deflandre, 1939a) Klement, 1960. *In*: Jain *et al.*, 1986: 79-80, pl. 1, fig. 1; pl. 3, fig. 37, LATE JURASSIC, Kutch, Gujarat.

"ENERGLYNIA" Sarjeant, 1976. **NOW WANAEA** Cookson & Eisenack, 1958 emend. Fensome, 1981. (Taxonomic senior synonym, according to Riley & Fenton, 1982, p. 199-200)

cf. *Energlynia* Sarjeant, 1976. *In*: Jain *et al.*, 1984 = cf. **Wanaea** Cookson & Eisenack, 1958 emend. Fensome, 1981.

Energlynia sp. *In*: Garg *et al*., 2003 = **Wanaea sp.**

ENNEADOCYSTA Stover & Williams, 1995.

Enneadocysta arcuata (Eaton, 1971) Stover & Williams, 1995 emend. Stover & Williams, 1995.

Areosphaeridium arcuatum Eaton, 1971. *In*: Jain & Tandon, 1981: 8, pl. 2, figs 23-24, MIDDLE EOCENE (Harudi Formation), Kutch, Gujarat; Kar, 1985: 186, MIDDLE EOCENE (Harudi Formation), Kutch, Gujarat, (reproduction from Jain & Tandon, 1981); Khanna *et al.*, 1985, pl. 2, fig. 9, PALAEOCENE (Subathu Formation), Jammu Hills. (Orthographic change: Khanna *et al.*, 1985 listed *Areosphaera arcuatum*); Mehrotra *et al.*, 1996: 685-688, LUTETIAN-PRIABONIAN – RUPELIAN (ONGC well Gulf- 1, Tarapur Shale), LUTETIAN–PRIABONIAN (ONGC well Gulf- 2, well Gulf- 3 and well Gulf- 4, Tarapur Shale Formation), Gulf of Cambay, Gujarat; Sarkar & Prasad, 2000b: 141, pl. II, fig. 6, EARLY – MIDDLE LUTETIAN (Subathu Formation, Morni Hills), Haryana; Saxena & Sarkar, 2000: 256, 263, pl. 2, fig. 14, MIDDLE EOCENE (Siju Formation), Simsang River near Siju, South Garo Hills, Meghalaya; Mehrotra *et al.*, 2005: 65, EOCENE ex Mehrotra *et al.*, 1996, Cambay Basin, Gujarat; MIDDLE EOCENE ex Saxena & Sarkar, 2000, Assam-Arakan Basin, Northeastern India.

Enneadocysta cf. **E. arcuata** (Eaton, 1971) Stover & Williams, 1995 emend. Stover & Williams, 1995.

Areosphaeridium cf. *A. arcuatum* Eaton, 1971. *In*: Mehrotra & Kamla Singh, 2003: 24, pl. 16, figs 3-6, EARLY OLIGOCENE (ONGC well Mori- A, 1495 – 1500m, Matsyapuri Sandstone), Krishna-Godavari Basin, Andhra Pradesh.

EOCLADOPYXIS Morgenroth, 1966a emend. Stover & Evitt, 1978.

Eocladopyxix peniculata Morgenroth, 1966a emend. McLean, 1976. *In*: Aswal & Pundeer, 1996: 615-616, pl. 1, figs 2, 3 & 7, LUTETIAN - BARTONIAN (ONGC Mori well- A, 2500 – 2000m), Krishna-Godavari Basin, Andhra Pradesh; Garg & Khowaja-Ateequzzaman, 2000: 471, pl. 3, fig. 5, LATE THANETIAN (Lakadong Sst Member, Sylhet Limestone Formation), Cherrapunji area, Khasi Hills, Meghalaya; Mehrotra & Kamla Singh, 2003: 39, pl. 11, figs 1 & 2, MIDDLE EOCENE (ONGC well Mori- A, 2020 – 2025m, Pasarlapudi Formation), Krishna-Godavari Basin, Andhra Pradesh; MIDDLE EOCENE (ONGC well SRP- A, 1450 – 1900m, Bhimanapalli Limestone), Krishna-Godavari Basin, Andhra Pradesh; EOCENE (ONGC well CTP- A, 1760 – 2250m), Krishna-Godavari Basin, Andhra Pradesh; LATE BARTONIAN – YPRESIAN (ONGC well MNP- A, 1125 – 2120m), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al.*, 2005: 69, LUTETIAN TOP (41.3 Ma) - BARTONIAN ex Mehrotra *et al.*, 2002, Mumbai Offshore; YPRESIAN - BARTONIAN ex Mehrotra & Kamla Singh, 2003, Krishna-Godavari Basin, Andhra Pradesh; SELANDIAN - THANETIAN ex Garg & Khowaja-Ateequzzaman, 2000, Assam-Arakan Basin, Northeastern India.

Eocladopyxis sp. *In*: Singh & Tripathi, 1987: 303, PALAEOCENE (Therria Formation), Meghalaya; Tripathi, 1989: 72, pl. 3, fig. 10, PALAEOCENE (Therria Formation), Meghalaya.

?Eocladopyxis sp. *In*: Dutta & Jain, 1980: 65, pl. 7, fig. 63; pl. 8, fig. 80, LATE PALAEOCENE-MIDDLE EOCENE (Sylhet Formation), Meghalaya.

Eocladopyxis sp. A *In*: Jain & Tandon. 1981: 9, pl. 2, fig. 34, MIDDLE EOCENE (Harudi Formation), Kutch, Gujarat.

Eocladopyxis sp. A *In*: Kar, 1985: 188, pl. 43, fig. 3, MIDDLE EOCENE (Harudi Formation), Kutch, Gujarat, (reproduction from Jain & Tandon, 1981).

?Eocladopyxis sp. A *In*: Jain & Garg 1986b: 114, pl. 2, fig. 15, LATE PALAEOCENE, Vriddhachalam area, Cauvery Basin, Tamil Nadu.

EPELIDOSPHAERIDIA Davey. 1969a.

Epelidosphaeridia spinosa Cookson & Hughes, 1964 ex Davey, 1969a. *In*: Mehrotra & Aswal, 2003: 50, pl. 14, fig. 4; pl. 17, fig. 5, CENOMANIAN (ONGC well END- A, 1340 – 1575m, Tirupati and Raghavapuram formations), Krishna-Godavari Basin, Andhra Pradesh; TURONIAN – EARLY APTIAN (ONGC well RCPM- A, 1665 – 2100m, Raghavapuram Formation), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 49, CENOMANIAN - TITHONIAN ex Mehrotra & Aswal, 2003, Krishna-Godavari Basin, Andhra Pradesh.

Palaeoperidinium spinosum Cookson & Hughes, 1964. *In*: Jain & Taugourdeau-Lantz, 1973: 65, pl. 4, fig. 8, ?APT IAN-EARLY ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu; Venkatachala & Kumar, 1980: 101, pl. 4, fig. 12, ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

ESCHARISPHAERIDIA Erkmen & Sarjeant. 1980.

Escharisphaeridia pocockii (Sarjeant, 1968) Erkmen & Sarjeant. 1980. *In*: Jain *et al.*, 1986: 76, pl. 2, figs 19, 23, LATE JURASSIC, Kutch, Gujarat; Kumar, 1986b: 385, pl. 2, fig. I, EARLY KIMMERIDGIAN-TITHONIAN (Jhuran Formation). Kutch, Gujarat; Kumar, 1987a: 598, EARLY KIMMERIDGIAN-TITHONIAN (Jhuran Formation), Kutch, Gujarat.

Escharisphaeridia psilata Kumar, 1986b. *In*: Kumar, 1986b: 383-385. pl. 2, fig. 2, text-fig. 3, EARLY KIMMERIDGIAN-TITHONIAN (Jhuran Formation), Kutch, Gujarat; Kumar, 1987a: 598, pl. 1, fig. 3, EARLY KIMMERIDGIAN-TITHONIAN (Jhuran Formation). Kutch, Gujarat.

EXOCHOSPHAERIDIUM Davey *et al.*, 1966.

Exochosphaeridium bifidum (Clarke & Verdier, 1967) Clarke *et al*., 1968 emend. Davey, 1969b. *In*: Khowaja-Ateequzzaman & Jain, 1992: 156, pl. 2, figs 6, 9, HAUTERIVIAN-BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu.

Exochosphaeridium brevispinosum Matsuoka, 1984a. *In*: Saxena & Sarkar, 2000: 256, 263, MIDDLE EOCENE (Siju Formation), Simsang River near Siju, South Garo Hills, Meghalaya.

Exochosphaeridium ?indicum Jain & Taugourdeau-Lantz, 1973. *In*: Jain & Taugourdeau-Lantz, 1973: 63, pl. 3, fig. 7, ?APTIAN-EARLY ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu; Jain, 1977b: 174, EARLY ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.(Questionable assignment: Stover & evitt, 1978)

Exochosphaeridium phragmites Davey *et al.,* 1966. *In*: Jain, 1977b: 183, pl. 5, fig. 66, EARLY ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu; Venkatachala & Kumar, 1980: 96, pl. 2, fig. 9, ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu; Kumar, 1982: 174, pl. 1, fig. 5, NEOCOMIAN, Krishna-Godavari Basin, Andhra Pradesh; Khowaja-Ateequzzaman & Jain, 1992: 156, pl. 1, figs 1-3, HAUTERIVIAN-BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu; Sarkar & Prasad, 2000b: 141, LATE YPRESIAN (Subathu Formation, Morni Hills), Haryana; Khowaja-Ateequzzaman & Garg, 2002: 136, pl. 1, fig. 9, MIDDLE TURONIAN (Kulakkalnattam Sandstone Member, Garudamangalam Formation), Cauvery Basin, southern India.

Exochosphaeridium sp. A *In*: Jain 1977b: 183-184, pl. 2, fig. 22, EARLY ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

Exochosphaeridium sp. A *In*: Venkatachala & Kumar, 1980: 96, pl. 2, fig. 22, ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

FIBROCYSTA Stover & Evitt, 1978.

Fibrocysta axialis (Eisenack, 1965b) Stover & Evitt, 1978.

Lanternosphaeridium axiale (Eisenack, 1965b) Morgenroth, 1966a. *In*: Jain, 1978: 150, pl. 1, fig. 11, LATE CRETACEOUS, Vriddhachalam area, Cauvery Basin, Tamil Nadu. (Orthographic change: Jain. 1978 listed *L. axialis*).

Fibrocysta bipolaris (Cookson & Eisenack, 1965b) Stover & Evitt, 1978. *In*: Jain & Garg, 1986b: 114-115, pl. 3. fig. 15, LATE PALAEOCENE. Vriddhachalam area. Cauvery Basin, Tamil Nadu, (Orthographic change: Jain & Garg, 1986b listed *F. bipolare*).

Fibrocysta licia (Jain *et al*., 1975) Stover & Evitt, 1978.

Lanternosphaeridium licium Jain *et al.*,1975. *In*: Jain *et al.*, 1975: 10, pl. 4, figs 51-53, DANIAN (Langpar Formation), Meghalaya.

Fibrocysta variabilis Mehrotra & Sarjeant, 1987. *In*: Mehrotra & Sarjeant, 1987: 155--156, pl. 4, fig. 2; pl. 5, figs 1-2, 5-6; pl. 6, fig. 5, MAASTRICHTIAN-PALAEOCENE (Narsapur well-1), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra & Kamla Singh, 2003: 40-41, pl. 15, figs 1-7, THANETIAN – MAASTRICHTIAN (ONGC well NSP- A, 3621 – 2706m), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 69-70, MAASTRICHTIAN - THANETIAN ex Mehrotra & Kamla Singh, 2003, Krishna-Godavari Basin, Andhra Pradesh.

Fibrocysta sp. *In*: Mehrotra & Sarjeant, 1987: 156, pl. 5, figs 3-4, MAASTRICHTIAN (Narsapur well- I), Krishna-Godavari Basin, Andhra Pradesh.

Fibrocysta sp. *In*: Nandi, 1990: 126, pl. 5, fig. 8, MAASTRICHTIAN-DANIAN, Meghalaya.

Fibrocysta sp. *In*: Garg & Khowaja-Ateequzzaman, 2000: 471, LATE THANETIAN (Lakadong Sst Member, Sylhet Limestone Formation), Cherrapunji area, Khasi Hills, Meghalaya.

FLORENTINIA Davey & Verdier, 1973 emend. Duxbury, 1980.

Florentinia buspina Davey & Verdier, 1976) Duxbury, 1980. *In*: Khowaja-Ateequzzaman & Garg, 2002: 136, pl. 3, fig. 14, MIDDLE TURONIAN (Kulakkalnattam Sandstone Member, Garudamangalam Formation), Cauvery Basin, southern India.

Florentinia cooksoniae (Singh, 1971) Duxbury, 1980 emend. Duxbury, 1980. *In*: Khowaja-Ateequzzaman & Garg, 2002: 136, EARLY TURONIAN (Kulakkalnattam Sandstone Member, Garudamangalam Formation), Cauvery Basin, southern India; Mehrotra & Aswal, 2003: 51, pl. 4, figs 3 & 4; pl. 5, figs 5 & 6, CENOMANIAN – BERRIASIAN (ONGC well END- A, 1760 – 1915m, Raghavapuram Formation), Krishna-Godavari Basin, Andhra Pradesh; CENOMANIAN – KIMMERIDGIAN (ONGC well RCPM- A, 1665 – 2976m, Raghavapuram and Golapalli formations), Krishna-Godavari Basin, Andhra Pradesh; TURONIAN – LATE APTIAN (ONGC well MVD- A, 1050 – 1775, Tirupati and raghavapuram formations), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 49, KIMMERIDGIAN - CENOMANIAN ex Mehrotra & Aswal, 2003, Krishna-Godavari Basin, Andhra Pradesh.

Florentinia deanei (Davey & Williams, 1966b) Davey & Verdier, 1973. *In*: Khowaja-Ateequzzaman & Garg, 2002: 136, pl. 1, fig. 19, MIDDLE – LATE TURONIAN (Kulakkalnattam Sandstone Member, Garudamangalam Formation), Cauvery Basin, southern India.

Hystrichosphaeridium deanei Davey & Williams, 1966. *In*: Singh *et al*., 1979: 35-36, text-fig. 1, LATE PALAEOCENE-LATE EOCENE (Subathu Formation) , Simla Hills, Punjab Basin, Himachal Pradesh.

Florentinia cf. **F. deanei** (Davey & Williams, 1966b) Davey & Verdier, 1973. *In*: Mehrotra

& Sarjeant, 1987: 157, pl. 9, fig. 2, MAASTRICHTIAN (Narsapur well- 1), Krishna-Godavari Basin, Andhra Pradesh.

Florentinia ferox (Deflandre, 1937b) Duxbury, 1980. *In*: Mehrotra & Aswal, 2003: 52, pl. 32, figs 5 & 6, LATE MAASTRICHTIAN (ONGC well DRK- A, 1250 – 1805m, Chintalapalli and Raghavapuram formations), Krishna-Godavari Basin, Andhra Pradesh; TURONIAN – KIMMERIDGIAN (ONGC well RCPM- A, 1380 – 2976m, Raghavapuram and Golapalli formations), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 49, KIMMERIDGIAN – LATE MAASTRICHTIAN *ex* Mehrotra & Aswal, 2003, Krishna-Godavari Basin, Andhra Pradesh.

Florentinia sp. cf. **F. ferox** (Deflandre, 1937b) Duxbury, 1980.

Hystrichosphaeridium sp. cf. *H. ferox* Deflandre, 1937b. *In*: Varma & Dangwal, 1964: 65, pl. 2, fig. 6, EOCENE-OLIGOCENE (Cambay deep well no. 14), Cambay Basin, Gujarat.

Florentinia mantellii (Davey & Williams, 1966b) Davey & Verdier, 1973. *In*: Jain, 1977b: 178, pl. 2, figs 14-15, EARLY ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu, (Orthographic change: Jain, 1977b listed *F. mantelli*); Khowaja-Ateequzzaman & Garg, 2002: 136, EARLY - MIDDLE TURONIAN (Kulakkalnattam Sandstone Member, Garudamangalam Formation), Cauvery Basin, southern India; Mehrotra & Aswal, 2003: 53, pl. 4, fig. 1; pl. 25, fig. 3, SANTONIAN – BERRIASIAN (ONGC well END- A, 1160 – 1870m, Tirupati and Raghavapuram formations), Krishna-Godavari Basin, Andhra Pradesh; CONIACIAN – KIMMERIDGIAN (ONGC well RCPM- A, 1380 – 2976m, Raghavapuram and Golapalli formations), Krishna-Godavari Basin, Andhra Pradesh; CENOMANIAN-TURONIAN – LATE APTIAN (ONGC well MVD- A, 1050 – 1775m, Tirupati and Raghavapuram formations), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 49, KIMMERIDGIAN – SANTONIAN *ex* Mehrotra & Aswal, 2003, Krishna-Godavari Basin, Andhra Pradesh..

Florentinia stellata (Maier, 1959) Below, 1982a

Hystrichosphaeridium stellatum Maier, 1959. *In*: Jain, 1977b: 180, EARLY ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu; Venkatachala & Kumar, 1980: 100, pl. 4, fig. 7, ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

Florentinia tridactylites (Valensi, 1955a) Duxbury, 1980.

Achomosphaera tridactylites (Valensi, 1955a) Deflandre & Sarjeant, 1970. *In*: Singh *et al.*, 1979: 35-36, text-fig. 1, LATE PALAEOCENE-EARLY EOCENE (Subathu Formation), Simla Hills, Punjab Basin, Himachal Pradesh.

Florentinia sp. *In*: Sarkar, 1991: 3, pl. I, fig. 5, EARLY EOCENE (Kakara Series, Lesser Himalaya), Kakara-Chapla group of villages, Simla, Himachal Pradesh.

Florentinia sp. *In*: Khowaja-Ateequzzaman & Garg, 2002: 136, pl. 3, fig. 18, MIDDLE TURONIAN (Kulakkalnattam Sandstone Member, Garudamangalam Formation), Cauvery Basin, southern India.

Florentinia sp. A.

Silicia sp. A *In*: Jain, 1978: 151, LATEST MAASTRICHTIAN Formation), Vriddhachalam Basin, Tamil Nadu.

Florentinia sp. B.

Silicia sp. B In: Jain, 1978: 151, pl. 3, figs 29-30, LATEST MAASTRICHTIAN (Kallankurchi Formation), Vriddhachalam area, Cauvery Basin, Tamil Nadu.

FROMEA Cookson & Eisenack, 1958 emend. Yun, 1981. (Acritarch genus)

Fromea acambra Sah *et al.*, 1970. *In*: Sah *et al.*, 1970:148, pl. 2, fig. 28 LATE CRETACEOUS (Langpar Formation), Meghalaya.

Fromea amphora Cookson & Eisenack, 1958. *In*: Jain, 1977b: 176, pl. 3, fig. 26, EARLY ALBIAN (Dalmiapuram Flomaton), Cauvery Basin, Tamil Nadu; Jain *et al.*, 1984: 78, pl. 3, fig. 53, KIMMERIDGIAN-EARLY TITHONIAN (Spiti Shale Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh; Kumar, 1986a: 31, VALANGINIAN-HAUTERIVIAN (ONGC bore core no. 5), Krishna-Godavari Basin, Andhra Pradesh, (Garg *et al.,* 1988 reassessed the age of this assemblage to be Hauterivian-Barremian); Mehrotra & Sarjeant, 1986: 720-721, pl. 10, figs 2-3, HAUTERIVIAN--APTIAN (Periyavadavadi shallow well- 1), Cauvery Basin, Tamil Nadu; Singh & Sarkar, 1987: 208, EOCENE (Subathu Formation), Himachal Pradesh; Sarkar & Singh, 1988: 42, pl. 1, fig. 20, EOCENE (Subathu Formation), Himachal Pradesh; Khowaja-Ateequzzaman & Jain, 1992: 156, pl. 4, fig. 4, HAUTERIVIAN-BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu; Saxena & Sarkar, 2000: 256, MIDDLE EOCENE (Siju Formation), Simsang River near Siju, South Garo Hills, Meghalaya; Mehrotra *et al.*, 2005: 49, NEOCOMIAN - APTIAN ex Mehrotra *et al.*, 2002, Cauvery Basin, Tamil Nadu.

Fromea chytra (Drugg, 1967) Stover & Evitt, 1978. *In*: Mehrotra & Aswal, 2003: 54, pl. 22, fig. 3, MAASTRICHTIAN (ONGC well NSP- A, 3643 – 3649m, Chintalapalli Formation), Krishna-Godavari Basin, Andhra Pradesh; PALAEOCENE (2703 – 2706m, Pasarlapudi Formation), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al.*, 2005: 70, MAASTRICHTIAN - PALAEOCENE ex Mehrotra & Kamla Singh, 2003, Krishna-Godavari Basin, Andhra Pradesh.

Fromea fragilis (Cookson & Eisenack, 1962a) Stover & Evitt, 1978. *In*: Kumar, 1986a: 31, VALANGINIAN--HAUTERIVIAN (ONGC core nos 7, 8), Krishna-Godavari Basin, Andhra Pradesh, (Garg *et al.,* 1988 reassessed the age of this assemblage to be Hauterivian -Barremian).

Fromea glabella (Singh, 1971) Lentin & Williams, 1981. *In*: Kumar, 1986a: 31, VALANGINIAN--HAUTERIVIAN (ONGC bore core no. I), Krishna-Godavari Basin, Andhra Pradesh, (Garg *et al.,* 1988 reassessed the age of this assemblage to be Hauterivian-Barremian).

Fromea microgranulosa Jain, 1977b. **NOW Bosedinia microgranulosa** (Jain, 1977b) Jansoneus, 1989.

Fromea pachyderma Kar, 1979. *In*: Kar, 1979: 35, pl. 4, fig. 78, OLIGOCENE, Kutch, Gujarat, (Pteridophytic spore, according to Jain, 1980).

Fromea sp. *In*: Nandi, 1990: 124, pl. 4, fig. 20; pl. 5, fig. 20, MAASTRICHTIAN-DANIAN, Meghalaya.

Fromea sp. A *In*: Jain, 1977b: 176, pl. 3, fig. 27, EARLY ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

GAGIELLA Backhouse, 1988.

Gagiella mutabilis Backhouse, 1988. *In*: Khowaja-Ateequzzaman & Jain, 1992: 157, pl. 3, figs 2, 3, HAUTERIVIAN-BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu.

Gagiella sp. A. *In*: Khowaja-Ateequzzaman & Jain, 1992: 157, pl. 3, figs 12, 13; pl. 6, fig. 9; pl. 7, fig. 3, HAUTERIVIAN-BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu.

GARDODINIUM Alberti, 1961 emend. Harding, 1996.

Gardodinium trabeculosum (Gocht, 1959) Alberti, 1961 emend. Harding, 1996. *In*: Khowaja-Ateequzzaman & Jain, 1992: 157, pl. 4, fig. 2; pl. 9, fig. 3, HAUTERIVIAN-BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu.

Gardodinium sp. *In*: Kumar, 1982: 173, pl. 2, fig. 9, NEOCOMIAN, Krishna-Godavari Basin, Andhra Pradesh.

GEISELODINIUM Krutzch, 1962.

Geiselodinium inaffectum Drugg, 1978 emend. Kumar, 1986b. **NOW Subtilisphaera ?inaffecta** (Drugg, 1978) Bujak & Davies, 1983. (Questionable assignment: Lentin & Williams, 1985)

GLAPHYROCYSTA Stover & Evitt, 1978.

Glaphyrocysta assamica (Jain *et al.*, 1975) Jain, 1982. *In*: Kumar *et al.*, 1996: 150, pl. 2, fig. 10, LATEST MAASTRICHTIAN (Upper part of Mahadeo Formation, Um Sohryngkew River Section), Meghalaya.

Cyclonephelium assamicum Jain *et al.*, 1975. *In*: Jain *et al.*, 1975: 11, pl. 5, figs 61-62; pl. 6, fig. 73, DANIAN (Langpar Formation), Meghalaya.

Glaphyrocysta divaricata (Williams & Downie, 1966c) Stover & Evitt, 1978. *In*: Dutta & Jain, 1980: 69, pl. 2, fig, 9; pl. 6, fig. 53, EOCENE (Sylhet and Kopili formations). Meghalaya; Singh & Sarkar, 1987: 208, EOCENE (Subathu Formation), Himachal Pradesh; Sarkar & Singh. 1988: 43. pl. 2, figs 14, 15. EOCENE (Subathu Formation), Himachal Pradesh; Sarkar & Prasad, 2000a: 170, pl. 2, fig. 4, LATE YPRESIAN (Subathu Formation, Koshalia Nala Section), Shimla Hills; Sarkar & Prasad, 2000b: 141, LATE YPRESIAN – MIDDLE LUTETIAN (Subathu Formation, Morni Hills), Haryana.

Cyclonephelium divaricata Williams & Downie, 1966. *In*: Singh *et al.*, 1979: 37, 41, text-fig. 1, LATE PALAEOCENE - MIDDLE EOCENE (Subathu Formation). Himachal Pradesh.

Glaphyrocysta exuberans (Deflandre & Cookson, 1955) Stover & Evitt. 1978 emend. Sarjeant, 1986. *In*: Dutta & Jain, 1980: 69, pl. 2, figs 7-8, LATE EOCENE (Kopili Formation), Meghalaya; Jain & Tandon, 1981: 9, pl. 4, fig. 66, MIDDLE EOCENE (Harudi Formation), Kutch, Gujarat; Kar, 1985: 189, pl. 42, fig. 2, MIDDLE EOCENE (Harudi Formation), Kutch, Gujarat. (reproduction from Jain & Tandon. 1981); Mathur, 1986: 195-198, LUTETIAN-BARTONIAN (Kalol Formation, well no. 109), Cambay Basin, Gujarat; Singh & Sarkar, 1987: 208, EOCENE (Subathu Formation), Himachal Pradesh; Sarkar & Singh, 1988: 43, pl. 2, figs 18-19, EOCENE (Subathu Formation), Himachal Pradesh; Sarkar, 1991: 3, pl. III, fig. 11, EARLY EOCENE (Kakara Series, Lesser Himalaya), Kakara-Chapla group of villages, Simla, Himachal Pradesh; Singh & Sarkar, 1992: 185, LATE PALAEOCENE?-EOCENE (Subathu Formation), Garkhal area, Punjab Basin, Himachal Pradesh; Sarkar, 1997: 102, pl. 1, fig. 5, LATE YPRESIAN – LUTETIAN (Subathu Formation, Bilaspur area), Punjab Basin, Himachal Pradesh; Mehrotra & Kamla Singh, 2003: 42, pl. 29, figs 1-6; pl. 28, fig. 6, THANETIAN (ONGC well NSP- A, 2705 – 2871m, Palakollu Shale), Krishna-Godavari Basin, Andhra Pradesh; LATE MIDDLE EOCENE (ONGC well CTP- A, 1370 – 1840m, Matsyapuri Sandstone and Bhimanapalli Limestone), Krishna-Godavari Basin, Andhra Pradesh; LATE TO MIDDLE EOCENE (ONGC well GS- 21- A, 2205 – 2280m, Ravva Formation), Krishna-Godavari Basin, Andhra Pradesh; PRIABONIAN – BARTONIAN (ONGC well KSP- A, 2395 – 2500m), Krishna-Godavari Basin, Andhra Pradesh; PRIABONIAN – LUTETIAN (ONGC well MGP- A, 1620 – 2555m), Krishna-Godavari Basin, Andhra Pradesh; PRIABONIAN – LUTETIAN (ONGC well MNP- A, 1050 – 1455m, Matsyapuri Sandstone and Bhimanapalli Limestone), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al.*, 2005: 70, THANETIAN – PRIABONIAN ex Mehrotra *et al.*, 2003, Mumbai Offshore; THANETIAN TOP - PRIABONIAN ex Mehrotra & Kamla Singh, 2003, Krishna-Godavari Basin, Andhra Pradesh; THANETIAN – PRIABONIAN (54.8 – 37.30

Ma) ex Mehrotra *et al*., 2002, Assam-Arakan Basin, Northeastern India.

Cyclonephelium exuberans Deflandre & Cookson. 1955. *In*: Singh *et al.*, 1979: 37, 41, text-fig. 1, LATE PALAEOCENE--MIDDLE EOCENE (Subathu Formation), Himachal Pradesh; Khanna *et al.*, 1981: 259, pl. 2, fig. 8 (Subathu Formation), Simla Hills, Himachal Pradesh.

Glaphyrocysta indica Jain & Garg, 1991. *In*: Jain & Garg, 1991: 74 – 76, pl. 4, figs 1-3, 7-8, 13-16, MIOCENE (Khari Nadi Formation), Kutch, Gujarat (Restudy of Kar, 1985)

Cordosphaeridium cantharellum (Brosius, 1963) Gocht, 1969. *In*: Kar, 1985: 70, pl. 48, fig. 3, MIOCENE (Khari Nadi formation), Kutch, Gujarat. (Reallocated by Jain & Garg, 1991)

Cordosphaeridium ?cracenospinosum Davey & Williams, 1966b. *In*: Kar, 1985: 203-204, pl. 48, figs 5--6, MIOCENE (Khari Nadi Formation), Kutch, Gujarat. (Reallocated by Jain & Garg, 1991; Questionable assignment: Stover & Evitt, 1978)

Cordosphaeridium sp. In: Kar, 1985: 204, pl. 49, fig. 7, MIOCENE (Khari Nadi Formation), Kutch, Gujarat (Reallocated by Jain & Garg, 1991)

Glaphyrocysta intricata (Eaton, 1971) Stover & Evitt. 1978. *In*: Jain & Tandon. 1981: 9, pl. 4, figs 55-56, MIDDLE EOCENE (Harudi Formation), Kutch, Gujarat; Kar, 1985: 189, pl. 42, fig. 11, MIDDLE EOCENE (Harudi Formation), Kutch, Gujarat, (reproduction from Jain & Tandon, 1981); Mathur, 1986: 195-198, LUTETIAN-BARTONIAN (Kalol Formation, well no. 109), Cambay Basin, Gujarat; Singh & Sarkar, 1987: 208, pl. 1, fig. 24, EOCENE (Subathu Formation), Himachal Pradesh; Sarkar & Singh, 1988: 43-44, pl. 1, figs 8-9, EOCENE (Subathu Formation), Himachal Pradesh.

Glaphyrocysta kachchhensis Jain & Tandon, 1981. *In*: Jain & Tandon, 1981: 9, pl. 1, figs 17-19, MIDDLE EOCENE (Harudi Formation), Kutch, Gujarat; Kar, 1985: 188-189, pl. 44, fig. 5, MIDDLE EOCENE (Harudi Formation), Kutch. Gujarat, (reproduction from Jain & Tandon, 1981).

Glaphyrocysta laciniiformis (Gerlach, 1961) Stover & Evitt, 1978. *In*: Sarkar, 1991: 3, pl. II, fig. 9, EARLY EOCENE (Kakara Series, Lesser Himalaya), Kakara-Chapla group of villages, Simla, Himachal Pradesh.

Glaphyrocysta ordinata (Williams & Downie, 1966c) Stover & Evitt, 1978. *In*: Jain & Tandon. 1981: 9, MIDDLE EOCENE (Harudi Formation), Kutch, Gujarat; Kar, 1985: 189, MIDDLE EOCENE (Harudi Formation), Kutch, Gujarat, (reproduction from Jain & Tandon. 1981); Jain & Garg, 1986b: 115, pl. 2, figs 5-6; pl. 5, fig. 12, LATE PALAEOCENE, Vriddhachalam area, Cauvery Basin, Tamil Nadu; Mehrotra *et* al., 1996: 685, THANETIAN – YPRESIAN (ONGC well Gulf- 1 and well Gulf- 2, Olpad and Bhavnagar formations), YPRESIAN (ONGC well Gulf- 3, Bhavnagar Formation), DANIAN – YPRESIAN (ONGC well Gulf- 4, Olpad Formation), Gulf of Cambay, Gujarat; Mehrotra & Kamla Singh, 2003: 43, pl. 20, fig. 7, YPRESIAN (ONGC well RZL-A, 2745 – 2750m, Palakollu Shale), Krishna-Godavari Basin, Andhra Pradesh; PRIABONIAN – BARTONIAN (ONGC well KSP- A, 2395 – 2500m), Krishna-Godavari Basin, Andhra Pradesh; YPRESIAN (ONGC well MGP- A, 2825 – 2880m), Krishna-Godavari Basin, Andhra Pradesh; YPRESIAN – DANIAN (ONGC well MNP-A, 2050 – 3080m), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 70, SELANDIAN - YPRESIAN ex Mehrotra *et al*., 1996, Cambay Basin, Gujarat; SELANDIAN – YPRESIAN (59 – 52 Ma) ex Mehrotra *et al*., 2003, Mumbai Offshore; SELANDIAN – THANETIAN ex Mehrotra *et al*., 2002, Cauvery Basin, Tamil Nadu; DANIAN - PRIABONIAN ex Mehrotra & Kamla Singh, 2003, Krishna-Godavari Basin, Andhra Pradesh.

Cyclonephelium ordinatum Williams & Downie, 1966c. *In*: Jain. 1978 : 150, pl. 1, figs 5. 8, LATEST MAASTRICHTIAN (Kallankurchi Formation), Vriddhachalam area, Cauvery Basin, Tamil Nadu.

Glaphyrocysta pastielsii (Deflandre & Cookson, 1955) Stover & Evitt, 1978 emend. Sarjeant, 1986. *In*: Jain & Tandon, 1981: 10, pl. 4, fig. 69, MIDDLE EOCENE (Harudi Formation), Kutch, Gujarat; Kar, 1985: 182, 189-190, pl. 40, figs. 8, EARLY EOCENE (Lakhpat bore-hole 1) and MIDDLE EOCENE (Harudi Formation), Kutch, Gujarat, (latter is a reproduction from Jain & Tandon. 1981); Mathur, 1986: 195-198, LUTETIAN-BARTONIAN (Kalol Formation, well no. 109), Cambay Basin, Gujarat; Sarkar & Singh, 1988: 44, pl. 1, fig. 17, EOCENE (Subathu Formation), Banethi-Bagthan area. Himachal Pradesh.

Glaphyrocysta pastielsii (Deflandre & Cookson, 1955) Stover & Evitt, 1978 emend. Sarjeant, 1986. *In*: Kar. 1985: 182. 189-190. pl. 40. figs 7. EARLY EOCENE (Lakhpat bore-hole 1) = **Adnatosphaeridium multispinosum** Williams & Downie, 1966c. (According to Jain & Garg, 1991)

Glaphyrocysta paupercula Liengjarern *et al*., 1980. *In*: Mathur, 1986: 200-201, LUTETIAN-BARTONIAN (Kalol Formation, well no. 109), Cambay Basin, Gujarat.

Glaphyrocysta retiintexta (Cookson, 1965a) Stover & Evitt, 1978. *In*: Singh & Sarkar, 1992: 185, pl. 1, fig. 10, LATE PALAEOCENE?-EOCENE (Subathu Formation), Garkhal area, Punjab Basin, Himachal Pradesh.

Glaphyrocysta ?spineta (Eaton, 1976) Stover & Evitt, 1978.

Cyclonephelium spinetum Eaton, 1976. *In*: Singh *et al.*, 1979: 35-36, text-fig. 1, LATE PALAEOCENE-LATE EOCENE (Subathu Formation), Simla Hills, Punjab Basin, Himachal Pradesh

Glaphyrocysta texta (Bujak, 1976) Stover & Evitt, 1978. *In*: Mathur. 1986: 200-201, LUTETIAN-BARTONIAN (Kalol Formation, well no. 109), Cambay Basin, Gujarat.

Glaphyrocysta cf. **G. texta** (Bujak, 1976) Stover & Evitt, 1978. *In*: Mehrotra & Kamla Singh, 2003: 44, pl. 28, figs 3-5, THANETIAN (ONGC well NSP- A, 2703 – 2706m, Pasaralpudi Formation), Krishna-Godavari Basin, Andhra Pradesh.

Glaphyrocysta vicina (Eaton, 1976) Stover & Evitt. 1978. *In*: Khanna *et al.*, 1985: 100, pl. 1, fig. 8, PALAEOGENE (Subathu Formation), Jammu Hills; Sarkar & Prasad, 2000b: 141, pl. II, fig. 10, EARLY – MIDDLE LUTETIAN (Subathu Formation, Morni Hills), Haryana.

Glaphyrocysta sp. A *In*: Jain & Tandon. 1981: 10, pl. 4, fig. 57, MIDDLE EOCENE (Harudi Formation), Kutch, Gujarat.

Glaphyrocysta sp. A *In*: Kar, 1985: 190, pl. 42, fig. 10, MIDDLE EOCENE (Harudi Formation), Kutch, Gujarat, (reproduction from Jain & Tandon. 1981).

Glaphyrocysta sp. A *In*: Jain & Garg, 1986b: 116, pl. 2, figs 3-4; pl. 3, figs 5-6, LATE PALAEOCENE, Vriddhachalam area, Cauvery Basin, Tamil Nadu.

GOCHTEODINIA Norris, 1978 emend. Below, 1990.

Gochteodinia verrucosa (Vozzhennikova, 1967) Dörhöfer & Davies. 1980 emend. Lentin & Vozzhennikova, 1990.

Pareodinia verrucosa (Vozzhennikova, 1967) Wiggins, 1975. *In*: Kumar, 1986b: 398-399, pl. 6, fig. 2, EARLY KIMMERIDGIAN-TITHONIAN (Jhuran Formation), Kutch, Gujarat.

Gochteodinia sp. cf. **G. villosa** (Vozzhennikova, 1967) Norris, 1978 emend. Lentin & Vozzhennikova, 1990 emend. Below, 1990. *In*: Garg *et al*., 2003: 52-53, pl, III, fig. 16, LATE LOWER TITHONIAN (*Kosmatia* Ammonite, Middle Division, Spiti Shale Formation, Kibber Section of Spiti

Valley), Malla Johar area, Kumaon Himalaya.

GODAVARIELLA Mehrotra & Sarjeant, 1987.

Godavariella venkatachalae Mehrotra & Sarjeant, 1987. *In*: Mehrotra & Sarjeant, 1987: 167-168, pl. 1, figs 2-6, text-fig. 3, MAASTRICHTIAN (Narsapur well- 1). Krishna-Godavari Basin, Andhra Pradesh; Mehrotra & Aswal, 2003: 55-56, pl. 28, figs 2 – 6, MAASTRICHTIAN (ONGC well NSP-A, 3643 – 3649m, Chintalapalli Shale, Holotype), Krishna-Godavari Basin, Andhra Pradesh; MAASTRICHTIAN (3621 – 3624m, Paratype A & b), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 50, MAASTRICHTIAN ex Mehrotra & Aswal, 2003, Krishna-Godavari Basin, Andhra Pradesh..

GONYAULACYSTA Deflandre, 1964 emend. Sarjeant, 1969 emend. Stover & Evitt, 1978 emend. Sarjeant, 1982b emend. Helenes & Lucas-Clarke, 1997.

Gonyaulacysta aichmetes Sarjeant, 1966b. **NOW Cribroperidinium aichmetes** (Sarjeant, 1966b) Helenes, 1984.

Gonyaulacysta cassidata (Eisenack & Cookson, 1960) Sarjeant, 1966b emend. Sarjeant, 1966b. **NOW Wrevittia cassidata** (Eisenack & Cookson, 1966b) Helenes & Lucas-Clark, 1997 emend. Helenes & Lucas-Clark, 1997.

Gonyaulacysta diaphanis (Cookson & Eisenack, 1958) Stover & Evitt. 1978. **NOW Cribroperidinium muderongense** (Cookson & Eisenack, 1958) Davey. 1969.

Gonyaulacysta edwardsii (Cookson & Eisenack, 1958) Clarke & Verdier, 1967. **NOW Cribroperidinium edwardsii** (Cookson & Eisenack, 1958) Davey, 1969a.

Gonyaulacysta ehrenbergii Gitmez, 1970. **NOW Cribroperidinium ehrenbergii** (Gitmez, 1970) Helenes, 1984.

Gonyaulacysta eisenackii subsp. **eisenackii** Autonym.

Tubotuberella eisenackii subsp. *oligodentata* (Cookson & Eisenack, 1958) Stover & Evitt, 1978. *In*: Garg *et al*., 2003: 52-53, pl, III, fig. 5-6, EARLY LOWER TITHONIAN (*Uhligites* Ammonite, Lower part of Middle Division of Spiti Shale Formation, Laptal Section); Malla Johar area, Kumaon Himalaya.

Gonyaulacysta episoma Sarjeant, 1966b. **NOW Leptodinium episomum** (Sarjeant, 1966b) Helenes, 1984.

Gonyaulacysta exanguia Duxbury, 1977 emend. Harding, 1990b. **NOW Stanfordella exanguia** (Duxbury, 1977) Helenes & Lucas-Clark, 1997.

Gonyaulacysta fetchamensis Sarjeant. 1966b. **NOW Cribroperidinium fetchamense** (Sarjeant, 1966b) Helenes, 1984.

Gonyaulacysta hadra Sarjeant, 1966b. **NOW Leptodinium hadrum** (Sarjeant) Helenes, 1984.

Gonyaulacysta helicoidea (Eisenack & Cookson, 1960) Sarjeant, 1966b. *In*: Jain & Taugourdeau-Lantz, 1973: 62, pl. 4, fig. 7, ?APTIAN-EARLY ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

Gonyaulacysta jurassica (Deflandre, 1939a)Norris & Sarjeant, 1965 emend. Sarjeant, 1982b. *In*: Venkatachala & Kumar, 1968: 408-409, LATE JURASSIC, Kutch. Gujarat; Jain *et al*., 1978: 116, pl. 1, fig. 8, LATE JURASSIC (Spiti Shale Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh; Garg *et al*., 2003: 52-53, pl, I, fig. 3; pl. III, fig. 1, LATE LOWER TITHONIAN (*Kosmatia* Ammonite, Middle Division, Spiti Shale Formation, Kibber Section of Spiti Valley); LATE LOWER TITHONIAN (*Virgatosphinctes* Ammonite, Upper level of the Middle Division, Spiti Shale Formation, Gate Section of Spiti Valley); LATE LOWER TITHONIAN (*Paraboliceras* Ammonite, Upper part of the Middle Division, Spiti Shale Formation, Kibber Section), Malla Johar area, Kumaon Himalaya; Mehrotra & Aswal, 2003: 57, pl. 3, figs 3 & 4, KIMMERIDGIAN (ONGC well RCPM- A, 2960 – 2965m, Golapalli Formation), Krishna-Godavari Basin, Andhra Pradesh; BERRIASIAN –

TITHONIAN (ONGC well MVD- A, 2180 – 2345m, Golapalli Formation), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al.*, 2005: 50, KIMMERIDGIAN - BERRIASIAN ex Mehrotra & Aswal, 2003, Krishna-Godavari Basin, Andhra Pradesh.

Gonyaulacysta jurassica subsp. **jurassica** Deflandre, 1938 emend. Sarjeant, 1982. *In*: Jain *et al.*,1984: 79. pl. 1. figs 1-4, EARLY UPPER TITHONIAN (Spiti Shale Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh; Jain *et al.*, 1986: 74, pl. 2, figs 15,22: pl. 3. fig. 44. LATE JURASSIC. Kutch. Gujarat.

Gonyaulacysta jurassica subsp. **jurassica** var. **quadrata** Kumar, 1986b. *In*: Kumar, 1986b: 386-388, pl. 1, fig. 6; pl. 3, fig. I, text-fig. 4, EARLY KIMMERIDGIAN-TITHONIAN (Jhuran Formation), Kutch, Gujarat; Kumar, 1987a: 598, EARLY KIMMERIDGIAN-TITHONIAN (Jhuran Formation), Kutch, Gujarat.

Gonyaulacysta orthoceras (Eisenack, 1958a) Sarjeant, 1966b. **NOW Cribroperidinium orthoceras** (Eisenack, 1958a) Davey, 1969a emend. Sarjeant, 1985a.

Gonyaulacysta orthoceras (Eisenack, 1958a) Sarjeant. 1966b. **NOW Cribroperidinium orthoceras** (Eisenack, 1958a) Davey, 1969a emend. Sarjeant. 1985a.

Gonyaulacysta cf. **G. ?perforans** (Cookson & Eisenack, 1958a) Morgan, 1980. *In*: Venkatachala & Kumar. 1980: 97, pl. 3, fig. 6, ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu: Jain, Jana & Maheshwari, 1986: 75, pl. 1, fig. 2; pl. 2, figs 26-27, LATE JURASSIC, Kutch, Gujarat. (Questionable assignment: Helenes, 1984)

Gonyaulacysta ?rara Kar *et al.*, 1972. *In*: Kar *et al.*, 1972: 147, pl. 1, figs 4-5, Tura Formation), Garo Hills, Meghalaya. (Questionable assignment: Stover & Evitt, 1978)

Gonyaulacysta serrata (Cookson & Eisenack, 1958) Sarjeant, 1969. **NOW Rhynchodiniopsis serrata** (Cookson & Eisenack, 1958) Jan du Chene *et al.,* 1985b.

Gonyaulacysta sp.

Gonyaulax sp. *In*: Banerjee, 1972: 135, CRETACEOUS, Khara Tar well, Rajasthan.

Gonyaulacysta sp.

Gonyaulax sp. In: Banerjee & Misra, 1972: 207, pl. I, fig. 3, EOCENE-MIOCENE. Assam and Tripura.

Gonyaulacysta sp. *In*: Jain & Taugourdeau-Lantz, 1973: 62. pl. 4. fig. 4. ?APTIAN-EARLY ALBIAN (Dalmiapuram Formation).Cauvery Basin. Tamil Nadu.

Gonyaulacysta sp. *In*: Singh & Khanna, 1980: 471, pl. 2, fig. 13, LATE PALAEOCENE-LATE EOCENE (Subathu Formation), Simla Hills, Punjab Basin, Himachal Pradesh.

Gonyaulacysta sp. *In*: Mehrotra & Sinha, 1981: 153, pl. 3, figs 5-6, MIDDLE EOCENE (Sangchamalla Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh. (Jain & Garg, 1986a reassessed the age of this assemblage to be Late Cretaceous).

Gonyaulacysta sp. *In*: Kumar. 1982: 170. pl. 2. fig. 13. NEOCOMIAN. Krishna-Godavari Basin. Andhra Pradesh.

Gonyaulacysta sp. *In:* Singh & Tripathi. 1987: 302. LATE EOCENE (Kopili Formation). Meghalaya.

Gonyaulacysta sp. *In:* Tripathi. 1989: 64, pl. 3, fig. 5, LATE EOCENE (Kopili Formation). Meghalaya.

?Gonyaulacysta sp. *In*: Nandi, 1990: 124, pl. 4, figs 21-22, MAASTRICHTIAN-DANIAN, Meghalaya.

Gonyaulacysta sp. *In*: Singh & Sarkar, 1992: 185, LATE PALAEOCENE?-EOCENE (Subathu Formation), Garkhal area, Punjab Basin, Himachal Pradesh.

Gonyaulacysta sp. A *In*: Jain *et al.*, 1975: 7, pl. 3, figs 40-41, MAASTRICHTIAN (Jadukata Formation), Meghalaya.

Gonyaulacysta sp. A *In*: Venkatachala & Kumar. 1980: 97. pl. 2. fig. 7. ALBIAN (Dalmiapuram Formation). Cauvery Basin. Tamil Nadu.

Gonyaulacysta sp. **A** *In*: Mehrotra & Sarjeant, 1986: 712--713. pl. 2 ,fig. 12, APTIAN

(Periyavadavadi shallow well- 1), Cauvery Basin, Tamil Nadu.

Gonyaulacysta sp. A *In*: Kumar, 1987b: 241, pl. I, figs 1- -2, text-fig. 4, EARLY KIMMERIDGIAN-TITHONIAN (Jhuran Formation), Kutch. Gujarat.

Gonyaulacysta sp. B *In*: Jain *et al.*, 1975: 7, pl. 3, fig. 48, MAASTRICHTIAN (Jadukata Formation), Meghalaya.

Gonyaulacysta sp. B *In*: Venkatachala & Kumar, 1980: 97-98, pl. 3, fig. 5, ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

Gonyaulacysta sp. B *In*: Mehrotra & Sarjeant, 1986: 713--714, pl. 2, figs 7-8, APTIAN (Periyavadavadi shallow well- 1), Cauvery Basin, Tamil Nadu.

?Gonyaulacysta sp. C *In*: Jain *et al.*, 1975: 7, pl. 3, fig. 47, MAASTRICHTIAN (Jadukata Formation), Meghalaya.

Gonyaulacysta sp. C *In*: Venkatachala & Kumar, 1980: 98, pl. 2, fig. 11, ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

Gonyaulacysta sp. D *In*: Venkatachala & Kumar, 1980: 98, pl. 2, fig. 13, ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

Gonyaulacysta sp. E *In*: Venkatachala & Kumar, 1980: 98, pl. 3, fig. 4, ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

Gonyaulacysta sp. F *In*: Venkatachala & Kumar, 1980: 98, pl. 3, fig. 9, ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

Gonyaulacysta sp. G *In*: Venkatachala & Kumar, 1980: 98, pl. 3, fig. 2, ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

Gonyaulacysta sp. H *In*: Venkatachala & Kumar, 1980: 98, pl. 3, fig. 12, ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

Gonyaulacysta sp. 1 *In*: Venkatachala & Kumar, 1980: 98, pl. 3. fig. 7, ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

"GONYAULAX" Diesing. 1866. (a modern genus defined from motile stage. Fossil dinoflagellates formerly included in *Gonyaulax* have been assigned to **Gonyaulacysta** Deflandre, 1964 emend. Sarjeant, 1969 emend. Stover & Evitt, 1978 emend. Sarjeant, 1982 emend. Helenes & Lucas Clarke, 1997 as well as to some other genera).

Gonyaulax sp. In: Banerjee, 1972 = **Gonyaulacysta sp.**

Gonyaulax sp. In: Banerjee & Misra, 1972 = **Gonyaulacysta sp.**

GORGONISPHAERIDIUM Staplin *et al.*, 1965 emend. Kiryanov, 1978 (Acritarch genus)

Gorgonisphaeridium ambiguum (Deflandre, 1937b) Sarjeant & Stancliffe, 1994. (Acritarch)

Chlamydophorella ambigua (Deflandre, 1937b) Stover & Helby, 1987d. *In*: Garg *et al.*, 2003: 52-53, pl, IV, fig. 14; pl. V, fig. 8, EARLY LOWER TITHONIAN (*Uhligites* Ammonite, Lower part of Middle Division of Spiti Shale Formation, Laptal Section); LATE LOWER TITHONIAN (*Kosmatia* Ammonite, Middle Division, Spiti Shale Formation, Kibber Section of Spiti Valley); LATE LOWER TITHONIAN (*Paraboliceras* Ammonite, Upper part of the Middle Division, Spiti Shale Formation, Kibber Section); LATE UPPER TITHONIAN (*Blanfordiceras* Ammonite), Malla Johar area, Kumaon Himalaya; Mehrotra & Aswal, 2003: 34, pl. 26, figs 3 & 4, BERRIASIAN – SANTONIAN (ONGC well END-A, 1140 – 1870m, Tirupati and Raghavapuram formations), Krishna-Godavari Basin, Andhra Pradesh; CENOMANIAN (ONGC well DRK- A, 1645 – 1675m, Chintalapalli Formation), Krishna Godavari-Basin, Andhra Pradesh;

TURONIAN – BARREMIAN (ONGC well RCPM- A, 1360 – 200m, Tirupati and Raghavapuram formations), Krishna-Godavari Basin, Andhra Pradesh; CENOMANIAN – TITHONIAN (ONGC well MVD-A, 1355 – 2285m, Tirupati and Raghavapuram formations), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 45, TITHONIAN – SANTONIAN ex Mehrotra & Aswal, 2003, Krishna-Godavari Basin, Andhra Pradesh.

"GYMNODINIUM" Stein, 1878, (a modem genus defined from motile stage. Fossil dinoflagellates formerly included in *Gymnodinium* have been assigned to **Dinogymnium** Evitt *et al*., 1967 emend. Lentin & Vozzhennikova, 1990, as well as to some other genera).

Gymnodinium nelsonense Cookson, 1956. (Orthographic change from G. *nelsonensis* listed by Venkatachala & Sharma, 1974) **NOW Dinogymnium nelsonense** (Cookson, 1956) Evitt *et al.,* 1967.

Gymnodinium sp. 1. *In*: Salujha & Kindra, 1981 = **Dinogymnium sp. 1.** (*in* Jain & Garg. 1982).

Gymnodinium sp. 2. *In*: Salujha & Kindra, 1981 = **Dinogymnium sp. 2.** (in Jain & Garg, 1982).

HAPSOCYSTA Davey, 1979b.

Hapsocysta peridictya (Eisenack & Cookson, 1960) Davey, 1979 emend. Davey, 1979b. *In*: Khowaja-Ateequzzaman & Garg, 2002: 136, pl. 2, fig. 20, EARLY TURONIAN (Kulakkalnattam Sandstone Member, Garudamangalam Formation), Cauvery Basin, southern India; Mehrotra *et al*., 2005: 50, ALBIAN – CENOMANIAN ex Mehrotra *et al*., 2002, Cauver Basin, Tamil Nadu.

Cannosphaeropsis peridictya Eisenack & Cookson, 1960. *In*: Jain, 1977b; 185-186, pl. 4, figs 55-56, EARLY ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu; Venkatachala & Kumar. 1980: 94, pl. 1, fig. 3, ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

HEBECYSTA Bujak & Fisher, 1976

Hebecysta balmei (Stover & Helby, 1987a) Below, 1987a emend. Below, 1987a.

Heibergella balmei Stover & Helby, 1987a. *In*: Mehrotra *et al*., 2005: 50, ANISIAN – LADINIAN-NORIAN ex Aswal & Mehrotra, 2002, Krishna-Godavari Basin, Andhra Pradesh.

HEIBERGELLA Bujak & Fisher, 1976.

Heibergella asymmetrica Bujak & Fisher, 1976. *In*: Sharma & Sarjeant, 1987: 259, pl. 2, fig. 1, LATE TRIASSIC (Baratang Formation), Andaman Islands.

Heibergella balmei Stover & Helby, 1987a. **NOW Hebecysta balmei** (Stover & Helby, 1987a) Below, 1987a emend. Below, 1987a.

Heibergella salebrosacea Bujak & Fisher, 1976. *In*: Sharma & Sarjeant. 1987: 259, pl. 2. fig. 2. LATE TRIASSIC (Baratang Formation), Andaman Islands.

"HEMICYSTODINIUM" Wall, 1967. **NOW POLYSPHAERIDIUM** Davey & Williams, 1966 emend. Bujak *et al.,* 1980. (Taxonomic senior synonym, according to Bujak *et. al*., 1980, p. 34)

Hemicystodinium zoharyi (Rossignol, 1962) Wall. 1967. **NOW Polysphaeridium zoharyi** (Rossignol, 1962) Bujak *et al.,* 1980.

HERENDEENIA Wiggins, 1969.

Herendeenia alaskaensis (Stover & Evitt, 1978) Stover & Helby, 1987b. *In*: Khowaja-Ateequzzaman & Jain, 1992: 157, pl. 2, figs 1, 2, HAUTERIVIAN-BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu.

Herendeenia pisciformis (Cookson & Eisenack, 1958) Wiggins, 1969 emend. Stover & Helby, 1987b. *In*: Khowaja-Ateequzzaman & Jain, 1992: 158, pl. 2, figs

3, 4, HAUTERIVIAN-BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu.

Omatia pisciformis Cookson & Eisenack, 1958. *In*: Jain *et al.*, 1984: 79, pl. 1, fig. 17, EARLY LATE TITHONIAN (Spiti Shale Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh.

Herendeenia postprojects Stover & Helby, 1987c. *In*: Khowaja-Ateequzzaman & Jain, 1992: 158, pl. 1, figs 7, 9, HAUTERIVIAN-BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu.

HETERAULACACYSTA Drugg & Loeblich Jr., 1967 emend. Bujak in Bujak *et al.*, 1980.

Heteraulacacysta campanula Drugg & Loeblich Jr., 1967. *In*: Aswal & Pundeer, 1996: 636, pl. 2, fig. 9, OLIGOCENE (ONGC Mori well- A, 1600 – 1400m), Krishna-Godavari Basin, Andhra Pradesh;Mehrotra & Kamla Singh, 2003: 45, pl. 27, figs 3-5, PLEISTOCENE AND YOUNGER (ONGC well SRP- A, 460 – 650m, Narasapur Claystone, Rajahmundry Sandstone), Krishna-Godavari Basin, Andhra Pradesh; OLIGOCENE – LATE EOCENE (ONGC well MORI- A, 1450 – 1600m, Matsyapuri Sandstone), Krishna-Godavari Basin, Andhra Pradesh; MIOCENE – MIDDLE EOCENE (ONGC well GS- 21- A, 1250 – 2600m), Krishna-Godavari Basin, Andhra Pradesh; OLIGOCENE – LATE EOCENE (ONGC well BMP- A, 750 – 760m, Narasapur Claystone and Matsyapuri Sandstone), Krishna-Godavari Basin, Andhra Pradesh; YPRESIAN (ONGC well KSP- A, 2520 – 2875m), Krishna-Godavari Basin, Andhra Pradesh; BARTONIAN (ONGC well SSY- A, 2065 – 2090m, Ravva Formation), Krishna-Godavari Basin, Andhra Pradesh; BARTONIAN-LUTETIAN – YPRESIAN (ONGC well MNP- A, 1115 – 2480m, Matsyapuri Sandstone, Bhimanapalli Limestone, Pasarlapudi Formation and Palakollu Shale), Krishna-Godavari Basin, Andhra Pradesh; CALABRIAN-ZANCLEAN – RUPELIAN (ONGC well GS- 15- D, 1600 – 3110m), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al.*, 2005: 71, EOCENE - PLEISTOCENE ex Mehrotra & Kamla Singh, 2003, Krishna-Godavari Basin, Andhra Pradesh.

Heteraulacacysta ?leptalea Eaton, 1976. *In*: Aswal & Pundeer, 1996: 636, LUTETIAN - BARTONIAN (ONGC Mori well- A, 2000 – 1600m), Krishna-Godavari Basin, Andhra Pradesh. (Questionable assignment: Eaton, 1976)

Heteraulacacysta porosa Bujak in Bujak *et al.*, 1980. *In*: Aswal & Pundeer, 1996: 636, pl. 2, fig. 2, YPRESIAN – LUTETIAN-BARTONIAN (ONGC Mori well- A, 2700 – 1600m), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra & Kamla Singh, 2003: 46, pl. 27, figs 1 & 2, MIDDLE EOCENE (ONGC well SRP- A, 1040 – 1020m, Matsyapuri Sandstone), Krishna-Godavari Basin, Andhra Pradesh; MIDDLE - EARLY EOCENE (ONGC well Mori- A, 1500 – 2725m, Matsyapuri Sandstone, Bhimanapalli Limestone and Pasarlapudi Formation), Krishna-Godavari Basin, Andhra Pradesh; MIDDLE EOCENE (ONGC well BMP- A, 1250 – 1260m, Bhimanapalli Limestone), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al.*, 2005: 71, BARTONIAN ex Mehrotra *et al.*, 2002, Mumbai Offshore; EOCENE ex Mehrotra & Kamla Singh, 2003, Krishna-Godavari Basin, Andhra Pradesh.

HETEROSPHAERIDIUM Cookson & Eisenack, 1968. emend. Yun. 1981.

Heterosphaeridium difficile (Manum & Cookson, 1964) Ioannides, 1986. *In*: Khowaja-Ateequzzaman & Garg, 2002: 136, pl. 3, fig. 11, EARLY - MIDDLE TURONIAN (Kulakkalnattam Sandstone Member, Garudamangalam Formation), Cauvery Basin, southern India.

Heterosphaeridium heteracanthum (Deflandre & Cookson, 1955) Eisenack & Kjellstrom. 1972. *In*: Kar, 1979: 34, OLIGOCENE (Maniyara Fort Formation),

Kutch, Gujarat; Khowaja-Ateequzzaman & Garg, 2002: 137, LATE TURONIAN (Kulakkalnattam Sandstone Member, Garudamangalam Formation), Cauvery Basin, southern India.

Cleistosphaeridium heteracanthum Deflandre & Cookson, 1955. *In*: Banerjee & Misra, 1972: 207, 211, pl. 2. fig. 15, EOCENE-MIOCENE, Assam and Tripura.

Heterosphaeridium heteracanthum (Deflandre & Cookson, 1955) Eisenack & Kjellström. 1972. *In*: Kar, 1985: 182-183, pl. 41, fig. 6, EARLY EOCENE (Lakhpat bore hole- 1), Kutch. Gujarat = **?Areosphaeridium sp. A.** (According to Jain & Garg, 1991)

Heterosphaeridium heteracanthum subsp. **sparsiprocessum** (Varma & Dangwal, 1964) Eisenack & Kjellstrom, 1972. *In*: Kar, 1985: 183, pl. 40, fig. 9, EARLY EOCENE (Lakhpat bore hole-1), Kutch, Gujarat.

Heterosphaeridium heteracanthum subsp. *sparsiprocessum* (Varma & Dangwal, 1964) Eisenack & Kjellstrom, 1972. *In*: Kar, 1985: 183, pl. 40, fig. 9, EARLY EOCENE (Lakhpat bore hole-1), Kutch, Gujarat = **Forma A** (According to Jain & Garg, 1991)

Hystrichosphaeridium heteracanthum subsp. *sparsiprocessum* Varma & Dangwal, 1964. *In*: Varma & Dangwal, 1964: 64, pl. 1, fig. 7, EOCENE-OLIGOCENE (Cambay deep well no. 2), Cambay Basin, Gujarat.

HEXAGONIFERA Cookson & Eisenack. 1961a emend. Cookson & Eisenack. 1962b emend. Stover & Evitt, 1978.

Hexagonifera chlamydata Cookson & Eisenack. 1962b. **NOW Leberidocysta chlamydata** (Cookson & Eisenack, 1962b) Stover & Evitt, 1978 emend. Fechner, 1985 emend. Marheinecke, 1992.

Hexagonifera reticulata Khanna & Singh, 1981b. *In*: Khanna & Singh, 1981b: 391, pl. 1, figs 1, 6, text-fig. 3, EARLY-MIDDLE EOCENE (Subathu Formation), Simla Hills, Himachal Pradesh.

Hexagonifera reticulata Singh *et al.*, 1979. *In*: Singh *et al.*, 1979: 35-36, text-fig. 1, EARLY-MIDDLE EOCENE (Subathu Formation), Himachal Pradesh. (name not validly published)

Hexagonifera reticulata Khanna. 1979. *In*: Khanna, 1979: 216, LATE PALAEOCENE-LATE EOCENE (Subathu Formation), Simla Hills, Himachal Pradesh. (name not validly published)

Hexagonifera reticulata Khanna *et al.*, 1981. *In*: Khanna *et al.*, 1981: 261, pl. 3, fig. 10, (Subathu Formation), Simla Hills, Himachal Pradesh. (name not validly published)

Hexagonifera sahii Khanna & Singh, 1981b. *In*: Khanna & Singh, 1981: 391-393, pl. 2, figs 1, 3; pl. 4, fig. 4, text-figs 4-5, EARLY--MIDDLE EOCENE (Subathu Formation), Simla Hills, Himachal Pradesh.

Hexagonifera sahii Singh *et al.*, 1979. *In*: Singh *et al.*, 1979: 35-36, text-fig. 1, EARLY-MIDDLE EOCENE (Subathu Formation), Simla Hills, Himachal Pradesh. (name not validly publishe)

Hexagonifera sahii Khanna, 1979. *In*: Khanna, 1979: 216, LATE PALAEOCENE-LATE EOCENE (Subathu Formation), Simla Hills, Himachal Pradesh. (name not validly published).

Hexagonifera sahii Khanna *et al.*, 1981. *In*: Khanna *et al.*, 1981: 261, pl. 3, fig. 9, (Subathu Formation), Simla Hills, Himachal Pradesh, (name not validly published).

Hexagonifera scabrata Jain & Taugourdeau-Lantz, 1973. **NOW Ovoidinium scabratum** (Jain & Taugourdeau-Lantz, 1973) Khowaja-Ateequzzaman & Garg, 2004 emend. Khowaja-Ateequzzaman & Garg, 2004.

Hexagonifera vermiculala Cookson & Eisenack, 1961a. **NOW Trithyrodinium**

vermiculatum (Cookson & Eisenack, 1961a) Lentin & Williams, 1976.

Hexagonifera sp. *In*: Singh & Khanna, 1980: 470, pl. 1, fig. 8, LATE PALAEOCENE-LATE EOCENE (Subathu Formation), Simla Hills, Punjab Basin, Himachal Pradesh.

"HEXASPHAERA" Clarke & Verdier, 1967. (Name illegitimate) **NOW CALLAIOSPHAERIDIUM** Davey & Williams, 1966b emend. Duxbury, 1980 emend. Below, 1981a.

Hexasphaera asymmetricum (Deflandre & Courteville, 1939) Clarke & Verdier, 1967 emend. Clarke & Verdier, 1967. **NOW Callaiosphaeridium asymmetricum** (Deflandre & Courteville, 1939) Davey & Williams, 1966b.

HISTIOPHORA Klement, 1960.

Histiophora ornata Klement, 1960. *In*: Jain *et al.*, 1984: 78, pl. 3, fig. 65, EARLY LATE TITHONIAN (Spiti Shale Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh.

HOMOTRYBLIUM Davey & Williams, 1966b.

Homotryblium abbreviatum Eaton, 1976. *In*: Singh *et al.*, 1979: 35-36, text-fig. 1, pl. 1, fig. 16, LATE PALAEOCENE-LATE EOCENE (Subathu Formation), Simla Hills, Himachal Pradesh; Khanna *et al.*, 1981: 259, pl. 2, fig. 1, (Subathu Formation), Simla Hills, Himachal Pradesh; Mathur, 1986: 200, LUTETIAN--BARTONIAN (Kalol Formation. well no. 109), Cambay Basin, Gujarat; Singh & Sarkar, 1987: 208, EOCENE (Subathu Formation), Banethi-Bagthan area, Himachal Pradesh; Sarkar & Singh, 1988: 44, pl. 2, figs 1-3, EOCENE (Subathu Formation), Banethi-Bagthan area, Himachal Pradesh; Jain & Garg, 1991: 60-61, pl. 1, figs 10-11, EARLY EOCENE (Lakhpat bore hole- 1), Kutch, Gujarat (Restudy of Kar, 1985); Sarkar, 1991: 3, pl. II, figs 1, 2, EARLY EOCENE (Kakara Series, Lesser Himalaya), Kakara-Chapla group of villages, Simla, Himachal Pradesh; Singh & Sarkar, 1992: 185, pl. 1, fig. 7, LATE PALAEOCENE?-EOCENE (Subathu Formation), Garkhal area, Punjab Basin, Himachal Pradesh; Aswal & Pundeer, 1996: 636, pl. 2, fig. 2, LUTETIAN - BARTONIAN (ONGC Mori well- A, 2400 – 1600m), Krishna-Godavari Basin, Andhra Pradesh; Sarkar, 1997: 102, pl. 1, fig. 1, LATE YPRESIAN – LUTETIAN (Subathu Formation, Bilaspur area), Punjab Basin, Himachal Pradesh; Sarkar & Prasad, 2000a: 170, LATE YPRESIAN (Subathu Formation, Koshalia Nala Section), Shimla Hills; Sarkar & Prasad, 2000b: 141, pl. 2, fig. 3, LATE YPRESIAN – EARLY LUTETIAN (Subathu Formation, Morni Hills), Haryana.

Homotryblium tenuispinosum Davey & Williams, 1966b. *In*: Kar, 1985: 183, pl. 41, fig. 7, EARLY -EOCENE (Lakhpat bore hole- 1), Kutch. Gujarat. (Reallocated by Jain & Garg, 1991)

Hystrichosphaeridium salpingophorum Deflandre, 1935 ex Deflandre, 1937b emend. Davey & Williams, 1966b. *In*: Kar, 1985: 184, pl. 41, figs 11-12, EARLY EOCENE (Lakhpat bore hole-1), Kutch, Gujarat. (Reallocated by Jain & Garg, 1991)

Homotryblium caliculum Bujak *in* Bujak *et aI.,* 1980. *In*: Mathur, 1986: 195-198, LUTETIAN-BARTONIAN (Kalol Formation, well no. 109), Cambay Basin, Gujarat.

Homotryblium distinctum Salujha & Kindra, 1981. *In*: Salujha & Kindra, 1981: 51, pl. 2, fig. 45 = **Spiniferites ramosus ramosus** (Ehrenberg, 1838) Loeblich & Loeblich, 1966, *(*According to Jain & Garg, 1982).

Homotryblium distinctum Salujha & Kindra, 1981. *In*: Salujha & Kindra, 1981: 51, pl. 2, fig. 46 = **Achomosphaera ramulifera** (Deflandre, 1937b) Evitt, 1963.

Homotryblium floripes (Deflandre & Cookson, 1955) Stover, 1975. *In*: Saxena & Rao, 1984: 57, pl. 2, fig. 20, OLIGOCENE and EARLY MIOCENE (Laisong, Jenam & Bhuban formations), Meghalaya and Cachar, Assam; Mathur, 1986: 195-198, LUTETIAN-BARTONIAN (Kalol Formation, well no. 109), Cambay Basin, Gujarat;

Saxena *et al.*, 1987: 152, pl. 2, fig. 6, OLIGOCENE and EARLY MIOCENE (Laisong, Jenam, Renji and Bhuban formations), Meghalaya & Cachar, Assam; Sarkar & Singh, 1988: 45, pl. 2, fig. 17, EOCENE (Subathu Formation), Banethi-Bagthan area, Himachal Pradesh; Singh & Sarkar, 1992: 185, LATE PALAEOCENE?-EOCENE (Subathu Formation), Garkhal area, Punjab Basin, Himachal Pradesh; Aswal & Pundeer, 1996: 636, pl. 2, fig. 20, THANETIAN – LATE EOCENE (ONGC Mori well- A, 3200 – 1500m), Krishna-Godavari Basin, Andhra Pradesh; Sarkar, 1997: 102, LATE YPRESIAN – LUTETIAN (Subathu Formation, Bilaspur area), Punjab Basin, Himachal Pradesh; Sarkar & Prasad, 2000b: 141, MIDDLE LUTETIAN (Subathu Formation, Morni Hills), Haryana; Saxena & Sarkar, 2000: 256, 263, pl. 1, fig.10, MIDDLE EOCENE (Siju Formation), Simsang River near Siju, South Garo Hills, Meghalaya.

Homotryblium floripes subsp. **breviradiatum** (Cookson & Eisenack, 1961b) Lentin & Williams, 1977b. *In*: Mathur, 1986: 200-201, LUTETIAN-BARTONIAN (Kalol Formation. well no. 109), Cambay Basin, Gujarat.

Homotryblium meghalayense Saxena & Rao, 1984. *In*: Saxena & Rao, 1984: 57, pl. 2, figs 21-23, EARLY MIOCENE (Bhuban Formation), Jaintia Hills, Meghalaya & Cachar, Assam.

Homotryblium oceanicum Eaton, 1976. *In*: Singh & Tripathi, 1987: 303, PALAEOCENE (Therria Formation), Meghalaya; Tripathi, 1989: 68, pl. 1, fig. 3, LATE EOCENE (Kopili Formation), Meghalaya; Sarkar & Prasad, 2000b: 141, EARLY – MIDDLE LUTETIAN (Subathu Formation, Morni Hills), Haryana; Mehrotra *et al.*, 2005: 71, LATE EOCENE ex Mehrotra *et al.*, 2002, Assam-Arakan Basin, Northeastern India.

Homotryblium pallidum Davey & Williams, 1966b. **NOW Homotryblium tenuispinosum** Davey & Williams, 1966b.

Homotryblium pallidum Davey & Williams, 1966b. *In*: Kar, 1985: 183-184, 191, pl. 41, figs 8-10 = **Homotryblium tenuispinosum** Davey & Williams, 1966b. (According to Jain & Garg, 1991)

Homotryblium plectilum Drugg & Loeblich Jr., 1967. *In*: Dutta & Jain, 1980: 68-69, pl. 2, figs 10-11, LATE EOCENE (Kopili Formation), Meghalaya; Jain & Tandon, 1981: 10, pl. 4, figs 51-54, MIDDLE EOCENE (Harudi Formation), Kutch, Gujarat; Kar, 1985: 190-191, pl. 42, figs 3-5, MIDDLE EOCENE (Harudi Formation), Kutch, Gujarat, (reproduction from Jain & Tandon, 1981); Jain & Garg, 1986b: 116, pl. 3, fig. 7, LATE PALAEOCENE, Vriddhachalam area, Cauvery Basin, Tamil Nadu; Singh & Tripathi, 1987: 303, LATE EOCENE (Kopili Formation), Meghalaya; Tripathi, 1989: 68, pl. 1, figs 4-5, LATE EOCENE (Kopili Formation), Meghalaya; Jain & Garg, 1991, pl. 1, figs 1-2, EARLY EOCENE (restudy of Lakhpat bore-hole 1 described by Kar, 1985), Kutch, Gujarat; Mehrotra & Kamla Singh, 2003: 48, pl. 24, figs 1-6, LATE – MIDDLE EOCENE (ONGC well NSP- A, 1620 – 1800m, Matsyapuri Sandstone), Krishna-Godavari Basin, Andhra Pradesh; OLIGOCENE – LATE PALAEOCENE (ONGC well Mori- A, 1350 – 3160m, Matsyapuri Sandstone, Bhimanapalli Limestone and pasarlapudi Formation), Krishna-Godavari Basin, Andhra Pradesh; OLIGOCENE – LATE EOCENE (ONGC well RZL- A, 100 – 1600m, Matsyapuri Sandstone and Bhimanapalli Limestone0, Krishna-Godavari Basin, Andhra Pradesh; LANGHIAN-AQUITANIAN – PRIABONIAN-BARTONIAN (ONGC well KSP- A, 1875 – 2475m), Krishna-Godavari Basin, Andhra Pradesh; SERRAVALLIAN-LANGHIAN – BARTONIAN (ONGC well MGP- A, 1110 – 2230m), Krishna-Godavari Basin, Andhra Pradesh; PRIABONIAN – BARTONIAN (ONGC well MNP- A, 1050 – 2160m, Matsyapuri Sandstone, Bhimanapalli Limestone, Pasarlapudi Formation and Palakollu Shale), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra

et al., 2005: 72, SELANDIAN - SERRAVALLIAN ex Mehrotra & Kamla Singh, 2003, Krishna-Godavari Basin, Andhra Pradesh; LATE EOCENE ex Mehrotra *et al*., 2002, Assam-Arakan Basin, Northeastern India.

Areoligera digitata Kar, 1985. *In*: Kar, 1985: 180-181, pl. 40, fig. -3; pl. 41, figs 2-3, EARLY EOCENE (Lakhpat bore-hole 1), Kutch, Gujarat. (Reallocated by Jain & Garg, 1991)

Homotryblium cf. **H. suggestatum** Islam, 1983a. *In*: Mathur, 1986:195-198, LUTETIAN-BARTONIAN (Kalol Formation, well no. 109), Cambay Basin, Gujarat, (orthographic change from *H.* cf. *suggestum* listed by Mathur 1986).

Homotryblium tenuispinosum Davey & Williams, 1966b. *In*: Singh *et al.*, 1979: 35-36, text-fig. 1, pl. 1, fig. 6, LATE PALAEOCENE-LATE EOCENE (Subathu Formation), Simla Hills, Himachal Pradesh; Khanna *et al.*, 1981: 259, pl. 2, fig. 2, (Subathu Formation), Simla Hills, Himachal Pradesh; Mathur, 1986: 200-201, LUTETIAN-BARTONIAN (Kalol Formation, well no. 109), Cambay Basin, Gujarat; Singh & Sarkar, 1986: 208, EOCENE (Subathu Formation), Banethi-Bagthan area, Himachal Pradesh; Singh & Tripathi, 1987: 303, PALAEOCENE (Therria Formation), Meghalaya; Sarkar & Singh, 1988: 45, pl. 2, figs 4-6, EOCENE (Subathu Formation), Banethi-Bagthan area, Himachal Pradesh; Tripathi, 1989: 66-68, pl. 2, fig. 17, PALAEOCENE (Therria Formation), Meghalaya; Sarkar, 1991: 3, pl. II, 11; pl. III, fig. 4, EARLY EOCENE (Kakara Series, Lesser Himalaya), Kakara-Chapla group of villages, Simla, Himachal Pradesh; Singh & Sarkar, 1992: 185, LATE PALAEOCENE?-EOCENE (Subathu Formation), Garkhal area, Punjab Basin, Himachal Pradesh; Aswal & Pundeer, 1996: 636, pl. 2, fig. 18, YPRESIAN – LUTETIAN-BARTONIAN (ONGC Mori well- A, 2700 – 1600m,), Krishna-Godavari Basin, Andhra Pradesh; Sarkar, 1997: 102, LATE YPRESIAN – LUTETIAN (Subathu Formation, Bilaspur area), Punjab Basin, Himachal Pradesh; Sarkar & Prasad, 2000a: 170, pl. 2, fig. 7, LATE YPRESIAN – MIDDLE LUTETIAN (Subathu Formation, Koshalia Nala Section), Shimla Hills; Sarkar & Prasad, 2000b: 141, LATE YPRESIAN – EARLY LUTETIAN (Subathu Formation, Morni Hills), Haryana; Saxena & Sarkar, 2000: 256, 263, MIDDLE EOCENE (Siju Formation), Simsang River near Siju, South Garo Hills, Meghalaya; Mehrotra & Kamla Singh, 2003: 47, pl. 18, figs 2 & 3, LATE – EARLY EOCENE (ONGC well Mori- A, 1550 – 2870m, Matsyapuri Sandstone, Bhimanapalli Sandstone and Pasarlapudi Formation), Krishna-Godavari Basin, Andhra Pradesh; RUPELIAN – LUTETIAN (ONGC well MGP- A, 1595 – 2530m), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 71, YPRESIAN – PRIABONIAN (52 – 33.7 Ma) ex Mehrotra *et al*., 2002, Mumbai Offshore; YPRESIAN - RUPELIAN ex Mehrotra & Kamla Singh, 2003, Krishna-Godavari Basin, Andhra Pradesh; YPRESIAN – PRIABONIAN (53.37 – 36 Ma) ex Mehrotra *et al*., 2002, Assam-Arakan Basin, Northeastern India.

Cordosphaeridium gracilis (Eisenack) Davey & Williams, 1966. *In*: Kar, 1985: 181, 198, 203, pl. 40, fig. 6; pl. 45, fig. 12; pl. 49, fig. 5, EARLY EOCENE (Lakhpat bore hole- 1), Kutch, Gujarat.

Homotryblium pallidum Davey & Williams, 1966b. *In*: Jain & Tandon, 1981: 10, pl. 1, fig. 20, MIDDLE EOCENE (Harudi Formation), Kutch, Gujarat; Kar, 1985: 183-184, 191, pl. 41, figs 8-10, EARLY EOCENE (Lakhpat bore hole- 1) and MIDDLE EOCENE (Harudi Formation), Kutch, Gujarat, (latter is a reproduction from Jain & Tandon, 1981); Khanna *et al.*, 1985: 106, pl. 2, fig. 5, PALAEOGENE (Subathu Formation), Jammu

Hills; Mathur, 1986: 200-201, LUTETIAN-BARTONIAN (Kalol Formation, well no. 109), Cambay Basin, Gujarat: Singh & Sarkar, 1986: 208, pl. 1, fig. 26, EOCENE (Subathu Formation), Banethi-Bagthan area, Himachal Pradesh; Sarkar & Singh, 1988: 45, pl. 2, figs 7-8, EOCENE (Subathu Formation), Banethi-Bagthan area, Himachal Pradesh; Jain & Garg, 1991: 60-61, pl. 1, fig. 13, EARLY EOCENE (restudy of Lakhpat bore-hole 1 described by Kar, 1985), Kutch, Gujarat; Sarkar, 1991: 3, pl. II, figs 5, 6, EARLY EOCENE (Kakara Series, Lesser Himalaya), Kakara-Chapla group of villages, Simla, Himachal Pradesh; Singh & Sarkar, 1992: 185, pl. 1, fig. 15, LATE PALAEOCENE?-EOCENE (Subathu Formation), Garkhal area, Punjab Basin, Himachal Pradesh; Mehrotra *et* al., 1996: 685-688, YPRESIAN – MIOCENE (ONGC well Gulf- 1, Bhavnagar, Tarapur, Babaguru and Post Babaguru formations), LUTETIAN-PRIABONIAN – RUPELIAN BERDIGALIAN (ONGC well Gulf- 2, Tarapur Shale Formation), LUTETIAN – PRIABONIAN (ONGC well Gulf-3 and well Gulf- 4, Olpad, Bhavnagar and Tarapur formations), Gulf of Cambay, Gujarat; Sarkar, 1997: 102, LATE YPRESIAN – LUTETIAN (Subathu Formation, Bilaspur area), Punjab Basin, Himachal Pradesh; Sarkar & Prasad, 2000a: 170, pl. 2, fig. 5, LATE YPRESIAN – MIDDLE LUTETIAN (Subathu Formation, Koshalia Nala Section), Shimla Hills; Sarkar & Prasad, 2000b: 141, LATE YPRESIAN – EARLY LUTETIAN (Subathu Formation, Morni Hills), Haryana; Saxena & Sarkar, 2000: 256, 263, pl. 2, fig. 8, MIDDLE EOCENE (Siju Formation), Simsang River near Siju, South Garo Hills, Meghalaya; Mehrotra *et al*., 2005: 71, EOCENE ex Mehrotra *et al*., 1996, Cambay Basin, Gujarat; YPRESIAN – EARLY RUPELIAN (50 – 33 Ma), Mumbai Offshore; YPRESIAN – PRIABONIAN TOP (52 – 33.7 Ma) ex Mehrotra *et al*., 2002, Assam-Arakan Basin, North-eastern India.

Homotryblium tenuispinosum Davey & Williams, 1966b. *In*: Mehrotra & Sinha, 1981, pl. 2, figs 3-5 = **Cordosphaeridium sp.** (According to Jain & Garg, 1986a: 65)

Homotryblium tenuispinosum Davey & Williams, 1966b. *In*: Kar, 1985: 183, pl. 41, fig. 7 = **Homotryblium abbreviatum**, Eaton, 1976. (According to Jain & Garg, 1991)

Homotryblium vallum Stover, 1977. *In*: Mehrotra & Kamla Singh, 2003: 49, pl. 25, figs 1-6; pl. 26, figs 1-6, OLIGOCENE – EARLY EOCENE (ONGC well Mori- A, 1350 – 3000m), Krishna-Godavari Basin, Andhra Pradesh; LATE – MIDDLE EOCENE (ONGC well GS- 21- A, 1980 – 2800m), Krishna-Godavari Basin, Andhra Pradesh; EOCENE (ONGC well CTP- A, 1400 – 2300m), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 72, YPRESIAN – RUPELIAN (49 – 33 Ma), Mumbai Offshore; YPRESIAN - CHATTIAN ex Mehrotra & Kamla Singh, 2003, Krishna-Godavari Basin, Andhra Pradesh.

Homotryblium sp. *In*: Kar, 1979: 35, pl. 4, fig. 73 = **Operculodinium uncinispinosum** (de Coninck, 1969) Islam, 1983. (According to Jain & Garg, 1991)

Homotryblium sp. *In*: Singh & Khanna, 1980: 471, pl. 2, fig. 2, LATE PALAEOCENE-LATE EOCENE (Subathu Formation), Simla Hills, Punjab Basin, Himachal Pradesh.

Homotryblium sp. *In*: Mehrotra *et* al., 1996: 685, THANETIAN – YPRESIAN (ONGC

well Gulf- 1, Olpad and Bhavnagar formations), Gulf of Cambay, Gujarat.

HYSTRICHODINIUM Deflandre, 1935 emend. Sarjeant, 1966b emend. Clarke & Verdier, 1967.

Hystrichdinium compactum Alberti, 1961. *In*: Khowaja-Ateequzzaman & Jain, 1992: 158, pl. 3, fig. 1, HAUTERIVIAN - BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu.

Hystrichodinium ?infundibulum Jain *et al.*, 1975. *In*: Jain *et al.*, 1975: 11-12. pl, 3, fig. 35, MAASTRICHTIAN (Jadukata Formation), Meghalaya. (Questionable assignment: Stover & Evitt, 1978)

Hystrichodinium oligacanthum Deflandre & Cookson, 1955. *In*: Kumar, 1986a: 31, VALANGINIAN - -HAUTERIVIAN (ONGC bore core no. 7), Krishna- Godavari Basin, Andhra Pradesh. (Garg *et al*., 1988 reassessed the age of this assemblage to be Hauterivian - Barremian); Mehrotra & Sarjeant, 1986: 717, pl. 2, fig. 36; pl. 10, fig. 4, BARREMIAN- - APTIAN (Periyavadavadi shallow well- I), Cauvery Basin. Tamil Nadu.

Hystrichodinium pulchrum Deflandre, 1935. *In*: Jain, 1977: 177, pl. 3, fig. 28, EARLY ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu; Kumar, 1986a: 31, VALANGINIAN - HAUTERIVIAN (ONGC bore core no. 7), Krishna- Godavari Basin, Andhra Pradesh, (Garg *et al.,* reassessed the age of this assemblage to be Hauterivian-Barremian); Mehrotra & Sarjeant, 1986: 717, pl. 2, fig. 36; pl. 10, fig. 4, BARREMIAN - APTIAN (Periyavadavadi shallow well- 1), Cauvery Basin, Tamil Nadu; Khowaja-Ateequzzaman & Jain, 1992: 158, 159, pl. 8, fig. 11, HAUTERIVIAN - BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu; Khowaja-Ateequzzaman & Garg, 2002: 136, EARLY - LATE TURONIAN (Kulakkalnattam Sandstone Member, Garudamangalam Formation), Cauvery Basin, southern India; Mehrotra & Kamla Singh, 2003: 50, pl. 30, fig. 4, EARLY OLIGOCENE (ONGC well Mori- A, 1495 – 1500m, Matsyapuri Sandstone), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 72, THANETIAN – BARTONIAN (55 – 41 Ma), Mumbai Offshore; THANETIAN ex Mehrotra *et al*., 2002, Cauvery Basin, Tamil Nadu; YPRESIAN - BARTONIAN ex Mehrotra & Kamla Singh, 2003, Krishna-Godavari Basin, Andhra Pradesh; THANETIAN ex Mehrotra *et al*., 2002, Assam-Arakan Basin, Northeastern India.

"HYSTRICHOGONYAULAX" Sarjeant 1969. **NOW CTENIDODINIUM** Deflandre, 1939a emend. Sarjeant, 1966b emend. Sarjeant, 1975a emend. Woollam, 1983 emend. Benson, 1985.

Hystrichogonyaulax serrata (Cookson & Eisenack, 1958) Stover & Evitt, 1978. **NOW Rhynchodiniopsis serrata** (Cookson & Eisenack, 1958) Jan du Chene *et al.,* 1985b.

HYSTRICHOKOLPOMA Klumpp, 1953 emend. Williams & Downie, 1966 emend. Zevenboom & Santarelli in Zevenboom *et al*., 1995. .

Hystrichokolpoma cinctum Klumpp, 1953. *In*: Jain & Tandon, 1981:10, pl. 1, figs 6-7, MIDDLE EOCENE (Harudi Formation), Kutch, Gujarat. (Orthographic change: Jain & Tandon, 1981 listed *H. cincta*); Kar, 1985: 191, pl. 43, fig. 1, MIDDLE EOCENE (Harudi Formation), Kutch. Gujarat. (reproduction from Jain & Tandon. 1981; Orthographic change: Kar 1985 listed *H. cicta*); Singh & Sarkar, 1987: 208, pl. I, fig. 13, EOCENE (Subathu Formation), Banethi-Bagthan area, Himachal Pradesh; Sarkar & Singh, 1988: 47, pl. 2, figs 2-4, EOCENE (Subathu Formation), Banethi-Bagthan area, Himachal Pradesh; Sarkar, 1991: 3, pl. I, figs 11, 13, EARLY EOCENE (Kakara Series, Lesser Himalaya), Kakara-Chapla group of villages, Simla, Himachal Pradesh; Sarkar & Prasad, 2000a: 170, LATE YPRESIAN – EARLY LUTETIAN (Subathu Formation, Koshalia Nala Section), Shimla Hills; Sarkar & Prasad, 2000b: 141, LATE

YPRESIAN – EARLY LUTETIAN (Subathu Formation, Morni Hills), Haryana; Saxena & Sarkar, 2000: 256, MIDDLE EOCENE (Siju Formation), Simsang River near Siju, South Garo Hills, Meghalaya.

Hystrichokolpoma eisenackii Williams & Downie, 1966a. *In*: Kar & Saxena, 1981: 152, pl. 4, fig. 84, MIDDLE-LATE EOCENE (Rataria bore core no. 27), Kutch, Gujarat; Mathur, 1986: 195-198, LUTETIAN-BARTONIAN (Kalol Formation. well no. 109), Cambay Basin, Gujarat.

Hystrichokolpoma eisenackii Williams & Downie, 1966a. **NOW Hystrichokolpoma cinctum** Klumpp, 1953.

Hystrichokolpoma granulatum Eaton, 1976. *In*: Dutta & Jain, 1980: 68, pl. 7 fig. 62, EARLY –MIDDLE EOCENE (Sylhet Formation). Meghalaya; Khanna *et al.*, 1981: 262, pl. 4, fig. 1, (Subathu Formation), Simla Hills, Himachal Pradesh, (orthographic change from *Hystrichokolpoma granulata* reported by Dutta & Jain, 1980 and Khanna *et al.*, 1981); Singh & Sarkar, 1987: 208, EOCENE (Subathu Formation), Banethi-Bagthan area, Himachal Pradesh; Sarkar & Singh, 1988: 47, pl. 3, fig. 1, EOCENE (Subathu Formation), Banethi-Bagthan area, Himachal Pradesh.

Hystrichokolpoma sp. cf. **H. granulatum** Eaton, 1976. *In*: Jain & Tandon, 1981: 10. pl. 1, figs 1-3, MIDDLE EOCENE (Harudi Formation), Kutch, Gujarat. (orthographic change from *Hystrichokolpoma sp.* cf. *granulata* listed by Jain & Tandon, 1981); Kar, 1985: 191-192, pl. 43, fig. 2, MIDDLE EOCENE (Harudi Formation) , Kutch. Gujarat, (reproduction from Jain & Tandon, 1981; orthographic change from H*ystrichokolpoma sp.* cf. *granulata* listed by Kar, 1985).

Hystrichokolpoma indicum Salujha & Kindra, 1981. *In*: Salujha & Kindra, 1981: 52, pl. 3, fig. 53, DANIAN (Langpar Formation), Meghalaya. (a junior homonym. Jain & Garg, 1982 is of the view that the species is based on a single, broken and poorly preserved specimen, the name should, therefore be restricted to holotype. They reassessed the age of this assemblage to be Latest Cretaceous- Danian).

Hystrichokolpoma indica Singh *et al.*, 1979. *In*: Singh *et al.*, 1979: 35-36, text-fig. 1, pl. I, fig. 8, EARLY EOCENE (Subathu Formation), Simla Hills, Himachal Pradesh. (name not validly published)

Hystrichokolpoma indica Khanna, 1979. *In*: Khanna, 1979: 217, LATE PALAEOCENE-LATE EOCENE (Subathu Formation), Simla Hills, Himachal Pradesh, (name not validly published)

Hystrichokolpoma indica Khanna & Singh, 1981a. *In*: Khanna & Singh, 1981a, pl. 4. fig. 9, LATE PALAEOCENE-LATE EOCENE (Subathu Formation) , Simla Hills, Himachal Pradesh, (name not validly published)

Hystrichokolpoma kutharense Jain *et al.*, 1991.

Hystrichokolpoma indicum Khanna & Singh, 1981b. *In*: Khanna & Singh, 1981a: 397-398, pl. 2, figs 4, 9, text-fig. 9, LATE PALAEOCENE-EARLY EOCENE (Subathu Formation), Simla Hills, Himachal Pradesh.

Hystrichokolpoma palaeocenica Khanna & Singh, 1981b. *In*: Khanna & Singh, 1981b: 396-397, pl. 2, figs. 7, 10, text-fig. 8, LATE PALAEOCENE-LATE EOCENE (Subathu Formation), Simla Hills, Himachal Pradesh.

Hystrichokolpoma palaeocenica Singh *et al.*, 1979. *In*: Singh *et al.*, 1979: 35-36, text-fig. I, 38, LATE PALAEOCENE--LATE EOCENE (Subathu Formation), Simla Hills, Punjab Basin, Himachal Pradesh, (name not validly published)

Hystrichokolpoma palaeocenica Khanna, 1979. *In*: Khanna, 1979:

217, LATE PALAEOCENE-LATE EOCENE (Subathu Formation), Simla Hills, Himachal Pradesh, (name not validly published)

Hystrichokolpoma poculum Maier, 1959 emend. Sarjeant, 1983. *In*: Kar, 1985: 204-205, pl. 49, fig. 1, MIOCENE (Khari Nadi For-mation), Kutch, Gujarat.

Hystrichokolpoma rigaudiae Deflandre & Cookson, 1955. *In*: Dutta & Jain, 1980: 67, pl. 2, fig. 15; pl. 7, fig. 58; pl. 8, fig. 78, EOCENE (Sylhet and Kopili formations), Meghalaya; Jain & Tandon, 1981: 10-11, pl. 1, fig. 4, MIDDLE EOCENE: (Harudi Formation), Kutch, Gujarat; Khanna *et al.*, 1981: 262, pl. 4, fig. 2, (Subathu Formation), Simla Hills, Himachal Pradesh; Kar, 1985: 204, pl. 48, figs 7-8, MIOCENE (Khari Nadi Formation), Kutch, Gujarat; Mathur, 1986: 195-198, LUTETIAN-BARTONIAN (Kalol Formation, well no. 109), Cambay Basin, Gujarat; Aswal & Pundeer, 1996: 636, pl. 2, figS 13 & 17, LUTETIAN-BARTONIAN – EARLY MIOCENE (ONGC Mori well- A, 1900 – 1200m), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 1996: 685-688, YPRESIAN – RUPELIAN-BURDIGALIAN (ONGC well Gulf- 1 and well Gulf- 2, Bhavnagar, Tarapur Shale, Babaguru and Post Babaguru Shale formations), LUTETIAN - MIOCENE (ONGC well Gulf- 3 AND WELL Gulf- 4, Olpad, Bhavnagar, Tarapur Shale, Babaguru and Post Babaguru formations), Gulf of Cambay, Gujarat; Sarkar & Prasad, 2000b: 141, pl. II, fig. 11, LATE YPRESIAN – EARLY LUTETIAN (Subathu Formation, Morni Hills), Haryana; Mehrotra & Kamla Singh, 2003: 51, pl. 5, figs 1 7 2; pl. 17, figs 4 7 5, MIOCENE – OLIGOCENE (ONGC well RZL- A, 810 – 1300m, Matsyapuri Sandstone), Krishna-Godavari Basin, Andhra Pradesh; PLEISTOCENE-PLIOCENE – MIDDLE EOCENE (ONGC well Mori- A, 100 – 1900m), Krishna-Godavari Basin, Andhra Pradesh; PLIOCENE – LANGHIAN-AQUITANIAN (ONGC well KSP- A, 930 – 1855m), Krishna-Godavari Basin, Andhra Pradesh; CALABRIAN-ZANCLEAN – LANGHIAN-AQUITANIAN (ONGC well GS- 15- D, 1250 – 2500m), Krishna-Godavari Basin, Andhra Pradesh; CALABRIAN – ZANCLEAN (ONGC well SSY- A, 790 – 970m), Krishna-Godavari Basin, Andhra Pradesh; AQUITANIAN-CHATTIAN – RUPELIAN-PRIABONIAN (ONGC well MNP- A, 950 – 1000m), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 72-73, YPRESIAN - MIOCENE ex Mehrotra *et al*., 1996, Cambay Basin, GujaratYPRESIAN - RUPELIAN ex Mehrotra *et al*., 2002, Mumbai Offshore; MIDDLE EOCENE – PLIO-PLEISTOCENE ex Mehrotra & Kamla Singh, 2003, Krishna-Godavari Basin, Andhra Pradesh; LATE EOCENE ex Mehrotra *et al*., 2002, Assam-Arakan Basin, Northeastern India.

Hystrichosphaeridium perifurcatum Salujha *et al.*, 1969. *In*: Salujha *et al.*, 1969: 35, pl. 4, figs 51, 52, 55, 62, EARLY EOCENE (Subathu Formation), Simla Hills, Himachal Pradesh, (orthographic change from H. *perifurcatus* listed by Salujha *et al.,* 1969).

Hystrichokolpoma rigaudiae subsp. **granulosa** Jain & Tandon, 1981. *In*: Jain & Tandon, 1981: 11, pl. 1, fig. 5, MIDDLE EOCENE (Harudi Formation), Kutch, Gujarat.

Hystrichokolpoma robusta Salujha & Kindra, 1981. *In*: Salujha & Kindra, 1981, pl. 3, fig. 55 (holotype). **NOW Amphorosphaeridium robustum** (Salujha & Kindra, 1981) Jain & Garg, 1982.

Hystrichokolpoma robusta Salujha & Kindra, 1981. *In*: Salujha & Kindra, 1981, pl. 3, fig. 56 = **Achomosphaera sp.** (According to Jain & Garg, 1982)

Hystrichokolpoma salacia Eaton, 1976. *In*: Dutta & Jain, 1980: 68, pl. 7, fig. 59, EARLY-MIDDLE EOCENE (Sylhet Formation), Meghalaya; Singh & Sarkar, 1987: 208. EOCENE (Subathu Formation), Banethi-Bagthan area, Himachal Pradesh; Sarkar &

Singh 1988: 47-48, pl. 3, fig. 12, EOCENE (Subathu Formation), Banethi-Bagthan area, Himachal Pradesh; Singh & Sarkar, 1992: 185, pl. 1, figs 13-14, LATE PALAEOCENE?-EOCENE (Subathu Formation), Garkhal area, Punjab Basin, Himachal Pradesh; Sarkar, 1997: 102, pl. 1, fig. 3, LATE YPRESIAN – LUTETIAN (Subathu Formation, Bilaspur area), Punjab Basin, Himachal Pradesh; Sarkar & Prasad, 2000a: 170, pl. 1, fig. 10, LATE YPRESIAN – EARLY LUTETIAN (Subathu Formation, Koshalia Nala Section), Shimla Hills; Mehrotra *et al*., 2005: 73, EARLY – MIDDLE EOCENE *ex* Mehrotra *et al*., 2002, Assam-Arakan Basin, Northeastern India.

Hystrichokolpoma unispinum Williams & Downie, 1966a. *In*: Dutta & Jain, 1980: 67. pl. 2, fig. 14, EOCENE (Sylhet and Kopili formations), Meghalaya: Jain & Tandon, 1981: 10, pl. 4, figs 65, MIDDLE EOCENE (Harudi Formation), Kutch, Gujarat; Kar, 1985: 191, 205, pl. 49, fig. 2, MIDDLE EOCENE (Harudi Formation) and MIOCENE (Khari Nadi Formation), Kutch, Gujarat, (former is a reproduction from Jain & Tandon, 1981; Jain & Garg, 1991, pl. 3, figs 1-2 questionably assigned pl. 49, fig. 2 of Kar, 1985 to *H. unispinum*); Jain & Garg, 1986b: 116-117, pl. 3, fig. 16, LATE PALAEOCENE, Vriddhachalam area, Cauvery Basin, Tamil Nadu; Mehrotra *et al*., 2005: 73, LATE EOCENE *ex* Mehrotra *et al*., 2002, Assam-Arakan Basin, Northeastern India.

Hystrichokolpoma unispinum Williams & Downie. 1966a. *In*: Mehrotra & Sinha, 1981, pl. 2, fig. 9 = **Cordosphaeridium sp**. (According to Jain & Garg, 1986a)

Hystrichokolpoma sp. *In*: Singh & Khanna, 1980: 471, pl. 2, fig. 8, LATE PALAEOCENE-LATE EOCENE (Subathu Formation), Simla Hills, Punjab Basin, Himachal Pradesh.

Hystrichokolpoma sp. *In*: Salujha & Kindra. 1981: 52-53, pl. 3, fig. 52, MAASTRICHTIAN-DANIAN (Langpar Formation), Meghalaya, (Jain & Garg, 1982 reassessed the age of this. assemblage to be Latest Cretaceous-Danian).

Hystrichokolpoma sp. *In*: Sarkar & Singh. 1988: 48, pl. 3, fig. 9, EOCENE (Subathu Formation). Banethi- Bagthan area, Himachal Pradesh.

Hystrichokolpoma sp. A *In*: Jain & Tandon, 1981: 11. pl. 1, fig. 13, MIDDLE EOCENE (Harudi Formation), Kutch, Gujarat.

Hystrichokolpoma sp. B *In*: Jain & Tandon, 1981: 11. pl. 4, fig. 71, MIDDLE EOCENE (Harudi Formation), Kutch, Gujarat.

"HYTRICHOSPHAERA" O. Wetzel, 1933b emend. Deflandre, 1937b emend. Davey & Williams, 1966a. **NOW SPINIFERITES** Mantell, 1850 emend. Sarjeant, 1970

Hystrichosphaera assamica Kar *et al.*, 1972. **NOW Spiniferites assamicus** (Kar *et al.,* 1972) Lentin & Wil-liams, 1973.

Hystrichosphaera bentorii Rossignol, 1964. **NOW Spiniferites bentorii** (Rossignol, 1964) Wall & Dale, 1970.

Hystrichosphaera cingulata (O. Wetzel, 1933b) Deflandre & Cookson, 1955. **NOW Pterodinium cingulatum** (O. Wetzel, 1933b) Below, 1981a.

Hystrichosphaera furcata (Ehrenberg, 1838) Deflandre, 1937b. **NOW Spiniferites ramosus** (Ehrenberg, 1838) Mantell, 1854.

Hystrichosphaera furcata (Ehrenberg, 1838) Deflandre, 1937b. **NOW Spiniferites ramosus** (Ehrenberg, 1838) Mantell, 1854.

Hystrichosphaera hyperacantha Deflandre & Cookson, 1955. **NOW Spiniferites hyperacanthus** (Deflandre & Cookson, 1955) Cookson & Eisenack, 1974.

Hystrichosphaera pseudofurcata Varma & Dangwal, 1964. **NOW Spiniferites varmae** Lentin & Williams. 1973 emend. Matsuoka & Bujak, 1988.

Hystrichosphaera ramosa (Ehrenberg, 1838) Deflandre, 1937b. **NOW Spiniferites ramosus** (Ehrenberg, 1838) Mantell, 1854.

Hystrichosphaera sp. In: Salujha *et al.*, 1969 = **Spiniferites sp.**

Hystrichosphaera sp. In: Banerjee & Misra, 1972 = **Spiniferites sp**.

Hystrichosphaera sp. In: Venkatachala & Sharma, 1982 = **Spiniferites sp**.

Hystrichosphaera sp. In: Nandi, 1986 = **Spiniferites sp**.

Hystrichosphaera spp. In: Jain & Subbaraman, 1969 = **Spiniferites spp.**

HYSTRICHOSPHAERIDIUM Deflandre, 1937b emend. Davey & Williams, 1966b.

Hystrichosphaeridium albertense Pocock, 1962. **NOW Oligosphaeridium albertense** (Pocock, 1962) Davey & Williams, 1969.

Hystrichosphaeridium anthophorum Cookson & Eisenack, 1958. **NOW Stiphrosphaeridium anthophorum** (Cookson & Eisenack, 1958) Lentin & Williams, 1985.

Hystrichosphaeridium arborispinum Davey & Williams, 1966b. *In*: Kumar, 1986a: 31, VALANGINIAN-HAUTERIVIAN (ONGC bore core nos. 2, 4, 7), Krishna-Godavari Basin, Andhra Pradesh, (Garg *et al.,* 1988 reassessed the age of this assemblage to be Hauterivian-Barremian); Singh & Sarkar, 1987: 208, EOCENE (Subathu Formation). Banethi-Bagthan area, Himachal Pradesh, Sarkar & Singh, 1988: 46, pl. 2, figs 9-11, EOCENE (Subathu For-mation). Himachal Pradesh; Saxena & Sarkar, 2000: 256, 263, pl. 2, fig. 5, MIDDLE EOCENE (Siju Formation), Simsang River near Siju, South Garo Hills, Meghalaya..

Hystrichosphaeridium ?assamicum Sah *et al.*, 1970. *In*: Sah *et al.*, 1970: 147, pl. 2, figs 20-21, LATE CRETACEOUS (Langpar Formation), Meghalaya; Kar *et al.*, 1972: 147-148, pl. 1, fig. 9, Tura Formation), Garo Hills, Assam. (Questionable assignment: Stover & Evitt, 1978)

Hystrichosphaeridium ?cambayense Varma & Dang-wal, 1964. *In*: Varma & Dangwal, 1964: 63, pl. 1, figs 1-2, EOCENE-OLIGOCENE (Cambay deep well no. 1), Cambay Basin, Gujarat. (Questionable assignment: Stover & Evitt, 1978)

Hystrichosphaeridium centrocarpum Deflandre & Cookson. 1955. **NOW Operculodinium centrocarpum** (Deflandre & Cookson, 1955) Wall, 1967.

Hystrichosphaeridium centrocarpum var. *teokides* Sri-vastava & Banerjee, 1969. **NOW Operculodinium centrocarpum** subsp. **teokides** (Srivastava & Baner-jee, 1969) Lentin & Williams, 1981.

Hystrichosphaeridium coelentratum Tasch in Tasch *et al.*, 1964. **NOW Oligosphaeridium albertense** (Pocock, 1962) Davey & Wil-liams, 1969.

Hystrichosphaeridium complex (White, 1842) Deflandre, 1946b. **NOW Oligosphaeridium complex** (White, 1842) Davey & Wil-liams, 1966b.

Hystrichosphaeridium sp. cf. *H. cornigerum* (Wetzel). *In*: Varma & Dangwal, 1964: 65, pl. 2, figs 4-5, EOCENE-OLIGOCENE (Cambay deep well no. 2), Cambay Basin, Gujarat. (Name *H. cornigerum* not validly published)

Hystrichosphaeridium deanei Davey & Williams, 1966b. **NOW Floretinia deanei** (Davey & Williams, 1966b) Davey & Ver-dier, 1973.

Hystrichosphaeridium dupulum (White, 1842) Downie & Sarjeant, 1965. **NOW Hystrichosphaeridium recurvatum** (White, 1842) Lejeune Carpentier, 1940.

Hystrichosphaeridium ferox Deflandre, 1937b. **NOW Florentinia ferox** (Deflandre, 1937b) Duxbury, 1980.

Hystrichosphaeridium grande Salujha *et al.*, 1969. *In*: Salujha *et al.*, 1969: 37, pl. 4, figs 59-90, EARLY EOCENE (Subathu Formation), Simla Hills, Himachal Pradesh. (Orthographic change: Salujha *et al.,* 1969 listed *H. grandis*).

Hystrichosphaeridium granulatum Khanna & Singh, 1981b. *In*: khanna *et al.*, 1981b: 394, pl. 3, figs 3-4, text-fig. 6, EARLY MIDDLE EOCENE (Subathu Formation), Simla Hills, Himachal Pradesh.

Hystrichosphaeridium granulatum Khanna, 1979. *In*: Khanna, 1979:

217, LATE PALAEOCENE-LATE EOCENE (Subathu For-mation), Simla Hills, Himachal Pradesh. (name not validly published)

Hystrichosphaeridium granulatum Singh *et al.*, 1979. *In*: Singh *et al.*, 1979: 35-36, text-fig. 1, pl. 1, figs 1-2, LATE PALAEOCENE-LATE EOCENE (Subathu Forma-tion), Simla Hills, Punjab Basin. Himachal Pradesh. (name not validly published)

Hystrichosphaeridium heteracanthum subsp. *sparsiprocessum* Varma & Dangwal, 1964. **NOW Heterosphaeridium heteracanthum** subsp. **sparsiprocessum** (Varma & Dangwal, 1964) Eisenack & Kjell-ström, 1972.

Hystrichosphaeridium himalayense Mehrotra & Sinha, 1981. **NOW Oligosphaeridium complex** (White, 1842) Davey & Williams, 1966b. (According to Jain & Garg, 1986a).

Hystrichosphaeridium inodes Klumpp, 1953. **NOW Cordosphaeridium inodes** (Klumpp, 1953) Eisenack, 1963b emend. Morgeroth, 1968 emend. Sarjeant, 1981.

Hystrichosphaeridium cf. **H. ?intermedium** (O. Wetzel, 1933b) Deflandre, 1937b. *In*: Banerjee & Misra, 1972: 211, pl. 2, fig. 19, EOCENE-MIOCENE, Assam and Tripura. (Questionable assignment: Stover & Evitt, 1978)

Hystrichosphaeridium ?latera1iprocessum Srivastava & Banerjee, 1969. *In*: Srivastava & Banerjee, 1969: 102, pl. 1, figs 1-3, EOCENE-OLI-GOCENE, Upper Assam. (Questionable assignment: Stover & Evitt, 1978)

Hystrichosphaeridium ?latirictum Davey & Williams, 1966b. *In*: Saxena & Sarkar, 2000: 256, 263, pl. 2, fig. 12, MIDDLE EOCENE (Siju Formation), Simsang River near Siju, South Garo Hills, Meghalaya Sarkar & Prasad, 2000b: 141, EARLY LUTETIAN (Subathu Formation, Morni Hills), Haryana. (Questionable assignment: Bujak *et al.*, 1980)

Hystrichosphaeridium machaerophorum Deflandre & Cookson, 1955. **NOW Lingulodinium machaerophorum** (Deflandre & Cookson, 1955) Wall, 1967.

Hystrichosphaeridium ?mineralosum Varma & Dang-wal, 1964. *In*: Varma & Dangwal, 1964: 64, pl. 1, figs 8-9, EOCENE-OLIGOCENE (Cambay deep well no. 1), Cambay Basin, Gujarat; Banerjee, 1972: 135, CRETACEOUS, Khara Tar Well, Rajasthan; Banerjee & Misra, 1972: pl. 1, fig. 12, EOCENE-MIOCENE, Assam & Tripura. (Questionable assignment: Stover & Evitt, 1978)

Hystrichosphaeridium sp. cf. **H. ?mineralosum** Varma & Dangwal, 1964. *In*: Salujha *et al.*, 1969: 37, pl. 4, fig. 61, EARLY EOCENE (Subathu Formation), Simla Hills, Himachal Pradesh. (Questionable assignment: Stover & Evitt, 1978)

Hystrichosphaeridium mineralosum subsp. **jekhowskyi** Varma & Dangwal, 1964. *In*: Varma & Dangwal, 1964: 65, pl. 1, fig. 12; pl. 2, fig. 1, EOCENE-OLIGOCENE (Cambay deep well no. 15), Cambay Basin, Gujarat.

Hystrichosphaeridium mineralosum subsp. **labiatum** Varma & Dangwal, 1964. *In*: Varma & Dangwal, 1964: 64, pl. 1, figs 10-11, EOCENE-OLIGOCENE (Cambay deep well no. 14), Cambay Basin, Gujarat.

Hystrichosphaeridium monstruosum Tasch in Tasch *et al.*, 1964. **NOW Coronifera oceanica** Cookson & Eisenack, 1958 emend. May, 1980.

Hystrichosphaeridium cf. **H. paracostatum** Cookson & Eisenack, 1974. *In*: Mehrotra & Sarjeant, 1987: 159, pl. 9, fig. 1, MAESTRICHTIAN (Narsapur well- 1), Krishna-Godavari Basin, Andhra Pradesh.

Hystrichosphaeridium perifurcatum Salujha *et al.*, 1969 (Orthographic change: Salujha *et al.*. 1969 listed *H. perifurcatus*). **NOW Hystrichokolpoma rigaudiae** Deflandre & Cookson, 1955.

Hystrichosphaeridium ?perplexum Varma & Dangwal, 1964. *In*: Varma & Dangwal,

1964: 64, pl. 1, figs 5-6, EOCENE-OLIGOCENE (Cambay deep well no. 9), Cambay Basin, Gujarat. (Questionable assignment: Stover & Evitt, 1978)

Hystrichosphaeridium polytrichum Valensi, 1947. **NOW Impletosphaeridium polytrichum** (Valensi, 1947) Islam, 1993.

Hystrichosphaeridium ramuliferum Deflandre, 1937b. **NOW Achomosphaera ramulifera** (Deflandre, 1937b) Evitt, 1963.

Hystrichosphaeridium recurvatum (White, 1842) Lejeune Carpentier, 1940. *In*: Khowaja-Ateequzzaman & Garg, 2002: 136, EARLY TURONIAN (Kulakkalnattam Sandstone Member, Garudamangalam Formation), Cauvery Basin, southern India.

Hystrichosphaeridium dupulum (White, 1842) Downie & Sarjeant, 1965. *In*: Khowaja-Ateequzzaman & Garg, 2002: 136, pl. 1, fig. 7, EARLY TURONIAN (Kulakkalnattam Sandstone Member, Garudamangalam Formation), Cauvery Basin, southern India.

Hystrichosphaeridium cf. **H. recurvatum** (White, 1842) Lejeune-Carpentier, 1940. *In*: Banerjee & Misra, 1972: 211, pl. 2, fig. 20, EOCENE-MIO-CENE, Assam and Tripura.

Hystrichosphaeridium robustum Sah *et al.*, 1970. **NOW Hystrichosphaeridium sahii** Lentin & williams, 1993. (Name *Hystrichosphaeridium robustum* Sah *et al.*, 1970 illegitimate, senior homonym *Hystrichosphaeridium robustum* Sannemann, 1955. Subsitute name: **Hystrichosphaeridium sahii** Lentin & williams, 1993)

Hystrichosphaeridium rubina Banerjee, 1972. *In*: Banerjee, 1972: 135, CRETACEOUS (Khara Tar Well), Rajasthan. (Name not validly published)

Hystrichosphaeridium sahii Lentin & Williams, 1993.

Hystrichosphaeridium robustum Sah et al., 1970. In: Sah *et al.*, 1970: 146, pl. 2, figs 16-17, LATE CRETACEOUS (Langpar Formation), Assam.

Hystrichosphaeridium salpingophorum Deflandre, 1935 ex Deflandre, 1937b emend. Davey & Williams, 1966b. *In*: Kar, 1985: 184, pl. 41, figs 11-12 = **Homotryblium abbreviatum** Eaton, 1976. (According to Jain & Garg, 1991)

Hystrichosphaeridium scaffoldii Baksi. 1962. **NOW Cannosphaeropsis scaffoldii** (Baksi, 1962) Downie & Sarjeant, 1965.

Hystrichosphaeridium scaffoldii Baksi, 1962. **NOW Cannosphaeropsis scaffoldii** (Baksi, 1962) Downie & Sarjeant, 1965.

Hystrichosphaeridium ?senii Srivastava & Banerjee, 1969. *In*: Srivastava & Banerjee, 1969: 104, pl. 1, fig. 12, EOCENE-OLIGOCENE, Upper Assam. (Questionable assignment: Stover & Evitt, 1978)

Hystrichosphaeridium simplicispinum Davey & Williams, 1966b. **NOW Kleithriasphaeridium eoinodes** (Eisenack, 1958a) Davey. 1974 emend. Sarjeant, 1985a.

Hystrichosphaeridium stellatum Maier, 1959. **NOW Florentinia stellata** (Maier, 1959) Below, 1982a.

Hystrichosphaeridium sylheti Baksi, 1962. *In*: Baksi, 1962: 17, pl. 2, fig. 20. **NOW Baltisphaeridium sylheti** (Baksi, 1962) Downie & Sarjeant, 1965. (an acritarch species)

Hystrichosphaeridium transculentum Sah *et al.*, 1970. **NOW Achomosphaera transculenta** (Sah *et al.,*1970) Jain, 1982.

Hystrichosphaeridium tubiferum (Ehrenberg, 1938) Deflandre. 1937b emend. Davey & Williams. 1966b. *In*: Banerjee & Misra, 1972: 207, EOCENE-MIOCENE, Assam & Tripura; Singh *et al.*, 1979: 35-36, text-fig. 1, LATE PALAEOCENE-LATE EOCENE (Subathu Formation), Simla Hills, Punjab Basin. Himachal Pradesh; van Erve *et al.*, 1980: 620, pl. 2, figs 2-4, EARLY EOCENE (Subathu Formation), Simla Hills, Himachal Pradesh; Venkat-achala & Kumar, 1980: 100, pl. 3, fig. 12; pl. 4, fig. 2, ALBlAN

(Dalmiapuram Formation), Cauvery Basin, Tamil Nadu; Kar & Saxena, 1981: 115, pl. 4, fig. 78, MIDDLE-LATE EOCENE (Rataria bore core no. 27), Kutch, Gujarat; Kumar, 1982: 173, pl. 1, fig. 11, NEOCOMIAN, Krishna-Godavari Basin, Andhra Pradesh; Venkatachala & Sharma, 1982: 4, pl. 2, fig. 18, CAMPANIAN-MAASTRICHTIAN, Krishna-Godavari Basin, Andhra Pradesh: Khanna *et al.,* 1985: 106, pl. 2, fig. 4, PALAEOGENE (Subathu Formation), Jammu Hills; Kumar, 1986a: 31, VALANGINIAN-HAUTERIVIAN (ONGC bore core no. 5), Krishna-Godavari Basin, Andhra Pradesh, (Garg *et al*., 1988 reassessed the age of this assemblage to be Hauterivian-Barre-mian); Singh & Sarkar, 1987: 208, EOCENE (Subathu Formation), Himachal Pradesh; Sarkar & Singh, 1988: 46-47, pl. 2, figs 12-13: pl. 5, fig. 21, EOCENE (Subathu Formation), Himachal Pradesh; Sarkar, 1991: 3, pl. II, figs 7, 10, EARLY EOCENE (Kakara Series, Lesser Himalaya), Kakara-Chapla group of villages, Simla, Himachal Pradesh; Aswal & Pundeer, 1996: 636, pl. 1, fig. 9, THANETIAN - YPRESIAN (ONGC Mori well- A, 3200 – 2640m), Krishna-Godavari Basin, Andhra Pradesh; Sarkar, 1997: 102, pl. 2, fig. 11, LATE YPRESIAN – LUTETIAN (Subathu Formation, Bilaspur area), Punjab Basin, Himachal Pradesh; Saxena & Sarkar, 2000: 256, MIDDLE EOCENE (Siju Formation), Simsang River near Siju, South Garo Hills, Meghalaya; Khowaja-Ateequzzaman & Garg, 2002: 137, LATE TURONIAN (Kulakkalnattam Sandstone Member, Garudamangalam Formation), Cauvery Basin, southern India; Mehrotra & Kamla Singh, 2003: 52, pl. 19, fig. 2, YRESIAN – THANETIAN (ONGC well SRP- A, 1980 – 2570m, Bhimanapalli Limestone, Pasarlapudi Formation and Palakollu Shale), Krishna-Godavari Basin, Andhra Pradesh; EARLY EOCENE (ONGC well MORI- A, 2600 – 2760m), Krishna-Godavari Basin, Andhra Pradesh; EARLY OLIGOCENE – MIDDLE EOCENE (ONGC well CTO- A, 1050 – 1760m), Krishna-Godavari Basin, Andhra Pradesh; PALAEOCENE TOP (ONGC well BMP- A, 2730 – 2735m, Pasarlapudi Formation and Palakollu Shale), Krishna-Godavari Basin, Andhra Pradesh; YPRESIAN (ONGC well KSP- A, 785 – 2955m), Krishna-Godavari Basin, Andhra Pradesh; YPRESIAN – THANETIAN (ONGC well MGP- A, 2695 – 3175m), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 73, SELANDIAN – YPRESIAN (58 – 49 Ma) ex Mehrotra *et al*., 2003, Mumbai Offshore; SELANDIAN - RUPELIAN ex Mehrotra & Kamla Singh, 2003, Krishna-Godavari Basin, Andhra Pradesh.

Hystrichosphaeridium tubiferum subsp. **brevispinum** Davey & Williams, 1966b. *In*: Jain, 1977b: 181, pl. 1, fig. 10, EARLY ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu; Jain, 1978: 149, pl. 2, fig. 14, LATEST MAASTRICHTIAN (Kallankurchi Formation), Vriddhachalam area, Cauvery Basin, Tamil Nadu; Venkatachala & Kumar, 1980: 109, pl. 4, fig. 8, ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu. (Orthographic change from *H. tubiferum* var. *brevispinosum* reported by Venkatachala & Kumar, 1980); Sarkar, 1991: 3, pl. III, figs. 3, 6, EARLY EOCENE (Kakara Series, Lesser Himalaya), Kakara-Chapla group of villages, Simla, Himachal Pradesh; Khowaja-Ateequzzaman & Garg, 2002: 137, LATE TURONIAN (Kulakkalnattam Sandstone Member, Garudamangalam Formation), Cauvery Basin, southern India.

Hystrichosphaeridium unituberculatum Tasch in Tasch *et al*., 1964. **NOW Kiokansium unituberculatum** (Tasch in Tasch *et al*., 1964) Stover & Evitt, 1978.

Hystrichosphaeridium zoharyi Rossignol, 1962. **NOW Polysphaeridium zoharyi** (Rossignol, 1962) Bujak *et al*., 1980.

Hystrichosphaeridium zoharyi Rossignol, 1962. **NOW Polysphaeridium zoharyi** (Rossignol, 1962) Bujak *et al.,* 1980.

Hystrichosphaeridium zoharyi var. *ktana* Rossignol, 1964. **NOW Polysphaeridium**

zoharyi subsp. **ktana** (Rossignol, 1964) Lentin & Williams, 1981.

Hystrichosphaeridium sp. *In*: Deb. 1970: 130. pl. 2. fig. 10, TERTIARY (Bodra well-1), West Bengal.

Hystrichosphaeridium sp. *In*: Banerjee & Misra, 1972: 211, pl. 2, fig. 22, EOCENE-MIOCENE, Assam and Tripura.

Hystrichosphaeridium sp. *In*: Banerjee & Misra, 1972: 211, pl. 2, figs. 14,16, EOCENE-MIOCENE, Assam and Tripura.

Hystrichosphaeridium sp. *In*: Kar *et al.*, 1972: 148, pl. 1, fig. 10, (Tura Formation), Garo Hills, Assam.

?Hystrichosphaeridium sp. *In*: Jain *et al.*, 1975: 10, pl. 6, fig. 68, MAESTRICHTIAN-DANIAN, Megha-laya.

Hystrichosphaeridium sp. *In*: Singh & Khanna, 1980: 471, pl. 2, fig. 14, PALAEOGENE (Subathu Formation), Simla Hills, Himachal Pradesh.

Hystrichosphaeridium sp. *In*: Venkatachala & Sharma, 1980: 177-178, pl. 3, figs 37-38, SENONIAN--MAASTRICHTIAN (Tiruchittambalam, Marathandi-chavadi & Mettuveli shallow wells), Pondicherry area, Cauvery Basin, Tamil Nadu.

Hystrichosphaeridium sp. *In*: Salujha & Kindra, 1981: 52, pl. 2, fig. 50, MAASTRICHTIAN-DANIAN (Langpar Formation), Meghalaya, (Jain & Garg, 1982 reassessed the age of this assemblage to be Latest Cretaceous-Danian).

Hystrichosphaeridium sp. *In*: Kumar, 1982: 173, pl. I, fig. 2, NEOCOMIAN, Krishna-Godavari Basin, Andhra Pradesh.

Hystrichosphaeridium sp. *In*: Venkatachala & Sharma, 1982: 4, pl. 2, figs 9,17, CAMPANIAN--MAASTRICHTIAN (Narsapur well- I), Krishna-Go-davari Basin, Andhra Pradesh.

Hystrichosphaeridium spp. *In*: Biswas, 1962: 36, pl. 2, figs 12-13, LATE CRETACEOUS (Langpar Formation), Meghalaya.

Hystrichosphaeridium spp. *In*: Ghosh & Lukose, 1967: 244, pl. 3, figs 29-30, text-figs 13-14, LATE JURAS-SIC-MIDDLE CRETACEOUS, Jammu and Kashmir.

Hystrichosphaeridium spp. 1-4 *In*: Mathur, 1964: 365--366, pl. 21, figs 30-33, EARLY EOCENE, Kutch, Gujarat.

Hystrichosphaeridium spp. A-C *In*: Rawat, 1966: 46-47, figs 3-9, LATE JURASSIC, Kutch, Gujarat.

Hystrichosphaeridium spp. A-E *In*: Salujha *et al.*, 1969: 35-37, pl. 4, figs 50-58, EARLY EOCENE (Subathu Formation), Simla Hills, Hima-chal Pradesh.

Hystrichosphaeridium spp. A-E *In*: Srivastava & Baner-jee, 1969: 104-105, pl. 1, figs 13-20, EOCENE-OLI-GOCENE, Upper Assam.

Hystrichosphaeridium spp. *In*: Jain & Subbaraman, 1970: 549, EARLY CRETACEOUS (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

Hystrichosphaeridium sp. A *In*: Jain, 1977b: 187, pl. 1, fig. 11, EARLY ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

Hystrichosphaeridium sp. A *In*: Venkatachala & Kumar, 1980: 100, pl. 4, fig. 3, ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

Hystrichosphaeridium sp. B *In*: Venkatachala & Kumar, 1980: *100.* pl. 4, fig. 5, ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

HYSTRICHOSPHAERINA Alberti, 1961 emend. Stancliffe & Sarjeant, 1990.

Hystrichosphaerina sarjeantii (Gitmez, 1970) Duxbury, 1980.

Emmetrocysta sarjeantii (Gitmez, 1970) Stover & Evitt, 1978. *In*: Jain *et al.*, 1984: *70,* pl. 2, figs 39-40, EARLY LATE TITHONIAN (Spiti Shale Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh.

Hystrichosphaerina schindewolfii Alberti, 1961.

Systematophora schindewolfii (Alberti, 1961) Downie & Sarjeant, 1965. *In*: Mehrotra, 1981: 16, pl. 1, fig. 11, MIDDLE EOCENE, Mikir-North Cachar Hills, Assam; Mehrotra & Sinha, 1981: 153, pl. 3, fig. 4, UPPER CRETACEOUS-MIDDLE EOCENE (Sangchamalla Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh, (Jain & Garg, 1986a reassessed the age of this assemblage to be Late Cretaceous).

HYSTRICHOSPHAEROPSIS Deflandre, 1935 emend. Sarjeant, 1966b emend. Sarjeant, 1982b.

Hystrichosphaeropsis cf. **H. obscura** Habib, 1972. Mehrotra & Kamla Singh, 2003 : 53, pl. 7, figs 6 & 7, PLEISTOCENE AND YOUNGER (ONGC well SSY- A, 40 – 230m, Ravva Formation), Krishna-Godavari Basin, Andhra Pradesh; MIOCENE – EARLY OLIGOCENE (ONGC well MNP- A, 575 – 980m, Matsyapuri Sandstone), Krishna-Godavari Basin, Andhra Pradesh; PLIOCENE (ONGC well MGP- A, 1005 – 1080m), Krishna-Godavari Basin, Andhra Pradesh.

HYSTRICHOSTROGYLON Agelopoulos, 1964 emend. Stover & Evitt, 1978.

Hystrichostrogylon membraniphorum Agelopoulos, 1964 emend. Eaton, 1976. *In*: Dutta & Jain, 1980: 69, pl. 2, figs 16-17, LATE EOCENE (Kopili Formation), Meghalaya.

IFECYSTA Jan du Chêne & Adediran, 1985.

Ifecysta pachyderma Jan du Chêne & Adediran, 1985. *In*: Garg & Khowaja-Ateequzzaman, 2000: 471, LATE THANETIAN (Lakadong Sst Member, Sylhet Limestone Formation), Cherrapunji area, Khasi Hills, Meghalaya.

IMBATODINIUM Vozzhennikova, 1970 emend. Dörhöfer & Davies, 1980 emend. Mehrotra & Sarjeant, 1984a emend. Lentin & Vozzhennikova, 1990.

Imbatodinium fractum Mehrotra & Sarjeant, 1984b. *In*: Mehrotra & Sarjeant, 1984b: 217-218, pl. 1, figs 1-7; pl. 2, figs 1-7, text-figs la-e, APTIAN (Periyavadavadi shallow well- 1), Cauvery Basin, Tamil Nadu; Mehrotra &Aswal, 2003: 59, pl. 28, fig. 1; pl. 30, fig. 5, HAUTERIVIAN – BARREMIAN (ONGC well END- A, 1845 – 1900m, Raghavapuram Formation), Krishna-Godavari Basin, Andhra Pradesh; EARLY ALBIAN – LATE KIMMERIDGIAN (ONGC well RCPM- A, 1960 – 2965m, Raghavapuram and Golapalli formations), Krishna-Godavari Basin, Andhra Pradesh; CENOMANIAN – TITHONIAN (ONGC well MVD- A, 1620 – 2365m, Raghavapuram and Golapalli formations), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 50-51, NEOCOMIAN – LOWER ALBIAN ex Mehrotra *et al*., 2002, Cauvery Basin, Tamil Nadu; KIMMERIDGIAN - CENOMANIAN ex Mehrotra & Aswal, 2003, Krishna-Godavari Basin, Andhra Pradesh. (Originally *Imbatodinium fractum*, subsequently *Batioladinium fractum* (Mehrotra & Sarjeant, 1984a) Lentin & Williams, 1985, thirdly *Necrobroomea micropoda* (Eisenack & Cookson, 1960) Wiggins, 1975 emend. Below, 1990, fourthly *Batioladinium micropodum* (Eisenack & Cookson, 1960) Brideau, 1975, fifthly and **now** *Imbatodinium fractum* Mehrotra & Sarjeant, 1984a, retained by Mehrotra & Aswal, 2003, p. 59)

Imbatodinium sp. A *In*: Mehrotra & Sarjeant, 1984b: 218--219, pl. 1, fig. 8; pl. 2, fig. 8, text-fig. 2, HAUTERIVIAN-BARREMIAN (Periyavadavadi shallow well- 1), Cauvery Basin, Tamil Nadu.

IMPAGIDINIUM Stover & Evitt, 1978.

Impagidinium dispertitum (Cookson & Eisenack, 1965a) Stover & Evitt, 1978. *In*: Aswal & Pundeer, 1996: 636, pl. 1, fig. 11, LUTETIAN-BARTONIAN – OLIGOCENE (ONGC Mori well- A, 1800 – 1400m), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra & Kamla Singh, 2003: 54, pl. 5, figs 3 & 4, EARLY OLIGOCENE – EARLY

EOCENE (ONGC well MNP- A, 895 – 2030m, Matsyapuri Sandstone, Bhimanapalli Limestone and Pasarlapudi Formation), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 73, LUTETIAN ex Mehrotra *et al*., 2003, Mumbai Offshore; EARLY EOCENE – EARLY OLIGOCENE ex Mehrotra & Kamla Singh, 2003, Krishna-Godavari Basin, Andhra Pradesha.

Impagidinium ?ovum (Sah *et al*., 1970) Stover & Evitt, 1978. (Questionable assignment: Stover & Evitt, 1978)

Leptodinium ovum Sah *et al*., 1970. *In*: Sah *et al.*, 1970: 147-148, pl. 2, fig. 25, LATE CRETACEOUS (Langpar Formation), Meghalaya.

Impagidinium patulum (Wall, 1967) Stover & Evitt, 1978. *In*: Mehrotra & Kamla Singh, 2003: 55, pl. 21, figs 2 & 4, PLEISTOCENE AND YOUNGER TO EARLY MIOCENE (ONGC well SSY- A, 40 – 1520m, Ravva Formation), Krishna-Godavari Basin, Andhra Pradesh; PLEISTOCENE AND YOUNGER TO LATE OLIGOCENE (ONGC well KSP- A, 330 – 2280m), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 74, LATE OLIGOCENE – PLEISTOCENE AND YOUNGER ex Mehrotra & Kamla Singh, 2003, Krishna-Godavari Basin, Andhra Pradesh.

Impagidinium phlyctaena Stover & Helby, 1987d. *In*: Khowaja-Ateequzzaman & Jain, 1992: 160, pl. 7, figs 4, 5, HAUTERIVIAN-BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu.

Impagidinium reductum Stover & Helby, 1987c. *In*: Khowaja-Ateequzzaman & Jain, 1992: 160, pl. 7, fig. 2, HAUTERIVIAN-BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu.

Impagidinium sp. *In*: Jain & Tandon, 1981: 11, pl. 4, fig. 67, MIDDLE EOCENE (Harudi Formation), Kutch, Gujarat.

Impagidinium sp. *In*: Kar, 1985: I92, MIDDLE EOCENE (Harudi Formation), from Jain & Tandon, Kutch, Gujarat, (reproduction from Jain & Tandon, 1981).

IMPLETOSPHAERIDIUM Morgenroth, 1966a emend. Islam, 1993.

Impletosphaeridium cracens Eaton, 1976. *In*: Mehrotra *et* al., 1996: 685-87, YPRESIAN – RUPELIAN-BERDIGALIAN (ONGC well Gulf- 1, Bhavnagar and Tarapur formations), LUTETIAN - PRIABONIAN (ONGC well Gulf- 2 and well Gulf- 3, Bhavnagar and Tarapur formations), Gulf of Cambay, Gujarat.

Impletosphaeridium giganteum (Caro, 1973) Islam, 1993.

Polysphaeridium giganteum Caro, 1973. *In*: Singh & Tripathi, 1987: 303, LATE EOCENE (Kopili Formation), Meghalaya; Tripathi, 1989: 70, pl. 2, fig.12, LATE EOCENE (Kopili Formation), Meghalaya.

Impletosphaeridium granulatum (Burger, 1980a) Islam, 1993.

Cleistosphaeridium granulatum Burger, 1980. *In*: Kumar, 1986a: 27, VALANGINIAN-HAUTERIVIAN (ONGC bore core nos. 3, 4, 7), Krishna-Godavari Basin, Andhra Pradesh, (Garg *et al.,* 1988 reassessed the age of this assemblage to be Hauterivian-Barremian).

Impletosphaeridium granulosum Jain & Tandon, 1981. *In*: Jain & Tandon, 1981: 11, pl. 2, figs 30-31; pl. 3, fig. 50, MIDDLE EOCENE (Harudi Formation), Kutch, Gujarat; Kar, 1985: 192, pl. 42, fig. 9; pl. 43, fig. 4, MIDDLE EOCENE (Harudi Formation), Kutch, Gujarat, (reproduction from Jain & Tandon, 1981).

Impletosphaeridium insolitum Eaton, 1976. *In*: Jain & Tandon, 1981: 11, pl. 1. fig. 12, MIDDLE EOCENE (Harudi Formation), Kutch, Gujarat; Saxena & Rao, 1984: 54, pl. I, fig. 6, OLIGOCENE (Laisong Forma-

tion), Jaintia Hills, Meghalaya; Kar, 1985: 192, MIDDLE EOCENE (Harudi Formation), Kutch, Gujarat, (reproduction from Jain & Tandon, 1981); Saxena *et al.*, 1987: 152, pl. 1, fig. 5, OLIGOCENE (Laisong Formation), Jaintia Hills, Meghalaya; Mehrotra *et al.*, 2005: 74, YPRESIAN *ex* Mehrotra *et al.*, 2002, Assam-Arakan Basin, Northeastern India.

Impletosphaeridium kroemmelbeinii Morgenroth, 1966a. *In*: Singh *et al.*, 1979: 35-36, text-fig. 1, pl. 1, fig. 10, LATE PALAEOCENE–LATE EOCENE (Subathu formation), Simla Hills, Himachal Pradesh.

Impletosphaeridium luxurium Eaton, 1976. *In*: Mathur, 1986: 195-198, LUTETIAN-BARTONIAN (Kalol Formation, well no. 109), Cambay Basin, Gujarat.

Impletosphaeridium cf. **I. mediterraneum** (Corradini, 1973) Islam, 1993.

Cleistosphaeridium cf. *C. mediterraneum* Corradini, 1973. *In*: Venkatachala & Kumar, 1980: 95, pl. 1, fig. 12, ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

Impletosphaeridium sp. cf. **I. Polytrichum** (Valensi, 1947) Islam, 1993.

Hystrichosphaeridium sp. cf. *H. polytrichum* Valensi, 1947. *In*: Varma & Dangwal, 1964: 63, pl. 1, figs 3-4, EOCENE-OLIGOCENE (Cambay deep well no. 1), Cambay Basin, Gujarat.

Impletosphaeridium rugosum Morgenroth, 1966a. *In*: Mehrotra, 1981: 15, pl. 1, fig. 6, MIDDLE EOCENE (Garampani Limestone Formation), North Cachar Hills, Assam; Mehrotra *et al.*, 2005: 74, MIDDLE EOCENE *ex* Mehrotra *et al.*, 2002, Assam-Arakan Basin, Northeastern India.

Impletosphaeridium tribuliferum (Sarjeant, 1962a) Islam, 1993.

Cleistosphaeridium ?tribuliferum (Sarjeant, 1962a) Davey *et al.*, 1969. *In*: Jain *et al.*, 1984: 70, pl. 5. fig. 99. KIMMERIDGIAN (Spiti Shale Formation). Malla Johar area, Kumaon Himalaya, Uttar Pradesh.

Impletosphaeridium cf. **I. varispinosum** (Sarjeant, 1959) Islam, 1993 .

Cleistosphaeridium cf. *C. varispinosum* (Sarjeant, 1959) Woollam & Riding, 1983. *In*: Kumar. 1987a: 599, pl. 3. fig. 1. LATE BATHONIAN-CALLOVIAN (Jhurio Formation). Kutch. Gujarat.

Impletosphaeridium sp. *In*: Singh & Khanna, 1980: 471, pl. 2, fig. 10, LATE PALAEOCENE–LATE EOCENE (Subathu Formation), Simla Hills, Punjab Basin, Himachal Pradesh.

Impletosphaeridium sp. *In*: Singh & Tripathi, I987: 303, PALAEOCENE (Therria Formation), Meghalaya.

Impletosphaeridium sp. A *In*: Jain & Tandon, 1981: 11, pl. 3, fig. 46, MIDDLE EOCENE (Harudi Formation), Kutch, Gujarat.

Impletosphaeridium sp. *In*: Sarkar & Prasad, 2000a: 170, pl. 1, fig. 3, LATE YPRESIAN – MIDDLE LUTETIAN (Subathu Formation, Koshalia Nala Section), Shimla Hills.

INDODINIUM Kumar, 1986b.

Indodinium khariense Kumar, 1986b. *In*: Kumar, 1986b: 389-391, pl. 4, figs 2-3, text-fig. 5, EARLY KIMMERIDGIAN-TITHONIAN (Jhuran Formation), Kutch, Gujarat; Kumar, 1987a: 598, EARLY KIMMERIDGIAN-TITHONIAN (Jhuran Formation), Kutch, Gujarat.

INDOSPHAERA Kumar, 1986b.

Indosphaera bhujensis Kumar, 1986b. *In*: Kumar, 1986b: 392, pl. 3, figs 3-5, text-fig. 6, EARLY KIMMERIDGIAN-TITHONIAN (Jhuran Formation), Kutch, Gujarat; Kumar, 1987a; 598, EARLY KIMMERIDGIAN-TITHONIAN (Jhuran Formation), Kutch, Gujarat.

ISABELIDINIUM Lentin & Williams, 1977a emend. N.G. Marshall, 1988.

Isabelidinium acuminatum (Cookson & Eisenack, 1958) Stover & Evitt, 1978. *In*: Khowaja-Ateequzzaman & Garg, 2002: 136, EARLY TURONIAN (Kulakkalnattam Sandstone Member, Garudamangalam Formation), Cauvery Basin, southern India.

Isabelidinium sp. A *In*: Jain & Garg, 1986b: 117, pl. 3, fig. 9, LATE PALAEOCENE, Vriddhachalam area, Cauvery Basin, Tamil Nadu.

JAINIELLA Khowaja-Ateequzzaman & Garg, 1995.

Jainiella breviornata Khowaja-Ateequzzaman & Garg, 1995. *In*: Khowaja-Ateequzzaman & Garg, 1995: 246-247, pl. 1, figs 1-6, LATE CRETACEOUS (Trichinopoly Formation), Cauvery Basin, Tamil Nadu. (Khowaja-Ateequzzaman & Garg, 2002 reassessed the age to be MIDDLE TURONIAN); Khowaja-Ateequzzaman & Garg, 2002: 137, MIDDLE TURONIAN (Kulakkalnattam Sandstone Member, Garudamangalam Formation), Cauvery Basin, southern India.

KAIWARADINIUM Wilson, 1978.

Kaiwaradinium scrutillinum Backhouse, 1987. *In*: Khowaja-Ateequzzaman & Jain, 1992: 160, pl. 1, figs 10, 12, HAUTERIVIAN-BARREMIAN (CGWB borehole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu.

KALLOSPHAERIDIUM de Coninck, 1969 emend. Jan du Chêne *et al*., 1985a.

Kallosphaeridium brevibarbatum de Coninck, 1969 emend. Jan du Chêne *et al*., 1985a. *In***:** Sarkar & Prasad, 2000b: 141, pl. I, fig. 10, LATE YPRESIAN (Subathu Formation, Morni Hills), Haryana.

Kallosphaeridium ?granulatum (Norvick in Norvick & Burger) Stover & Evitt, 1978. *In*: Kumar, 1986a: 31, VALANGINIAN-HAUTERIVIAN (ONGC bore core no. 7), Krishna-Godavari Basin, Andhra Pradesh, (Garg *et al.,* 1988 reassessed the age of this assemblage to be Hauterivian-Barremian). (Questionable assignment: Stover & Evitt, 1978)

Kallosphaeridium norvickii (Burger, 1980a) Lentin & Williams, 1981. **NOW Batiacasphaera norvickii** (Burger, 1980a) Lentin & Williams, 1989.

KALYPTEA Cookson & Eisenack, 1960b emend. Wiggins, 1975.

Kalyptea indica Jain & Maheshwari *in* Jain *et al*., 1982. *In*: Jain *et al.*, 1982: 24-25, pl.1, figs 7-12, text-figs 1a-c, ?LATE JURASSIC (Jabalpur Formation), Madhya Pradesh.

Kalyptea monoceras Cookson & Eisenack, 1960b. **NOW Pareodinia ceratophora** Deflandre, 1947d emend. Gocht, 1970b.

Kalyptea wisemaniae Stover & Evitt, 1987a. *In*: Mehrotra & Aswal, 2003: 59, pl. 31, fig. 3, BARREMIAN – KIMMERIDGIAN (ONGC well RCPM- A, 2640 – 2976m, Golapalli Formation), V; BARREMIAN – TITHONIAN (ONGC well MVD- A, 1620 – 2365m, Raghavapuram and Golapalli formations), Krishna-Godavari Basin, Andhra Pradesh; BERRIASIAN (ONGC well END- A, 1895 – 1900m, Raghavapuram Formation), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 51, KIMMERIDGIAN - BARREMIAN ex Mehrotra & Aswal, 2003, Krishna-Godavari Basin, Andhra Pradesh.

Kalyptea sp. A. *In*: Khowaja-Ateequzzaman & Jain, 1992: 160, pl. 10, fig. 11, HAUTERIVIAN-BARREMIAN (CGWB borehole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu.

KENLEYIA Cookson & Eisenack, 1965b.

Kenleyia lophophora Cookson & Eisenack, 1965b. *In*: Aswal & Pundeer, 1996: 636, THANETIAN - YPRESIAN (ONGC Mori well- A, 3200 – 2640m), Krishna-Godavari Basin, Andhra Pradesh.

KIOKANSIUM Stover & Evitt, 1978 emend. Duxbury, 1983.

Kiokansium polypes (Cookson & Eisenack, 1962b) Below, 1982c. **NOW Kiokansium unituberculatum** (Tasch *in* Tasch *et al*., 1964) Stover & Evitt, 1978.

Kiokansium unituberculatum (Tasch *in* Tasch *et al*., 1964) Stover & Evitt, 1978.

Bacchidinium polypes (Cookson & Eisenack, 1962b) Davey, 1979. *In*: Kumar, 1986a: VALANGINIAN--HAUTERIVIAN (ONGC bore core nos. 2, 7, 8), Krishna-Godavari Basin, Andhra Pradesh, (Garg *et al.,* 1988 reassessed the age of this assemblage to be Hauterivian-Barremian).

Cleistosphaeridium polypes (Cookson & Eisenack, 1962b) Davey, 1969. *In*: Jain, 1977b: 185, pl. 3, figs 33, 39, EARLY ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu; Kumar, 1982: 174-175, pl. 1, fig. 7, NEOCOMIAN, Krishna-Godavari Basin, Andhra Pradesh.

Hystrichosphaeridium unituberculatum Tasch *in* Tasch *et al*., 1964. *In*: Venkatachala & Kumar, 1980: 100, pl. 3, fig. 2, ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

Kiokansium polypes (Cookson & Eisenack, 1962b) Below, 1982c. *In*: Khowaja-Ateequzzaman & Jain, 1992: 160, 161, pl. 5, figs 4, 13; 8, fig. 1, HAUTERIVIAN-BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu; Khowaja-Ateequzzaman & Garg, 2002: 136, pl. 2, fig. 10, EARLY TURONIAN (Kulakkalnattam Sandstone Member, Garudamangalam Formation), Cauvery Basin, southern India.

Kiokansium cf. **K. unituberculatum** (Tasch in Tasch *et al*., 1964) Stover & Evitt, 1978.

Cleistosphaeridium cf. C. *polypes* (Cookson & Eisenack, 1962b) Davey, 1969. *In*: Venkatachala & Kumar, 1980: 95, pl. 1, fig. 4, ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

Kiokansium williamsii Singh, 1983. *In*: Mehrotra & Aswal, 2003: 61, pl. 5, figs 3 & 4; pl. 7, fig. 5; pl. 8, figs 4 & 5, TURONIAN – BERRIASIAN (ONGC well END- A, 1240 – 1900m, Tirupati and raghavapuram formations), Krishna-Godavari Basin, Andhra Pradesh; CENOMANIAN – TITHONIAN (ONGC well DRK- A, 1645 – 2180m, Chintalapalli and Raghavapuram formations), Krishna-Godavari Basin, Andhra Pradesh; TURONIAN – KIMMERIDGIAN (ONGC well RCPM- A, 1380 – 2976m, Tirupati, Raghavapuram and Golapalli formations), Krishna-Godavari Basin, Andhra Pradesh; CENOMANIAN – BERRIASIAN (ONGC well MVD- A, 1100 – 2140m, Tirupati, Raghavapuram and Golapalli formations), Krishna-Godavari Basin, Andhra Pradesh Mehrotra *et al*., 2005: 51, KIMMERIDGIAN - TURONIAN ex Mehrotra & Aswal, 2003, Krishna-Godavari Basin, Andhra Pradesh.

Kiokansium sp. A. *In*: Khowaja-Ateequzzaman & Jain, 1992: 161, pl. 12, fig. 5, HAUTERIVIAN-BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu.

KISSELEVIA Vozzhennikova, 1963 ex Vozzhennikova, 1967 emend. Lentin & Williams, 1976 emend. Lentin & Vozzhennikova, 1989.

Kisselevia tenuivirgu1a (Williams & Downie, 1966b) Lentin & Williams, 1976. **NOW Charlesdowniea tenuivirgula** (Williams & Downie, 1966b) Lentin & Vozzhennikova, 1989. (Orthographic change: Lentin & Williams, 1976 cited *Kisselovia tenuivirgula*)

"KISSELOVIA" Vozzhennikova, 1963 (*In*: van Erve *et* al., 1980, name not validly published, orthographic variant of **KISSELEVIA**)

KLEITHRIASPHAERIDIUM Davey, 1974.

Kleithriasphaeridium corrugatum Davey, 1974. *In*: Khowaja-Ateequzzaman & Jain, 1992: 161, pl. 9, fig. 10, HAUTERIVIAN-BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu.

Kleithriasphaeridium eoinodes (Eisenack, 1958a) Davey, 1974 emend. Sarjeant,

1985a. *In*: Kumar, 1986a: 31, VALANGINIAN-HAUTERIVIAN (ONGC bore core nos. 1, 7), Krishna-Godavari Basin, Andhra Pradesh, (orthographic change from *K. eoindoes* listed by Kumar, 1986a ; Garg *et al*., 1988 reassessed the age of this assemblage to be Hauterivian-Barremian); Khowaja-Ateequzzaman & Jain, 1992: 161, pl. 1, figs 5,8, 11; pl. 11, fig. 14, HAUTERIVIAN-BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu.

Hystrichosphaeridium simplicispinum Davey & Williams, 1966b. *In*: Singh *et al*., 1979: 35-36, text-fig. 1, LATE PALAEOCENE-LATE EOCENE (Subathu Formation), Simla Hills, Punjab Basin, Himachal Pradesh, (orthographic change: Singh *et al.,* 1979 listed *H. simplicispinosum*).

Kleithriasphaeridium simplicispinum (Davey & Williams, 1966b) Davey, 1974. *In*: Jain, 1977b: 177-178, pl. 2, figs 12-13, EARLY ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu; Kumar, 1986a: 31, pl. 2, fig. 2, VALANGINIAN-HAUTERIVIAN (ONGC bore core nos, 2. 4), Krishna-Godavari Basin, Andhra Pradesh. (Garg *et al*., 1988 reassessed the age of this assemblage to be Hauterivian-Barremian); Khowaja-Ateequzzaman & Jain, 1992: 161, pl. 1, figs 4, 6, HAUTERIVIAN-BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu.

Kleithriasphaeridium loffrense Davey & Verdier, 1976. *In*: Mehrotra & Aswal, 2003: 62, pl. 21, figs 4 & 5, LATE CAMPANIAN – APTIAN (ONGC well END- A, 1080 – 1795m, Tirupati and Raghavapuram formations), Krishna-Godavari Basin, Andhra Pradesh; LATE MAASTRICHTIAN – EARLY CAMPANIAN (ONGC well DRK- A, 1250 – 1530m, Chintalapalli Formation), Krishna-Godavari Basin, Andhra Pradesh; LATE CAMPANIAN – EARLY MAASTRICHTIAN (ONGC well RCPM- A, 1100 – 1105m, Tirupati Formation), Krishna-Godavari Basin, Andhra Pradesh; LATE CAMPANIAN – CENOMANIAN (ONGC well MVD- A, 915 – 1105m, Tirupati Formation), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 51, APTIAN – LATE CAMPANIAN ex Mehrotra & Aswal, 2003, Krishna-Godavari Basin, Andhra Pradesh.

Kleithriasphaeridium simplicispinum (Davey & Williams, 1966b) Davey, 1974. **NOW Kleithriasphaeridium eoinodes** (Eisenack, 1958a) Davey, 1974 emend. Sarjeant, 1985a.

Kleithriasphaeridium sp. A *In*: Jain & Garg, I 986b: I 17, pl. 6, fig. 14, LATE PALAEOCENE, Vriddhachalam area, Cauvery Basin, Tamil Nadu.

KOMEWUIA Cookson & Eisenack, 1960b emend. Dörhöfer & Davies, 1980, emend. Chên, 1982.

Komewuia glabra Cookson & Eisenack, 1960b emend, Chên, 1982. *In*: Mehrotra & Aswal, 2003:63, pl. 33, fig. 5, TITHONIAN – BERRIASIAN (ONGC well RCPM- A, 2865 – 2985m, Golapalli Formation), Krishna-Godavari Basin, Andhra Pradesh; KIMMERIDGIAN – TITHONIAN (ONGC well MVD- A, 2320 – 2480m, Golapalli Formation), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 51-52, KIMMERIDGIAN - BERRIASIAN ex Mehrotra & Aswal, 2003, Krishna-Godavari Basin, Andhra Pradesh.

LAGENORHYTIS Duxbury, 1979b emend. Piasecki, 1984.

Lagenorhytis delicatula (Duxbury, 1977) Duxbury, 1979b emend. Piasecki, 1984. *In*: Garg *et al*., 2003: 52-53, pl, III, fig. 14, LATE UPPER TITHONIAN – BERRIASIAN-EARLY VALANGINIAN (*Pterolytoceras* Ammonite, Upper levels of the Upper Division, Spiti Shale Formation), Malla Johar area, Kumaon Himalaya.

?Lagenorhytis sp. *In*: Garg *et al*., 2003: 52-53, pl, IV, fig. 19, LATE LOWER TITHONIAN (*Paraboliceras* Ammonite, Upper part of the Middle Division, Spiti Shale Formation, Kibber Section), Malla Johar area, Kumaon Himalaya.

LANTERNA Dodekova, 1969 emend. Courtinat, 1989.

Lanterna sp. *In*: Jain *et al*., 1984: 78, pl. 3, figs 55-56. EARLY-MIDDLE TITHONIAN (Spiti Shale Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh.

LANTERNOSPHAERIDIUM Morgenroth, 1966a emend. Stover & Evitt, 1978.

Lanternosphaeridium axiale (Eisenack, 1965b) Morgenroth, 1966a. **NOW Fibrocysta axialis** (Eisenack, 1965b) Stover & Evitt, 1978.

Lanternosphaeridium lanosum Morgenroth, 1966a. *In*: Jain & Garg, 1986b: 117, pl. 6, fig. 10, LATE PALAEOCENE, Vriddhachalam area, Cauvery Basin, Tamil Nadu; Garg & Khowaja-Ateequzzaman, 2000: 471, pl. 3, fig. 8, LATE THANETIAN (Lakadong Sst Member, Sylhet Limestone Formation), Cherrapunji area, Khasi Hills, Meghalaya; Sarkar & Prasad, 2000b: 141, LATE YPRESIAN (Subathu Formation, Morni Hills), Haryana.

Lanternosphaeridium licium Jain *et al*., 1975. **NOW Fibrocysta licia** (Jain *et al.,* 1975) Stover & Evitt, 1978.

LEBERIDOCYSTA Stover & Evitt, 1978.

Leberidocysta chlamydata (Cookson & Eisenack, 1962b) Stover & Evitt, 1978 emend. Fechner, 1985 emend. Marheinecke, 1992. *In*: Kumar, 1986a: 31, VALANGINIAN-HAUTERIVIAN (ONGC bore core nos. 7, 8), Krishna-Godavari Basin, Andhra Pradesh.

Hexagonifera chlamydata Cookson & Eisenack, 1962b. *In*: Jain, 1977b: 179, pl. 4, fig. 47, EARLY ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

Leberidocysta defloccata (Davey & Verdier, 1973) Stover & Evitt, 1978. *In*: Kumar, 1986a: 31, VALANGINIAN-HAUTERIVIAN (ONGC bore core nos. 4, 7, 8), Krishna-Godavari Basin. Andhra Pradesh. (Garg *et al.,* 1988 reassessed the age of this assemblage to be Hauterivian-Barremian).

Leberidocysta ?scabrata (Jain & Taugourdeau-Lantz, 1973) Stover & Evitt. 1978. (Questionable assignment: stover & evitt, 1978). **NOW Ovoidinium scabratum** (Jain & Taugourdeau--Lantz, 1973) Khowaja-Ateequzzaman & Garg, 2004.

LEJEUNECYSTA Artzner & Dörhöfer, 1978 emend. Kjellström, 1972 emend. Lentin & Williams, 1976 emend. Bujak *in* Bujak *et al*., 1980.

Lejeunecysta cinctoria (Bujak in Bujak *et al*., 1980) Lentin & Williams, 1981. *In*: Mehrotra & Kamla Singh, 2003: 57, pl. 32, figs 5 & 6, LATE EOCENE – MIDDLE EOCENE (ONGC well SSY- A, 1450 – 2095m, Ravva Formation), Krishna-Godavari Basin, Andhra Pradesh; LATE MIOCENE – MIDDLE MIOCENE (ONGC well KSP- A, 1165 – 2475m), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 74, MIDDLE EOCENE – LATE MIOCENE ex Mehrotra & Kamla Singh, 2003, Krishna-Godavari Basin, Andhra Pradesh.

Lejeunecysta hyalina (Gerlach, 1961) Artzner & Dörhöfer, 1978 emend. Kjellström, 1972 emend. Sarjeant, 1984. *In*: Jain & Garg, 1986b: 118, pl. 6, fig. 11, LATE PALAEOCENE, Vriddhachalam area. Cauvery Basin, Tamil Nadu; Aswal & Pundeer, 1996: 636, pl. 1, fig. 4, LUTETIAN-BARTONIAN – EARLY MIOCENE (ONGC Mori well- A, 1900 – 1200m), Krishna-Godavari Basin, Andhra Pradesh; Kumar *et al.*, 1996: 150, pl. 2, fig. 11, LATEST MAASTRICHTIAN (Upper part of Mahadeo Formation, Um Sohryngkew River Section), Meghalaya; Sarkar & Prasad, 2000b: 141, pl. I, fig. 7, EARLY – MIDDLE LUTETIAN (Subathu Formation, Morni Hills), Haryana; Mehrotra & Kamla Singh, 2003: 56, pl. 32, figs, 3 & 4, EARLY EOCENE (ONGC well NSP- A, 1899 – 1902m, Matsyapuri Sandstone and Bhimanapalli Limestone), Krishna-Godavari Basin, Andhra Pradesh;

HOLOCENE-CALABRIAN – AQUITANIAN-CHATTIAN (ONGC well GS-15- D, 570 – 2880m), Krishna-Godavari Basin, Andhra Pradesh; CALABRIAN – BARTONIAN (ONGC well SSY- A, 70 – 2100m), Krishna-Godavari Basin, Andhra Pradesh; CALABRIAN – PRIABONIAN (ONGC well MGP- A, 30 – 1905m), Krishna-Godavari Basin, Andhra Pradesh; TORTONIAN AND YOUNGER – BARTONIAN-LUTETIAN (ONGC well MNP-A, 150 – 1175m, Matsyapuri Sandstone), Krishna-Godavari Basin, Andhra Pradesh; MIDDLE MIOCENE – LATE OLIGOCENE (ONGC well BMP- A, 650 – 950m), Krishna-Godavari Basin, Andhra Pradesh Mehrotra *et al*., 2005: 74, EARLY RUPELIAN ex Mehrotra *et al*., 2002, Mumbai Offshore; EARLY EOCENE - HOLOCENE ex Mehrotra & Kamla Singh, 2003, Krishna-Godavari Basin, Andhra Pradesh.

Lejeunecysta sp. *In*: Jain *et al*., 1975.

Lejeunia sp. *In*: Jain *et al*., 1975: 12, pl. 6, fig. 66, DANIAN (Langpar Formation), Meghalaya.

Lejeunecysta sp. *In* : Mehrotra & Kamla Singh, 2003 : 58, pl. 32, figs 1 & 2, PLEISTOCENE AND YOUNGER – MIDDLE EOCENE (ONGC well SSY- A, 40 – 2100m, Ravva Formation), Krishna-Godavari Basin, Andhra Pradesh; EARLY OLIGOCENE (ONGC well MORI- A, 1495 – 1500m, Matsyapuri Sandstone), Krishna-Godavari Basin, Andhra Pradesh.

"LEJEUNIA" Gerlach, 1961 emend. Kjellström, 1972 emend. Lentin & Williams, 1976 (Name illegitimate, senior homonym: *Lejeunea* Libert, 1820). **NOW LEJEUNECYSTA** Artzner & Dörhöfer, 1978 emend. Kjellström, 1972 emend. Lentin & Williams, 1976 emend. Bujak *in* Bujak *et al*., 1980. (Substitute name)

Lejeunia sp. *In*: Jain *et al*., 1975 = **Lejeunecysta sp.** (According to Jain *et al*., 1975)

LEPTODINIUM Klement, 1960b emend. Sarjeant, 1966 emend. Wall, 1967 emend. Sarjeant, 1969 emend. Stover & Evitt, 1978 emend, Sarjeant. 1982b.

Leptodinium ambiguum (Deflandre, 1939b) Helenes, 1984.

Rhynchodiniopsis ambigua (Deflandre, 1939a) Sarjeant, 1982b. *In*: Jain *et al*., 1984: 71, pl. 4, fig. 77; pl. 5, figs 82-83, EARLY LATE TITHONIAN (Spiti Shale Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh.

Leptodinium episomum (Sarjeant, 1966b) Helenes, 1984.

Gonyaulacysta episoma Sarjeant. 1966. Jain, 1977b. *In*: Jain, 1977b: 175,pl. 6, fig. 68, EARLY ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

Leptodinium eumorphum (Cookson & Eisenack, 1960b) Sarjeant in Davey *et al.,* 1969. *In*: Jain *et al*., 1986: 75, pl. 1, figs 6, 13, LATE JURASSIC, Kutch, Gujarat; Kumar, 1986b: 392, pl. 3, fig. 7, EARLY KIMMERIDGIAN-TITHONIAN (Jhuran Formation), Kutch, Gujarat; Kumar, 1987a: 598, EARLY KIMMERIDGIAN-TITHONIAN (Jhuran Formation), Kutch, Gujarat.

Leptodinium cf. **L. ?hadrum** (Sarjeant) Helenes, 1984. *In*: Mehrotra & Aswal, 2003: 64, pl. 16, fig. 7, EARLY – LATE CAMPANIAN (ONGC well RCPM-A, 1200 – 1205m, Tirupati Formation), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 52, CAMPANIAN ex Mehrotra & Aswal, 2003, Krishna-Godavari Basin, Andhra Pradesh. (Questionable assignment: Helenes, 1984)

Gonyaulacysta cf. *hadra* Sarjeant, 1966. *In*: Venkatachala & Kumar, 1980: 97, pl. 2, fig. 10, ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

Leptodinium ?hyalodermopse (Cookson & Eisenack) Stover & Evitt. 1978. (Questionable assignment: Stover & evitt, 1978)

Rhynchodiniopsis hyalodermopsis (Cookson & Eisenack) Sarjeant,

1982. *In*: Kumar, 1986a: 32, VALANGINIAN-HAUTERIVIAN (ONGC bore core no. 1), Krishna-Godavari Basin, Andhra Pradesh, (Garg *et al.*, 1988 reassessed the age of this assemblage to be Hauterivian-Barremian).

Leptodinium sp. cf **L. ?hyalodermopse** (Cookson & Eisenack, 1958) Stover & Evitt, 1978. *In*: Garg *et al.*, 2003: 52-53, LATE LOWER TITHONIAN (*Paraboliceras* Ammonite, Upper part of the Middle Division, Spiti Shale Formation, Kibber Section); LATE UPPER TITHONIAN (*Blanfordiceras* Ammonite), Malla Johar area, Kumaon Himalaya.

Leptodinium ovum Sah *et al.*, 1970. **NOW Impagidinium ovum** (Sah *et al.*, 1970) Stover & Evitt. 1978.

Leptodinium simplex Burger, 1980a. *In*: Kumar, 1986a: 32, pl. 2, fig. 3, VALANGINIAN - HAUTERIVIAN (ONGC bore core nos. I, 2, 4, 7), Krishna-Godavari Basin, Andhra Pradesh, (Garg *et al.,* 1988 reassessed the age of this assemblage to be Hauterivian - Barremian).

Leptodinium sp. *In*: Mehrotra & Sarjeant, 1986: 714-715, pl. 2, figs 4-5, text-fig. 5, APTIAN (Periyavadavadi shallow well- 1), Cauvery Basin, Tamil Nadu.

Leptodinium sp. A *In*: Venkatachala & Kumar, 1980: 99, pl. 6, fig. 5, ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

Leptodinium sp. A *In*: Jain *et al.*, 1984: 70, pl. 3, fig. 50, EARLY LATE TITHONIAN (Spiti Shale Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh.

Leptodinium sp. A. *In*: Khowaja-Ateequzzaman & Jain, 1992: 161, pl. 9, fig. 9, HAUTERIVIAN-BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu.

Leptodinium sp. B *In*: Venkatachala & Kumar, 1980: 99, pl. 5, fig. 3, ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

?Leptodinium sp. C *In*: Venkatachala & Kumar, 1980: 99, pl. 6, fig. 11, ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

?Leptodinium sp. D *In*: Venkatachala & Kumar, 1980: 99, pl. 6, fig. 13, ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

Leptodinium *In*: Tissot, 1990: 356, LATE HOLOCENE (Kandavara bore-well), Coondapur area, Karnataka.

LEVISPHAERA Davey, 1988.

Levisphaera crassicingulata (Burger, 1980b) Davey, 1988.

Batiacasphaera crassicingulata (Burger, 1980b) Kumar, 1986a. *In*: Kumar, 1986a: 32, VALANGINIAN-HAUTERIVIAN (ONGC bore core nos. 4, 5, 7), Krishna-Godavari Basin, Andhra Pradesh, (Garg *et al.,* 1988 reassessed the age of this assemblage to be Hauterivian-Barremian). (Orthographic change: Kumar, 1986a listed *B. crassiangulata*).

LINGULODINIUM Wall, 1967 emend. Wall & Dale *in* Wall *et al.,* 1973 emend. Dodge, 1989.

Lingulodinium machaerophorum (Deflandre & Cookson, 1955) Wall, 1967. *In*: Jain & Tandon, 1981: 12, pl. 2, fig. 28, MIDDLE EOCENE (Harudi Formation), Kutch, Gujarat; Kar, 1985: 192-193, 205, pl. 42, fig. 7; pl. 49, figs 3-4, MIDDLE EOCENE (Harudi Formation) and MIOCENE (Khari Nadi Formation), Kutch, Gujarat, (former is a reproduction from Jain & Tandon, 1981); Mathur, 1986: 195-198, LUTETIAN-BARTONIAN (Kalol Formation, well no. 109), Cambay Basin, Gujarat; Singh & Sarkar, 1987: 208. EOCENE (Subathu Formation), Banethi-Bagthan area, Himachal Pradesh; Sarkar & Singh, 1988: 48, pl. 3, fig. 11, EOCENE (Subathu Formation), Banethi-Bagthan area, Himachal Pradesh; Singh & Sarkar, 1992: 185, LATE PALAEOCENE?-EOCENE (Subathu Formation), Garkhal area, Punjab Basin, Himachal Pradesh; Aswal & Pundeer, 1996:

636, pl. 1, fig. 14, THANETIAN – EARLY MIOCENE (ONGC Mori well- A, 3200 – 1200m), Krishna-Godavari Basin, Andhra Pradesh (Orthographic change: Aswal & Pundeer, 1996 listed *Lengulodinium machaerophorum*); Mehrotra *et* al., 1996: 685, YPRESIAN - MIOCENE (ONGC well Gulf- 1, well Gulf- 2 and well Gulf- 4, Bhavnagar, Tarapur Shale, Babaguru and Post Babaguru formations), DANIAN – MIOCENE (ONGC well Gulf- 3, Olpad, Bhavnagar, Tarapur shale, Babaguru and Post Babaguru formations), Gulf of Cambay, Gujarat; Sarkar, 1997: 102, pl. 2, fig. 9, LATE YPRESIAN – LUTETIAN (Subathu Formation, Bilaspur area), Punjab Basin, Himachal Pradesh; Sarkar & Prasad, 2000a: 170, EARLY - MIDDLE LUTETIAN (Subathu Formation, Koshalia Nala Section), Shimla Hills; Sarkar & Prasad, 2000b: 141, pl. I, fig. 5, EARLY – MIDDLE LUTETIAN (Subathu Formation, Morni Hills), Haryana; Saxena & Sarkar, 2000: 256, 263, MIDDLE EOCENE (Siju Formation), Simsang River near Siju, South Garo Hills, Meghalaya; Mehrotra & Kamla Singh, 2003: 59, pl. 8, figs 1, 3-6, PLIO - PLEISTOCENE (ONGC well GS- 21- A, 40 – 50m), Krishna-Godavari Basin, Andhra Pradesh; maastrichtian (ONGC well SRP- A, 620 – 625m, Narasapur Claystone and Rajahmundry Sandstone), Krishna-Godavari Basin, Andhra Pradesh; HOLOCENE-CALABRIAN – CHATTIAN (ONGC well GS- 15- D, 570 – 3010m), Krishna-Godavari Basin, Andhra Pradesh; CALABRIAN-ZANCLEAN – LUTETIAN (ONGC well MGP- A, 240 – 2555m), Krishna-Godavari Basin, Andhra Pradesh; MIDDLE MIOCENE – EOCENE (ONGC well BMP- A, 650 – 1500m, Matsyapuri Sandstone and Pasarlapudi Formation), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 75, YPRESIAN - MIOCENE *ex* Mehrotra *et al*., 1996, Cambay Basin, Gujarat; THANETIAN – PLIOCENE (54 – 3.3 Ma) *ex* Mehrotra *et al*., 2002, Mumbai Offshore; MAASTRICHTIAN - HOLOCENE *ex* Mehrotra & Kamla Singh, 2003, Krishna-Godavari Basin, Andhra Pradesh; MIDDLE EOCENE (LUTETIAN) - OLIGOCENE *ex* Mehrotra *et al*., 2002, Assam-Arakan Basin, Northeastern India

Cleistosphaeridium disjunctum Davey *et al.,* 1966. *In*: Khanna *et al*., 1979: 35-36, text-fig. 1, pl. I, fig. 12, LATE PALAEOCENE- LATE EOCENE (Subathu Formation), Simla Hills, Punjab Basin, Himachal Pradesh; Khanna & Singh, 1981c: 204, fig. 8, LATE PALAEOCENE-EOCENE (Subathu Formation), Simla Hills, Himachal Pradesh; Khanna *et al*., 1981: 259, pl. 2, fig. 6, (Subathu Formation), Simla Hills, Himachal Pradesh; Mehrotra & Sinha, 1981: 154, pl. 3, fig. 1, LATE CRETACEOUS--MIDDLE EOCENE (Sangchamalla Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh. (Jain & Garg, 1986a reassessed the age of this assemblage to be Late Cretaceous).

Cleistosphaeridium mikirii Mehrotra, 1981. *In*: Mehrotra, 1981: 14-15, pl. 1, figs 2-5, MIDDLE EOCENE (Garampani Limestone Formation), North Cachar Hills, Assam.

Hystrichosphaeridium machaerophorum Deflandre & Cookson, 1955. *In*: Banerjee & Misra, 1972: 207, pl. 2, fig. 17, EOCENE-MIOCENE, Assam and Tripura.

Lingulodinium solarum (Drugg, 1970b) Wall & Dale in Wall *et al.,* 1973. *In*: Jain & Tandon, 1981: 12, pl. 2, fig. 29, MIDDLE EOCENE (Harudi Formation), Kutch, Gujarat; Kar, 1985: 193, pl. 44, fig. 4, MIDDLE EOCENE (Harudi Formation), Kutch, Gujarat, (reproduction from Jain & Tandon, 1981).

?Lingulodinium sp. *In*: Jain & Garg, 1991: 70-71, pl. 3, fig. 7, MIOCENE (Khari Nadi Formation), Kutch, Gujarat. (Restudy of Kar, 1985)

Operculodinium ?placitum Drugg & Loeblich Jr., 1967. *In*: Kar, 1985: 207, pl. 48, fig. 10, MIOCENE (Khari Nadi Formation), Kutch. Gujarat. (Reallocated by Jain & Garg, 1991; Questionable assignment: Stover & Evitt, 1978))

LITHODINIA Eisenack, 1935 emend. Gocht, 1975b emend. Williams *et al*., 1993.

Lithodinia bulloidea (Cookson & Eisenack, 1960b) Gocht, 1976.

Meiourogonyaulax bulloidea (Cookson & Eisenack, 1960b) Sarjeant, 1969. *In*: Khowaja-Ateequzzaman & Jain, 1992: 162, pl. 4, fig. 1; pl. 6, fig. 2, HAUTERIVIAN-BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu; Khowaja-Ateequzzaman & Garg, 2002: 136, pl. 2, fig. 5, EARLY TURONIAN (Kulakkalnattam Sandstone Member, Garudamangalam Formation), Cauvery Basin, southern India.

Lithodinia deflandrei (Sarjeant, 1968) Gocht, 1976. *In*: Mehrotra *et al*., 2005: 52, NORIAN – RHAETIAN-MIDDLE SINEMURIAN, Krishna-Godavari Basin, Andhra Pradesh

Lithodinia jurassica Eisenack, 1935 emend. Eisenack & Klement, 1964 emend. Gocht, 1975. *In*: Jain *et al*., 1984: 70, pl. 3, fig. 58, EARLY LATE TITHONIAN (Spiti Shale Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh.

Lithodinia cf. **L. jurassica** Eisenack, 1935 emend. Eisenack & Klement, 1964 emend Gocht, 1975. *In*: Kumar, 1986a: 31, VALANGINIAN-HAUTERIVIAN (ONGC bore core no. 5), Krishna-Godavari Basin, Andhra Pradesh, (Garg *et al.,* 1988 reassessed the age of this assemblage to be Hauterivian-Barremian).

Lithodinia stoveri (Millioud, 1964) Gocht, 1976. *In*: Mehrotra & Aswal, 2003: 65, HAUTERIVIAN (ONGC well END- A, 1845 – 1850m, Raghavapuram Formation), Krishna-Godavari Basin, Andhra Pradesh; OXFORDIAN (ONGC well RCPM- A, 3060 – 3084m, Golapalli Formation), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 52, OXFORDIAN - HAUTERIVIAN ex Mehrotra & Aswal, 2003, Krishna-Godavari Basin, Andhra Pradesh.

Lithodinia sp. *In*: Jain *et al*., 1978: 116, pl. 1, fig. 2, LATE JURASSIC (Spiti Shale Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh.

Lithodinia sp. A *In*: Jain *et al*., 1984: 78, pl. 4, fig. 75, KIMMERIDGIAN (Spiti Shale Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh.

Lithodinia sp.

Meiourogonyaulax sp. *In*: Kumar, 1987a: 599, BATHONIAN-CALLOVIAN (Jhurio Formation), Kutch. Gujarat.

LITOSPHAERIDIUM Davey & Williams, 1966b emend. Davey & Verdier, 1973 emend. Lucas-Clark, 1984.

Litosphaeridium arundum (Eisenack & Cookson, 1960) Davey, 1979b emend. Lucas-Clark, 1984. *In*: Mehrotra & Aswal, 2003: 67, pl. 3, figs 1 & 2; pl. 7, fig. 2, CENOMANIAN (ONGC well END- A, 1610 – 1755m, Raghavapuram Formation), Krishna-Godavari Basin, Andhra Pradesh; BARREMIAN – EARLY VALANGINIAN (ONGC well DRK- A, 2020 – 2045m, Raghava[uram Formation), Krishna-Godavari Basin, Andhra Pradesh; ALBIAN – KIMMERIDGIAN (ONGC well RCPM- A, 1900 – 2976m, Raghavapuram and Golapalli formations), Krishna-Godavari Basin, Andhra Pradesh; CENOMANIAN (ONGC well MVD- A, 1380 – 1745m, Tirupati and Raghavapuram formations), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 53, KIMMERIDGIAN - CENOMANIAN ex Mehrotra & Aswal, 2003, Krishna-Godavari Basin, Andhra Pradesh.

Litosphaeridium siphoniphorum (Cookson & Eisenack, 1958) Davey & Williams, 1966b emend. Lucas--Clark, 1984. *In*: Khowaja-Ateequzzaman & Garg, 2002: 136, pl. 2, fig. 15, EARLY TURONIAN (Kulakkalnattam Sandstone Member, Garudamangalam Formation), Cauvery Basin, southern India; Mehrotra & Aswal, 2003: 66, pl. 5, figs 1 & 2, CENOMANIAN (ONGC well END- A, 1295 – 1555m, Tirupati and Raghavapuram formations), Krishna-Godavari Basin, Andhra Pradesh; CENOMANIAN (ONGC well DRK- A, 1670 – 1675m, Chintalapalli Formation), Krishna-Godavari Basin, Andhra Pradesh; TURONIAN - CENOMANIAN (ONGC well RCPM- A, 1480 – 1640m, Tirupati Formation), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 52, CENOMANIAN - TURONIAN ex Mehrotra & Aswal, 2003, Krishna-Godavari Basin, Andhra Pradesh.

Litosphaeridium siphoniphorum (Cookson & Eisenack, 1958) Davey & Williams, 1966b emend. Lucas--Clark, 1984. *In*: Kar, 1985: 184, pl. 40, fig. 10, EARLY EOCENE (Lakhpat bore hole- 1), Kutch, Gujarat = **Cordosphaeridium robustum** (Gocht, 1969) Sarjeant, 1981 emend. Sarjeant, 1981. (Reallocated by Jain & Garg, 1991)

LUNATODINIUM Brideaux & McIntyre, 1973.

Lunatodinium sp. *In*: Sarkar, 1991: 3, pl. II, fig. 4, EARLY EOCENE (Kakara Series, Lesser Himalaya), Kakara-Chapla group of villages, Simla, Himachal Pradesh.

MATHUROSPHAERA Varma & Dangwal, 1964. (Acritarch genus)

Mathurosphaera rajivii Varma & Dangwal, 1964. *In*: Varma & Dangwal, 1964: 70, pl. 2, figs 11-12, EOCENE-OLIGOCENE (Cambay deep well), Cambay Basin, Gujarat.

"MEIOUROGONYAULAX" Sarjeant, 1966. **NOW LITHODINIA** Eisenack, 1935 emend. Gocht, 1975b, emend. Williams *et al*., 1993. (Taxonomic senior synonym)

Meiourogonyaulax bulloidea (Cookson & Eisenack, 1960b) Sarjeant, 1969. **NOW Lithodinia bulloidea** (Cookson & Eisenack, 1960b) Gocht, 1976.

Meiourogonyaulax sp. *In*: Kumar, 1987a = **Lithodinia sp.**

MEMBRANILARNACIA Eisenack, 1963a emend. Williams & Downie, 1966c.

Membranilarnacia delicata Kar, 1979. *In*: Kar, 1985, pl. 4, figs 70-71 = **Polysphaeridium zoharyi** (Rossignol, 1962) Bujak *et al*., 1980. (According to Jain & Garg, 1991).

Membranilarnacia donaensis Saxena & Rao, 1984. **NOW Tuberculodinium vancampoae** (Rossignol, 1962) Wall, 1967. (Taxonomic senior synonym, according to Jain & Garg. 1990).

Membranilarnacia leptoderma (Cookson & Eisenack, 1958) Eisenack, 1963a. *In*: Jain *et al*., 1984: 79, pl. 2, fig. 30, EARLY LATE TITHONIAN (Spiti Shale Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh.

Membranilarnacia sp. *In*: Kar. 1979, pl. 4, fig. 73 = **Tuberculodinium vancampoae** (Rossignol, 1962) Wall, 1967. (According to Jain, 1980).

Membranilarnacia sp. *In*: Sarkar, 1991: 3, pl. II, fig. 13, EARLY EOCENE (Kakara Series, Lesser Himalaya), Kakara-Chapla group of villages, Simla, Himachal Pradesh.

MEMBRANOPHORIDIUM Gerlach, 1961 emend. Stover & Evitt, 1978.

Membranophoridium aspinatum Gerlach, 1961. *In*: Mehrotra *et* al., 1996: 685-688, RUPELIAN - BERDIGALIAN (ONGC well Gulf- 1 and well Gulf- 2, Tarapur Shale Formation), RUPELIAN – BERDIGALIAN (ONGC well Gulf- 3 and well Gulf- 4, Tarpur, Babaguru and Post Babaguru formations), Gulf of Cambay, Gujarat; Mehrotra & Kamla Singh, 2003: 60, pl. 36, figs 3 & 6, THANETIAN (ONGC well NSP- A, 2703 – 2706m, Palakollu Shale), Krishna-Godavari Basin, Andhra Pradesh; MIDDLE EOCENE (ONGC well RZL- A, 1705 – 1710m), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 75, PRIABONIAN - RUPELIAN ex Mehrotra *et al*., 1996,

Cambay Basin, Gujarat; PRIABONIAN TOP (33.7 Ma), Mumbai Offshore; SELANDIAN - LUTETIAN ex Mehrotra & Kamla Singh, 2003, Krishna-Godavari Basin, Andhra Pradesh.

MENDICODINIUM Morgenroth, 1970 emend. Bucéfalo Palliani *et al*., 1997a.

Mendicodinium granulatum Kumar, 1986b. *In*: Kumar, 1986b: 393, pl. 3, fig. 6, text-fig. 7, EARLY KIMMERIDGIAN -- TITHONIAN (Jhuran Formation), Kutch. Gujarat; Kumar, 1987a: 598, EARLY KIMMERIDGIAN-TITHONIAN (Jhuran Formation), Kutch, Gujarat; Garg *et al*., 2003: 52-53, pl, IV, fig. 21, LATE LOWER TITHONIAN (*Kosmatia* Ammonite, Middle Division, Spiti Shale Formation, Kibber Section of Spiti Valley); LATE LOWER TITHONIAN (*Virgatosphinctes* Ammonite, Upper level of the Middle Division, Spiti Shale Formation, Gate Section of Spiti Valley); LATE LOWER TITHONIAN (*Paraboliceras* Ammonite, Upper part of the Middle Division, Spiti Shale Formation, Kibber Section), Malla Johar area, Kumaon Himalaya.

Mendicodinium microreticulatum Kumar, 1986b. *In*: Kumar, 1986b: 395-396, pl. 5, figs 1, 5, text-fig. 8, EARLY KIMMERIDGIAN-TITHONIAN (Jhuran Formation), Kutch, Gujarat; Kumar, 1987a: 598, EARLY KIMMERIDGIAN-TITHONIAN (Jhuran Formation), Kutch, Gujarat.

Mendicodinium quadratum Kumar, 1987a. *In*: Kumar, 1987: 242, pl. 2, figs 8-9, EARLY KIMMERIDGIAN-TITHONIAN (Jhuran Formation), Kutch, Gujarat.

Mendicodinium reticulatum Morgenroth, 1970. *In*: Singh & Sarkar, 1987: 208, EOCENE (Subathu Formation), Banethi-Bagthan area, Himachal Pradesh; Sarkar & Singh, 1988: 49, pl. 3, fig. 16, EOCENE (Subathu Formation), Banethi-Bagthan area, Himachal Pradesh.

cf. **Mendicodinium sp**. *In*: Kumar, 1986a: 31, VALANGINIAN-HAUTERIVIAN ONGC bore core nos. 1, 7, 8), Krishna-Godavari Basin, Andhra Pradesh.

MICRODINIUM Cookson & Eisenack, 1960a. emend. Sarjeant, 1966b emend. Stover & Evitt, 1978 emend. Slimani, 1994.

Microdinium cf. **M. setosum** Sarjeant, 1966b emend. Below, 1987b. *In*: Mathur, 1986: 195-198, LUTETIAN-BARTONIAN Kalol Formation. well no. 109), Cambay Basin, Gujarat.

Microdinium sp. *In*: Venkatachala & Kumar, 1980: 104, pl. 6, fig. 6, ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

Microdinium sp. *In*: Kumar, 1982: 171, pl. 2, fig. 14, NEOCOMIAN, Krishna-Godavari Basin, Andhra Pradesh.

Microdinium spp. *In*: Mehrotra *et al*., 2005: 53, ALBIAN – CENOMANIAN, Cauvery Basin, Tamil Nadu.

"MILLIOUDODINIUM" Stover & Evitt, 1978 emend. Sarjeant, 1982. **NOW CRIBROPERIDINIUM** Neale Sarjeant, 1962 emend. Davey, 1969a emend. Sarjeant, 1982b emend. Helenes, 1984. (Taxonomic senior senonym, according to Duxbury, 1980, p. 122)

Milloudodinium unicornum Kar, 1985. **NOW Apteodinium unicornum** (Kar, 1985) Jain & Garg, 1991.

MOMBASADINIUM Riding & Helby, 2001

Mombasadinium parvelatum (Jiang) Riding & Helby, 2001. *In*: Garg *et al*., 2003: 52-53, pl, II, fig. 8, LATE LOWER TITHONIAN (*Kosmatia* Ammonite, Middle Division, Spiti Shale Formation, Kibber Section of Spiti Valley), Malla Johar area, Kumaon Himalaya.

MUDERONGIA Cookson & Eisenack. 1958 emend. Monteil, 1991b.

Muderongia australis Helby, 1987 emend. Monteil, 1991b. *In*: Khowaja-Ateequzzaman & Jain, 1992: 162, pl. 4, fig. 4, HAUTERIVIAN-BARREMIAN (CGWB borehole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu; Mehrotra & Aswal, 2003: 69, pl. 12, figs 1, 2, 4 & 5; pl. 13, fig. 3, EARLY VALANGINIAN – TITHONIAN (ONGC well DRK- A, 2125 – 2130m,

Raghavapuram Formation), Krishna-Godavari Basin, Andhra Pradesh; LATE APTIAN – TITHONIAN (ONGC well RCPM-A, 2030 – 2930m, Raghavapuram and Golapalli formations), Krishna-Godavari Basin, Andhra Pradesh; LATE ALBIAN-CENOMANIAN – TITHONIAN-BERRIASIAN (ONGC well MVD- A, 1580 – 2340m, Raghavapuram and Golapalli formations), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 53, TITHONIAN - CENOMANIAN ex Mehrotra & Aswal, 2003, Krishna-Godavari Basin, Andhra Pradesh.

Muderongia crucis Neale & Sarjeant, 1962 emend. Monteil, 1991b. *In*: Khowaja-Ateequzzaman & Jain, 1992: 162, pl. 4, fig. 12, HAUTERIVIAN-BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu.

Muderongia mcwhaei Cookson & Eisenack, 1958 emend. Helby, 1987 emend. Monteil, 1991b. *In*: Jain & Khowaja-Ateequzzaman, 1984: 37-38, pl. 1, figs 1-5; pl. 2, figs 1-7; pl. 3, figs 3-9, EARLY CRETACEOUS (Puduvoyal bore hole), Palar Basin, Andhra Pradesh (Khowaja-Ateequzzaman & Jain, 1992 reassessed the age to be Hauterivian-Barremian); Kumar, 1986a: 31, pl. 2, fig. 4, VALANGINIAN-HAUTERIVIAN (ONGC bore core no. 5), Krishna-Godavari Basin, Andhra Pradesh. (Garg *et al.,* 1988 reassessed the age of this assemblage to be Hauterivian-Barremian); Mehrotra & Sarjeant 1986: 725, pl. 11, figs 5-6, APTIAN (Periyavadavadi shallow well- 1), Cauvery Basin, Tamil Nadu; Khowaja-Ateequzzaman & Jain, 1992: 162, pl. 12, fig. 15, HAUTERIVIAN-BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu; Mehrotra & Aswal, 2003: 68, pl. 14, figs 2 & 5, APTIAN – BARREMIAN (ONGC well RCPM- A, 2075 – 2305m, Raghavapuram and Golapalli formations), Krishna-Godavari Basin, Andhra Pradesh; APTIAN-BARREMIAN – LATE KIMMERIDGIAN (ONGC well MVD- A, 1900 – 2645m, Raghavapuram and Golapalli formations), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 53, NEOCOMIAN – LOWER ALBIAN ex Mehrotra *et al.*, 2002, Cauvery Basin, Tamil Nadu; KIMMERIDGIAN - APTIAN ex Mehrotra & Aswal, 2003, Krishna-Godavari Basin, Andhra Pradesh.

Muderongia cf. **M. mcwhaei** Cookson & Eisenack, 1958 emend. Helby, 1987 emend. Monteil, 1991b. *In*: Mehrotra & Sarjeant, 1986: 725-726, pl. 11, figs 1-3, text-fig. 7b, APTIAN (Periyavadavadi shallow well- I), Cauvery Basin, Tamil Nadu.

Muderongia simplex Alberti, 1961 emend. Monteil, 1991b emend. Poulsen, 1996. *In*: Khowaja-Ateequzzaman & Jain, 1992: 162, 164, pl. 8, figs 8, 13, HAUTERIVIAN-BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu; Mehrotra *et al*., 2005: 53, LATE KIMMERIDGIAN - APTIAN ex Mehrotra & Aswal, 2003, Krishna-Godavari Basin, Andhra Pradesh

Muderongia staurota Sarjeant, 1966c emend. Monteil, 1991b. *In*: Kumar, 1982: 173, pl. 2, fig. 11, NEOCOMIAN, Krishna-Godavari Basin, Andhra Pradesh; Kumar, 1986a: 31, VALANGINIAN-HAUTERIVIAN (ONGC bore core nos. 1, 3-7), Krishna-Godavari Basin, Andhra Pradesh. (Garg *et al.,* 1988 reassessed the age of this assemblage to be Hauterivian-Barremian); Khowaja-Ateequzzaman & Jain, 1992: 164, pl. 6, fig. 12, HAUTERIVIAN-BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu.

Muderongia tetracantha (Gocht, 1957) Alberti, 1961 emend. Monteil, 1991b. *In*: Jain, 1977b: 180, pl. 5, fig. 57, ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu; Jain & Khowaja-Ateequzzaman, 1984: 38-39, pl. 2, figs 8, 9; pl. 3, fig. 9, EARLY CRETACEOUS (Puduvoyal bore hole), Palar Basin, Tamil Nadu; Mehrotra & Sarjeant, 1986: 726, pl. 4, figs 1-2, APTIAN (Periyavadavadi shallow well- 1), Cauvery Basin, Tamil Nadu; Mehrotra & Aswal, 2003: 71, pl. 12, figs 4 & 5; pl. 14, fig. 1, NEOCOMIAN (ONGC

well END- A, 1825 – 1830m, Raghavapuram Formation), Krishna-Godavari Basin, Andhra Pradesh; LATE APTIAN – OXFORDIAN (ONGC well RCPM- A, 2055 – 3084m, Raghavapuram and Golapalli formations), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al.*, 2005: 54, NEOCOMIAN – LOWER ALBIAN ex Mehrotra *et al.*, 2002, Cauvery Basin, Tamil Nadu; OXFORDIAN – LATE APTIAN ex Mehrotra & Aswal, 2003, Krishna-Godavari Basin, Andhra Pradesh.

Muderongia sp. *In*: Kumar, 1982: 173, pl. 1, fig. 12, NEOCOMIAN, Krishna-Godavari Basin, Andhra Pradesh.

Muderongia sp. *In*: Mehrotra & Sarjeant, 1986: 726-727, pl. 11, figs 4, 7, HAUTERIVIAN (Periyavadavadi shallow well- 1), Cauvery Basin, Tamil Nadu.

Muderongia sp. A. Khowaja-Ateequzzaman & Jain, 1992: 164, pl. 3, fig. 4, HAUTERIVIAN-BARREMIAN (CGWB borehole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu.

Muderongia sp. A. *In*: Mehrotra & Aswal, 2003: 72, pl. 11, figs 5 & 6, LATE APTIAN (ONGC well RCPM- A, 2055 – 2060m, Raghavapuram Formation), Krishna-Godavari Basin, Andhra Pradesh.

Muderongia sp. **B.** *In*: Mehrotra & Aswal, 2003: 73, pl. 11, figs 1 & 2, EARLY APTIAN (ONGC well RCPM- A, 2095 – 2100m, Raghavapuram Formation), Krishna-Godavari Basin, Andhra Pradesh.

MURATODINIUM Drugg. 1970b.

Muratodinium fimbriatum (Cookson & Eisenack, 1967b) Drugg, 1970b. *In*: Mathur, 1986: 195-198, LUTETIAN-BARTONIAN (Kalol Formation. well no. 109), Cambay Basin, Gujarat; Singh & Sarkar, 1987: 208, EOCENE (Subathu Formation), Banethi-Bagthan area. Himachal Pradesh; Sarkar & Singh, 1988: 49, pl. 3, figs 21-22, EOCENE (Subathu Formation). Banethi-Bagthan area, Himachal Pradesh; Aswal & Pundeer, 1996: 636, pl. 2, fig. 7, THANETIAN – YPRESIAN (ONGC Mori well- A, 3200 – 3120m), Krishna-Godavari Basin, Andhra Pradesh; Kumar *et al.*, 1996: 150, DANIAN (Upper part of Mahadeo Formation, Um Sohryngkew River Section), Meghalaya; Garg & Khowaja-Ateequzzaman, 2000: 471, LATE THANETIAN (Lakadong Sst Member, Sylhet Limestone Formation), Cherrapunji area, Khasi Hills, Meghalaya; Sarkar & Prasad, 2000b: 141, EARLY – MIDDLE LUTETIAN (Subathu Formation, Morni Hills), Haryana; Saxena & Sarkar, 2000: 256, 263, MIDDLE EOCENE (Siju Formation), Simsang River near Siju, South Garo Hills, Meghalaya; Mehrotra & Kamla Singh, 2003: 61, pl. 17, figs 1 & 2; pl. 30, fig. 1, EARLY EOCENE – LATE PALAEOCENE (ONGC well MORI- A, 3000 – 3200m, Palakollu Shale), Krishna-Godavari Basin, Andhra Pradesh; PRIABONIAN – THANETIAN (ONGC well RZL- A, 1500 – 3200m, Bhimapalli Limestone, Pasarlapudi Formation and Palakollu Shale), Krishna-Godavari Basin, Andhra Pradesh; BARTONIAN – LUTETIAN (ONGC well SRP- A, 1500 – 2000m), Krishna-Godavari Basin, Andhra Pradesh; MIDDLE EOCENE – PALAEOCENE (ONGC well CTP- A, 1950 – 3350m, Bhimapalli Limestone and Pasarlapudi Formation), Krishna-Godavari Basin, Andhra Pradesh; THANETIAN (ONGC well MNP- A, 1425 – 2750m), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 75, YPRESIAN – LUTETIAN (51 – 44 Ma) ex Mehrotra *et al*., 2003, Mumbai Offshore; SELANDIAN - PRIABONIAN ex Mehrotra & Kamla Singh, 2003, Krishna-Godavari Basin, Andhra Pradesh; YPRESIAN - LUTETIAN ex Mehrotra *et al*., 2002, Assam-Arakan Basin, Northeastern India.

Muratodinium sp. A *In*: Jain & Tandon, 1981: 12, pl. 3, fig. 42, MIDDLE EOCENE (Harudi Formation), Kutch. Gujarat.

Muratodinium sp. A *In*: Kar, 1985: 193, pl. 44, fig. 6, MIDDLE EOCENE (Harudi Formation), Kutch, Gujarat. (reproduction from Jain & Tandon. 1981).

Muratodinium sp. B *In*: Jain & Tandon, 1981: 12, pl. 3, fig. 43, MIDDLE EOCENE (Harudi Formation), Kutch. Gujarat.

Muratodinium sp. B *In*: Kar, 1985: 193-194, EOCENE (Harudi Formation), Kutch, (reproduction from Jain & Tandon, 1981).

NANNOCERATOPSIS Deflandre, 1939a emend. Evitt, 1961b emend. Piel & Evitt, 1980 emend. Poulsen, 1992b.

Nannoceratopsis dictyambonis Riding, 1984a. *In*: Sharma & Sarjeant, 1987: 259, pl. 2, fig. 6, LATE JURASSIC (Baratang Formation), Andaman Islands.

Nannoceratopsis gracilis Alberti, 1961 emend. Evitt, 1962 emend. Van Helden, 1977. *In*: Mehrotra & Aswal, 2003: 75, pl. 31, figs 4 & 5, KIMMERIDGIAN (ONGC well MVD- A, 2460 – 2465m, Golapalli formation), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 54, LATE KIMMERIDGIAN ex Mehrotra & Aswal, 2003, Krishna-Godavari Basin, Andhra Pradesh.

Nannoceratopsis pellucida Deflandre, 1939a emend. Evitt, 1961b. *In*: Jain *et al*., 1984: 78, pl. 1, fig. 12, EARLY-MIDDLE TITHONIAN (Spiti Shale Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh; Jain *et al*., 1986: 82, pl. 1, fig. 4, LATE JURASSIC, Kutch, Gujarat; Garg *et al*., 2003: 52-53, pl, III, fig. 2, LATE LOWER TITHONIAN (*Kosmatia* Ammonite, Middle Division, Spiti Shale Formation, Kibber Section of Spiti Valley); LATE LOWER TITHONIAN (*Virgatosphinctes* Ammonite, Upper level of the Middle Division, Spiti Shale Formation, Gate Section of Spiti Valley); LATE LOWER TITHONIAN (*Paraboliceras* Ammonite, Upper part of the Middle Division, Spiti Shale Formation, Kibber Section); LATE UPPER TITHONIAN (*Blanfordiceras* Ammonite), Malla Johar area, Kumaon Himalaya; Mehrotra & Aswal, 2003: 74, pl. 31, fig. 1, BERRIASIAN – OXFORDIAN (ONGC well RCPM- A, 2720 – 3084m, Golapalli Formation), Krishna-Godavari Basin, Andhra Pradesh; BARREMIAN – TITHONIAN (ONGC well MVD- A, 2040 – 2395m, Golapalli Formation), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 54, OXFORDIAN - BARREMIAN ex Mehrotra & Aswal, 2003, Krishna-Godavari Basin, Andhra Pradesh.

Nannoceratopsis radiata Kumar, 1986b. *In*: Kumar, 1986b: 404-405, pl. 5, figs 2, 6, EARLY KIMMERIDGIAN-TITHONIAN (Jhuran Formation), Kutch, Gujarat; Kumar, 1987a: 598, EARLY KIMMERIDGIAN-TITHONIAN, (Jhuran Formation), Kutch, Gujarat, (orthographic change from *N. radiatus* listed by Kumar, 1986b & 1987a); *In*: Garg *et al*., 2003: 52-53, pl, I, fig. 6, LATE LOWER TITHONIAN (*Kosmatia* Ammonite, Middle Division, Spiti Shale Formation, Kibber Section of Spiti Valley), Malla Johar area, Kumaon Himalaya.

Nannoceratopsis ridingii Poulsen, 1992b. *In*: Mehrotra & Aswal, 2003: 76, pl. 31, fig. 2, OXFORDIAN – KIMMERIDGIAN (ONGC well RCPM- A, 3020 – 3120m, Golapalli Formation), Krishna-Godavari Basin, Andhra Pradesh; KIMMERIDGIAN – TITHONIAN (ONGC well MVD- A, 2360 – 2485m, Golapalli Formation), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 54, OXFORDIAN - TITHONIAN ex Mehrotra & Aswal, 2003, Krishna-Godavari Basin, Andhra Pradesh.

"NECROBROOMEA" Wiggins, 1975 emend. Below, 1990. **NOW BATIOLADINIUM** Brideaux, 1975 emend. Pourtoy, 1988. (Taxonomic senior synonym, according to Dörhöfer & davies, 1980, p. 37)

Necrobroomea Jaegeri (Alberti, 1961) Wiggins, 1975 emend. Below, 1990 **NOW Batioladinium jaegeri** (Alberti, 1961) Brideaux, 1975 emend. Below, 1990.

NELSONIELLA Cookson & Eisenack, 1960.

Nelsoniella aceras Cookson & Eisenack, 1960. *In*: Mehrotra & Aswal, 2003: 77, pl. 27, figs 3 & 5, LATE CAMPANIAN – TURONIAN (ONGC well MVD- A, 880 – 1045m, Tirupati Formation), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 54, TURONIAN – LATE

CAMPANIAN ex Mehrotra & Aswal, 2003, Krishna-Godavari Basin, Andhra Pradesh.

NEMATOSPHAEROPSIS Deflandre & Cookson, 1955 emend. Williams & Downie, 1966c emend. Wrenn, 1988.

Nematosphaeropsis densiradiata (Cookson & Eisenack, 1962b) Stover & Evitt, 1978. *In*: Kar, 1985: 184-185, pl. 40, figs 11-12 = **Adnatosphaeridium multispinosum** Williams & Downie, 1966c (According to Jain & Garg, 1991) .

Nematosphaeropsis lamniscata Bujak, 1984 emend. Wrenn, 1988. *In*: Mehrotra & Kamla Singh, 2003: 62, pl. 3, fig. 2. MIOCENE (ONGC well NSP- A, 630 – 633m, Rajahmundry Sandstone), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 76, MIOCENE ex Mehrotra & Kamla Singh, 2003, Krishna-Godavari Basin, Andhra Pradesh.

Nematosphaeropsis sp. *In*: Mehrotra & Kamla Singh, 2003, pl. 7, figs 1 & 2, SERRAVALLIAN (ONGC well SRP- A, 875 – 888m, Narasapur Claystone and Rajahmundry Sandstone), Krishna-Godavari Basin, Andhra Pradesh.

NUMMUS Morgan, 1975 (Acritarch genus)

Nummus monoculatus Morgan, 1975. *In*: Mehrotra & Aswal, 2003: 78, pl. 35, fig. 3, APTIAN – TURONIAN (ONGC well RCPM-A, 1360 – 1915m, Raghavapuram and Tirupati formations), Krishna-Godavari Basin, Andhra Pradesh; LATE TITHONIAN – CENOMANIAN (ONGC well DRK- A, 1670 – 2180m, Raghavapuram Formation), Krishna-Godavari Basin, Andhra Pradesh; CENOMANIAN (ONGC well MVD- A, 1080 – 1585m, Raghavapuram and Tirupati formations), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 55, LATE TITHONIAN - TURONIAN ex Mehrotra & Aswal, 2003, Krishna-Godavari Basin, Andhra Pradesh.

Nummus similis (Cookson & Eisenack, 1960b) Burger, 1980b. *In*: Khowaja-Ateequzzaman & Jain, 1992: 164, pl. 6, fig. 7; pl. 13, fig. 2, HAUTERIVIAN-BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu; Garg *et al*., 2003: 52-53, pl, II, fig. 6; pl. V, 10, EARLY LOWER TITHONIAN (*Uhligites* Ammonite, Lower part of Middle Division of Spiti Shale Formation, Laptal Section); LATE LOWER TITHONIAN (*Hildoglochiceras* Ammonite, Middle part of the Middle Division, Spiti Shale Formation, Laptal Section); LATE LOWER TITHONIAN (*Kosmatia* Ammonite, Middle Division, Spiti Shale Formation, Kibber Section of Spiti Valley); LATE LOWER TITHONIAN (*Virgatosphinctes* Ammonite, Upper level of the Middle Division, Spiti Shale Formation, Gate Section of Spiti Valley); LATE UPPER TITHONIAN – BERRIASIAN-EARLY VALANGINIAN (*Pterolytoceras* Ammonite, Upper levels of the Upper Division, Spiti Shale Formation), Malla Johar area, Kumaon Himalaya.

OCCISUCYSTA Gitmez, 1970 emend. Jan du Chêne *et al.,* 1986b.

Occisucysta crestata Jain, 1977b. **NOW Tehamadinium crestatum** (Jain, 1977b) Jan du Chêne *et al.,* 1986b.

Occisucysta sp. *In*: Jain *et al*., 1986: 75--76, pl. 2, fig. 21, LATE JURASSIC, Kutch, Gujarat.

Occisucysta sp. A *In*: Jain, 1977b: 175, pl. 5, figs 59-60, EARLY ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

ODONTOCHITINA Deflandre, 1937b emend. Davey, 1970 emend. Bint, 1986.

Odontochitina athabaskensis Pocock, 1962. *In*: Khowaja-Ateequzzaman & Jain, 1992: 164, pl. 13, fig. 10, HAUTERIVIAN-BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu.

Odontochitina costata Alberti, 1961 emend. Clarke & Verdier, 1967. *In*: Mehrotra & Aswal, 2003: 80, pl. 29, fig. 5, MAASTRICHTIAN (ONGC well NSP- A, 3621 – 3624m, Chintalapalli Formation), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 55,

MAASTRICHTIAN *ex* Mehrotra & Aswal, 2003, Krishna-Godavari Basin, Andhra Pradesh.

Odontochitina cribropoda Deflandre & Cookson, 1955. *In*: Jain, 1977b: 186, pl. 3, fig. 31, EARLY ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu; Mehrotra & Sinha, 1981: 154, pl. 3, figs 7-8, LATE CRETACEOUS-MIDDLE EOCENE (Sangchamalla Formation), Malla Johar area, Kumaon Himalaya, (Jain & Garg, 1986a reassessed the age of this assemblage lo be Late Cretaceous).

Odontochitina subbaramana Jain & Taugourdeau-Lantz, 1973. *In*: Jain & Taugourdeau-Lantz, 1973: 64-65, pl. 4, fig. 3, ?APTIAN-EARLY ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

Odontochitina operculata (O. Wetzel, 1933a) Deflandre & Cookson, 1955. *In*: Jain, 1977b: 186, pl. 3, fig. 30, EARLY ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu: Venkatachala & Kumar, 1980: 102, pl. 1, fig. 1, ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu; Khowaja-Ateequzzaman & Jain, 1992: 164, pl. 12, figs 13, 14, HAUTERIVIAN-BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu; Khowaja-Ateequzzaman & Garg, 2002: 137, LATE TURONIAN (Kulakkalnattam Sandstone Member, Garudamangalam Formation), Cauvery Basin, southern India; Mehrotra & Aswal, 2003: 79, pl. 10, figs 1, 3 & 4, BARREMIAN – MAASTRICHTIAN (ONGC well RCPM- A, 1015 – 2967m, Golapalli, Raghavapuram and Tirupati formations), Krishna-Godavari Basin, Andhra Pradesh; CENOMANIAN (ONGC well DRK- A, 1475 – 1700m, Raghavapuram Formation), Krishna-Godavari Basin, Andhra Pradesh; TITHONIAN – CAMPANIAN (ONGC well MVD- A, 880 – 2485m, Golapalli, Raghavapuram and Tirupati formations), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 55, ALBIAN - CENOMANIAN *ex* Mehrotra *et al*., 2002, Cauvery Basin, Tamil Nadu; TITHONIAN - MAASTRICHTIAN *ex* Mehrotra & Aswal, 2003, Krishna-Godavari Basin, Andhra Pradesh.

Odontochitina silicorum Deflandre, 1937b. *In*: Venkatachala & Sharma, 1982: 4, pl. 2, fig. 5, LATE SENONIAN, Krishna-Godavari Basin, Andhra Pradesh.

Odontochitina sp. cf. **O. operculata** (O. Wetzel, 1933a) Deflandre & Cookson, 1955. *In*: Jain, 1977b: 186, pl. 3, fig. 32, EARLY ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu; Venkatachala & Kumar, 1980: 102, pl. 4, fig. 11, ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

Odontochitina porifera Cookson, 1956. *In*: Mehrotra *et al*., 2005: 55, BARREMIAN - CAMPANIAN *ex* Mehrotra & Aswal, 2003, Krishna-Godavari Basin, Andhra Pradesh

Odontochitina silicorum Deflandre, 1937b. **NOW Odontochitina operculata** (O. Wetzel, 1933a) Deflandre & Cookson, 1955.

Odontochitina subbaramana Jain & Taugourdeau--Lantz, 1973. **NOW Odontochitina cribropoda** Deflandre & Cookson, 1955. (Taxonomic senior synonym, according to Jain, 1977b).

Odontochitina sp. A *In*: Jain *et al*., 1975: 9, pl. 7, figs 75-76, MAASTRICHTIAN (Mahadek Formation), Cherrapunji area, Meghalaya.

Odontochitina sp. A *In*: Venkatachala & Kumar, 1980: 102, pl. 5, fig. 11, ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

Odontochitina sp. A. *In*: Khowaja-Ateequzzaman & Jain, 1992: 165, pl. 10, figs 14-16, HAUTERIVIAN-BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu.

Odontochitina sp. B *In*: Jain *et al*., 1975: 9, pl. 7, fig. 74, MAASTRICHTIAN (Mahadek Formation), Cherrapunji area, Meghalaya.

Odontochitina sp. B *In*: Venkatachala & Kumar, 1980: 102, pl. 5, fig. 6, ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

Odontochitina sp. B. *In*: Khowaja-Ateequzzaman & Jain, 1992: 165, pl. 11, fig. 10, HAUTERIVIAN-BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu.

OLIGOSPHAERIDIUM Davey & Williams, 1966b emend. Davey, 1982b.

Oligosphaeridium albertense (Pocock, 1962) Davey & Williams, 1969. *In*: Jain & Taugourdeau-Lantz, 1973: 61, pl. 3, fig. 3, ?APTIAN-EARLY ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu; Khowaja-Ateequzzaman & Jain, 1992: 166, pl. 7, figs 14, 16, HAUTERIVIAN-BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu.

Hystrichosphaeridium albertense (Pocock, 1962) Davey & Williams, 1969. *In*: Banerjee, 1972: 135, CRETACEOUS (Khara Tar well), Rajasthan.

Hystrichosphaeridium coelentratum (Tasch in Tasch *et al.*, 1964) davey & williams, 1969. *In*: Venkatachala & Kumar, 1980: 100, pl. 4, fig. 10, ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

Oligosphaeridium reniforme (Tasch in Tasch *et al.*, 1964) Davey, 1969. *In*: Jain, 1977b: 182, pl. I, fig. 9, EARLY ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

Oligosphaeridium anthophorum (Cookson & Eisenack, 1958) Davey, 1969a. **NOW Stiphrosphaeridium anthophorum** (Cookson & Eisenack, 1958) Lentin & Williams, 1985.

Oligosphaeridium ?asterigerum (Gocht, 1959) Davey & Williams, 1969. *In*: Mehrotra & Sarjeant. 1986: 718, pl. 6, figs 1,3,5,6, APTIAN (Periyavadavadi shallow well- 1), Cauvery Basin, Tamil Nadu; Mehrotra *et al*., 2005: 56, APTIAN ex Mehrotra *et al*., 2002, Cauvery Basin, Tamil Nadu. (Questionable assignment: Davey & Williams, 1969)

Oligosphaeridium cephalum Sah *et al*., 1970. **NOW Oligosphaeridium complex** (White, 1842) Davey & Williams, 1966. (Taxonomic senior synonym, according to Lejeune-Sarpentier & Sarjeant, 1981, p. 9 and Jain, 1982, p. 52).

Oligosphaeridium complex (White, 1842) Davey & Williams, 1966b. *In*: Jain & Subbaraman, 1969: 549, EARLY CRETACEOUS (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu: Jain & Taugourdeau-Lantz, 1973: 61, pl. 3, figs 1-2, ?APTIAN-EARLY ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu; Jain, 1977b: 181-182, pl. 1, fig. 8, EARLY ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu; Singh *et al*., 1979: 35-36, text-fig. 1, pl. 1, fig. 5, LATE PALAEOCENE-LATE EOCENE (Subathu Formation), Simla Hills, Punjab Basin, Himachal Pradesh; Venkatachala & Kumar, 1980: 101, pl. 1, figs 6,9, ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu; Kar & Saxena, 1981: 151, pl. 4, fig. 79, MIDDLE-LATE EOCENE (Rataria bore core no. 27), Kutch, Gujarat; Khanna *et al*., 1981: 259, pl. 2, fig. 3, (Subathu Formation), Simla Hills, Himachal Pradesh; Mehrotra, 1981: 15-16, pl. 1, fig. 7, MIDDLE EOCENE, Mikir-North Cachar Hills, Assam; Mehrotra & Sarjeant, 1981, pl. 1, figs 1-2, LATE CRETACEOUS-MIDDLE EOCENE (Sangchamalla Formation) , Malla Johar area, Kumaon Himalaya, Uttar Pradesh (Jain & Garg, 1982 reassessed the age of this assemblage to be Late Cretaceous); Kumar, 1982: 173-174, pl. 1, fig. 8, NEOCOMIAN, Krishna-Godavari Basin, Andhra Pradesh; Kumar, 1986a: 31, VALANGINIAN--HAUTERIVIAN (ONGC bore core nos. 7, 8), Krishna-Godavari Basin, Andhra Pradesh, (Garg *et al.,* 1988 reassessed the age of this assemblage to be Hauterivian-Barremian); Mehrotra & Sarjeant, 1986: 717-718, pl. 6, fig. 2,

APTIAN (Periyavadavadi shallow well- 1), Cauvery Basin, Tamil Nadu; Singh & Sarkar, 1987: 208, EOCENE (Subathu Formation), Banethi-Bagthan area, Himachal Pradesh; Sarkar & Singh, 1988: 49-50, EOCENE (Subathu Formation), Banethi-Bagthan area, Himachal Pradesh; Khowaja-Ateequzzaman & Jain, 1992: 166, 168, pl. 2, figs 11, 13, HAUTERIVIAN-BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu; Aswal & Pundeer, 1996: 636, YPRESIAN – LUTETIAN-BARTONIAN (ONGC Mori well-A, 2700 – 2500m), Krishna-Godavari Basin, Andhra Pradesh; Khowaja-Ateequzzaman & Garg, 2002: 136, EARLY – LATE TURONIAN (Kulakkalnattam Sandstone Member, Garudamangalam Formation), Cauvery Basin, southern India; Mehrotra *et al*., 2005: 55, APTIAN *ex* Mehrotra *et al*., 2002, Cauvery Basin, Tamil Nadu; PRIABONIAN *ex* Mehrotra & Aswal, 2003, Krishna-Godavari Basin, Andhra Pradesh; LOWER – MIDDLE EOCENE *ex* Mehrotra *et al*., 2002, Assam-Arakan Basin, Northeastern India.

Areosphaeridium arcuatum Eaton, 1971. *In*: Mehrotra & Sinha, 1981: 152, pl. 2, fig. 2, LATE CRETACEOUS-MIDDLE EOCENE (Sangchamalla Formation), Malla Johar area, Kumaon Himalaya, (Jain & Garg, 1986a reassessed the age of this assemblage to be Late Cretaceous).

Hystrichosphaeridium complex (White, 1842) Deflandre, 1946b. *In*: Varma & Dangwal, 1964: 65, pl. 2, figs 2-3, EOCENE-OLIGOCENE (Cambay deep well no. 2), Cambay Basin, Gujarat.

Hystrichosphaeridium himalayense Mehrotra & Sinha, 1981. *In*: Mehrotra & Sinha, 1981: 152, pl. 1, figs 7-9, LATE CRETACEOUS-MIDDLE EOCENE (Sangchamalla Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh, (Jain & Garg, 1986a reassessed the age of this assemblage to be Late Cretaceous).

Oligosphaeridium cephalum Sah *et al*., 1970. *In*: Sah *et al*., 1970: 147, pl. 2, figs 22-23, LATE CRETACEOUS (Langpar Formation), Meghalaya; Kar *et al*., 1972: 146. pl. 1, fig. 2, Tura Formation). Garo Hills, Meghalaya.

Oligosphaeridium complex subsp. **brevispinum** Jain, 1977b. *In*: Jain, 1977b: 182, pl. 1. fig. 4, EARLY ALBIAN (Dalmiapuram Formation), Cauvery Basin. Tamil Nadu; Khowaja-Ateequzzaman & Garg, 2002: 137, LATE TURONIAN (Kulakkalnattam Sandstone Member, Garudamangalam Formation), Cauvery Basin, southern India.

Oligosphaeridium dharampurense Khanna & Singh, 1981 b.*In*: Khanna & Singh, 1981: 398, pl. 2, figs 5-6, text-fig. 11, MIDDLE EOCENE (Subathu Formation), Simla Hills, Himachal Pradesh.

Oligosphaeridium dharampurensis Singh *et al*., 1979. *In*: Singh *et al*., 1979: 35-36, text-fig. 1, LATE PALAEOCENE--LATE EOCENE (Subathu Formation), Simla Hills, Punjab Basin, Himachal Pradesh, (name not validly published)

Oligosphaeridium dharampurensis Khanna, 1979. *In*: Khanna, 1979: 217, LATE PALAEOCENE-LATE EOCENE (Subathu Formation), Simla Hills, Himachal Pradesh, (name not validly published)

Oligosphaeridium dharampurensis Khanna *et al*., 1981. *In*: Khanna *et al*., 1981, pl. 3, fig. 5, (Subathu Formation), Simla Hills, Himachal Pradesh, (name not validly published)

Oligosphaeridium dictyophorum (Cookson & Eisenack, 1958) Davey & Williams, 1969. **NOW Stiphrosphaeridium dictyophorum** (Cookson & Eisenack, 1958) Lentin & Williams, 1985.

Oligosphaeridium diluculum Davey, 1982b. *In*: Mehrotra & Sarjeant, 1986: 718-719, pl. 7, figs 1-7, APTIAN (Periyavadavadi shallow well- 1), Cauvery Basin, Tamil Nadu; Mehrotra *et al*., 2005: 56, APTIAN ex Mehrotra *et al*., 2002, Cauvery Basin, Tamil Nadu.

Oligosphaeridium divergens (Authorship not cited). *In*: Aswal & Pundeer, 1996: 636, LUTETIAN-BARTONIAN – LATE EOCENE (ONGC Mori well- A, 2500 – 1500m), Krishna-Godavari Basin, Andhra Pradesh. (Name not validly published)

Oligosphaeridium patulum Riding & Thomas, 1988. *In*: Mehrotra *et al*., 2005: 56, RHAETIAN-MIDDLE SINEMURIAN – EARLY TITHONIAN, Krishna-Godavari Basin, Andhra Pradesh.

Oligosphaeridium perforatum Jain 1977b (Name illegitimate, senior senonym: *Oligosphaeridium perforatum* (Gocht, 1959) Davey & Williams, 1969). **NOW Oligosphaeridium porosum** Lentin & Williams, 1981. (Substitute name)

Oligosphaeridium poculum Jain, 1977b. *In*: Jain, 1977b: 181, pl. 1, figs 1-3, EARLY ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

Oligosphaeridium porosum Lentin & Williams, 1981. *In*: Sarkar, 1991: 3, pl. I, fig. 15, EARLY EOCENE (Kakara Series, Lesser Himalaya), Kakara-Chapla group of villages, Simla, Himachal Pradesh;

> *Oligosphaeridium perforatum* Jain, 1977b. *In*: Jain, 1977b: 181, pl. 1, figs 5-7, EARLY ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

Oligosphaeridium pulcherrimum (Deflandre & Cookson, 1955) Davey & Williams, 1966. *In*: Jain, 1977b: 182, EARLY ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu; Jain *et al*., 1978: 117, pl. 1, fig. 3, LATE JURASSIC (Spiti Shale Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh; Mehrotra & Sinha, 1981: 152-153, pl. 1, figs 3-5, LATE CRETACEOUS-MIDDLE EOCENE (Sangchamalla Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh, (Jain & Garg, I986a reassessed the age to be Late Cretaceous); Jain *et al*., 1984: 78, KIMMERIDGIAN (Spiti Shale Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh; Kumar, 1986a: 31, VALANGINIAN-HAUTERIVIAN (ONGC bore core nos. 4, 6, 7), Krishna-Godavari Basin, Andhra Pradesh, (Garg *et aI.,* 1988 reassessed the age of this assemblage to be Hauterivian-Barremian); Kumar, 1986b: 396, pl. 2, fig. 5, EARLY KIMMERIDGIAN-TITHONIAN (Jhuran Formation), Kutch, Gujarat; Kumar, 1987a: 598, EARLY KIMMERIDGIAN-TITHONIAN (Jhuran Formation), Kutch, Gujarat; Khowaja-Ateequzzaman & Jain, 1992: 168, pl. 6, fig. 6; pl. 9, fig. 5, HAUTERIVIAN-BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu; Khowaja-Ateequzzaman & Garg, 2002: 136, pl. 1, fig. 16, EARLY TURONIAN (Kulakkalnattam Sandstone Member, Garudamangalam Formation), Cauvery Basin, southern India.

> *Areosphaeridium dictyoplokus* (Klumpp, 1953) Eaton, 1971. *In*: Mehrotra & Sinha, 1981: 152, pl. 2, fig, 1, LATE CRETACEOUS-MIDDLE EOCENE (Sangchamalla Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh, (Jain & Garg, 1986a reassessed the age of this assemblage to be Late Cretaceous).

Oligosphaeridium reniforme (Tasch in Tasch *et al*., 1964) Davey, 1969a. **NOW Oligosphaeridium albertense** (Pocock, 1962) Davey & Williams, 1969.

Oligosphaeridium totum Brideaux, 1971. *In*: Khowaja-Ateequzzaman & Jain, 1992: 168, pl. 2, figs 8, 10, HAUTERIVIAN-BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu.

Oligosphaeridium sp. *In*: Venkatachala & Kumar, 1980: 101, pl. 4, fig. 4, ALBIAN

(Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

Oligosphaeridium sp. *In*: Mehrotra & Sinha, 1981: 153, pl. 1, fig. 6, LATE CRETACEOUS-MIDDLE EOCENE (Sangchamalla Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh, (Jain & Garg, 1986a reassessed the age of this assemblage to be Late Cretaceous).

Oligosphaeridium sp. *In*: Jain *et al.*, 1986: 82, pl. 1, fig. 3; pl. 3, fig. 43, LATE JURASSIC, Kutch, Gujarat.

Oligosphaeridium sp. *In*: Nandi, 1990: 126, pl. 5, fig, 9, MAASTRICHTIAN-DANIAN, Meghalaya.

Oligosphaeridium sp. *In:* Mehrotra & Kamla Singh, 2003: 64, pl. 6, figs 1 & 2, PRIABONIAN (ONGC well NSP- A, 3643 – 3649, Chintalapalli Shale), Krishna-Godavari Basin, Andhra Pradesh.

Oligosphaeridium spp. *In*: Singh & Khanna, 1980: 471,2, figs 6-7, LATE PALAEOCENE-LATE EOCENE (Subathu Formation), Simla Hills, Punjab Basin, Himachal Pradesh.

Oligosphaeridium sp. A. *In*: Khowaja-Ateequzzaman & Jain, 1992: 168, pl. 8, fig. 3; pl. 10, fig. 3, HAUTERIVIAN-BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu.

Oligosphaeridium sp. B. *In*: Khowaja-Ateequzzaman & Jain, 1992: 168, 169, pl. 9, fig. 12, HAUTERIVIAN-BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu.

OMATIA Cookson & Eisenack, 1958 emend. Wiggins, 1969 emend. Stover & Helby, 1987b.

Omatia montgomeryi Cookson & Eisenack, 1958 emend. Stover & Helby, 1987b. *In*: Jain *et al.*, 1984: 79, pl. 1, fig. 17, EARLY LATE TITHONIAN (Spiti Shale Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh; Garg *et al.*, 2003: 52-53, pl, I, fig. 2, LATE LOWER TITHONIAN (*Kosmatia* Ammonite, Middle Division, Spiti Shale Formation, Kibber Section of Spiti Valley); LATE LOWER TITHONIAN (*Virgatosphinctes* Ammonite, Upper level of the Middle Division, Spiti Shale Formation, Gate Section of Spiti Valley); LATE LOWER TITHONIAN (*Paraboliceras* Ammonite, Upper part of the Middle Division, Spiti Shale Formation, Kibber Section); LATE UPPER TITHONIAN (*Blanfordiceras* Ammonite), Malla Johar area, Kumaon Himalaya; Mehrotra *et al.*, 2005: 56, ANISIAN-LADINIAN – EARLY TITHONIAN, Krishna-Godavari Basin, Andhra Pradesh.

Omatia pisciformis Cookson & Eisenack, 1958. **NOW Herendeenia pisciformis** (Cookson & Eisenack, 1958) Wiggins, 1969 emend. Stover & Helby, 1987b.

OPERCULODINIUM, Wall, 1967 emend. Matsuoka *et al.*, 1997.

Operculodinium centrocarpum (Deflandre & Cookson, 1955) Wall, 1967. *In*: Dutta & Jain, 1980: 68, pl. 3, figs 25-26; pl. 7, figs 60-60a; pl. 6, figs 52-52a, EARLY-MIDDLE EOCENE (Sylhet Formation), Meghalaya; Jain & Tandon, 1981: 12, pl. 4, fig. 60, MIDDLE EOCENE (Harudi Formation), Kutch, Gujarat; Kar, 1985: 194, pl. 42, fig. 12, MIDDLE EOCENE (Harudi Formation), Kutch, Gujarat, (former is a reproduction from Jain & Tandon, 1981); Jain & Garg, 1991: 66-67, pl.14, fig. 16, OLIGOSPHAERIDIUM (Maniyara Fort Formation), Kutch, Gujarat (Restudy of Kar, 1985); Khanna *et al.*, 1985: 106, PALAEOGENE (Subathu Formation), Jammu Hills; Jain & Garg, 1986b: 118, pl. 3, fig. 2, LATE PALAEOCENE, Vriddhachalam area, Cauvery Basin, Tamil Nadu; Mathur, 1986: 200, LUTETIAN--BARTONIAN (Kalol Formation, well no. 109), Cambay Basin, Gujarat; Singh & Sarkar, 1987: 208, pl. 1, fig. 17, EOCENE (Subathu Formation), Banethi-Bagthan area, Simla Hills, Himachal Pradesh; Singh & Tripathi, 1987: 303, PALAEOCENE-EOCENE (Therria and Kopili formations), Meghalaya; Sarkar & Singh, 1988: 50, pl. 2, fig. 16; pl. 3, figs 7-8, EOCENE (Subathu Formation) , Banethi-Bagthan area, Himachal Pradesh; Tripathi, 1989: 70, pl.

2, figs 19-20, PALAEOCENE-EOCENE (Therria and Kopili formations), Meghalaya; Tissot, 1990: 356, LATE HOLOCENE (Kandavara bore-well), Coondapur area, Karnataka; Sarkar, 1991: 3, pl. II, fig. 8, EARLY EOCENE (Kakara Series, Lesser Himalaya), Kakara-Chapla group of villages, Simla, Himachal Pradesh; Singh & Sarkar, 1992: 185, pl. 1, fig. 3, LATE PALAEOCENE?-EOCENE (Subathu Formation), Garkhal area, Punjab Basin, Himachal Pradesh; Aswal & Pundeer, 1996: 636, THANETIAN – EARLY MIOCENE (ONGC Mori well- A, 3200 – 1200m), Krishna-Godavari Basin, Andhra Pradesh; Sarkar, 1997: 102, pl. 1, fig. 4, LATE YPRESIAN – LUTETIAN (Subathu Formation, Bilaspur area), Punjab Basin, Himachal Pradesh; Sarkar & Prasad, 2000a: 170, EARLY – MIDDLE LUTETIAN (Subathu Formation, Koshalia Nala Section), Shimla Hills; Sarkar & Prasad, 2000b: 141, pl. II, fig. 4, LATE YPRESIAN – MIDDLE LUTETIAN (Subathu Formation, Morni Hills), Haryana; Saxena & Sarkar, 2000: 256, 263, pl. 1, fig. 1, MIDDLE EOCENE (Siju Formation), Simsang River near Siju, South Garo Hills, Meghalaya; Mehrotra & Kamla Singh, 2003: 65, pl. 4, figs 2 & 4, MIOCENE (ONGC well NSP- A, 630 – 633m, Rajahmundry Sandstone), Krishna-Godavari Basin, Andhra Pradesh; PLIOCENE – PRIABONIAN-BARTONIAN (ONGC well KSP- A, 570 – 2455m), Krishna-Godavari Basin, Andhra Pradesh; HOLOCENE-CALABRIAN – BARTONIAN (ONGC well GS- 15- D, 630 – 3080m), Krishna-Godavari Basin, Andhra Pradesh; CALABRIAN-ZANCLEAN – YPRESIAN (ONGC well MGP- A, 360 – 2588m), Krishna-Godavari Basin, Andhra Pradesh; TORTONIAN AND YOUNGER – YPRESIAN (ONGC well MNP- A, 250 – 2360m), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 76, THANETIAN – YPRESIAN (56 – 51 Ma) ex Mehrotra *et al*., 2002, Mumbai Offshore; YPRESIAN - CALABRIAN ex Mehrotra & Kamla Singh, 2003, Krishna-Godavari Basin, Andhra Pradesh; MIDDLE EOCENE - OLIGOCENE ex Mehrotra *et al*., 2002, Assam-Arakan Basin, Northeastern India.

Polysphaeridium (Hystrichosphaeridium) microtriainum (Klumpp, 1953) Kar, 1979 emend. Sarjeant, 1981 (as *Achomosphaera microtriaina*). *In:* Kar, 1979, pl. 4, fig. 64. OLIGOCENE (Maniyara Fort Formation), Kutch, Gujarat. (Reallocated by Jain & Garg, 1991)

Operculodinium centrocarpum (Deflandre & Cookson, 1955) Wall, 1967. *In*: Kar, 1985: 194, 206, pl. 50, fig. 5 = **Operculodinium ornamentum** (Jain & Tandon, 1981) Jain & Garg, 1991 (According to Jain & Garg, 1991)

Operculodinium cf. **O. centrocarpum** (Deflandre & Cookson, 1955) Wall, 1967.

Hystrichosphaeridium cf. *H. centrocarpum* Deflandre & Cookson, 1955. *In*: Banerjee & Misra, 1972: 211, pl. 2, fig. 18, EOCENE--MIOCENE, Assam and Tripura.

Operculodinium centrocarpum subsp. **teokides** (Srivastava & Banerjee, 1969) Lentin & Williams, 1981. *In*: Jain & Garg, 1991: 66-67, pl. 1, fig. 16, OLIGOCENE (Maniyara Fort Formation), Ktch, Gujarat. (Restudy of Kar, 1985)

Hystrichosphaeridium centrocarpum var. *teokides* Srivastava & Banerjee, 1969. *In*: Srivastava & Banerjee, 1969: 103, pl. 1, figs 6-8, EOCENE-OLIGOCENE, Assam.

Operculodinium ?delicatum Kar, 1985. *In*: Kar, 1985: 207. pl. 50, fig. 7, MIOCENE (Khari Nadi Formation), Kutch, Gujarat. (Questionable assignment: Jain & Garg, 1991)

Operculodinium divergens (Eisenack, 1954b) Stover & Evitt, 1978. *In*: Mehrotra & Kamla Singh, 2003: 66, pl. 4, figs 1 & 3, EARLY OLIGOCENE (ONGC well NSP- A,

1395 – 1399m, Matsyapuri Sandstone), Krishna-Godavari Basin, Andhra Pradesh; MIDDLE EOCENE (ONGC well NSP- A, 2754 – 2757m), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 76, LUTETIAN - RUPELIAN ex Mehrotra *et al*., 2003, Mumbai Offshore; LUTETIAN RUPELIAN ex Mehrotra & Kamla Singh, 2003, Krishna-Godavari Basin, Andhra Pradesh; RUPELIAN ex Mehrotra *et al*., 2002, Assam-Arakan Basin, Northeastern India..

Operculodinium sp. cf. **O. divergens** (Eisenack, 1954b) Stover & Evitt, 1978. *In*: Dutta & Jain, 1980: 68, pl. 3, fig. 23, LATE PALAEOCENE (Sylhet Formation), Jaintia Hills, Meghalaya.

Operculodinium giganteum Wall, 1967. *In*: Singh & Sarkar, 1987: 208, EOCENE (Subathu Formation), Banethi-Bagthan area, Simla Hills, Himachal Pradesh; Sarkar & Singh, 1988: 50, pl. 4, figs 16-17, EOCENE (Subathu Formation), Banethi-Bagthan area, Simla Hills, Himachal Pradesh.

Operculodinium israelianum (Rossignol, 1962) Wall, 1967. *In*: Kar, 1985: 206, MIOCENE (Khari Nadi Formation), Kutch, Gujarat; Singh & Tripathi, 1987: 303, PALAEOCENE (Therria Formation), Meghalaya; Tripathi, 1989: 70, pl. 2, fig. 18, PALAEOCENE (Therria Formation), Meghalaya; Jain & Garg, 1991, pl. 1, figs 8-9, 15, EARLY EOCENE (restudy of Lakhpat bore hole- 1, described by Kar, 1985), Kutch, Gujarat; Saxena & Sarkar, 2000: 256, MIDDLE EOCENE (Siju Formation), Simsang River near Siju, South Garo Hills, Meghalaya..

Cleistosphaeridium cephalum Kar, 1985. *In*: Kar, 1985: 181, pl. 40, figs 1-2; pl. 41, fig. 1, EARLY EOCENE (Lakhpat bore hole- 1), Kutch, Gujarat. (Reallocated by Jain & Garg, 1991)

Operculodinium majus Jain & Dutta *in* Dutta & Jain, 1980. *In*: Dutta & Jain, 1980: 68, pl. 3, figs 19-22, LATE PALAEOCENE (Sylhet Formation), Meghalaya; Jain & Garg, 1986b: 118, pl. 2, fig. 16, LATE PALAEOCENE, Vriddhachalam area, Cauvery Basin, Tamil Nadu; Singh & Tripathi, 1987; 303, PALAEOCENE--EOCENE (Therria and Kopili formations), Meghalaya; Tripathi, 1989: 70, pl. 3. fig. 9, PALAEOCENE (Therria Formation), Meghalaya. (Orthographic change: Jain & Dutta in Dutta & Jain, 1980 listed *Operculodinium majuor* **);** Saxena & Sarkar, 2000: 256, 263, pl. 2, fig. 15, MIDDLE EOCENE (Siju Formation), Simsang River near Siju, South Garo Hills, Meghalaya (Orthographic change: Saxena & Sarkar, 2000 listed *Operculodinium major*); Mehrotra *et al*., 2005: 76, LATE PALAEOCENE ex Mehrotra *et al*., 2002, Assam-Arakan Basin, Northeastern India.

Operculodinium sp. cf. **O. majus** Jain & Dutta *in* Dutta & Jain, 1980. *In*: Saxena & Rao, 1984: 56, pl. 2, fig. 16, OLIGOCENE (Laisong Formation), Jaintia Hills, Meghalaya.

Operculodinium microtriainum (Klumpp, 1953) Islam, 1983.

Achomosphaera microtriaina (Klumpp, 1953) Sarjeant, 1981. *In*: Jain & Garg, 1986b: 100-107, pl. 4, fig. 6, LATE PALAEOCENE, Vriddhachalam area, Cauvery Basin, Tamil Nadu.

Operculodinium paucispinosum Kar, 1985. *In*: Kar, 1985: 207, pl. 50, fig. 6, MIOCENE (Khari Nadi Formation), Kutch, Gujarat.

Operculodinium robustum Kar, 1985. *In*: Kar, 1985: 207-208, pl. 50, fig. 8, MIOCENE (Khari Nadi Formation), Kutch, Gujarat. (Reallocated by Jain & Garg, 1991)

Operculodinium operculatum (Sah *et al.*, 1970) Jain, 1982.

Achomosphaera operculata Sah *et al*., 1970. *In*: Sah *et al.*, 1970: 144, pl. 1, fig. 1, LATE CRETACEOUS (Langpar Formation), Meghalaya;

Kar *et al*., 1972: 147, pl. 1, fig. 8, (Tura Formation), Garo Hills, Meghalaya; Salujha & Kindra, 1981: 51, pl. 2, figs 43-44, DANIAN (Langpar Formation), Meghalaya, (Jain & Garg. 1982 reassessed the age of this assemblage to be Latest Cretaceous-Danian).

Operculodinium ornamentum (Jain & Tandon, 1981) Jain & Garg, 1991.

Operculodinium centrocarpum (Deflandre & Cookson, 1955) Wall, 1967. *In*: Kar, 1985: 206, pl. 50, fig. 5, MIOCENE (Khari Nadi Formation), Kutch, Gujarat (Reallocated by Jain & Garg, 1991)

Polysphaeridium ornamentum Jain & Tandon, 1981. *In*: Jain & Tandon, 1981: 12-13, pl. 2, fig. 35, MIDDLE EOCENE (Harudi Formation), Kutch, Gujarat; Kar, 1985:194, MIDDLE EOCENE (Harudi Formation), Kutch, Gujarat, (reproduction from Jain & Tandon, 1981); Singh & Tripathi, 1987: 303, LATE EOCENE (Kopili Formation), Meghalaya; Tripathi, 1989: 70, pl. 3, fig. 4, LATE EOCENE (Kopili Formation), Meghalaya.

Operculodinium paucispinosum Kar, 1985. **NOW Operculodinium microtriainum** (Klumpp, 1953) Islam, 1983. (According to Jain & Garg, 1991)

Operculodinium ?placitum Drugg & Loeblich Jr., 1967. *In*: Jain & Garg, 1991: 66-67, pl. 1, figs 18-20, OLIGOCENE (Maniyara Fort Formation), Kutch, Gujarat. (Restudy of Kar, 1985)

Polysphaeridium cephalum Kar, 1977. *In*: Kar, 1977: 121, OLIGOCENE (Maniyara Fort Formation), Kutch, Gujarat. (name not validly published)

Polysphaeridium cephalum Kar, 1979. *In*: Kar, 1979: 34, pl. 4, figs 66a, 66b & 67, OLIGOCENE (Maniyara Fort Formation), Kutch, Gujarat.

?Sumatradinium cephalum (Kar, 1979) Jain, 1980. *In*: Jain, 1980: 141.

Operculodinium ?placitum Drugg & Loeblich Jr., 1967. *In*: Kar, 1985: 207, pl. 48, fig. 10 (Questionable assignment: Stover & Evitt, 1978) = **?Lingulodinium sp.** (According to Jain & Garg, 1991)

Operculodinium robustum Kar, 1985. *In*: Kar, 1985: 207-208, pl. 50, fig. 8 = **Operculodinium microtriainum** (Klumpp, 1953), Islam, 1983. (According to Jain & Garg, 1991)

Operculodinium scalenofurcatum. *In*: Mathur, 1986: 200, LUTETIAN-BARTONIAN (Kalol Formation, well no. 109), Cambay Basin, Gujarat. (Species authorship not cited, name not validly published).

Operculodinium uncinispinosum (de Coninck, 1969) Islam, 1983. *In*: Jain & Garg, 1991: 66-67, pl. 2, fig. 13, OLIGOCENE (Maniyara Fort Formation), Kutch (Restudy of Kar, 1985)

Homotryblium sp. *In*: Kar, 1979: 35, pl. 4, fig. 73, OLIGOCENE (Maniyara Fort Formation), Kutch, Gujarat. (Reallocated by Jain & Garg, 1991)

Operculodinium sp. *In*: Kar, 1985: 208, pl. 50, fig. 9, MIOCENE (Khari Nadi Formation), Kutch, Gujarat.

Operculodinium sp. *In*: Nandi, 1990: 124, pl. 4, fig. 19, LATE CRETACEOUS, Meghalaya.

Operculodinium sp. *In*: Rao, 1990: 249, pl. 3, fig. 12, OLIGOCENE, (Arthungal bore hole), Kerala.

Operculodinium sp. *In*: Mehrotra *et al*., 1996: 685-688, YPRESIAN - RUPELIAN (ONGC well Gulf- 1, Bhavnagar and Tarapur Shale formations), Gulf of Cambay, Gujarat.

Operculodinium sp. *In*: Sarkar, 1991: 3, pl. III, fig. 1, EARLY EOCENE (Kakara Series,

Lesser Himalaya), Kakara-Chapla group of villages, Simla, Himachal Pradesh.

Operculodinium sp. *In*: Garg & Khowaja-Ateequzzaman, 2000: 471, LATE THANETIAN (Lakadong Sst Member, Sylhet Limestone Formation), Cherrapunji area, Khasi Hills, Meghalaya.

Operculodinium sp. A. *In*: Jain & Garg, 1991: 66-67, pl. 4, figs 9-10, OLIGOCENE (Maniyara Fort Formation), Kutch Gujarat. (Restudy of Kar, 1985)

Polysphaeridium (Hystrichosphaeridium) microtriainum (Klumpp, 1953) Kar, 1979 emend. Sarjeant, 1981 (as *Achomosphaera microtriaina*), pl. 4, figs 63a-63b, OLIGOCENE (Maniyara Fort Formation), Kutch, Gujarat. (Reallocated by Jain & Garg, 1991)

OVOIDINIUM Davey, 1970 emend. Lentin & Williams, 1976 emend. Duxbury, 1983.

Ovoidinium indicum Jain & Taugourdeau-Lantz, 1973. **NOW Yalkalpodinium Indicum** (Jain & Taugourdeau--Lantz) Morgan, 1980.

Ovoidinium scabratum (Jain & Taugourdeau--Lantz, 1973) Khowaja-Ateequzzaman & Garg, 2004. *In*: Khowaja-Ateequzzaman & Garg, 2004: 13-14, pl. 1, figs 1-9, EARLY ALBIAN (Grey Shale Member, Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

Leberidocysta ?scabrata (Jain & Taugourdeau-Lantz, 1973) Stover & Evitt. 1978. (Questionable assignment: stover & evitt, 1978) =

Hexagonifera scabrata Jain & Taugourdeau--Lantz, 1973. *In*: Jain & Taugourdeau-Lantz, 1973: 64, pl. 4, figs 11-12, ?APTIAN--EARLY ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu; Jain, 1977b: 179, pl. 4, figs 45-46. EARLY ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

Ovoidinium cf. **O. scabrosum** (Cookson & Hughes, 1964) Davey, 1970.

Ascodinium cf. A. *scabrosum* Cookson & Hughes, 1964. *In*: Sah *et al*., 1970: 148-149, pl. 2, fig. 30, LATE CRETACEOUS (Langpar Formation), Meghalaya.

Ovoidinium waltonii (Pocock, 1972) Lentin & Williams, 1976. *In*: Jain *et al*., 1984: 79, pl. 2, fig. 31, MIDDLE TITHONIAN (Spiti Shale Formation). Malla Johar area, Kumaon Himalaya, Uttar Pradesh.

PALAEOCYSTODINIUM Alberti. 1961.

Palaeocystodinium australinum (Cookson, 1965b) Lentin & Williams, 1976 emend. Meloy, 1972. *In*: Mandal *et al.*, 2003: 104, pl. 1, fig. 7, EARLY EOCENE (Baratang Formation), Andaman-Nicobar Islands.

Palaeocystodinium golzowense Alberti, 1961. *In*: Kumar *et al.*, 1996: 150, pl. 1, fig. 9, LATE MAASTRICHTIAN – DANIAN (Upper part of Mahadeo Formation, Um Sohryngkew River Section), Meghalaya.

Palaeocystodinium scabratum Jain *et al*., 1975. *In*: Jain *et al.*, 1975: 12-13, pl. 6, fig. 63, DANIAN (Langpar Formation), Meghalaya.

Palaeocystodinium sp. *In*: Venkatachala & Kumar, 1982: 2, LATE SENONIAN (Narsapur well- 1), Krishna- Godavari Basin, Andhra Pradesh.

Palaeocystodinium sp. A *In*: Jain *et al*., 1975: 13, pl. 4, fig. 54, DANIAN (Langpar Formation), Meghalaya.

PALAEOHYSTRICHPHORA Deflandre, 1935 emend. Deflandre & Cookson, 1955.

Palaeohystrichophora infusorioides Deflandre, 1935. *In*: Khowaja-Ateequzzaman & Garg, 2002: 136, pl. 2, fig. 1, EARLY TURONIAN (Kulakkalnattam Sandstone Member, Garudamangalam Formation), Cauvery Basin, southern India.

PALAEOPERIDINIUM Deflandre, 1934 ex Sarjeant, 1967b.

Palaeoperidinium cretaceum (Pocock, 1962 ex Davey, 1970) Lentin & Williams, 1976

emend. Harding, 1990a. *In*: Khowaja-Ateequzzaman & Jain, 1992: 169, pl. 11, fig. 9, HAUTERIVIAN-BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu; Khowaja-Ateequzzaman & Garg, 2002: 137, pl. 3, fig. 3, MIDDLE - LATE TURONIAN (Kulakkalnattam Sandstone Member, Garudamangalam Formation), Cauvery Basin, southern India; Mehrotra & Aswal, 2003: 82, pl. 17, figs 1 & 2, CENOMANIAN – HAUTERIVIAN (ONGC well END- A, 1635 – 1830m, Raghavapuram Formation), Krishna-Godavari Basin, Andhra Pradesh; LATE MAASTRICHTIAN – EARLY ALBIAN (ONGC well DRK- A, 1200 – 1205, Chintalapalli and Tirupati formations), Krishna-Godavari Basin, Andhra Pradesh; TURONIAN – CENOMANIAN (ONGC well RCPM- A, 1360 – 2445m, Raghavapuram and Golapalli formations), Krishna-Godavari Basin, Andhra Pradesh; TURONIAN – BARREMIAN (ONGC well MVD- A, 1050 – 1985m, Tirupati and Raghavapuram formations), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 56, HAUTERIVIAN - MAASTRICHTIAN *ex* Mehrotra & Aswal, 2003, Krishna-Godavari Basin, Andhra Pradesh.

Astrocysta cretacea (Pocock, 1962) Davey, 1970. *In*: Jain, 1977b: 187, pl. 4, fig. 54, EARLY ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

Palaeoperidinium spinosum Cookson & Hughes, 1964. **NOW Epelidosphaeridia spinosa** Cookson & Hughes, 1964 *ex* Davey, 1969a.

Palaeoperidinium pyrophorum (Ehrenberg, 1838 *ex* O. Wetzel, 1933a) Sarjeant, 1967bemend. Sarjeant 1967b emend. Gocht & Netzel, 1976. *In*: Khowaja-Ateequzzaman & Garg, 2002: 136, pl. 3, figs 2, 13, 16, LATE TURONIAN (Kulakkalnattam Sandstone Member, Garudamangalam Formation), Cauvery Basin, southern India; Mehrotra *et al*., 2005: 76, SELANDIAN - THANETIAN, Mumbai Offshore.

Palaeoperidinium sp. *In*: Jain & Subbaraman, 1969: 549, EARLY CRETACEOUS (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

Palaeoperidinium sp. *In*: Venkatachala & Kumar, 1980.

Astrocysta sp. Venkatachala & Kumar, 1980: 96, pl. 2, fig. 6, ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

Palaeoperidinium sp. A *In*: Jain. 1977b.

Astrocysta sp. A *In*: Jain, 1977b: 187, pl. 3, fig. 35, EARLY ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

PAPUADINIUM Davey, 1988.

Papuadinium apiculatum (Cookson & Eisenack, 1960b) Davey, 1988 emend. Davey, 1988. *In*: Mehrotra *et al*., 2005: 56-57, RHAETIAN - TITHONIAN *ex* Aswal & Mehrotra, 2002, Krishna-Godavari Basin, Andhra Pradesh

PAREODINIA Deflandre, 1947d emend. Gocht, 1970b emend. Johnson & Hills, 1973 emend. Wiggins, 1975 emend. Stover & Evitt, 1978 emend. Below, 1990.

Pareodinia ?angulata Kumar, 1987a. *In*: Kumar, 1987b: 242-243, pl. 1, figs 3, 6, 9, text-fig. 5, EARLY KIMMERIDGIAN-TITHONIAN (Jhuran Formation), Kutch. Gujarat. (Questionable assignment: Below, 1990)

Pareodinia ceratophora Deflandre. 1947d emend. Gocht, 1970b. *In*: Jain *et al*., 1978: 116, pl. 1, fig. 6, LATE JURASSIC (Spiti Shale Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh; Jain *et al*., 1984: 78, pl. 1, fig. 20; pl. 3, fig. 4, KIMMERIDGIAN- EARLY LATE TITHONIAN (Spiti Shale Formation, Malla Johar area, Kumaon Himalaya, Uttar Pradesh; Kumar, 1986b: 398, pl. 6, fig. 1, EARLY KIMMERIDGIAN-TITHONIAN (Jhuran Formation, Kutch, Gujarat; Jain *et al*., 1986: 80, pl. 3, fig. 35, LATE JURASSIC, Kutch, Gujarat; Kumar, 1987a: 598-599, LATE BATHONIAN-CALLOVIAN (Jhurio

Formation) and EARLY KIMMERIDGIAN-TITHONIAN (Jhuran Formation), Kutch, Gujarat; Khowaja-Ateequzzaman & Jain, 1992: 169, pl. 5, fig. 4; pl. 9, fig. 1, HAUTERIVIAN-BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu; Garg *et al*., 2003: 52-53, pl, III, fig. 7, LATE LOWER TITHONIAN (*Kosmatia* Ammonite, Middle Division, Spiti Shale Formation, Kibber Section of Spiti Valley); LATE LOWER TITHONIAN (*Paraboliceras* Ammonite, Upper part of the Middle Division, Spiti Shale Formation, Kibber Section); LATE UPPER TITHONIAN – BERRIASIAN-EARLY VALANGINIAN (*Pterolytoceras* Ammonite, Upper levels of the Upper Division, Spiti Shale Formation), Malla Johar area, Kumaon Himalaya; Mehrotra *et al*., 2005: 57, KIMMERIDGIAN – LATE CAMPANIAN *ex* Mehrotra & Aswal, 2003, Krishna-Godavari Basin, Andhra Pradesh.

Kalyptea monoceras Cookson & Eisenack, 1960. *In:* Khowaja-Ateequzzaman & Jain, 1992: 160, pl. 11, fig. 12, HAUTERIVIAN-BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu.

Pareodinia cf. **P. ceratophora** Deflandre, 1947d emend. Gocht, 1970b. *In*: Kumar, 1986a: 32, VALANGINIAN--HAUTERIVIAN (ONGC bore core nos. 4, 6, 7, 8), Krishna-Godavari Basin, Andhra Pradesh, (Garg *et al.,* 1988 reassessed the age of this assemblage to be Hauterivian-Barremian).

Pareodinia imbatodinensis (Vozzhennikova, 1967) Lentin & Williams, 1977b. **NOW Protbatioladinium imbatodinense** (Vozzhennikova, 1967) Lentin & Vozzhennikova, 1990 emend. Lentin & Vozzhennikova, 1990.

Pareodinia prolongata Sarjeant, 1959. *In*: Kumar, I 987a: 599, LATE BATHONIAN-CALLOVIAN (Jhurio Formation), Kutch, Gujarat.

Pareodinia verrucosa (Vozzhennikova, 1967) Wiggins, 1975. **NOW Gochteodinia verrucosa** (Vozzhennikova, 1967) Dörhöfer & Davies, 1980 emend. Lentin & Vozzhennikova, 1990.

Pareodinia cf. **P. ?villosa** Tasch in Tasch *et al*., 1964, 1964. *In*: Venkatachala & Kumar, 1980: 102, pl. 4, fig. 9, ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

Pareodinia sp. *In*: Mehrotra & Aswal, 2003: 84, pl. 33, fig. 2, BERRIASIAN (ONGC well END- A, 1865 – 1870m, Raghavapuram Formation), Krishna-Godavari Basin, Andhra Pradesh; VALANGINIAN (ONGC well DRK- A, 2000 – 2025m, Raghavapuram Formation), Krishna-Godavari Basin, Andhra Pradesh; HAUTERIVIAN – LATE KIMMERIDGIAN (ONGC well MVD- A, 2060 – 2420m, Golapalli Formation), Krishna-Godavari Basin, Andhra Pradesh.

Pareodinia sp. A *In*: Kumar, 1982: 172, pl. 2, fig. 4, NEOCOMIAN, Krishna-Godavari Basin, Andhra Pradesh.

Pareodinia sp. A *In*: Jain *et al*., 1984: 78, pl. 3, fig. 49, KIMMERIDGIAN-EARLY LATE TITHONIAN (Spiti Shale Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh.

Pareodinia sp. A. *In*: Garg *et al*., 2003: 52-53, pl, IV, fig. 11, LATE LOWER TITHONIAN (*Paraboliceras* Ammonite, Upper part of the Middle Division, Spiti Shale Formation, Kibber Section); LATE UPPER TITHONIAN – BERRIASIAN-EARLY VALANGINIAN (*Pterolytoceras* Ammonite, Upper levels of the Upper Division, Spiti Shale Formation), Malla Johar area, Kumaon Himalaya.

Pareodinia sp. B *In*: Kumar, 1982: 172, pl. 2, fig. 5, NEOCOMIAN, Krishna-Godavari Basin, Andhra Pradesh.

Pareodinia sp. B. *In*: Garg *et al*., 2003: 52-53, pl, V, fig. 7, LATE LOWER TITHONIAN (*Hildoglochiceras* Ammonite, Middle part of the Middle Division, Spiti Shale Formation, Laptal Section), Malla Johar area, Kumaon Himalaya.

Pareodinia sp. C *In*: Kumar, 1982: 172, pl. 2, fig. 6, NEOCOMIAN, Krishna-Godavari Basin, Andhra Pradesh.

PAUCISPHAERIDIUM Bujak *et al.,* 1980.

?Paucisphaeridium sp. *In*: Mehrotra & Sarjeant, 1987: 159, pl. 4, fig. 1, MAASTRICHTIAN (Narsapur well-- 1), Krishna-Godavari Basin, Andhra Pradesh.

PENTADINIUM Gerlach, 1961 emend. Benedek *et al.,* 1982.

Pentadinium laticinctum Gerlach, 1961 emend. Benedek *et al.,* 1982. *In*: Singh & Sarkar, 1987: 208, EOCENE (Subathu Formation), Banethi-Bagthan area, Simla Hills, Himachal Pradesh; Sarkar & Singh, 1988: 51, pl. 3, fig. 19, EOCENE (Subathu Formation), Banethi-Bagthan area, Simla Hills, Himachal Pradesh; Sarkar & Prasad, 2000b: 141, EARLY LUTETIAN (Subathu Formation, Morni Hills), Haryana; Mehrotra *et al*., 2005: 77, YPRESIAN (50 Ma) Mumbai Offshore.

PERIDICTYOCYSTA Cookson & Eisenack, 1974.

Peridictyocysta mirabilis (Cookson & Eisenack, 1958) Cookson & Eisenack, 1974. *In*: Jain *et al*., 1984: 78, pl. 1, fig. 11, EARLY-MIDDLE TITHONIAN (Spiti Shale Formation) , Malla Johar area, Kumaon Himalaya, Uttar Pradesh; Garg *et al*., 2003: 52-53, pl, IV, fig. 3, EARLY LOWER TITHONIAN (*Uhligites* Ammonite, Lower part of Middle Division of Spiti Shale Formation, Laptal Section); LATE LOWER TITHONIAN (*Kosmatia* Ammonite, Middle Division, Spiti Shale Formation, Kibber Section of Spiti Valley); LATE LOWER TITHONIAN (*Virgatosphinctes* Ammonite, Upper level of the Middle Division, Spiti Shale Formation, Gate Section of Spiti Valley), Malla Johar area, Kumaon Himalaya.

Peridictyocysta sp. A *In*: Jain & Tandon, 1981: pl. 4, fig. 68, MIDDLE EOCENE (Harudi Formation), Kutch, Gujarat.

Peridictyocysta sp. A *In*: Kar, 1985: 194, MIDDLE EOCENE (Harudi Formation), Kutch, Gujarat, (reproduction from Jain & Tandon, 1981).

"PERIDINIUM" Ehrenberg, 1830, (modern genus defined from motile stage).

Peridinium sp. In: Banerjee 1972: 135, CRETACEOUS, Khara Tar Well, Rajasthan, (not a dinoflagellate cyst).

PERISSEIASPHAERIDIUM Davey & Williams, 1966b.

Perisseiasphaeridium pannosum Davey & Williams, 1966b. *In*: Singh & Sarkar, 1987: 208, EOCENE (Subathu Formation), Banethi-Bagthan area, Simla Hills, Himachal Pradesh; Sarkar & Singh, 1988: 50--51, pl. 3, fig. 10, EOCENE (Subathu Formation), Banethi-Bagthan area, Simla Hills, Himachal Pradesh.

cf. **Perisseiasphaeridium pannosum** Davey & Williams, 1966b. *In*: Kar & Saxena, 1981: 151, pl. 4, fig. 80, MIDDLE-LATE EOCENE (Rataria bore core no. 27), Kutch, Gujarat, (Jain & Garg, 1990 reassessed the age of this assemblage to be Middle Eocene).

PERVOSPHAERIDIUM Yun Hyesu, 1981.

Pervosphaeridium pseudohystrichodinium (Deflandre, 1937b) Yun Hyesu, 1981. *In*: Khowaja-Ateequzzaman & Garg, 2002: 136, pl. 2, fig. 11, EARLY TURONIAN (Kulakkalnattam Sandstone Member, Garudamangalam Formation), Cauvery Basin, southern India.

PHALLOCYSTA Dörhöfer & Davies, 1980.

Phallocysta sp. *In*: Tripathi, A, 2001: 245, pl. 2, fig. 21, LATEST EARLY – EARLY MIDDLE JURASSIC (Dubrajpur Formation, Chuperbhita Coalfield), Rajmahal Basin, India.

PHOBEROCYSTA Millioud, 1969 emend. Helby, 1987.

Phoberocysta neocomica (Gocht, 1957) Millioud, 1969 emend. Helby, 1987. *In*: Kumar, 1986a: 32, VALANGINIAN-HAUTERIVIAN (ONGC bore Core no. 8), Krishna-Godavari Basin, Andhra Pradesh, (Garg *et al.,* 1988 reassessed the age of this assemblage to be Hauterivian-Barremian); Khowaja-Ateequzzaman & Jain, 1992: 169, 170, pl. 7, figs 7, 8, HAUTERIVIAN-BARREMIAN (CGWB bore-hole near

Puduvoyal), Palar Basin, Chingleput, Tamil Nadu; Mehrotra & Aswal, 2003: 85, pl. 8, fig. 5; pl. 9, figs 2 & 5, BARREMIAN (ONGC well DRK- A, 1925 2075m, Raghavapuram Formation), Krishna-Godavari Basin, Andhra Pradesh; EARLY APTIAN – OXFORDIAN-KIMMERIDGIAN (ONGC well RCPM- A, 2100 – 2976m, Raghavapuram and Golapalli formations), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 57, OXFORDIAN – EARLY APTIAN ex Mehrotra & Aswal, 2003, Krishna-Godavari Basin, Andhra Pradesh.

PHTHANOPERIDINIUM Drugg & Loeblich Jr., 1967 emend. Edwards & Bebout, 1981 emend. Islam, 1982.

Phthanoperidinium echinatum Eaton, 1976. **NOW Phthanoperidinium stockmansii** (de Coninck, 1975) Lentin & Williams, 1977b.

Phthanoperidinium flebile Liengjarern *et al.,* 1980. *In*: Mathur, 1986: 200, LUTETIAN-BARTONIAN (Kalol Formation, well no. 109), Cambay Basin, Gujarat.

Phthanoperidinium stockmansii (de Coninck, 1975) Lentin & Williams, 1977b.

Phthanoperidinium echinatum Eaton, 1976. *In*: Aswal & Pundeer, 1996: 636, pl. 1, fig. 15, YPRESIAN (ONGC Mori well- A, 2800 – 2640m, *Deflandrea oebisfeldensis–Areoligera senonensis* Interval Zone), Krishna-Godavari Basin, Andhra Pradesh. (Orthographic change: Aswal & Pundeer, 1996 listed *Phthanoperidinium echinatus*)

PILOSIDINIUM Courtinat, 1989

Pilosidinium echinatum (Gitmez & Sarjeant, 1972) Courtinat, 1989.

Sentusidinium echinatum (Gitmez & Sarjeant, 1972) Sarjeant & Stover, 1978. *In*: Jain *et al*., 1984: 78, pl. 3, Fig. 63, KIMMERIDGIAN (Spiti Shale Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh; Jain *et al*., 1986: 76, pl. 3, fig. 50, LATE JURASSIC, Kutch, Gujarat; Kumar, 1986b: 400, pl. 2, fig. 4; pl. 4, fig. 4; pl. 5, fig. 4, EARLY KIMMERIDGIAN-TITHONIAN (Jhuran Formation), Kutch, Gujarat; Kumar, 1987a:598, EARLY KIMMERIDGIAN-TITHONIAN (Jhuran Formation) , Kutch, Gujarat.

Batiacasphaera echinata (Gitmez & Sarjeant) Dorhofer & Davies, 1980. *In*: Kumar, 1986a: 27, VALANGINIAN-HAUTERIVIAN (ONGC bore core no. 7), Krishna-Godavari Basin, Andhra Pradesh, (Garg *et al.,* 1988 reassessed the age of this assemblage to be Hauterivian--Barremian).

PLATYCYSTIDIA Cookson & Eisenack, 1960a.

Platycystidia eisenackii (Mehrotra & Sarjeant, 1984c) Backhouse, 1988. *In*: Khowaja-Ateequzzaman & Jain, 1992: 170, pl. 4, fig. 8, HAUTERIVIAN-BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu. (Acritarch)

POLYGONIFERA Habib, 1972 emend. Mehrotra & Sarjeant, 1984c.

Polygonifera eisenackii Mehrotra & Sarjeant, 1984c. *In*: Mehrotra & Sarjeant, 1984c: 86, pl. 29, figs 2 & 3, EARLY ALBIAN – OXFORDIAN (ONGC well RCPM- A, 1980 – 3045m, Raghavapuram and Golapalli formations), Krishna-Godavari Basin, Andhra Pradesh; CENOMANIAN (ONGC well MVD-A, 1100 – 1145m, Tirupati Formation), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 57, VALANGINIAN – APTIAN ex Mehrotra *et al*., 2002, Cauvery Basin, Tamil Nadu; OXFORDIAN - CENOMANIAN ex Mehrotra & Aswal, 2003, Krishna-Godavari Basin, Andhra Pradesh. (Originally *Polygonifera eisenackii,* subsequently *Leberidocysta? eisenackii* (Mehrotra & Sarjeant, 1984c) Lentin & Williams, 1985, thirdly *Platycystidia eisenackii* (Mehrotra & Sarjeant, 1984c) Backhouse, 1988, fourthly & **now** *Polygonifera eisenackii* Mehrotra &

Sarjeant, 1984c, retained by Mehrotra & Aswal, 2003, p. 86)

POLYSPHAERIDIUM Davey & Williams, 1966b emend. Bujak *et al.,* 1980.

Polysphaeridium asperum (Maier, 1959) Davey & Williams, 1969 emend. Sarjeant, 1983.

Dapsilidinium asperum (Maier, 1959) Bujak *et al.,* 1980. *In*: Mathur, 1986: 200-201, LUTETIAN--BARTONIAN (Kalol Formation, well no. 109), Cambay Basin, Gujarat,

Polysphaeridium biformum Islam, 1983b. *In*: Mathur, 1986: 200, LUTETIAN-BARTONIAN (Kalol Formation, well no. 109), Cambay Basin, Gujarat.

Polysphaeridium cephalum Kar, 1977. *In*: Kar, 1977: 121, OLIGOCENE (Maniyara Fort Formation), Kutch, Gujarat. (Name not validly published)

Polysphaeridium cephalum Kar, 1979, pl. 4, figs 66a, 66b & 67. **NOW Operculodinium placitum** Drugg & Loeblich Jr., 1967. (Reallocated by Jain & Garg, 1991)

Polysphaeridium congregatum (Stover, 1977) Bujak *et al.,* 1980. *In*: Jain & Garg, 1986b: 118, pl. 3, fig. 3, LATE PALAEOCENE, Vriddhachalam area, Cauvery Basin, Tamil Nadu; Jain & Garg, 1991: 66-67, pl. 1, figs 18-19, OLIGOCENE (Maniyara Fort Formation), Kutch, Gujarat (Restudy of Kar, 1985); Aswal & Pundeer, 1996: 636, pl. 2, fig. 19, LUTETIAN-BARTONIAN – OLIGOCENE (ONGC Mori well- A, 2600 – 1400m), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra & Kamla Singh, 2003: 68, pl. 22, figs 3 & 4; pl. 23, fig. 4; pl. 27, fig. 6, OLIGOCENE – EARLY EOCENE (ONGC well RZL- A, 1150 – 2600m, Matsyapuri Sandstone, Bhimapalli Sandstone, Pasarlapudi Formation and Palakollu Shale), Krishna-Godavari Basin, Andhra Pradesh; OLIGOCENE – MIDDLE EOCENE (ONGC well MORI- A, 1400 – 2550m, Matsyapuri Sandstone, Bhimapalli Limestone and Pasarlapudi Formation), Krishna-Godavari Basin, Andhra Pradesh; CHATTIAN-PRIABONIAN – PRIABONIAN-BARTONIAN (ONGC well KSP- A, 2325 – 2500m), Krishna-Godavari Basin, Andhra Pradesh; BARTONIAN (ONGC well SSY- A, 2065 – 2080m), Krishna-Godavari Basin, Andhra Pradesh; CHATTIAN-RUPELIAN – YPRESIAN (ONGC well MGP- A, 1490 – 2830m), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al.*, 2005: 77, BARTONIAN (40 Ma), Mumbai Offshore; YPRESIAN - CHATTIAN ex Mehrotra & Kamla Singh, 2003, Krishna-Godavari Basin, Andhra Pradesh; EARLY BARTONIAN ex Mehrotra *et al.*, 2002, Assam-Arakan Basin, Northeastern India.

Polysphaeridium (Hystrichosphaeridium) microtriainum (Klumpp) Kar, 1979 emend. Sarjeant, 1981 (as *Achomosphaera microtriaina*). *In*: Kar, 1979: 33-34, pl. 4, fig. 65, OLIGOCENE (Maniyara Fort Formation), Kutch, Gujarat.

Polysphaeridium giganteum Caro, 1973. **NOW Impletosphaeridium giganteum** (Caro, 1973) Islam, 1993.

Polysphaeridium microtriainum (Klumpp, 1953) Kar, 1979 emend. Sarjeant, 1981. **NOW Operculodinium microtriainum** (Klumpp) Islam, 1983.

Polysphaeridium microtriainum (Klumpp, 1953) Kar, 1979 emend. Sarjeant, 1981, pl. 4, figs 63a-63b = **Operculodinium sp. A** (According to Jain & Garg, 1991)

Polysphaeridium microtriainum (Klumpp, 1953) Kar, 1979 emend. Sarjeant, 1981, pl. 4, fig. 64 = **Operculodinium centrocarpum** (Deflandre & Cookson, 1955), Wall, 1967. (According to Jain & Garg, 1991)

Polysphaeridium microtriainum (Klumpp, 1953) Kar, 1979 emend. Sarjeant, 1981, pl. 4, fig. 65 = **Polysphaeridium congregatum**, (Stover, 1977) Bujak *et al.*, 1980. (According to Jain & Garg, 1991)

Polysphaeridium ornamentum Jain & Tandon, 1981. **NOW Operculodinium**

ornamentum (Jain & Tandon, 1981) Jain & Garg, 1991.

Polysphaeridium pastielsii Davey & Williams, 1966b. **NOW Dapsilidinium pastielsii** (Davey & Williams, 1966b) Bujak *et al*., 1980.

Polysphaeridium subtile Davey & Williams, 1966b emend. Bujak *et al.,* 1980. *In*: Mathur, 1986: 200-201, LUTETIAN-BARTONIAN (Kalol Formation, well no. 109), Cambay Basin, Gujarat; Sah *et al*., 1970: 147, pl. 2, fig. 24, LATE CRETACEOUS (Langpar Formation), Meghalaya; Khanna *et al*., 1985: 106, pl. 2, fig. 7, PALAEOGENE (Subathu Formation), Jammu Hills; Saxena & Rao, 1984: 54, pl. 1, figs 1-2, OLIGOCENE (Laisong Formation), Jaintia Hills, Meghalaya; Singh & Sarkar, 1987: 208, EOCENE (Subathu Formation), Banethi-Bagthan area, Simla Hills, Himachal Pradesh; Singh & Tripathi, 1987: 303, PALAEOCENE-EOCENE (Therria and Kopili formations), Meghalaya; Saxena *et al*., 1987: 152, pl. 1, fig. 8, OLIGOCENE (Laisong Formation), Jaintia Hills, Meghalaya; Sarkar & Singh, 1988: 51, pl. 3, fig. 6, EOCENE (Subathu Formation), Banethi-Bagthan area, Simla Hills, Himachal Pradesh; Tripathi, 1989: 70, pl. 2, fig. 13, PALAEOCENE (Therria Formation), Meghalaya; Jain & Garg, 1991, EARLY EOCENE (restudy of Lakhpat bore-hole 1 described by Kar, 1985), Kutch, Gujarat; Sarkar, 1991: 3, pl. I, figs 2, 3, EARLY EOCENE (Kakara Series, Lesser Himalaya), Kakara-Chapla group of villages, Simla, Himachal Pradesh; Singh & Sarkar, 1992: 185, pl. 1, fig. 10, LATE PALAEOCENE?-EOCENE (Subathu Formation), Garkhal area, Punjab Basin, Himachal Pradesh; Aswal & Pundeer, 1996: 636, THANETIAN – OLIGOCENE (Mori well- A, 3200 – 1400m), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 1996: 685-688, YPRESIAN – RUPELIAN (ONGC well Gulf-1 and well Gulf- 2, Bhavnagar and Tarapur Shale formations), LUTETIAN – PRIABONIAN (ONGC well Gulf- 3, Olpad, Bhavnagar and Tarapur Shale formations), YPRESIAN – LUTETIAN-PRIABONIAN (ONGC well Gulf- 4, Olpad, Bhavnagar and Tarapur Shale formations); Sarkar, 1997: 102, pl. 1, fig. 6, LATE YPRESIAN – LUTETIAN (Subathu Formation, Bilaspur area), Punjab Basin, Himachal Pradesh; Garg & Khowaja-Ateequzzaman, 2000: 471, pl. 3, fig. 4, LATE THANETIAN (Lakadong Sst Member, Sylhet Limestone Formation), Cherrapunji area, Khasi Hills, Meghalaya; Sarkar & Prasad, 2000a: 170, pl. 1, fig. 5, LATE YPRESIAN – MIDDLE LUTETIAN (Subathu Formation, Koshalia Nala Section), Shimla Hills; Mandal *et al.*, 2003: 104, EARLY EOCENE (Baratang Formation), Andaman-Nicobar Islands; Mehrotra & Kamla Singh, 2003: 67, pl. 22, figs 5 & 6; pl. 23, fig. 2, PALAEOCENE (ONGC well NSP- A, 2598 – 2601m, Palakollu Shale), Krishna-Godavari Basin, Andhra Pradesh; SERRAVALLIAN-LANGHIAN – YPRESIAN (ONGC well MGP- A, 1050 – 3025m), Krishna-Godavari Basin, Andhra Pradesh; OLIGOCENE – LATE PALAEOCENE (ONGC well MORI- A, 1400 – 3100m), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 77, EOCENE ex Mehrotra *et al*., 1996, Cambay Basin, Gujarat; YPRESIAN – PRIABONIAN (51 – 33.7 Ma), Mumbai Offshore; PALAEOCENE – SERRAVALLIAN (MIDDLE MIOCENE) ex Mehrotra & Kamla Singh, 2003, Krishna-Godavari Basin, Andhra Pradesh; PALAEOCENE – OLIGOCENE (RUPELIAN TOP) ex Mehrotra *et al*., 2002, Assam-Arakan Basin, Northeastern India

Cleistosphaeridium diverispinosum Davey *et al*., 1966b. *In* : Kar, 1985: 181, pl. 40, figs 4,5, EARLY EOCENE (Lakhpat bore hole- 1), Kutch, Gujarat. (Reallocated by Jain & Garg, 1991)

Polysphaeridium subtile subsp *ktana* (Rossignol, 1964) Islam., 1983b. **NOW Polysphaeridium zoharyi** subsp. **ktana** (Rossignol) Lentin & Williams, 1981.

Polysphaeridium zoharyi (Rossignol, 1962) Bujak *et al*., 1980. *In*: Singh& Sarkar, 1987, pl. 1, fig. 14, EOCENE (Subathu Formation),

Banethi-Bagthan area, Simla Hills, Himachal Pradesh, (Orthographic change: Singh & Sarkar, 1987 listed *P. zoharei*); Jain & Garg, 1991: 66-67, pl. 2, figs 1-4, OLIGOCENE (Maniyara Fort Formation), Kutch, Gujarat. (Restudy of Kar, 1985); Aswal & Pundeer, 1996: 636, pl. 2, fig. 1, LUTETIAN-BARTONIAN – EARLY MIOCENE (ONGC Mori well- A, 2000 – 1200m), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et* al., 1996: 685-688, RUPELIAN-BERDIGALIAN – MIOCENE (ONGC well Gulf- 1 and well Gulf- 4, Tarapur Shale, Babaguru and Post Babaguru formations), LUTETIAN-PRIABONIAN - MIOCENE (ONGC well Gulf- 2 and well Gulf- 3, Tarapur Shale, Babaguru and Post Babaguru formations), Gulf of Cambay, Gujarat; Mehrotra & Kamla Singh, 2003: 69, pl. 22, figs 1 & 2; pl. 23, figs 1, 3, 5 & 6, PLEISTOCENE – PLIOCENE (ONGC well GS- 21- A, 30 – 1125m, Rajahmundry Sandstone, Narasapur Claystone and Ravva Formatin), Krishna-Godavari Basin, Andhra Pradesh; MIDDLE MIOCENE- LATE OLIGOCENE (ONGC well BMP- A, 660 – 800m, Narasapur Claystone and Matsyapuri Sandstone), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 77, YPRESIAN (51 Ma) - PLIOCENE *ex* Mehrotra *et al*., 2002, Mumbai Offshore; LATE OLIGOCENE - PLEISTOCENE *ex* Mehrotra & Kamla Singh, 2003, Krishna-Godavari Basin, Andhra Pradesh.

Hemicystodinium zoharyi (Rossignol, 1962) Bujak *et al*., 1980. *In*: Jain & Tandon, 1981: 10, pl. 1, fig. 22, MIDDLE EOCENE (Harudi Formation), Kutch, Gujarat; Kar, 1985: 190, MIDDLE EOCENE (Harudi Formation), Kutch, Gujarat, (reproduction from Jain & Tandon, 1981).

Hystrichosphaeridium zoharyi Rossignol, 1962. *In*: Srivastava & Banerjee, 1969: 102, pl. 1, fig. 4, EOCENE-OLIGOCENE, Assam.

Membranilarnacia delicata Kar, 1979. *In*: Kar, 1979: 35, pl. 4, figs 70-71, OLIGOCENE, Kutch, Gujarat. (Reallocated by Jain & Garg, 1991)

Polysphaeridium cf. **P. zoharyi** (Rossignol, 1962) Bujak et al., 1980. *In*: Mehrotra *et* al., 1996: 685-688, RUPELIAN – MIOCENE (ONGC well Gulf- 1, Tarapur Shale, Babaguru and Post Babaguru formations), LUTETIAN-PRIABONIAN – RUPELIAN-BERDIGALIAN (ONGC well Gulf- 2, Tarapur Formation), RUPELIAN – MIOCENE, (ONGC well Gulf- 3, Babaguru and Post Babaguru formations), Gulf of Cambay, Gujarat; Mehrotra & Kamla Singh, 2003: 70, pl. 21, figs 1 & 3, ?PLIOCENE – LATE MIOCENE (ONGC wellNSP- A, 630 – 633m, Matsyapuri Sandstone), Krishna-Godavari Basin, Andhra Pradesh.

Hystrichosphaeridium sp. cf. *H. zoharyi* Rossignol, 1962. *In*: Banerjee & Misra, 1961: 100, pl. 4, fig. 68, LATE CRETACEOUS (Karikal well- 2), Pondicherry, Cauvery Basin, Tamil Nadu; Banerjee & Misra, 1972: 211, pl. 1, fig. 13, EOCENE-MIOCENE, Assam and Tripura.

Polysphaeridium zoharyi subsp. **ktana** (Rossignol, 1964) Lentin & Williams, 1981.

Hystrichosphaeridium zoharyi var. ktana Rossignol, 1964. *In*: Srivastava & Banerjee, 1969: 103, pl. 1, fig. 5, EOCENE OLIGOCENE, Assam.

Polysphaeridium subtile subsp. ktana (Rossignol, 1964) Islam, 1983b. *In*: Mathur, 1986: 200, LUTETIAN-BARTONIAN (Kalol Formation well no. 109), Cambay Basin, Gujarat.

Polysphaeridium sp**.** *In*: Kar, 1979: 34, pl. 4, fig. 69 = **Forma A** (According to Jain & Garg, 1991).

Polysphaeridium sp. *In*: Singh & Khanna, 1980: 471, p 2, fig. 4, LATE PALAEOCENE-

LATE EOCENE (Subathu Formation), Simla Hills, Punjab Basin, Himachal Pradesh.

Polysphaeridium sp. *In*: Saxena & Rao, 1984: 54, pl. 1, figs 3-4, EARLY MIOCENE (Bhuban Formation Jaintia Hills, Meghalaya and Cachar, Assam.

Polysphaeridium sp. A. *In*: Mehrotra *et* al., 1996: 685-687, THANETIAN – YPRESIAN (ONGC well Gulf- 1, Olpad and Bhavnagar formations), DANIAN – LUTETIAN-PRIABONIAN (ONGC well Gulf- 2 Olpad, Bhavnagar and Tarapur Shale formations), YPRESIAN – LUTETIAN-PRIABONIAN (ONGC well Gulf- 3, Bhavnagar and Tarapur Shale formations), Gulf of Cambay, Gujarat.

Polysphaeridium sp. B. *In*: Mehrotra *et al*., 1996: 686, RUPELIAN - BERDIGALIAN (ONGC well Gulf- 2, Tarapur Shale, Babaguru and Post Babagur formations), Gulf of Cambay, Gujarat.

POLYSTEPHANEPHORUS Sarjeant, 1961b emend. sarjeant, 1961b emend. Stancliffe & Sarjeant, 1990.

Polystephanephorus cf. **P. paracalathus** (Sarjeant, 1960a) sarjeant, 1961b emend. Stancliffe & Sarjeant, 1990. *In*: Kumar, 1987b: 243, pl. 2, fig. 1, EARLY KIMMERIDGIAN-TITHONIAN (Jhuran Formation), Kutch, Gujarat.

PRODUCTODINIUM Davey, 1988

Productodinium chenii Davey, 1988. *In*: Garg *et al*., 2003: 52-53, pl, V, fig. 6, LATE LOWER TITHONIAN (*Kosmatia* Ammonite, Middle Division, Spiti Shale Formation, Kibber Section of Spiti Valley), Malla Johar area, Kumaon Himalaya.

PROLIXOSPHAERIDIUM Davey *et al*., 1966 emend. Davey, 1969a.

Prolixosphaeridium anasillum Erkmen & Sarjeant 1980. *In*: Jain *et al*., 1986: 79, pl. 1, fig. 10; pl. 3, fig. 45, LATE JURASSIC, Kutch, Gujarat.

Prolixosphaeridium capitatum (Cookson & Eisenack, 1960b) Singh, 1971. *In*: Kumar, 1982; 174, pl. 1, fig. 4, NEOCOMIAN, Krishna-Godavari Basin, Andhra Pradesh; Jain *et al*., 1984: 78. pl. 3, fig. 52, KIMMERIDGIAN (Spiti Shale Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh; Kumar, 1986a: 32, VALANGINIAN- HAUTERIVIAN (ONGC bore core nos. 4, 7), Krishna Godavari Basin, Andhra Pradesh, (Garg *et al*., 1981 re-assessed the age of this assemblage to be Hauterivian -Barremian); Garg *et al*., 2003: 52-53, pl, V, fig. 12, LATE LOWER TITHONIAN (*Kosmatia* Ammonite, Middle Division, Spiti Shale Formation, Kibber Section of Spiti Valley); LATE UPPER TITHONIAN – BERRIASIAN-EARLY VALANGINIAN (*Pterolytoceras* Ammonite, Upper levels of the Upper Division, Spiti Shale Formation), Malla Johar area, Kumaon Himalaya.

Prolixosphaeridium conulum Davey, 1969a. *In*: Kumar, 1986a: 32, pl. 1, fig. 8, VALANGINIAN-HAUTERIVIAN (ONGC bore core no. 5), Krishna Godavari Basin, Andhra Pradesh, (Garg *et al.*. 1981 reassessed the age of this assemblage to be Hauterivian-Barremian); Singh & Tripathi, 1987: 303, PALAEOCENE (Therria Formation), Meghalaya; Tripathi, 1989: 68, pl. 3, fig. 14, PALAEOCENE (Therria Formation), Meghalaya.

Prolixosphaeridium deirense Davey *et al*., 1966 emend. Harding, 1990b. *In*: Jain, 1977b: 185, pl. 3, fig. 29, EARLY ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

Prolixosphaeridium parvispinum subsp. *deirense* (Davey *et al*., 1966) Below, 1982c. *In*: Khowaja-Ateequzzaman & Jain, 1992: 170, pl. 3, figs 6, 9, HAUTERIVIAN-BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu.

Prolixosphaeridium elongatum Jain, 1977b. **NOW Prolixosphaeridium parvispinum** (Deflandre, 1937b) Davey *et al.,* 1969.

Prolixosphaeridium granulosum (Deflandre, 1937b) Davey *et al.,* 1966. *In*: Jain *et al*., 1984: 78, pl. 2, fig. 34, EARLY-EARLY LATE TITHONIAN (Spiti Shale For-

mation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh; Kumar, 1987a: 599, pl. 1, fig. 1. LATE BATHONIAN-CALLOVIAN (Jhurio Formation), Kutch, Gujarat; Garg *et al*., 2003: 52-53, pl, IV, fig. 15, LATE LOWER TITHONIAN (*Kosmatia* Ammonite, Middle Division, Spiti Shale Formation, Kibber Section of Spiti Valley), Malla Johar area, Kumaon Himalaya.

Prolixosphaeridium sp. cf. **P. granulosum** (Deflandre, 1937b) Davey *et al.,* 1966. *In*: Jain & Taugourdeau-Lantz, 1973: 63, pl. 3. fig. 5, ?APTIAN-EARLY ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

Prolixosphaeridium mixtispinosum (Klement, 1960) Davey *et al.,* 1969. *In*: Jain *et al*., 1984: 79, pl. 2, fig. 35, EARLY LATE TITHONIAN (Spiti Shale Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh; Garg *et al*., 2003: 52-53, pl, IV, fig. 16, LATE LOWER TITHONIAN (*Kosmatia* Ammonite, Middle Division, Spiti Shale Formation, Kibber Section of Spiti Valley); LATE UPPER TITHONIAN – BERRIASIAN-EARLY VALANGINIAN (*Pterolytoceras* Ammonite, Upper levels of the Upper Division, Spiti Shale Formation), Malla Johar area, Kumaon Himalaya.

Prolixosphaeridium parvispinum (Deflandre, 1937b) Davey *et al.,* 1969. *In*: Khowaja-Ateequzzaman & Jain, 1992: 170, pl. 11, fig. 6, HAUTERIVIAN-BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu; Mehrotra & Kamla Singh, 2003 : 71, pl. 18, figs 1 & 4, EARLY OLIGOCENE (ONGC well MORI-A, 1495 – 1500m, Matsyapuri Sandstone), Krishna-Godavari Basin, Andhra Pradesh.

Prolixosphaeridium elongatum Jain, 1977b. *In*: Jain, 1977b: 185, pl. 4, figs 48-49, EARLY ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

Prolixosphaeridium parvispinum sub sp. *deirense* (Davey *et al*., 1966) Below, 1982c. **NOW Prolixosphaeridium deirense** Davey *et al*, 1966 emend Harding, 1990b.

Prolixosphaeridium torynum (Cookson & Eisenack, 1960b) Eisenack & Kjellstrom, 1971. **NOW Egmontodinium toryna** (Cookson & Eisenack, 1960b) Davey, 1979c.

Prolixosphaeridium sp. *In*: Venkatachala & Kumar, 1980: 104, pl. 6, fig. 7, ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

Prolixosphaeridium sp. A *In*: Kumar, 1982: 174, pl. 2, fig. 2, NEOCOMIAN, Krishna-Godavari Basin, Andhra Pradesh.

Prolixosphaeridium sp. B *In*: Kumar, 1982: 174, pl. 2, fig. 3, NEOCOMIAN, Krishna-Godavari Basin, Andhra Pradesh.

PROTOBATIOLADINIUM Nørhr-Hansen, 1986.

Protobatioladinium imbatodinense (Vozzhennikova, 1967) Lentin & Vozzhennikova, 1990 emend. Lentin & Vozzhennikova, 1990.

Pareodinia imbatodinensis (Vozzhennikova) Lentin & Williams, 1977. *In*: Kumar, 1986b: 398, pl. 6, figs 3, 5, EARLY KIMMERIDGIAN-TITHONIAN (Jhuran Formation), Kutch, Gujarat.

PROTOELLIPSODINIUM Davey & Verdier, 1971.

Protoellipsodinium sp. *In*: Kumar, 1986a: 32, VALANGINIAN-HAUTERIVIAN (ONGC bore core no. 4), Krishna-Godavari Basin, Andhra Pradesh, (Garg *et al.,* 1988 reassessed the age of this assemblage to be Hauterivian-Barremian).

PSALIGONYAULAX Sarjeant, 1966b emend. Sarjeant, 1982b.

Psaligonyaulax deflandrei Sarjeant, 1962b emend. Sarjeant, 1982b. *In*: Khowaja-Ateequzzaman & Garg, 2002: 136, EARLY TURONIAN (Kulakkalnattam Sandstone Member, Garudamangalam Formation), Cauvery Basin, southern India; Mehrotra & Aswal, 2003: 87, pl. 35, figs 1 & 2, TURONIAN – SANTONIAN (ONGC well RCPM- A, 1220 – 1400m, Tirupati formation), Krishna-Godavari Basin, Andhra Pradesh; BERRIASIAN – CAMPANIAN

(ONGC well END- A, 1100 – 1915m, Raghavapuram and Tirupati formations), Krishna-Godavari Basin, Andhra Pradesh ; Mehrotra *et al.*, 2005: 57, BERRIASIAN - CAMPANIAN ex Mehrotra & Aswal, 2003, Krishna-Godavari Basin, Andhra Pradesh.

PSEUDOCERATIUM Gocht, 1957 emend. Dörhöfer & Davies, 1980 emend. Bint, 1986 emend. Helby, 1987.

Pseudoceratium almohadense (Below, 1984) Lentin & Williams, 1985. *In*: 89, pl. 18, fig. 3, TURONIAN – TITHONIAN (ONGC well RCPM- A, 1415 – 2780m, Tirupati, Raghavapuram and Golapalli formations), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al.*, 2005: 58, TITHONIAN - TURONIAN ex Mehrotra & Aswal, 2003, Krishna-Godavari Basin, Andhra Pradesh.

Pseudoceratium anaphrissum (Sarjeant, 1966c) Bint, 1986 emend. Harding, 1990. *In*: Khowaja-Ateequzzaman & Jain, 1992: 172, pl. 3, figs 11, 14, HAUTERIVIAN-BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu.

Tenua anaphrissa (Sarjeant, 1966c) Benedek, 1972. *In*: Jain, 1977b: 178-179, pl. 3, fig. 36, EARLY ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

Aptea anaphrissa (Sarjeant, 1966c) Sarjeant & Stover, 1978. *In*: Mehrotra & Aswal, 2003: 14, pl. 36, figs 2, 4 & 5, TITHONIAN – BERRIASIAN (ONGC well RCPM-A, 2440 – 2967m, Golapalli Formation), Krishna-Godavari Basin, Andhra Pradesh; TITHONIAN – EARLY ALBIAN (ONGC well DRK-A, 1800 – 2180m, Raghavapuram Shale), Krishna-Godavari Basin, Andhra Pradesh; TITHONIAN – BARREMIAN (ONGC well MVD- A, 1935 – 2380m, Golapalli & Raghavapuram formations), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al.*, 2005: 41-42, TITHONIAN – EARLY ALBIAN ex Mehrotra & Aswal, 2003, Krishna-Godavari Basin, Andhra Pradesh.

Pseudoceratium cf. **P. pelliferum** Gocht, 1957 emend. Dörhöfer & Davies, 1980. *In* : Mehrotra & Aswal, 2003 : 88, pl. 16, fig. 3, TURONIAN (ONGC well RCPM- A, 1440 – 1945m, Tirupati and Raghavapuram formations), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al.*, 2005: 58, TURONIAN ex Mehrotra & Aswal, 2003, Krishna-Godavari Basin, Andhra Pradesh.

Pseudoceratium polymorphum (Eisenack, 1958a) Bint, 1986. **NOW Aptea polymorpha** Eisenack, 1958a emend. Dörhöfer & Davies, 1980.

Pseudoceratium spitiense Jain & Garg *in* Jain *et al.,* 1984. *In*: Jain *et al.*, 1984: 72, pl. 3, figs 41-42, MIDDLE TITHONIAN (Spiti Shale Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh (Orthographic change; Jain & Garg *in* Jain *et al.,* 1984 listed P. *spitiensis*).

PTERODINIUM Eisenack, 1958a emend. Yun, 1981 emend. Sarjeant, 1985a.

Pterodinium aliferum Eisenack, 1958 emend. Sarjeant, 1985a. *In*: Khowaja-Ateequzzaman & Jain, 1992: 172, pl. 6, fig. 3, HAUTERIVIAN-BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu; Khowaja-Ateequzzaman & Garg, 2002: 136, pl. 1, figs 5, 6; pl. 3, figs 9, 10, MIDDLE TURONIAN (Kulakkalnattam Sandstone Member, Garudamangalam Formation), Cauvery Basin, southern India.

Pterodinium cingulatum (O.Wetzel, 1933b) Below, 1981a. *In*:Singh & Sarkar, 1987: 208, EOCENE (Subathu Formation), Banethi-Bagthan area, Simla Hills, Himachal Pradesh; Sarkar & Singh, 1988: 52, pl. 4, fig. 6, EOCENE (Subathu Formation), Banethi- Bagthan area, Simla Hills, Himachal Pradesh; Sarkar, 1991: 3, EARLY EOCENE (Kakara Series, Lesser Himalaya),

Kakara-Chapla group of villages, Simla, Himachal Pradesh.

Spiniferites cingulatus (O. Wetzel, 1933b) Sarjeant, 1970. *In*: Jain, 1978: 148-149, pl. 1, fig. 10, LATEST MAASTRICHTIAN (Kallankurchi Formation), Vriddhachalam area, Cauvery Basin, Tamil Nadu.

Pterodinium cf**. P. cingulatum** (O. Wetzel, 1933b) Below, 1981.

Hystrichosphaera cf. *H. cingulata* (O. Wetzel, 1933b) Deflandre & Cookson, 1955. *In*: Banerjee & Misra, 1972: 211, pl. 1, fig. 9, EOCENE--MIOCENE, Assam and Tripura.

Spiniferites cf. *S. pterotus* (Cookson & Eisenack, 1958) Sarjeant, 1970. *In*: Kumar, 1986a: 32, VALANGINIAN-HAUTERIVIAN (ONGC bore core nos. 1, 2, 6), Krishna-Godavari Basin, Andhra Pradesh, (Garg *et al.,* 1988 reassessed the age of this assemblage to be Hauterivian-Barremian).

Pterodinium cingulatum subsp. **cingulatum** Autonym.

Spiniferites cingulatus subsp. *cingulatus* Autonym. *In*: Jain, 1977. pl. 6, figs 70-71, EARLY ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

Pterodinium eisenackii Jain. 1977b. *In*: Jain, 1977b: 178, pl. 6, fig. 73, EARLY ALBIAN Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

Pterodinium tuberculatum Khowaja-Ateequzzaman & Jain, 1992. *In*: Khowaja-Ateequzzaman & Jain, 1992: 172, 174, pl. 8, fig. 5, HAUTERIVIAN-BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu.

PTEROSPERMELLA Eisenack, 1972. (Prasinophyte genus)

Pterospermella aristotelesii (Ionnides *et al*.) Srivastava, 1984. *In*: Khowaja-Ateequzzaman & Jain, 1992: 174, pl. 13, figs 3, 4, HAUTERIVIAN - BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu.

Pterospermella aureolata (Cookson & Eisenack, 1958) Eisenack, 1972. *In*: Khowaja-Ateequzzaman & Jain, 1992: 174, pl. 13, fig. 1, HAUTERIVIAN - BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu.

Pterospermella hartii (Sarjeant) Eisenack *et al*., 1973. *In*: Khowaja-Ateequzzaman & Jain, 1992: 174, pl. 13, fig. 11, HAUTERIVIAN - BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu.

PTEROSPERMOPSIS W. Wetzel, 1952 (Acritarch genus)

Pterospermopsis sp. *In*: Garg & Khowaja-Ateequzzaman, 2000: 471, LATE THANETIAN (Lakadong Sst Member, Sylhet Limestone Formation), Cherrapunji area, Khasi Hills, Meghalaya.

PYXIDIELLA Cookson & Eisenack. 1958.

Pyxidiella ?scrobiculata (Deflandre Cookson, 1955) Cookson & Eisenack, 1958. *In*: Khowaja-Ateequzzaman & Jain, 1992: 174, pl. 6, fig. 4, HAUTERIVIAN-BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu. (Questionable assignment: Stover & Evitt, 1978)

Batiacasphaera scrobiculata (Deflandre & Cookson, 1955) Burger, 1980. *In*: Kumar, 1986a: 27, VALANGINIAN-HAUTERIVIAN, (ONGC bore core nos. 5. 6), Krishna-Godavari Basin, Andhra Pradesh, (Garg *et al.,* 1988 reassessed the age of this assemblage to be Hauterivian-Barremian).

RENIDINIUM Morgenroth, 1968.

?Renidinium sp. A *In*: Jain & Garg, 1986b; 119, pl. 3, figs 12-13, LATE PALAEOCENE, Vriddhachalam area, Cauvery Basin, Tamil Nadu.

RHAETOGONYAULAX Sarjeant, 1966b emend. Harland *et al.,* 1975 emend. Fisher & van Helden, 1979 emend. Below, 1987a.

Rhaetogonyaulax rhaetica (Sarjeant, 1963b) Loeblich Jr. & Loeblich III, 1968 emend. Harland *et al.,* 1975 emend. Fisher & van Helden, 1979 emend. Below, 1987a. *In*: Sharma & Sarjeant, 1987: 259, pl. 2, fig. 5, LATE TRIASSIC (Baratang Formation), Andaman Islands.

Rhaetogonyaulax wigginsii (Stover & Helby, 1987a) Lentin & Williams, , 1989. *In*; Mehrotra *et al*., 2005: 58, ANISIAN - LADINIAN ex Aswal & Mehrotra, 2002, Krishna-Godavari Basin, Andhra Pradesh

RHYNCHODINIOPSIS Deflandre, 1935 emend. Below, 1981a emend. Sarjeant, 1982b emend. Jan du Chêne *et al.,* 1985b.

Rhynchodiniopsis ambigua (Deflandre, 1939a} Sarjeant. 1982b. **NOW Leptodinium ambiguum** (Deflandre, 1939a) Helenes, 1984.

Rhynchodiniopsis aptiana Deflandre, 1935 emend. Sarjeant, 1982b. *In*: Kumar, 1986a: 32, VALANGINIAN--HAUTERIVIAN (ONGC bore core nos. 1, 7), Krishna -Godavari Basin, Andhra Pradesh, (Garg *et al.,* 1988 reassessed the age of this assemblage to be Hauterivian-Barremian).

Rhynchodiniopsis cladophora (Deflandre, 1939a) Below, 1981a. *In*: Mehrotra & Aswal, 2003: 91, pl. 1, figs 3 & 4, TURONIAN (ONGC well RCPM- A, 1395 – 1400m, Tirupati Formation), Krishna-Godavari Basin, Andhra Pradesh ; Mehrotra *et al*., 2005: 58, TURONIAN ex Mehrotra & Aswal, 2003, Krishna-Godavari Basin, Andhra Pradesh.

Rhynchodiniopsis hyalodermopsis (Cookson & Eisenack, 1958) Sarjeant, 1982b. **NOW Leptodinium hyalodermopse** (Cookson & Eisenack, 1958) Stover & Evitt, 1978.

Rhynchodiniopsis serrata (Cookson & Eisenack, 1958) Jan du Chêne *et al.,* 1985b.

Gonyaulacysta serrata (Cookson & Eisenack, 1958) Sarjeant, 1969. *In*: Jain & Taugourdeau-Lantz, 1973: 62, pl. 2, figs 14-15, ?APTIAN-EARLY ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

Hystrichogonyaulax serrata (Cookson & Eisenack, 1958) Stover & Evitt, 1978. *In*: Kumar, 1986a: 31, VALANGINIAN-HAUTERIVIAN (ONGC bore core nos. 5, 7), Krishna Godavari Basin, Tamil Nadu. (Garg *et al.,* 1988 reassessed the age of this assemblage to be Hauterivian-Barremian).

RICULACYSTA Stover, 1977.

Riculacysta fenestrate. *In*: Mathur, 1986: 195-198, LUTETIAN- - BARTONIAN (Kalol Formation, well no. 109), Cambay Basin, Gujarat. (Authorship not cited, name not validly published)

Riculacysta perforata Stover, 1977. *In*: Mathur, 1986: 195-198, LUTETIAN - BARTONIAN (Kalol Formation, well no. 109), Cambay Basin, Gujarat.

RIGAUDELLA Below, 1982b.

Rigaudella aemula (Deflandre, 1939a) Below, 1982b emend. Below, 1982b. *In*: Garg *et al*., 2003: 52-53, pl, V, fig. 4, LATE LOWER TITHONIAN (*Kosmatia* Ammonite, Middle Division, Spiti Shale Formation, Kibber Section of Spiti Valley); LATE LOWER TITHONIAN (*Virgatosphinctes* Ammonite, Upper level of the Middle Division, Spiti Shale Formation, Gate Section of Spiti Valley), Malla Johar area, Kumaon Himalaya.

Adnatosphaeridium aemulum (Deflandre, 1939a) Williams & Downie, 1969. *In*: Jain *et al*., 1978: 116, LATE JURASSIC (Spiti Shale Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh; Jain *et al*., 1984: 79, pl. 2, fig. 36, EARLY LATE TITHONIAN (Spiti Shale Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh; Jain *et al*., 1986: 76, pl. 3, fig. 34, LATE JURASSIC, Kutch, Gujarat.

Rigaudella cf. **R. aemula** (Deflandre, 1939a) Below, 1982b emend. Below, 1982b. *In*: Kumar, 1987a: 599, LATE BATHONIAN-CALLOVIAN (Jhurio Formation), Kutch, Gujarat.

Rigaudella filamentosa (Cookson & Eisenack, 1958) Below, 1982b.

Adnatosphaeridium filamentosum (Cookson & Eisenack, 1958) Williams & Downie, 1969. *In*: Jain *et al.*, 1986: 79, pl. 1, fig. 12, LATE JURASSIC, Kutch, Gujarat; Kumar, 1986b: 382, pl. 1, figs 1-3, EARLY KIMMERIDGIAN-TITHONIAN (Jhuran Formation), Kutch, Gujarat; Kumar, 1987a: 598, EARLY KIMMERIDGIAN-TITHONIAN (Jhuran Formation), Kutch, Gujarat.

Adnatosphaeridium paucispinum (Klement, 1960) Gitmez & Sarjeant, 1972. *In*: Jain *et al.*, 1986: 79, pl. 1, fig. 5, LATE JURASSIC, Kutch, Gujarat.

Rigaudella sp. cf. **R. filamentosa** (Cookson & Eisenack, 1958) Below, 1982b. *In*: Garg *et al.*, 2003: 52-53, pl, IV, fig. 20, LATE LOWER TITHONIAN (*Kosmatia* Ammonite, Middle Division, Spiti Shale Formation, Kibber Section of Spiti Valley), Malla Johar area, Kumaon Himalaya.

SAHULIDINIUM Stover & Helby, 1987a

Sahulidinium otti Stover & Helby, 1987a. *In*: Mehrotra *et al.*, 2005: 59, ANISIAN - LADINIAN ex Aswal & Mehrotra, 2002, Krishna-Godavari Basin, Andhra Pradesh.

SAMLANDIA Eisenack, 1954b.

Samlandia chlamydophora Eisenack, 1954b. *In*: Dutta & Jain, 1980: 65, pl. 7, fig. 65, EARLY-MIDDLE EOCENE (Sylhet Formation), Jaintia Hills, Meghalaya; Jain & Tandon, 1981: 13, pl. 4, fig, 72, MIDDLE EOCENE (Harudi Formation), Kutch, Gujarat; Kar, 1985: 195, pl. 42, fig. 13, MIDDLE EOCENE (Harudi Formation), Kutch, Gujarat, (reproduction from Jain & Tandon, 1981); Sarkar, 1991: 3, pl. III, figs 9, 10, EARLY EOCENE (Kakara Series, Lesser Himalaya), Kakara-Chapla group of villages, Simla, Himachal Pradesh; Singh & Sarkar, 1992: 185, LATE PALAEOCENE?-EOCENE (Subathu Formation), Garkhal area, Punjab Basin, Himachal Pradesh.

Samlandia sp. A. *In*: Mehrotra & Kamla Singh, 2003: 72, pl. 6, figs 4 & 6, EARLY OLIGOCENE – EARLY EOCENE (ONGC well MNP- A, 995 – 1930m, Matsyapuri Sandstone, Bhimapalli Limestone and Pasarlapudi Formation), Krishna-Godavari Basin, Andhra Pradesh; LATE EOCENE – EARLY EOCENE (ONGC well MGP- A, 1770 – 2750m), Krishna-Godavari Basin, Andhra Pradesh; MIDDLE EOCENE – PALAEOCENE (ONGC well RZL- A, 1750 – 3100m, Bhimapalli Limestone, Pasarlapudi Formation and Palakollu Shale), Krishna-Godavari Basin, Andhra Pradesh.

Samlandia sp. B. *In*: Mehrotra & Kamla Singh, 2003: 72, pl. 6, figs 3 & 5, EARLY OLIGOCENE – EARLY EOCENE (ONGC well MNP- A, 995 – 1930m, Matsyapuri Sandstone, Bhimapalli Limestone and Pasarlapudi Formation), Krishna-Godavari Basin, Andhra Pradesh; LATE EOCENE – EARLY EOCENE (ONGC well MGP- A, 1770 – 2750m), Krishna-Godavari Basin, Andhra Pradesh; MIDDLE EOCENE – PALAEOCENE (ONGC well RZL- A, 1750 – 3100m, Bhimapalli Limestone, Pasarlapudi Formation and Palakollu Shale), Krishna-Godavari Basin, Andhra Pradesh.

SCRINIOCASSIS Gocht. 1964 emend. Prauss, 1989.

Scriniocassis ?downiei Kumar 1986b. *In*: Kumar, 1986b: 402, pl. 4, fig. 7, text-fig. 11, EARLY KIMMERIDGIAN-TITHONIAN (Jhuran Formation), Kutch, Gujarat; Kumar, 1987a: 598, EARLY KIMMERIDGIAN-TITHONIAN (Jhuran Formation), Kutch, Gujarat. (Questionable assignment: Below, 1990 as a "nomen dubium")

SCRINIODINIUM Klement, 1957 emend. Prauss, 1989.

Scriniodinium attadalense (Cookson & Eisenack, 1958) Eisenack, 1967. *In*: Kumar,

1986a: 32, VALANGINIAN--HAUTERIVIAN (ONGC bore core no. 2), Krishna-Godavari Basin, Andhra Pradesh, (Garg *et al.,* 1988 reassessed the age of this assemblage to be Hauterivian-Barremian); Khowaja-Ateequzzaman & Jain, 1992: 174, pl. 13, fig. 5, HAUTERIVIAN-BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu.

Scriniodinium crystallinum (Deflandre, 1939a) Klement, 1960. *In*: Garg *et al*., 2003: 52-53, pl, II, fig. 5, LATE LOWER TITHONIAN (*Kosmatia* Ammonite, Middle Division, Spiti Shale Formation, Kibber Section of Spiti Valley); LATE LOWER TITHONIAN (*Virgatosphinctes* Ammonite, Upper level of the Middle Division, Spiti Shale Formation, Gate Section of Spiti Valley); LATE LOWER TITHONIAN (*Paraboliceras* Ammonite, Upper part of the Middle Division, Spiti Shale Formation, Kibber Section); LATE UPPER TITHONIAN (*Blanfordiceras* Ammonite), Malla Johar area, Kumaon Himalaya.

Scriniodinium dictyotum subsp. *papillatum* Gitmez, I970. **NOW Aldorfia dictyota** subsp. **papillata** (Gitmez, 1970) Jan du Chene *et al.,* 1986.

Scriniodinium dictyophorum (Deflandre, 1939a ex Sarjeant, 1967b) Brenner, 1988.

Scriniodinium dictyophora (Deflandre, 1939a ex Sarjeant, 1967b) Stover & Evitt, 1978. *In*: Garg *et al*., 2003: 52-53, pl, II, fig. 7, LATE LOWER TITHONIAN (*Kosmatia* Ammonite, Middle Division, Spiti Shale Formation, Kibber Section of the Spiti valley), Malla Johar area, Kumaon Himalaya.

Scriniodinium echinatum Jain & Garg *in* Jain *et al.,* 1984. *In*: Jain *et al.*, 1984: 73, pl. 2, fig. 21; pl. 3, fig 45, EARLY TITHONIAN (Spiti Shale Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh.

Scriniodinium galeritum (Deflandre, 1939a) Klement, 1960. **NOW Endoscrinium galeritum** (Deflandre, 1939a) Vozzhennikova, 1967.

Scriniodinium indicum Jain & Garg *in* Jain *et al.,* 1984. *In*: Jain *et al.*, 1984: 71-72, pl. 2, figs 22-23, KIMMERIDGIAN--EARLY TITHONIAN (Spiti Shale Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh, (misprinted as *Scriniodinium klementii* Jain & Garg, *n. sp.* for *S. indicum* in the checklist, p. 70).

Scriniodinium luridum (Deflandre, 1939a) Klement, 1960. **NOW Endoscrinium luridum** (Deflandre, 1939a) Gocht, 1970.

Scriniodinium parvimarginatum (Cookson & Eisenack, 1958) Eisenack, 1967. *In*: Garg *et al*., 2003: 52-53, pl, II, fig. 9, LATE LOWER TITHONIAN (*Hildoglochiceras* Ammonite, Middle part of the Middle Division, Spiti Shale Formation, Laptal Section); LATE LOWER TITHONIAN (*Kosmatia* Ammonite, Middle Division, Spiti Shale Formation, Kibber Section of Spiti Valley); LATE LOWER TITHONIAN (*Paraboliceras* Ammonite, Upper part of the Middle Division, Spiti Shale Formation, Kibber Section), Malla Johar area, Kumaon Himalaya.

Scriniodinium sp. *In*: Kumar. 1982: 172, pl. 2, fig. 17, NEOCOMIAN, Krishna-Godavari Basin, Andhra Pradesh.

?Scriniodinium sp. A *In*: Jain, 1977b: 185, pl. 5, fig. 62, EARLY ALBIAN, (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

cf. **Scriniodinium** Klement. 1957. *In*: Jain *et al*., 1984: 78, pl. 5, fig. 111, KIMMERIDGIAN (Spiti Shale Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh.

SELENOPEMPHIX Benedek, 1972 emend. Bujak *in* Bujak *et al.,* 1980 emend. Bujak & Sarjeant, 1981 emend. Head, 1993.

Selenopemphix armata Bujak in Bujak *et al.*, 1980. *In*: Mehrotra & Kamla Singh, 2003: 75, pl. 19, fig. 4; pl. 20, fig. 5, EARLY OLIGOCENE – MIDDLE EOCENE (ONGC well MORI- A, 1495 – 2050m, Matsyapuri sandstone and Bhimapalli Limestone),

Krishna-Godavari Basin, Andhra Pradesh; SERRAVALLIAN – LANGHIAN-AQUITANIAN (ONGC well KSP- A, 1550 – 2050m), Krishna-Godavari Basin, Andhra Pradesh; AQUITANIAN – CHATTIAN (ONGC well MNP- A, 750 – 780m, Matsyapuri Sandstone), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 78, MIDDLE EOCENE – MIDDLE MIOCENE ex Mehrotra & Kamla Singh, 2003, Krishna-Godavari Basin, Andhra Pradesh.

Selenopemphix coronata Bujak in Bujak *et al*., 1980. *In*: Mehrotra & Kamla Singh, 2003: 76, pl. 31, fig. 1, EARLY OLIGOCENE (ONGC well MORI- A, 1495 – 1500m, Matsyapuri Sandstone), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 78, EARLY OLIGOCENE ex Mehrotra & Kamla Singh, 2003, Krishna-Godavari Basin, Andhra Pradesh.

Selenopemphix maastrichta Kumar *et al*., 1993. *In*: Kumar *et al*., 1993: 141-143, pl. 1, figs 1 – 8. text-fig, 2, LATE MAASTRICHTIAN (Upper part of Mahadeo Formation, Um Sohryngkew River Section), Meghalaya; Kumar *et al*., 1996: 150, pl. 2, figs 3 - 6, LATEST MAASTRICHTIAN (Upper part of Mahadeo Formation, Um Sohryngkew River Section), Meghalaya..

Selenopemphix nephroides Benedek, 1972 emend. Bujak in Bujak *et el*., 1980. *In*: Khanna *et al*., 1985: 100, pl. 1, fig. 12, PALAEOGENE (Subathu Formation), Jammu Hills; Aswal & Pundeer, 1996: 636, pl. 1, fig. 1, LUTETIAN-BARTONIAN – EARLY MIOCENE (ONGC Mori well- A, 2000 – 1200m), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra & Kamla Singh, 2003: 74, pl. 31, figs 5 & 6, EARLY OLIGOCENE (ONGC well MORI- A, 1495 – 1500m, Matsyapuri Sandstone), Krishna-Godavari Basin, Andhra Pradesh; PLIOCENE – PRIABONIAN-BARTONIAN (ONGC well KSP- A, 630 – 2475m, Godavari Claystone and Ravva Formation), Krishna-Godavari Basin, Andhra Pradesh; HOLOCENE-CALABRIAN – LANGHIAN-AQUITANIAN (ONGC well GS- 15- D, 830 – 2510m), Krishna-Godavari Basin, Andhra Pradesh; CALABRIAN-ZANCLEAN – CHATTIAN (ONGC well SSY- A, 790 – 2055m), Krishna-Godavari Basin, Andhra Pradesh ; CALABRIAN-ZANCLEAN – BARTONIAN-LUTETIAN (ONGC well MGP- A, 450 – 2200), Krishna-Godavari Basin, Andhra Pradesh; MIDDLE MIOCENE – OLIGOCENE (ONGC well BMP- A, 650 – 1000m, Narasapur Claystone and Matsyapuri Sandstone), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 77-78, LUTETIAN (42 Ma) – RUPELIAN ex Mehrotra *et al*., 2002, Mumbai Offshore; MIDDLE EOCENE – HOLOCENE ex Mehrotra & Kamla Singh, 2003, Krishna-Godavari Basin, Andhra Pradesh.

Selenopemphix selenoides Benedek, 1972 emend. Bujak in Bujak *et al*., 1980 emend. Bujak & Sarjeant, 1980. *In*: Mehrotra & Kamla Singh, 2003: 77, pl. 31, fig. 3, EARLY OLIGOCENE – MIDDLE EOCENE (ONGC well MORI- A, 1495 – 1985m, Matsyapuri Sandstone, Bhimapalli Limestone and Pasarlapudi Formation), Krishna-Godavari Basin, Andhra Pradesh; AQUITANIAN – CHATTIAN (ONGC well GS- 15- D, 2230 – 2790m, Ravva Formation), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 78, MIDDLE EOCENE – LOWER MIOCENE ex Mehrotra & Kamla Singh, 2003, Krishna-Godavari Basin, Andhra Pradesh.

SENONIASPHAERA Clarke & Verdier, 1967.

Senoniasphaera sp. A *In*: Jain, 1977b: 179, pl. 5, fig. 61, EARLY ALBIAN Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

SENTUSIDINIUM Sarjeant & Stover, 1978 emend. Courtinat, 1989.

Sentusidinium aptiense (Burger, 1980a) Burger, 1980b. **NOW Batiacasphaera aptiensis** (Burger, 1980a) Kumar 1986a.

Sentusidinium brevispinosum (Jain & Millepied, 1975) Islam, 1993.

Cleistosphaeridium brevispinosum Jain & Millepied, 1975. *In*: Khanna *et al.*, 1985: 100, pl. 2, figs 2, 3, PALAEOGENE (Subathu Formation), Jammu Hills; Sarkar, 1991: 2, pl. II, fig. 3, EARLY EOCENE (Kakara Series, Lesser Himalaya), Kakara-Chapla group of villages, Simla, Himachal Pradesh; Singh & Sarkar, 1992: 185, LATE PALAEOCENE?-EOCENE (Subathu Formation), Garkhal area, Punjab Basin, Himachal Pradesh; Sarkar, 1997: 102, pl. 2, fig. 8, LATE YPRESIAN – LUTETIAN (Subathu Formation, Bilaspur area), Punjab Basin, Himachal Pradesh; Sarkar & Prasad, 2000a: 170, LATE YPRESIAN – MIDDLE LUTETIAN (Subathu Formation, Koshalia Nala Section), Shimla Hills; Sarkar & Prasad, 2000b: 141, pl. I, fig. 8, LATE YPRESIAN – EARLY LUTETIAN (Subathu Formation, Morni Hills), Haryana; Saxena & Sarkar, 2000: 256, 263, pl. 1, fig. 2, MIDDLE EOCENE (Siju Formation), Simsang River near Siju, South Garo Hills, Meghalaya; Mandal *et al.*, 2003: 104, EARLY EOCENE (Baratang Formation), Andaman-Nicobar Islands..

Sentusidinium cereberbarbatum Erkman & Sarjeant, 1980. **NOW Barbatacysta cerebarbata** (Erkman & Sarjeant, 1980) Courtinat, 1989.

Sentusidinium echinatum (Gitmez & Sarjeant, 1972) Sarjeant & Stover, 1978. **NOW Pilosidinium echinatum** (Gitmez & Sarjeant, 1972) Courtinat, 1989.

Sentusidinium ?fibrillosum Backhouse, 1988. *In*: Khowaja-Ateequzzaman & Jain, 1992: 174, pl. 10, figs 1, 5, HAUTERIVIAN-BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu. (Questionable assignment: Backhouse, 1988)

Sentusidinium fibrosum Kumar, 1987a. *In*: kumar, 1987b: 243-244, pl. 1, figs 5, 7, 8, 11, text-fig. 6, EARLY KIM-MERIDGIAN-TITHONIAN (Jhuran Formation), Kutch, Gujarat.

Sentusidinium hexagonale Kumar, 1986b. *In*: Kumar, 1986b: 400-401, pl. 1, figs 5, 7, text-fig. 10, EARLY KIMMERIDGIAN-TITHONIAN (Jhuran Formation), Kutch, Gujarat; Kumar, 1987a: 598, EARLY KIMMERIDGIAN-TITHONIAN (Jhuran Formation), Kutch, Gujarat, (orthographic change from S. *hexagonalis* listed by Kumar, 1986b and 1987a).

Sentusidinium microcystum (Bujak *in* Bujak *et al.,* 1980) Islam, 1993..

Tenua microcysta Bujak *in* Bujak et al., 1980. *In*: Mathur, 1986: 195-198, LUTETIAN--BARTONIAN (Kalol Formation, well no. 109), Cambay Basin, Gujarat.

Sentusidinium pelionense Fensome, 1979. **NOW Barbatacysta pelionensis** (Fensome, 1979) Courtinat, 1989.

Sentusidinium rioultii (Sarjeant, 1968) Sarjeant & Stover, 1978 emend. Courtinat, 1989. *In*: Khanna *et al.*, 1985: 106, pl. 1, fig. 2, PALAEOGENE (Subathu Formation), Jammu Hills; Singh & Sarkar, 1987: 208, pl. 1, fig 22, EOCENE (Subathu Formation), Banethi-Bagthan area, Simla Hills, Himachal Pradesh; Sarkar & Singh, 1988: 52, pl. 3, figs 13-15, EOCENE (Subathu Formation), Banethi-Bagthan area, Simla Hills, Himachal Pradesh; Sarkar & Prasad, 2000b: 141, LATE YPRESIAN (Subathu Formation, Morni Hills), Haryana.

Sentusidinium sp. *In*: Jain *et al.*, 1978: 116, pl. 1, fig. 4, LATE JURASSIC (Spiti Shale Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh.

?Sentusidinium sp. *In*: Jain *et al.*, 1978: 116, pl. 1, fig. 5, LATE JURASSIC (Spiti Shale Formation) , Malla Johar area, Kumaon Himalaya, Uttar Pradesh.

Sentusidinium sp. *In*: Sarkar & Singh, 1988: 52-53, pl. 3, fig. 17, EOCENE (Subathu

Formation), Banethi-Bagthan area, Simla Hills, Himachal Pradesh.

Sentusidinium sp. *In*: Singh & Sarkar, 1992: 185, LATE PALAEOCENE?-EOCENE (Subathu Formation), Garkhal area, Punjab Basin, Himachal Pradesh.

Sentusidinium sp. A *In*: Jain *et al*., 1982: 25, pl. 1, figs 1,4, LATE JURASSIC, Morghat, Madhya Pradesh, (Garg *et al.,* 1988 reassessed the of this assemblage to be Early Cretaceous).

Sentusidinium sp. A *In*: Jain *et al*., 1984: 71, pl. 3, fig. 51, MIDDLE-EARLY LATE TITHONIAN (Spiti Shale Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh.

Sentusidinium sp. A *In*: Kumar, 1986b: 401-402, pl. 3, fig. 2, EARLY KIMMERIDGIAN-TITHONIAN (Jhuran Formation), Kutch, Gujarat.

Sentusidinium sp. A *In*: Kumar, 1987a: 598, EARLY KIMMERIDGIAN-TITHONIAN (Jhuran Formation), Kutch, Gujarat.

Sentusidinium sp. B *In*: Jain *et al*., 1982: 25, pl. 1, figs 2-3, ?LATE JURASSIC, Mor-ghat, Madhya Pradesh.

Sentusidinium sp. B *In*: Jain *et al*., 1984: 71, pl. 5, fig. 96, MIDDLE-EARLY LATE TITHONIAN (Spiti Shale Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh.

Sentusidinium sp. D *In*: Jain *et al*., 1984: 71, pl. 3, fig. 44, LATE JURASSIC (Spiti Shale Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh.

Sentusidinium spp. *In*: Kumar, 1987a; 599, pl. 3, fig. 3, LATE BATHONIAN-CALLOVIAN (Jhurio Formation), Kutch, Gujarat.

SEPISPINULA Islam, 1993.

Sepispinula huguoniotii (Valensi, 1955a) Islam, 1993. *In* : Khowaja-Ateequzzaman & Garg, 2002: 136, EARLY TURONIAN (Kulakkalnattam Sandstone Member, Garudamangalam Formation), Cauvery Basin, southern India.

Cleistosphaeridium huguoniotii (Valensi, 1955a) Davey, 1969. *In*: Khowaja-Ateequzzaman & Jain, 1992: 148, 150, pl. 9, fig. 13, HAUTERIVIAN-BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu; Khowaja-Ateequzzaman & Garg, 2002: 136, pl. 2, fig. 4, EARLY TURONIAN (Kulakkalnattam Sandstone Member, Garudamangalam Formation), Cauvery Basin, southern India.

"SILICISPHAERA" Davey & Verdier, 1976. **NOW FLORENTINIA** Davey & Verdier, 1973 emend. Duxbury, 1980. (Taxonomic senior synonym, according to Duxbury, 1980, p. 119 and Lentin & Williams, 1989, p. 339)

Silicisphaera sp. A *In* Jain, 1978 = **Florentinia sp. A**

Silicisphaera sp. B *In* Jain, 1978 = **Florentinia sp. B**

SIRMIODINIUM Alberti, 1961 emend. Warren, 1973.

Sirmiodinium grossii Alberti, 1961 emend. Warren, 1973. *In*: Garg *et al*., 2003: 52-53, pl. I, fig. 7; pl, II, fig. 1, LATE LOWER TITHONIAN (*Kosmatia* Ammonite, Middle Division, Spiti Shale Formation, Kibber Section of Spiti Valley); LATE LOWER TITHONIAN (*Paraboliceras* Ammonite, Upper part of the Middle Division, Spiti Shale Formation, Kibber Section), Malla Johar area, Kumaon Himalaya.

SPINIDINIUM Cookson & Eisenack, 1962b emend. Lentin & Williams, 1976.

Spinidinium macmurdoense (Wilson, 1967a) Lentin & Williams, 1976. *In*: Garg & Khowaja-Ateequzzaman, 2000: 471, pl. 3, fig. 7, LATE THANETIAN (Lakadong Sst Member, Sylhet Limestone Formation), Cherrapunji area, Khasi Hills, Meghalaya.

SPINIFERELLA Stover Hardenbol, 1994

Spiniferella cornuta cornuta Autonym.

Spiniferites cornutus subsp. *opisthophorus* (Cookson &

Eisenack, 1974) Lentin & Williams, 1973. *In*: Jain & Garg, 1986b: 119, pl. 3, fig. 4, LATE PALAEOCENE, Vriddhachalam area, Cauvery Basin, Tamil Nadu.

SPINIFERITES Mantell, 1850 emend. Sarjeant, 1970.

Spiniferites ? assamicus (Kar *et al*., 1972) Lentin & Williams, 1973. (Questionable assignment: Stover & Evitt, 1978)

Hystrichosphaera assamica Kar *et al.*, 1972. *In*: Kar *et al.*, 1972: 147, pl. 1, figs 6-7, Tura Formation), Garo Hills, Assam.

Spiniferites bentorii (Rossignol, 1964) Wall & Dale, 1970

Hytrichosphaera bentorii Rossignol, 1964. *In*: Banerjee, 1972: 135, CRETACEOUS, Khara Tar Well, Rajasthan.

Spiniferites bulloideus (Deflandre & Cookson, 1955) Sarjeant, 1970. *In*: Kar, 1985: 209, pl. 50, fig. 2, MIO-CENE (Khari Nadi Formation), Kutch, Gujarat.

Spiniferites bulloideus (Deflandre & Cookson, 1955) Sarjeant, 1970. *In*: Kar, 1985: 209, pl. 50, figs 1-2 = **Spiniferites ramosus** subsp. **multibrevis (**Davey & Williams, 1966a) Lentin Williams, 1973 **NOW Spiniferites twistringiensis** (Maier, 1959) Fensome *et al*., 1990. (According to Jain & Garg, 1991)

Spiniferites cingulatus (O.Wetzel, 1933b) Sarjeant, 1970. **NOW Pterodinium cingulatum** (O. Wetzel, 1933b) Below, 1981.

Spiniferites cingulatus subsp. *cingulatus* Autonym. **NOW Pterodinium cingulatum** subsp. **cingulatum** Autonym.

Spiniferites cornutus subsp. *opisthophorus* (Cookson & Eisenack, 1974) Lentin & Williams, 1977b. **NOW Spiniferella cornuta** subsp. **cornuta** Autonym

Spiniferites crassipellis (Deflandre & Cookson, 1955) Sarjeant, 1970. **NOW Achomosphaera crassipellis** (De-flandre & Cookson, 1955) Stover & Evitt, 1978.

Spiniferites ?dentatus (Gocht, 1959) Lentin & Williams, 1973 emend. Duxbury, 1977. *In*: Mehrotra & Sarjeant, 1986: 716-717, pl. 5, figs 1-2; pl. 9, figs 6-7, APTIAN, Periyavadavadi shallow well- 1, Cauvery Basin, Tamil Nadu.

Spiniferites ellipsoideus Matsuoka, 1983. *In* : Mehrotra & Kamla Singh, 2003 : 79, pl. 13, fig. 3 & 4, MIDDLE MIOCENE (ONGC well SSY- A, 1585 – 1615m), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 79, MIDDLE MIOCENE ex Mehrotra & Kamla Singh, 2003, Krishna-Godavari Basin, Andhra Pradesh..

Spiniferites hyperacanthus (Deflandre & Cookson, 1955) Cookson & Eisenack, 1974. *In*: Kar, 1985: 209, pl. 49, fig. 9, MIOCENE (Khari Nadi Formation), Kutch, Gujarat.

Hystrichosphaera hyperacantha Cookson, 1955. *In*: Banerjee & Misra, 1972: 207, EOCENE-MIOCENE, Tripura.

Spiniferites membranaceus (Rossignol, 1964) Sarjeant, 1970. *In*: Singh & Sarkar, 1987; 208, EOCENE (Subathu Formation), Banethi-Bagthan area, Simla Hills, Himachal Pradesh; Sarkar & Singh, 1988: 53, pl. 4, figs 3-5, EOCENE (Subathu Formation), Banethi-Bagthan area, Simla Hills, Himachal Pradesh; Mehrotra *et* al., 1996: 685, 687, RUPELIAN – BERDIGALIAN (ONGC well Gulf- 1, Tara Shale, Babaguru and Post Babaguru formations), LUTETIAN-PRIABONIAN – RUPELIAN-BERDIGALIAN (ONGC well Gulf- 3, Tarapur Shale, Babaguru and Post Babaguru formations), Gulf of Cambay, Gujarat; Sarkar, 1997: 102, LUTETIAN (Subathu Formation, Bilaspur area), Punjab Basin, Himachal Pradesh; Sarkar & Prasad, 2000a: 170, LATE YPRESIAN – MIDDLE LUTETIAN (Subathu Formation, Koshalia Nala Section), Shimla Hills; Sarkar & Prasad, 2000b: 141, pl. I, fig. 12, LATE YPRESIAN – MIDDLE LUTETIAN (Subathu Formation, Morni

Hills), Haryana; Mehrotra & Kamla Singh, 2003: 80, pl. 11, figs 5 & 6, PLEISTOCENE – LATE MIOCENE (ONGC well SSY- A, 190 – 1030m, Godavari Formation), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 79, EARLY EOCENE - OLIGOCENE ex Mehrotra *et al*., 1996, Cambay Basin, Gujarat; MIOCENE - PLIOCENE ex Mehrotra *et al*., 2002, Mumbai Offshore; LATE MIOCENE - PLEISTOCENE ex Mehrotra & Kamla Singh, 2003, Krishna-Godavari Basin, Andhra Pradesh; MIDDLE EOCENE ex Mehrotra *et al*., 2002, Assam-Arakan Basin, Northeastern India..

Spiniferites ramosus var. *membranaceus* (Rossignol, 1964) Davey & Williams, 1966. *In*: Mehrotra, 1981: 16, pl. 1, figs 8-9, MIDDLE EOCENE, Mikir-North Cachar, Assam.

Spiniferites membranosus (Archangelsky, 1969) Lentin & Williams, 1973. **NOW Achomosphaera crassipellis** (Deflandre & Cookson, 1955) Stover & Evitt, 1978.

Spiniferites mirabilis (Rossignol, 1964) Sarjeant, 1970. *In*: Kar, 1985: 209, pl. 48, fig. 9; pl. 50, figs 3-4, MIOCENE (Khari Nadi Formation), Kutch, Gujarat; Mehrotra & Kamla Singh, 2003: 81, pl. 10, figs 4 & 5, PLIOCENE (ONGC well MGP- A, 270 – 940m), Krishna-Godavari Basin, Andhra Pradesh; PLEISTOCENE – PLIOCENE (ONGC well SSY- A, 190 – 950m), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 79, PLIOCENE - PLEISTOCENE ex Mehrotra & Kamla Singh, 2003, Krishna-Godavari Basin, Andhra Pradesh; SELANDIAN - THANETIAN ex Mehrotra *et al*., 2002, Assam-Arakan Basin, Northeastern India.

Spiniferites monilis (Davey & Williams, 1966a) Sarjeant, 1970 emend. Eaton, 1976. *In*: Dutta & Jain, 1980: 69, pl. 6, figs 50,50a, EARLY-MIDDLE EOCENE (Sylhet Formation), Jaintia Hills, Meghalaya; Singh & Sarkar, 1987: 208, EOCENE (Subathu Formation), Banethi--Bagthan area, Simla Hills, Himachal Pradesh; Sarkar & Singh, 1988: 53, pl. 4, figs 7-8, EOCENE (Subathu Formation), Banethi-Bagthan area, Simla Hills, Himachal Pradesh; Tissot, 1990: 356, LATE HOLOCENE (Kandavara bore-well), Coondapur area, Karnataka.

Spiniferites porosus (Manum & Cookson, 1964) Harland, 1973. *In*: Khowaja-Ateequzzaman & Garg, 2002: 136, pl. 1, fig. 3, EARLY – LATE TURONIAN (Kulakkalnattam Sandstone Member, Garudamangalam Formation), Cauvery Basin, southern India.

Spiniferites pseudofurcatus (Klumpp, 1953) Sarjeant, 1970 emend. Sarjeant, 1981. *In*: Khanna *et al*., 1985: 100, pl. 2, fig. 8, PALAEOGENE (Subathu Formation), Jammu Hills; Mehrotra *et* al., 1996: 685-686, RUPELIAN – BERDIGALIAN (ONGC well Gulf- 1, Tarapur Shale, Babaguru and Post Babaguru formations), LUTETIAN-PRIABONIAN – MIOCENE (ONGC well Gulf- 2, Tarapur Shale, Babaguru and Post Babaguru formations), Gulf of Cambay, Gujarat; Mehrotra & Kamla Singh, 2003: 82, pl. 11, figs3 & 4; pl. 13, figs 5 & 6, MIDDLE MIOCENE (ONGC well SSY- A, 1560 – 1615m), Krishna-Godavari Basin, Andhra Pradesh; LATE MIOCENE AND YOUNGER – EARLY MIOCENE (ONGC well MNP- A, 575 – 950m), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 79, OLIGOCENE - MIOCENE ex Mehrotra *et al*., 2002, Cambay Basin, Gujarat THANETIAN – EARLY RUPELIAN (58 – 33 Ma) ex Mehrotra *et al*., 2003, Mumbai Offshore; EARLY MIOCENE – LATE MIOCENE ex Mehrotra & Kamla Singh, 2003, Krishna-Godavari Basin, Andhra Pradesh.

Spiniferites pterotus (Cookson & Eisenack, 1958) Sarjeant, 1970. **NOW Pterodinium cingulatum** (O. Wetzel, 1933b) Below, 1981.

Spiniferites ramosus (Ehrenberg, 1838) Mantell, 1854. *In*: van Erve *et al*., 1980: 618, pl. 1, fig. 2, EARLY EOCENE (Subathu Formation), Simla Hills, Himachal Pradesh; Kumar, 1982: 171-172, pl. 1, fig. 6,

NEOCOMIAN, Krishna-Godavari Basin, Andhra Pradesh; Singh & Sarkar, 1992: 185, pl. 1, fig. 6, LATE PALAEOCENE?-EOCENE (Subathu Formation), Garkhal area, Punjab Basin, Himachal Pradesh; Mehrotra *et* al., 1996: 685-688, RUPELIAN – MIOCENE (ONGC well Gulf- 1, Tarapur Shale, Babaguru and Post Babaguru formations), LUTETIAN-PRIABONIAN – MIOCENE (ONGC well Gulf- 2, well Gulf-3 and well Gulf- 4, Tarapur Shale, Babaguru and Post Babaguru formations), Gulf of Cambay, Gujarat; Sarkar, 1997: 102, LATE YPRESIAN – LUTETIAN (Subathu Formation, Bilaspur area), Punjab Basin, Himachal Pradesh..

Cleistosphaeridium echinoides (Maier, 1959) Davey *et aI.,* 1969. *In*: Mathur, 1986: 195-198, LUTETIAN-BARTONIAN (Kalol Formation), Cambay Basin, Gujarat.

Hystrichosphaera furcata (Ehrenberg, 1838) Deflandre, 1937b. *In*: Banerjee, 1971: 135, CRETACEOUS (Khara Tar well), Rajasthan.

Hystrichosphaera ramosa (Ehrenberg, 1838) Deflandre, 1937b. *In*: Banerjee, 1971: 139, pl. 1, fig. 10, CRETACEOUS (Khara Tar well), Rajasthan.

Spiniferites cf. **S. ramosus** (Ehrenberg, 1838) Mantell, 1854.

Hystrichosphaera cf. *H. furcata* (Ehrenberg, 1838) Deflandre, 1937b. *In*: Banerjee, 1972: 135, pl. 1, figs 27, 31, CRETACEOUS (Khara Tar well), Rajasthan.

Hystrichosphaera cf. *H. ramosa* (Ehrenberg, 1838) Deflandre, 1937b. *In*: Banerjee, 1971: 139, pl. 1, fig. 26, CRETACEOUS (Khara Tar well), Rajasthan.

Spiniferites ramosus subsp. **endoperforatus** (Corradini, 1973) Lentin & Williams, 1975. *In*: Jain, 1977b: 176-177, pl. 3, fig. 37, EARLY ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

Spiniferites ramosus subsp. **gracilis** (Davey & Williams, 1966a) Lentin & Williams, 1973. *In*: Khowaja-Ateequzzaman & Garg, 2002: 136, pl. 2, fig. 8, EARLY TURONIAN (Kulakkalnattam Sandstone Member, Garudamangalam Formation), Cauvery Basin, southern India.

Spiniferites ramosus subsp. **granomembranaceus** (Davey & Williams, 1966a) Lentin & Williams, 1973. *In*: Jain, 1977b: 177, EARLY ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu; Jain & Tandon, 1981: 13, pl. 1, fig. 9; pl. 4, figs 62-63, MIDDLE EOCENE (Harudi Formation), Kutch, Gujarat; Kar, 1985: 195, pl. 42, fig. 8, MIDDLE EOCENE (Harudi Formation), Kutch, Gujarat, (reproduction from Jain & Tandon, 1981); Kumar, 1986a: 32, VALANGINIAN-HAUTERIVIAN (ONGC bore core no. 7), Krishna Godavari Basin, Andhra Pradesh, (Garg *et al.*, 1988 reassessed the age of this assemblage to be Hauterivian-Barremian).

Spiniferites ramosus subsp. **granosus** (Davey & Williams, 1966a) Lentin & Williams, 1973. *In*: Jain, 1977b: 177, EARLY ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu; Jain & Tandon, 1981: 13, pl. 4, fig. 59, MIDDLE EOCENE (Harudi Formation), Kutch, Gujarat; Jain & Garg, 1986b: 120, LATE PALAEOCENE, Vriddhachalam area, Cauvery Basin, Tamil Nadu; Jain & Garg, 1991: 66-67, OLIGOCENE (Maniyara Fort Formation), Kutch, Gujarat. (Restudy of Kar, 1985)

Spiniferites ramosus var. *granosus* (Davey & Williams, 1966a) Corradini, 1973. *In*: Jain & Taugourdeau-Lantz, 1973: 61, pl. 3, fig. 4, EARLY CRETACEOUS (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

Spiniferites ramosus cf. var. *multibrevis* (Davey & Williams, 1966a) Davey & Verdier, 1971. *In* : Kar, 1985 : 66-67, pl. 4, fig, 69, OLIGOCENE

(Maniyara Fort Formation), Kutch, Gujarat. (Reallocated by Jain & Garg, 1991)

Spiniferites ramosus var. *granosus* (Davey & Williams, 1966a) Corradini, 1973. **NOW Spiniferites ramosus** subsp. **granosus** (Davey & Williams) Lentin & Williams, 1973.

Spiniferites ramosus var. *membranaceus* (Rossignol, 1964) Davey & Williams, 1966. **NOW Spiniferites membranaceus** (Rossignol, 1964) Sarjeant, 1970.

Spiniferites ramosus subsp. *multibrevis* (Davey & Williams, 1966a) Lentin & Williams, 1973. **NOW Spiniferites twistringiensis** (Maier, 1959) Fensome *et al*., 1990.

Spiniferites ramosus cf. var. *multibrevis* (Davey & Williams, 1966a) Davey & Verdier, 1971. **NOW Spiniferites** cf. **S. twistringniensis** (Maier, 1959) Fensome *et al*., 1990.

Spiniferites ramosus cf. var. *multibrevis* (Davey & Williams, 1966a) Davey & Verdier, 1971. *In* : Kar, 1985 : 66-67, pl. 4, fig, 69 = **Spiniferites ramosus** subsp. **granosus** (Davey & Williams, 1966a) Lentin & Williams, 1973. (According to Jain & Garg, 1991)

Spiniferites ramosus subsp. **ramosus** Autonym. *In*: Jain, 1977b: 177, EARLY ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu; Jain, 1978; 149, pl. 3, fig. 33, LATEST MAASTRICHTIAN (Kallankurchi Formation), Vriddhachalam area, Cauvery Basin, Tamil Nadu; Venkatachala & Kumar, 1980: 102-103, pl. 5, fig. 12, ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu; Jain & Garg, 1986b: 119-120, pl. 6, fig, 9, LATE PALAEOCENE, Vriddhachalam area, Cauvery Basin, Tamil Nadu; Kumar, 1986a: 32, VALANGINIAN-HAUTERIVIAN (ONGC bore core nos. 2, 4, 6, 7), Krishna-Godavari Basin, Andhra Pradesh, (Garg *et al*., 1988 reassessed the age of this assemblage to be Hauterivian-Barremian); Singh & Sarkar, 1987: 208, pl. 1, fig. 2, EOCENE (Subathu Formation), Banethi-Bagthan area, Simla Hills, Himachal Pradesh; Sarkar & Singh, 1988; 53-54, pl. 4, figs 1-2, EOCENE (Subathu Formation), Banethi-Bagthan area, Simla Hills, Himachal Pradesh; Kumar *et al.*, 1996: 150, pl. 1, fig. 3, LATE MAASTRICHTIAN – DANIAN (Upper part of Mahadeo Formation, Um Sohryngkew River Section), Meghalaya; Khowaja-Ateequzzaman & Garg, 2002: 136, pl. 1, fig. 13, EARLY – LATE TURONIAN (Kulakkalnattam Sandstone Member, Garudamangalam Formation), Cauvery Basin, southern India; Mehrotra & Kamla Singh, 2003 : 78, pl. 10, figs 1-3, PLIOCENE – EARLY MIOCENE (ONGC well MGP- A, 180 – 1420m), Krishna-Godavari Basin, Andhra Pradesh; PLEISTOCENE – LATE OLIGOCENE (ONGC well SSY- A, 190 – 2000m, Godavari Shale and Ravva Formation), Krishna-Godavari Basin, Andhra Pradesh; LATE MIOCENE AND YOUNGER – THANETIAN (ONGC well MNP- A, 870 – 2880m, Matsyapuri Sandstone, Bhimapalli Siltstone, Pasarlapudi Formation and Palakollu Shale), Krishna-Godavari Basin, Andhra Pradesh; LEISTOCENE AND YOUNGER – LATE OLIGOCENE (ONGC well GS- 15- D, 555 – 2980m), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 78, SELANDIAN - PLEISTOCENE ex Mehrotra *et al*., 1996, Cambay Basin, Gujarat; THANETIAN TOP - RUPELIAN ex Mehrotra *et al*., 2002, Mumbai Offshore; NEOCOMIAN - APTIAN ex Mehrotra *et al*., 2002, Cauvery Basin, Tamil Nadu; THANETIAN – PLEISTOCENE AND YOUNGER ex Mehrotra & Kamla Singh, 2003, Krishna-Godavari Basin, Andhra Pradesh..

Homotryblium distinctum Salujha & Kindra, 1981. *In*: Salujha & Kindra, 1981: 51, pl. 2, fig. 45, DANIAN (Langpar Formation), Meghalaya.

Spiniferites ramosus var. *ramosus* Davey & Williams, 1966. *In*: Jain & Taugourdeau-Lantz, 1973: 61, pl. 3, figs 14-15, ?APTIAN-EARLY ALBIAN (Dalmiapuram Forma-

tion), Cauvery Basin, Tamil Nadu; Mehrotra & Sarjeant, 1986: 716, pl. 5, figs 3-4; pl. 10, figs 5-6, APTIAN (Periyavadavadi shallow well- 1), Cauvery Basin, Tamil Nadu.

Spiniferites ramosus var. *ramosus* Autonym. **NOW Spiniferites ramosus** subsp. **ramosus** Autonym.

Spiniferites ramosus subsp. **spinosus** Jain, 1978. *In*: Jain, 1978: 149, pl. 1, fig 3, LATEST MAASTRICHTIAN (Kallankurchi Formation), Vriddhachalam area, Cauvery Basin, Tamil Nadu.

Spiniferites scabrosus (Clarke & Verdier, 1967) Lentin & Williams, 1975. *In*: Venkatachala & Kumar, 1980: 103, pl. 5, fig. 7, ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu; Kumar, 1986a: 32, VALANGINIAN-HAUTERIVIAN (ONGC bore core nos. 3, 7), Krishna-Godavari Basin, Andhra Pradesh, (Garg *et al.*, 1988 reassessed the age of this assemblage to be Hauterivian-Barremian).

Spiniferites supparus (Drugg, 1967) Sarjeant, 1970. *In*: Singh & Sarkar, 1987: 208, EOCENE (Subathu Formation), Banethi-Bagthan area, Simla Hills, Himachal Pradesh; Sarkar & Singh, 1988: 54, pl. 4, figs 9-10, EOCENE (Subathu Formation), Banethi-Bagthan area, Simla Hills, Himachal Pradesh.

Spiniferites twistringiensis (Maier, 1959) Fensome *et al.*, 1990

Achomosphaera cambra Sah *et al.*, 1970.*In*: Sah *et al.*, 1970: 144, pl. 1, fig. 3, LATE CRETACEOUS (Langpar Formation), Meghalaya.

Spiniferites ramosus subsp. *multibrevis* (Davey & Williams, 1966a) Lentin & Williams, 1973. *In*: Dutta & Jain, 1980: 69, pl. 6, fig. 51, EARLY -MIDDLE EOCENE (Sylhet Formation), Jaintia Hills, Meghalaya; Jain & Garg, 1986b: 120, pl. 2, fig. 8, LATE PALAEOCENE, Vriddhachalam area, Cauvery Basin, Tamil Nadu; Jain & Garg, 1991: 70-71, pl. 4, fig. 6, MIOCENE (Khari Nadi Formation), Kutch, Gujarat (Restudy of Kar, 1985).

Spiniferites bulloideus (Deflandre & Cookson, 1955) Sarjeant, 1970. *In*: Kar, 1985: 209, pl. 50, figs 1,2, MIO-CENE (Khari Nadi Formation), Kutch, Gujarat (Reallocated by Jain & Garg, 1991)

Spiniferites cf **S. twistringiensis** (Maier, 1959) Fensome *et al.*, 1990

Spiniferites ramosus cf. var. *multibrevis* (Davey & Williams, 1966a) Davey & Verdier, 1971. *In*: Kar, 1979: 34, pl. 4, fig. 69, OLIGOCENE (Maniyara Fort Formation), Kutch, Gujarat.

Spiniferites ?**varmae** Lentin & Williams, 1973. (Questionable assignment: Stover & Evitt, 1978)

Hystrichosphaera pseudofurcata Varma & Dangwal, 1964. *In*: Varme & Dangwal, 1964: 66, pl. 2, figs 7-8, EOCENE--OLIGOCENE, Cambay Basin, Gujarat.

Spiniferites sp.

Hystrichosphaera sp. In: Salujha *et al.*, 1969: 35, pl. 4, fig. 49, EARLY EOCENE (Subathu Formation Simla Hills, Himachal Pradesh.

Spiniferites sp.

Hystrichosphaera sp. In: Banerjee & Misra, 1972: 211, pl. 1, figs 7-8, EOCENE-MIOCENE, Assam and Tripura.

Spiniferites sp. *In*: Jain & Taugourdeau-Lantz, 1973: 61, pl. 3, fig. 13, ?APTIAN-EARLY ALBIAN (Dalmiapuram Formation, Cauvery Basin, Tamil Nadu.

Spiniferites sp.

Hystrichosphaera sp. In: Venkatachala & Sharma, 1982: 4, pl. 2, figs 15-16, CAMPANIAN--MAASTRICHTIAN (Narsapur well-

1), Krishna-Godavari Basin, Andhra Pradesh.

Spiniferites sp. *In*: Jain *et al.*, 1986: 75, pl. 3, fig. 39, LATE JURASSIC, Kutch, Gujarat.

Spiniferites sp.

Hystrichosphaera sp. In: Nandi, 1990: 126, pl. 5, fig. 7, LATE CRETACEOUS, Meghalaya.

Spiniferites sp. *In*: Tissot, 1990: 356, LATE HOLOCENE (Kandavara bore-well), Coondapur area, Karnataka.

Spiniferites sp. *In*: Garg & Khowaja-Ateequzzaman, 2000: 471, LATE THANETIAN (Lakadong Sst Member, Sylhet Limestone Formation), Cherrapunji area, Khasi Hills, Meghalaya.

Spiniferites sp. A *In*: Venkatachala & Kumar, 1980: 103, pl. 5, fig. 8, ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

Spiniferites sp. A *In*: Kumar, 1982: 171-172, pl. 3. fig. 4, NEOCOMIAN, Krishna-Godavari Basin. Andhra Pradesh.

Spiniferites sp. B *In*: Venkatachala & Kumar, 1980: 103, pl. 5. fig. 13, ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

Spiniferites sp. B *In*: Kumar, 1982: 172. pl. 3, fig. 5, NEOCOMIAN, Krishna-Godavari Basin, Andhra Pradesh.

Spiniferites sp. C *In*: Venkatachala & Kumar, 1980. pl. 5, fig. 5, ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

Spiniferites sp. C *In*: Kumar, 1982: 172. pl. 3, fig. 6. NEOCOMIAN, Krishna-Godavari Basin. Andhra Pradesh.

Spiniferites spp.

Hystrichosphaera spp. In: Jain & Subbaraman, 1970: 549, EARLY CRETACEOUS (Dalmiapuram Formation), Cauvery Basin. Tamil Nadu.

Spiniferites spp. *In*: Mathur, 1986: 200-201, LUTETIAN--BARTONIAN (Kalol Formation, well no. 109), Cambay Basin, Gujarat.

Spiniferites spp. *In*: Singh & Khanna, 1980: 471, pl. 2, fig. 12, PALAEOGENE (Subathu Formation), Simla Hills, Himachal Pradesh.

STANFORDELLA Helenes & Lucas-Clark, 1997.

Stanfordella exanguia (Duxbury, 1977) Helenes & Lucas-Clark, 1997.

Gonyaulacysta exanguia Duxbury, 1977 emend. Harding, 199b. *In*: Khowaja-Ateequzzaman & Jain, 1992: 157, pl. 9, fig. 4, HAUTERIVIAN-BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu.

STIPHROSPHAERIDIUM Davey, 1982b.

Stiphrosphaeridium anthophorum (Cookson & Eisenack, 1958) Lentin & Williams, 1985. *In*: Mehrotra & Aswal, 2003: 92, pl. 6, figs 1, 3, 5 & 6, SANTONIAN – BARREMIAN (ONGC well DRK- A, 1495 – 1930m, Chintalapalli and Raghavapuram formations), Krishna-Godavari Basin, Andhra Pradesh; EARLY-LATE CAMPANIAN – TURONIAN-CENOMANIAN (ONGC well RCPM- A, 1255 – 1360m, Tirupati Formation, Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al.*, 2005: 59, BARREMIAN – LATE CAMPANIAN ex Mehrotra & Aswal, 2003, Krishna-Godavari Basin, Andhra Pradesh.

Hystrichosphaeridium anthophorum Cookson & Eisenack, 1958. *In*: Rawat, 1966: 46, figs 1-2, 14, LATE JURASSIC, Kutch, Gujarat; Rawat, 1969: 85, fig. 45, LATE JURASSIC, Kutch, Gujarat.

Oligosphaeridium anthophorum (Cookson & Eisenack, 1958) Davey, 1969a. *In*: Jain *et al.*, 1978: 117, pl. 1, fig. 1, LATE JURASSIC (Spiti Shale Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh.

Stiphrosphaeridium sp. cf. **S. anthophorum** (Cookson & Eisenack, 1958) Lentin & Williams, 1985.

Oligosphaeridium sp. cf. *anthophorum* (Cookson & Eisenack, 1958) Davey, 1969a. *In*: Jain *et al*., 1984: 78, pl. 4, fig. 67, KIMMERIDGIAN (Spiti Shale Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh.

Stiphrosphaeridium dictyophorum (Cookson & Eisenack, 1958) Lentin & Williams, 1985.

Oligosphaeridium dictyophorum (Cookson & Eisenack, 1958) Davey & Williams, 1969. *In*: Jain *et al*., 1978: 116, LATE JURASSIC (Spiti Shale Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh; Jain *et al*., 1984: 78, pl. 4, fig. 66, KIMMERIDGIAN (Spiti Shale Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh; Kumar, 1986a: 31, VALANGINIAN-HAUTERIVIAN (ONGC bore nos. 2. 3), Krishna-Godavari Basin, Andhra Pradesh, (Garg *et al.,* 1988 reassessed the age of this assemblage to be Hauterivian -Barremian).

"SUBATHUA" Khanna, 1979. (Name not validly published).

"SUBATHUA" Khanna & Singh, 1980. **NOW THALASSIPHORA** Eisenack & Gocht, 1960 emend. Gocht, 1968 emend. Benedek & Gocht, 1981. (Taxonomic senior synonym, according to Lentin & Williams, 1985, p. 340; 1989, p. 354)

Subathua sahnii Khanna & Singh, 1980. **NOW Thalassiphora patula** (Williams & Downie) Stover & Evitt, 1978.

Subathua sahnii Singh *et al*., 1979. *In*: Singh *et al.*, 1979: 35-36, text-fig. 1, pl. 2, fig. 4, LATE PALAEOCENE-LATE EOCENE (Subathu Formation), Simla Hills, Himachal Pradesh, (name not validly published)

Subathua sahnii Khanna, 1979. *In*: Khanna, 1979: 217, LATE PALAEOCENE-LATE EOCENE (Subathu Formation), Simla Hills, Himachal Pradesh. (name not validly published)

Subathua sp. In: Singh & Khanna, 1980 = **Thalassiphora sp.**

SUBTILISPHAERA Jain & Millepied, 1973 emend. Lentin & Williams, 1976.

Subtilisphaera ?inaffecta (Drugg, 1978) Bujak & Davies, 1983. (Questionable assignment: Lentin & Williams, 1985)

Geiselodinium inaffectum Drugg, 1978 emend. Kumar, 1987. *In*: kumar, 1987: 386, pl. 2, figs 3, 6-7, EARLY KIMMERIDGIAN-TITHONIAN (Jhuran Formation), Kutch, Gujarat.

Subtilisphaera cheit Below, 1981a. *In*: Mehrotra & Aswal, 2003:93, pl. 17, fig. 4, APTIAN – CENOMANIAN (ONGC well DRK- A, 1280 – 1960m, Tirupati Formation), Krishna-Godavari Basin, Andhra Pradesh; BERRIASIAN – SANTONIAN (ONGC well END- A, 1140 – 1870m, Raghavapuram and Tirupati formations), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 59, BERRIASIAN - SANTONIAN ex Mehrotra & Aswal, 2003, Krishna-Godavari Basin, Andhra Pradesh.

Subtilisphaera ?habibii Masure, 1988b. *In*: Khowaja-Ateequzzaman & Garg, 2002: 136, pl. 2, fig. 3; pl. 3, fig. 6, EARLY TURONIAN (Kulakkalnattam Sandstone Member, Garudamangalam Formation), Cauvery Basin, southern India.

Subtilisphaera perlucida (Alberti, 1959b) Jain & Millepied, 1973.

Deflandrea perlucida Alberti, 1959b. *In*: Nandi, 1990: 124, pl. 4, figs 24-25, CENOMANIAN--DANIAN, Meghalaya.

Subtilisphaera sp. *In*: Mehrotra & Aswal, 2003: 94, pl. 14, fig. 3, TITHONIAN (ONGC well DRK- A, 2225 – 2230m,

Golapalli Formation), Krishna-Godavari Basin, Andhra Pradesh.

SUMATRADINIUM Lentin & Williams. 1976 emend. Lentin *et al.*, 1994.

?Sumatradinium cephalum (Kar, 1979) Jain, 1980. **NOW Operculodinium ?placitum** Drugg & Loeblich Jr., 1967

Sumatradinium hispidum (Drugg, 1970°) Lentin & Williams, 1976 emend. Lentin *et al.*, 1994. *In*: Aswal & Pundeer, 1996: 636, pl. 1, fig. 5, MIOCENE (ONGC Mori well-A, 1400 – 1200m), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra & Kamla Singh, 2003: 83, pl. 30, figs 5 & 6, PLEISTOCENE – PLIOCENE (ONGC well NSP- A, 630 – 633m, Matsyapuri Sandstone), Krishna-Godavari Basin, Andhra Pradesh; MIDDLE MIOCENE (ONGC well Gs- 21- A, 1310 – 1620m), Krishna-Godavari Basin, Andhra Pradesh; MIDDLE MIOCENE (ONGC well BMP- A, 500 – 660m, Narasapur Claystone), Krishna-Godavari Basin, Andhra Pradesh; MIDDLE MIOCENE (ONGC well MORI- A, 850 – 860m, matsuapuri Sandstone), Krishna-Godavari Basin, Andhra Pradesh; MESSINIAN-TORTONIAN – LANGHIAN-AQUITANIAN (ONGC wellKSP- A, 1120 – 2075m), Krishna-Godavari Basin, Andhra Pradesh; CALABRIAN-ZANCLEAN – LANGHIAN-AQUITANIAN (ONGC well GS- 15- D, 1600 – 2690m, Godavari Clay and Ravva Formation), Krishna-Godavari Basin, Andhra Pradesh; MESSINIAN-SERRAVALLIAN – BARTONIAN (ONGC well SSY- A, 1175 – 2080m), Krishna-Godavari Basin, Andhra Pradesh; TORTONIAN-SERRAVALLIAN – AQUITANIAN (ONGC well MNP- A, Matsyapuri Sandstone), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al.*, 2005: 79-80, RUPELIAN TOP (30 Ma) ex Mehrotra *et al.*, 2002, Mumbai Offshore; BARTONIAN – PLIO-PEISTOCENE ex Mehrotra & Kamla Singh, 2003, Krishna-Godavari Basin, Andhra Pradesh.

SURCULOSPHAERIDIUM Davey *et al.,* 1966 emend. Davey, 1982.

Surculosphaeridium cribrotubiferum (Sarjeant, 1960a) Davey *et al.*, 1966 emend. Davey *et al.*, 1966 emend. Stancliffe & Sarjeant, 1990. *In*: Saxena & Sarkar, 2000: 256, 263, pl. 2, fig, 9, MIDDLE EOCENE (Siju Formation), Simsang River near Siju, South Garo Hills, Meghalaya.

Surculosphaeridium cribrotubiferum subsp. **granulosum** Jain, 1977b. *In*: Jain, 1977b: 183, pl. 6, fig. 76, EARLY ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

Surculosphaeridium divarispinosum Jain, 1977b. *In*: Jain, 1977b: 183, pl. 6, fig. 77, EARLY ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

Surculosphaeridium granulosum Jain, 1977b. *In*: jain, 1977b: 182--183, pl. 2, fig. 17, EARLY ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

Surculosphaeridium ?longifurcatum (Firtion, 1952) Davey *et al.,* 1966. *In*: Jain, 1977b: 183, pl. 2, fig. 16, EARLY ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu; Mehrotra & Aswal, 2003: 95, pl. 36, figs 1 & 3, CENOMANIAN – CAMPANIAN (ONGC well RCPM- A, 1159 – 1820m, Raghavapuram and Tirupati formations), Krishna-Godavari Basin, Andhra Pradesh; BERRIASIAN – CAMPANIAN (ONGC well END- A, 1040 – 1915m, Raghavapuram and Tirupati formations), Krishna-Godavari Basin, Andhra Pradesh; CENOMANIAN (ONGC well DRK- A, 1600 – 1700m, Raghavapuram Formation), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al.*, 2005: 59, BERRIASIAN - CAMPANIAN ex Mehrotra & Aswal, 2003, Krishna-Godavari Basin, Andhra Pradesh. (Questionable assignment: Stover & Evitt, 1978)

Surculosphaeridium vestitum (Deflandre, 1939a). *In*: Jain, 1977b: 183, EARLY ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu; Jain *et al.*, 1984: 71, pl. 2, figs 37-38, MIDDLE TITHONIAN (Spiti Shale Formation),

Malla Johar area, Kumaon Himalaya, Uttar Pradesh; Jain *et al.*, 1986: 82, pl. 3, figs 51-52, LATE JURASSIC (Spiti Shale Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh.

SUSADINIUM Dorhofer & Davies, 1980.

Susadinium sp. *In*: Sharma & Sarjeant, 1987: 259, pl. 3, fig. 1, LATE TRIASSIC (Baratang Formation), Andaman Islands.

SVERDRUPIELLA Bujak & Fisher, 1976.

Sverdrupiella mutabilis Bujak & Fisher, 1976. *In*: Sharma & Sarjeant, 1987: 259, pl. 2, fig. 3, LATE TRIASSIC (Baratang Formation), Andaman Islands.

SYSTEMATOPHORA Klement, 1960 emend. Brenner, 1988 emend. Stancliffe & Sarjeant, 1990.

Systematophora complicata Neale & Sarjeant, 1962. *In*: Mehrotra, 1981: 16, pl. 1, fig. 10, MIDDLE EOCENE, Garampani Limestone, Mikir-North Cachar Hills, Assam.

Systematophora diverispinosa (Davey *et al.*, 1966) Islam, 1993.

Cleistosphaeridium diverispinosum Davey, *et al.*, 1966. *In*: Singh *et al.*, 1979: 35-39, 41, pl. I, fig. 7, LATE PALAEOCENE-LATE EOCENE (Subathu Formation), Simla Hills, Punjab Basin, Himachal Pradesh; Venkatachala & Kumar, 1980: 94, pl. 1, fig. 7, ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu; Khanna & Singh, 1981a, pl. 3, fig. 1, LATE PALAEOCENE-LATE EOCENE (Subathu Formation), Simla Hills, Himachal Pradesh; Khanna & Singh, 1981c: 204, fig. 7, LATE PALAEOCENE--EOCENE (Subathu Formation), Simla Hills, Himachal Pradesh; Khanna *et al.*,1981: 259, pl. 2, fig. 4, (Subathu Formation), Simla Hills, Himachal Pradesh; Mehrotra, 1981: 14, pl. 1, fig. 1, MIDDLE EOCENE (Garampani Limestone Formation), North Cachar Hills, Assam; Jain & Garg, 1986b: 113, pl. 6, figs 5, 6, LATE PALAEOCENE, Vriddhachalam area, Cauvery Basin, Tamil Nadu; Singh & Sarkar, 1987: 208, EOCENE (Subathu Formation), Banethi Bagthan area, Himachal Pradesh; Sarkar & Singh, 1988: 39, pl. 1, figs 10, 11, EOCENE (Subathu Formation), Banethi-Bagthan area, Himachal Pradesh; Singh & Sarkar, 1992: 185, pl. 1, fig. 18, LATE PALAEOCENE?-EOCENE (Subathu Formation), Garkhal area, Punjab Basin, Himachal Pradesh; Sarkar, 1997: 102, LATE YPRESIAN – LUTETIAN (Subathu Formation, Bilaspur area), Punjab Basin, Himachal Pradesh; Sarkar & Prasad, 2000a: 170, LATE YPRESIAN – MIDDLE LUTETIAN (Subathu Formation, Koshalia Nala Section), Shimla Hills; Sarkar & Prasad, 2000b: 141, LATE YPRESIAN – EARLY LUTETIAN (Subathu Formation, Morni Hills), Haryana.

Systematophora orbifera Klement, 1960. *In*: Jain *et al.*, 1986: 79, pl. 2, fig. 28; pl. 3, fig. 53, LATE JURASSIC, Kutch, Gujarat.

Systematophora sp. cf. **S. orbifera** Klement, 1960. *In*: Jain *et al.*, 1984: 78, pl. 4, figs 68-69, KIMMERIDGIAN (Spiti Shale Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh.

Systematophora penicillata (Ehrenberg, 1843 ex Ehrenberg, 1854) Sarjeant, 1980. *In*: Jain *et al.*, 1984: 78, pl. 4, figs 70-71, KIMMERIDGIAN (Spiti Shale Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh; Jain *et al.*, 1986; 79, pl. 1, fig. 14; pl. 2, fig. 18, LATE JURASSIC, Kutch, Gujarat.

Systematophora placacantha (Deflandre & Cookson, 1955) Davey *et al.,* 1969. *In*: Jain & Tandon, 1981: 13, pl. 1, figs 14-15, MIDDLE EOCENE (Harudi Formation), Kutch, Gujarat; Kar, 1985: 195, MIDDLE EOCENE

(Harudi Formation), Kutch, Gujarat, (reproduction from Jain & Tandon, 1981) Mehrotra *et al*., 2005: 80, LUTETIAN (BASE) – RUPELIAN (48 – 33 Ma), Mumbai Offshore..

Systematophora schindewolfi (Alberti, 1961) Downie & Sarjeant, 1965. **NOW Hystrichosphaerina schindewolfii** Alberti, 1961.

TANYOSPHAERIDIUM Davey & Williams, 1966b.

Tanyosphaeridium isocalamum (Deflandre & Cookson, 1955) Davey & Williams, 1969. *In*: Jain, 1977b; 183, EARLY ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu; Mehrotra & Sarjeant, 1986; 719, pl. 6, fig. 4, APTIAN (Periyavadavadi shallow well- 1), Cauvery Basin, Tamil Nadu; Mehrotra *et al*., 2005: 60, APTIAN *ex* Mehrotra *et al*., 2002, Cauvery Basin, Tamil Nadu.

Tanyosphaeridium cf. **T. isocalamum** (Deflandre & Cookson, 1955) Davey & Williams, 1969. *In*: Kumar, 1986a: 31, pl. 2, fig. 11, VALANGINIAN-HAUTERIVIAN (ONGC bore core nos. 4, 5), Krishna-Godavari Basin, Andhra Pradesh, (Garg *et al.,* 1988 reassessed the age of this assemblage to be Hauterivian--Barremian) .

Tanyosphaeridium jurassicum Jain & Garg *in* Jain *et al.,* 1984. *In*: Jain *et al.*, 1984: 73, pl. 1, fig. 10, MIDDLE TITHONIAN (Spiti Shale Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh.

Tanyosphaeridium magdalium (Drugg, 1967) Heiseck, 1970. **NOW Tanyosphaeridium xanthiopyxides** (O. Wetzel, 1933b *ex* Deflandre, 1937b) Stover & Evitt, 1978 *emend*. Morgenroth, 1968 *emend*. Sarjeant, 1985b.

Tanyosphaeridium torynum (Cookson & Eisenack, 1960b) Stover & Evitt, 1978. **NOW Egmontodinium torynum** (Cookson & Eisenack, 1960b) Davey, 1979.

Tanyosphaeridium variecalamum Davey & Williams, 1966b. *In*: Venkatachala & Kumar, 1980: 101, pl. 5, fig. 2, ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu; Mehrotra *et* al., 1996: 685-688, YPRESIAN - MIOCENE (ONGC well Gulf-1, Bhavnagar and Tarapur Shale formations), LUTETIAN-PRIABONIAN – RUPELIAN-BERDIGALIAN, (ONGC well Gulf- 2 and ONGC well Gulf- 3, Bhavnagar, Tarapur Shale, Babaguru and Post Babaguru formation), LUTETIAN – PRIABONIAN (ONGC well Gulf- 4, Tarapur Shale Formation), Gulf of Cambay, Gujarat; Khowaja-Ateequzzaman & Jain, 1992: 174, pl. 4, fig. 3; pl. 5, fig. 5; pl. 12, fig. 8, HAUTERIVIAN-BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu; Mehrotra & Kamla Singh, 2003: 84, pl. 18, fig. 5, EARLY OLIGOCENE (ONGC well MORI- A, 1495 – 1500m, Matsyapuri Sandstone), Krishna-Godavari Basin, Andhra Pradesh. (Orthographic change: Mehrotra & Singh, 2003 listed *Tanyosphaeridium veriecalamum*); Mehrotra *et al*., 2005: 80, EARLY OLIGOCENE *ex* Mehrotra & Kamla Singh, 2003, Krishna-Godavari Basin, Andhra Pradesh.

Hystrichosphaeridium sp. In: Salujha & Kindra, 1981: 52, pl. 2, fig. 50, DANIAN (Langpar Formation), Meghalaya.

Tanyosphaeridium xanthiopyxides (O. Wtzel, 1933b *ex* Deflandre, 1937b) Stover & Evitt, 1978 *emend*. Morgenroth, 1968 *emend*. Sarjeant, 1985.

Tanyosphaeridium magdalium (Drugg, 1967) Heisecke, 1970. *In*: Kumar *et al.*, 1996: 150, pl. 2, fig. 2, LATE MAASTRICHTIAN (Upper part of Mahadeo Formation, Um Sohryngkew River Section), Meghalaya.

Tanyosphaeridium sp. *In*: Kumar, 1982: 174, pl. 1, fig. 9, NEOCOMIAN, Krishna-Godavari Basin, Andhra Pradesh.

Tanyosphaeridium sp. *In*: Mehrotra & Sarjeant, 1987: 160, pl. 3, fig, 3, MAASTRICHTIAN (Narsapur well- 1), Krishna-Godavari Basin, Andhra Pradesh.

Tanyosphaeridium sp. *In*: Khowaja-Ateequzzaman & Garg, 2002: 137, fig. 7,

LATE TURONIAN (Kulakkalnattam Sandstone Member, Garudamangalam Formation), Cauvery Basin, southern India.

Tanyosphaeridium sp. **A** *In*: Jain *et al*., 1984; 71, pl. 3, fig. 57, LATE JURASSIC (Spiti Shale Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh.

cf. **Tanyosphaeridium** Davey & Williams, 1966. *In*: Jain, Garg, Kumar & Singh, 1984: 71, pl. 5, fig. 90, LATE JURASSIC (Spiti Shale Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh.

TECTATODINIUM Wall, 1967 emend. Head, 1994a.

Tectatodinium grande Williams *et al*., 1993. **NOW Tectatodinium pellitum** Wall, 1967 emend. Head, 1994a.

Tectatodinium pellitum Wall, 1967 emend. Head, 1994.

Tectatodinium grande Williams *et al*., 1993. *In*: Aswal & Pundeer, 1996: 636, pl. 1, fig. 6, LUTETIAN-BARTONIAN – OLIGOCENE (ONGC Mori well- A, 2000 – 1400m), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra & Kamla Singh, 2003: 85, pl. 3, fig. 1, OLIGOCENE – EARLY EOCENE (ONGC well MORI- A, 1380 – 3100m, Matsyapuri Sandstone, Bhimapalli Limestone, Pasarlapudi Formation and Palakollu Shale), Krishna-Godavari Basin, Andhra Pradesh; CHATTIAN-PRIABONIAN – PRIABONIAN-BARTONIAN (ONGC well KSP- A, 2310 – 2430m), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 80, EARLY EOCENE - OLIGOCENE ex Mehrotra & Kamla Singh, 2003, Krishna-Godavari Basin, Andhra Pradesh.

TEHAMADINIUM Jan du Chêne *et al. in* Jan du Chêne *et al.,* 1986b.

Tehamadinium coummia (Below, 1981a) Jan du chene *et al*., 1986b. *In* : Khowaja-Ateequzzaman & Jain, 1992: 175, pl. 11, figs 5, 8, HAUTERIVIAN-BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu.

Tehamadinium crestatum (Jain, 1977b) Jan du Chêne *et al.,* 1986.

Occisucysta crestata Jain, 1977b. *In*: Jain, 1977b : 175, pl. 5, figs 63-65, EARLY ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

Tehamadinium sp. A. *In* : Khowaja-Ateequzzaman & Jain, 1992: 175, pl. 6, fig. 5, HAUTERIVIAN-BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu.

TENERIDINIUM Krutzsch, 1962.

Teneridinium cf. **T. magnoides** Krutzsch, 1962. *In*: Mathur, 1986: 195-198, LUTETIAN-BARTONIAN (Kalol Formation, well no. 109), Cambay Basin, Gujarat.

TENUA Eisenack, 1958a emend. Sarjeant, 1968 emend. Pocock, 1972 emend. Sarjeant, 1985a.

Tenua anaphrissa (Sarjeant, 1966c) Benedek. 1972. **NOW Pseudoceratium anaphrissum** (Sarjeant, 1966c) Bint, 1986.

Tenua hystricella Eisenack, 1958. **NOW Tenua hystrix** Eisenack, 1958.

Tenua hystrix Eisenack, 1958a emend. Sarjeant, 1985a emend. Sarjeant, 1992b. *In*: Jain, 1977: 179, pl. 6, fig. 75, EARLY ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu; Khowaja-Ateequzzaman & Jain, 1992: 175, pl. 8, fig. 2, HAUTERIVIAN-BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu; Khowaja-Ateequzzaman & Garg, 2002: 136, pl. 2, fig. 16, EARLY – LATE TURONIAN (Kulakkalnattam Sandstone Member, Garudamangalam Formation), Cauvery Basin, southern India.

Cerbia tabulata (Davey & Verdier, 1974) Below, 1981a. *In*; Mehrotra & Aswal, 2003: 24, pl. 13, figs 1 & 2; pl. 18, fig. 6, ALBIAN – BERRIASIAN (ONGC well RCPM-

A, 1895 – 2545m, Raghavapuram and Golapalli formations), Krishna-Godavari Basin, Andhra Pradesh; CENOMANIAN – BARREMIAN (ONGC well MVD-A, 1080 – 1960m, Tirupati and Raghavapuram formations), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 44, BERRIASIAN – CENOMANIAN ex Mehrotra & Aswal, 2003, Krishna-Godavari Basin, Andhra Pradesh.

Cyclonephelium hystrix (Eisenack, 1958a) Davey, 1978. *In*: Kumar, 1986a: 31, VALANGINIAN--HAUTERIVIAN ONGC bore core no. 1), Krishna-Godavari Basin, Andhra Pradesh, (Garg *et al*., 1988 reassessed the age of this assemblage to be Hauterivian-Barremian).

Tenua hystricella Eisenack, 1958. *In*: Banerjee, 1972: 135, CRETACEOUS, Khara Tar well, Rajasthan; Jain & Taugourdeau-Lantz, 1973: 62, pl. 3, fig. 16, ?APTIAN-EARLY ALBIAN, (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

Tenua aff. **hystrix** Eisenack, 1958a. *In*: Venkatachala & Kumar, 1980: 94, pl. 1, fig. 6, ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

Tenua kutharensis Khanna & Singh, 1981b. **NOW Batiacasphaera kutharensis** (Khanna & Singh, 1981b) Lentin & Williams, 1993.

Tenua microcysta Bujak *in* Bujak *et al*., 1980. **NOW Sentusidinium microcystum** (Bujak *in* Bujak *et al*., 1980) Islam, 1993.

Tenua simlaensis Khanna & Singh, 1981b. **NOW Batiacasphaera simlaensis** (Khanna & Singh, 1981b) Lentin & Williams, 1993.

Tenua sp. *In*: Banerjee, 1972: 135, CRETACEOUS, Khara Tar well, Rajasthan.

Tenua sp. *In*: Banerjee & Misra, 1972: 207, EOCENE- MIOCENE, Assam and Tripura.

Tenua sp. *In*: Singh & Khanna, 1980: 471, pl. 2, fig. 5, PALAEOGENE (Subathu Formation), Himachal Pradesh.

Tenua sp. *In*: Venkatachala & Kumar, 1980: 94, pl. 1, fig. 8, ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

THALASSIPHORA Eisenack & Gocht, 1960 emend. Gocht, 1968 emend. Benedek & Gocht. 1981.

Thalassiphora indica Saxena & Sarkar, 2000. *In*: Saxena & Sarkar, 2000: 256, pl. 1, figs 11-12, MIDDLE EOCENE (Siju Formation), Simsang River near Siju, South Garo Hills, Meghalaya.

Thalassiphora patula (Williams & Downie, 1966c) Stover & Evitt, 1978. *In*: Dutta & Jain, 1980: 64-65, pl. 3, figs 27-27a, LATE PALAEOCENE (Sylhet Formation), Jaintia Hills, Meghalaya; Mathur, 1986: 195-198, LUTETIAN-BARTONIAN (Kalol Formation, well no. 109), Cambay Basin, Gujarat; Sarkar, 1991: 3, EARLY EOCENE (Kakara Series, Lesser Himalaya), Kakara-Chapla group of villages, Simla, Himachal Pradesh; Singh & Sarkar, 1992: 185, pl. 1, fig. 8, LATE PALAEOCENE?-EOCENE (Subathu Formation), Garkhal area, Punjab Basin, Himachal Pradesh; Sarkar, 1997: 102, LUTETIAN (Subathu Formation, Bilaspur area), Punjab Basin, Himachal Pradesh; Saxena & Sarkar, 2000: 256, MIDDLE EOCENE (Siju Formation), Simsang River near Siju, South Garo Hills, Meghalaya; Mehrotra & Kamla Singh, 2003: 87, pl. 36, figs 1, 2, 4 & 5, THANETIAN (ONGC well NSP- A, 2703 – 2803m, Pasarlapudi Formation), Krishna-Godavari Basin, Andhra Pradesh; LUTETIAN – YPRESIAN (ONGC well MNP- A, 1325 – 3020m, Bhimanapalli Limestone, Pasarlapudi Formation and Palakollu Shale), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 81, YPRESIAN (53 – 50 Ma) ex Mehrotra *et al*., 2002, Mumbai Offshore; SELANDIAN - LUTETIAN ex Mehrotra & Kamla Singh, 2003, Krishna-Godavari Basin, Andhra

Pradesh; YPRESIAN (53 – 50 Ma) ex Mehrotra *et al*., 2002, Assam-Arakan Basin, Northeastern India.

Subathua sahnii Singh *et al*., 1979. *In*: Singh *et al.*, 1979: 35-36, text-fig. 1, pl. 2, fig. 4, LATE PALAEOCENE-LATE EOCENE (Subathu Formation), Simla Hills, Himachal Pradesh, (name not validly published)

Subathua sahnii Khanna, 1979. *In*: Khanna, 1979: 217, LATE PALAEOCENE-LATE EOCENE (Subathu Formation), Simla Hills, Himachal Pradesh. (name not validly published)

Subathua sahnii Khanna & Singh, 1980. *In*: Khanna & Singh, 1980: 308--309, pl. 1, figs 1-3, 5-9, text-figs 1-2, EOCENE (Subathu Formation), Simla Hills, Himachal Pradesh; Khanna *et al*., 1981: 261, pl. 3, fig. 1, (Subathu Formation), Simla Hills, Himachal Pradesh; Singh & Sarkar, 1987: 208, pl. 1, fig. 27, EOCENE (Subathu Formation), Banethi-Bagthan area, Simla Hills, Himachal Pradesh.

Thalassiphora pelagica (Eisenack, 1954b) Eisenack & Gocht, 1960 emend. Benedek & Gocht, 1981. *In*: Khanna *et al*., 1981: 261, pl. 3, fig. 2, (Subathu Formation), Simla Hills, Himachal Pradesh; Jain & Tandon, 1981: 13, pl. 3, fig. 44, MIDDLE EOCENE (Harudi Formation), Kutch, Gujarat; Kar, 1985: 196, 209, pl. 50, fig. 10, MIDDLE EOCENE (Harudi Formation) and MIOCENE (Khari Nadi Formation), Kutch, Gujarat; Khanna *et al*., 1985; 106, pl. 1, fig. 10, PALAEOGENE (Subathu Formation), Jammu Hills; Jain & Garg, 1986b: 120, LATE PALAEOCENE, Vriddhachalam area, Cauvery Basin, Tamil Nadu; Singh & Sarkar, 1987; 208, pl. 1, fig. 28, EOCENE (Subathu Formation), Banethi-Bagthan area, Simla Hills, Himachal Pradesh; Sarkar & Singh, 1988; 54--55, pl. 5, figs 19-20, EOCENE (Subathu Formation), Banethi-Bagthan area, Simla Hills, Himachal Pradesh; Sarkar, 1991: 3, pl. III, fig. 12, EARLY EOCENE (Kakara Series, Lesser Himalaya), Kakara-Chapla group of villages, Simla, Himachal Pradesh; Singh & Sarkar, 1992: 185, pl. 1, fig. 20, LATE PALAEOCENE?-EOCENE (Subathu Formation), Garkhal area, Punjab Basin, Himachal Pradesh; Sarkar, 1997: 102, pl. 2, fig. 7, LATE YPRESIAN – LUTETIAN (Subathu Formation, Bilaspur area), Punjab Basin, Himachal Pradesh; Garg & Khowaja-Ateequzzaman, 2000: 471, LATE THANETIAN (Lakadong Sst Member, Sylhet Limestone Formation), Cherrapunji area, Khasi Hills, Meghalaya; Sarkar & Prasad, 2000a: 170, pl. 2, figs 2 & 3, LATE YPRESIAN – EARLY LUTETIAN (Subathu Formation, Koshalia Nala Section), Shimla Hills; Sarkar & Prasad, 2000b: 141, pl. II, fig. 12, EARLY – MIDDLE LUTETIAN (Subathu Formation, Morni Hills), Haryana; Saxena & Sarkar, 2000: 256, MIDDLE EOCENE (Siju Formation), Simsang River near Siju, South Garo Hills, Meghalaya; Mehrotra & Kamla Singh, 2003: 86, pl. 8, fig. 2, OLIGOCENE – LATE EOCENE (ONGC well BMP- A, 890 – 900m, Matsyapuri Sandstone), Krishna-Godavari Basin, Andhra Pradesh; YPRESIAN – THANETIAN (ONGC well MGP- A, 2725 – 3175m), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 80, THANETIAN - CHATTIAN ex Mehrotra & Kamla Singh, 2003, Krishna-Godavari Basin, Andhra Pradesh.

Thalassiphora simlaensis Lentin & Williams, 1993.

Thalassiphora spinosa (Khanna & Singh, 1980) Stover & Williams, 1987. *In*: Sarkar & Prasad, 2000a: 170, LATE YPRESIAN – EARLY LUTETIAN (Subathu Formation, Koshalia Nala Section), Shimla Hills; Sarkar & Prasad, 2000b: 141, EARLY – MIDDLE LUTETIAN (Subathu Formation, Morni Hills), Haryana.

Thalassiphora spinosa (Khanna & Singh, 1980) Stover & Williams, 1987. **NOW Thalassiphora simlaensis** Lentin & Williams, 1993

Thalassiphora velata (Deflandre & Cookson, 1955) Eisenack & Gocht, 1960. *In*: Singh *et al*., 1979: 35-36, text-fig. 1, pl. 2, fig. 7, LATE PALAEOCENE-LATE EOCENE (Subathu Formation), Simla Hills, Punjab Basin, Himachal Pradesh; Khanna, Singh & Sah, 1981: 261, pl. 3, fig. 3, (Subathu Formation), Simla Hills; Singh & Sarkar, 1987; 208, pl. 1, fig. 25, EOCENE (Subathu Formation), Banethi-Bagthan area, Simla Hills, Himachal Pradesh; Sarkar & Singh, 1988: 55, pl. 5, figs 17-18, EOCENE (Subathu Formation), Banethi-Bagthan area, Simla Hills, Himachal Pradesh.

Thalassiphora sp.

Subathua sp. In: Singh & Khanna, 1980: 470, pl. 1, fig. 1, LATE PALAEOCENE-LATE EOCENE (Subathu Formation), Simla Hills, Punjab Basin, Himachal Pradesh.

Thalassiphora sp. *In*: Nandi, 1990: 126, pl. 5, figs 3-4, MAASTRICHTIAN-DANIAN, Meghalaya.

Thalassiphora sp. *In*: Rao, 1990: 249, pl. 3, fig 25, OLIGOCENE (Arthungal bore-hole), Alleppey, Kerala.

Thalassiphora sp. *In*: Jain *et al*., 1975: 9, pl. 7, fig. 78, DANIAN (Langpar Formation), Meghalaya.

Thalassiphora sp. **B** *In*: Jain *et al*., 1975: 10, pl. 6, fig. 71, MAASTRICHTIAN (Mahadek Formation), Meghalaya.

TITYROSPHAERIDIUM Sarjeant, 1981.

Tityrosphaeridium cantharellus (Brosius, 1963) Sarjeant, 1981. *In*: Mehrotra & Kamla Sigh, 2003: 90, pl. 9, figs 1 & 3, EARLY MIOCENE – MIDDLE EOCENE (ONGC well MNP- A, 645 – 1305m, Matsyapuri Sandstone), Krishna-Godavari Basin, Andhra Pradesh; AQUITANIAN-CHATTIAN – BARTONIAN (ONGC well SSY- A, 1895 – 2090m, Ravva Formation), Krishna-Gadavari Basin, Andhra Pradesh; EARLY MIOCENE – MIDDLE EOCENE (ONGC well KSP – A, 1920 – 2490m), Krishna-Godavari Basin, Andhra Pradesh; EARLY MIOCENE – LATE OLIGOCENE (ONGC well GS- 15- D, 2780 – 2950m), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 81, YPRESIAN - RUPELIAN (51 - 30 Ma), Mumbai Offshore; LUTETIAN AQUITANIAN ex Mehrotra & Kamla Singh, 2003, Krishna-Godavari Basin, Andhra Pradesh; YPRESIAN - BARTONIAN ex Mehrotra *et al*., 2002, Assam-Arakan Basin, Northeastern India..

Cordosphaeridium cantharellum (Brosius, 1963) Gocht, 1969. *In*: Kar, 1985: 203, pl. 48, figs 2-3, MIOCENE (Khari Nadi Formation), Kutch, Gujarat; Sarkar & Prasad, 2000b: 141, PL. 2, FIG. 9, EARLY LUTETIAN (Subathu Formation, Morni Hills), Haryana;.

Tityrosphaeridium sp. cf. **T. cantharellus** (Brosius, 1963) Sarjeant, 1981.

Cordosphaeridium sp. cf. *C. cantharellum* (Brosius, 1963) Gocht, 1969. *In*: Dutta & Jain, 1980: 66-67, pl. 7, figs 57, 57a, EARLY-MIDDLE EOCENE (Sylhet Formation), Meghalaya.

Tityrosphaeridium ?exilimurum (Davey & Williams, 1966b) Jain & Garg, 1986b. **NOW Cordosphaeridium exilimurum** Davey & Williams, 1966 emend. Davey, 1969b.

?Tityrosphaeridium fibrospinosum (Davey & Williams, 1966b) Jain & Garg, 1986b. **NOW Cordosphaeridium fibrospinosum** Davey & Williams, 1966 emend. Davey, 1969c.

?Tityrosphaeridium funiculatum (Morgenroth, 1966a) Sarjeant, 1981a. **NOW Cordosphaeridium funiculatum** Morgenroth, 1966a emend. Brinkhuis, 1992.

Tityrosphaeridium gracile (Eisenack, 1954b) Sarjeant, 1981. **NOW Cordosphaeridium gracile** (Eisenack, 1954b) Davey &

Williams, 1966b emend. Davey & Williams, 1966b.

Tityrosphaeridium sp. In: Mehrotra & Sarjeant 1987: pl. 7, figs 3, 5 = **Cordosphaeridium sp.**

TRIBLASTULA O. Wetzel, 1933b emend. Morgenroth, 1966a emend. Eisenack, 1969a.

Triblastula utinensis O. Wetzel, 1933b emend. Sarjeant, 1985b. *In*: Mehrotra & Aswal, 2003: 96, pl. 30, figs 1 & 2, CENOMANIAN (ONGC well RCPM- A, 1820 – 1825m, Raghavapuram Formation), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 60, ALBIAN ex Mehrotra & Aswal, 2003, Krishna-Godavari Basin, Andhra Pradesh.

TRICHODINIUM Eisenack & Cookson, 1960 emend. Clarke & Verdier, 1967.

Trichodinium brevispinosum Khowaja-Ateequzzaman, 1993. *In*: Khowaja-Ateequzzaman, 1993: 131-132, pl. 1, figs 1-3, EARLY ALBIAN (Grey Shale Member, Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

Trichodinium castanea Deflandre, 1935 ex Clarke & Verdier, 1967. *In*: Jain, 1977b: 176, pl. 4, fig. 43, EARLY ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu; Khowaja-Ateequzzaman & Garg, 2002: 136, pl. 2, fig. 2, EARLY TURONIAN (Kulakkalnattam Sandstone Member, Garudamangalam Formation), Cauvery Basin, southern India; Mehrotra *et al*., 2005: 60, CENOMANIAN – CAMPANIAN ex Mehrotra & Aswal, 2003, Krishna-Godavari Basin, Andhra Pradesh.

Trichodinium hirsutum Cookson, 1965b. *In*: Singh *et al*., 1979: 35-36, text-fig. 1, pl. 1, fig. 14, LATE PALAEOCENE-LATE EOCENE (Subathu Formation), Simla Hills, Punjab Basin, Himachal Pradesh.

Trichodinium jainii Khowaja-Ateequzzaman, 1993. *In*: Khowaja-Ateequzzaman, 1993: 134-135, pl. 1, figs 4-7, EARLY ALBIAN (Grey Shale Member, Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

Trichodinium minutum Khowaja-Ateequzzaman, 1993. *In*: Khowaja-Ateequzzaman, 1993: 132-134, pl. 1, figs 8-10, EARLY ALBIAN (Grey Shale Member, Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

Trichodinium magnum Jain, 1977b. **NOW Cribroperidinium magnum** (Jain, 1977b) Fensome & Williams, 2004.

TRITHYRODINIUM Drugg, 1967 emend. Davey, 1969b emend. Lentin & Williams, 1976 emend. Marheinecke, 1992.

Trithyrodinium vermiculatum (Cookson & Eisenack, 1961a) Lentin & Williams, 1976.

Hexagonifera vermiculata Cookson & Eisenack, 1961. *In*: Singh *et al*., 1979: 35-36, text-fig. 1, LATE PALAEOCENE-LATE EOCENE (Subathu Formation), Simla Hills, Punjab Basin, Himachal Pradesh.

TUBERCULODINIUM Wall, 1967.

Tuberculodinium vancampoae (Rossignol, 1962) Wall, 1967. *In*: Kar, 1985: 210, pl. 49, figs 10-11, MIOCENE (Khari Nadi Formation), Kutch, Gujarat; Tissot, 1990: 356, pl. 2, fig. 12, LATE HOLOCENE (Kandavara bore-well), Coondapar area, Karnataka; Jain & Garg, 1991: 66-67, OLIGOCENE (Maniyara Fort Formation, Kutch, Gujarat (Restudy of Kar, 1985); Mehrotra & Kamla Singh, 2003:91, pl. 14, figs 4-6, PLEISTOCENE – PLIOCENE (ONGC well NSP- A, 495 – 498m, Rajahmundry Sandstone), Krishna-Godavari Basin, Andhra Pradesh; HOLOCENE-CALABRIAN – CHATTIAN-PRIABONIAN (ONGC well KSP- A, 370 – 2400m), Krishna-Godavari Basin, Andhra Pradesh; HOLOCENE-CALABRIAN – CHATTIAN (ONGC well GS- 15- D, 680 – 2910m, Godavari Clay and Ravva Formation), Krishna-Godavari Basin, Andhra Pradesh; HOLOCENE-CALABRIAN – AQUITANIAN-CHATTIAN (ONGC well SSY- A, 70 – 1615m, Ravva Formation), Krishna-Godavari Basin, Andhra Pradesh; CALABRIAN – AQUITANIAN-CHATTIAN (ONGC well MGP- A, 180 – 1425m), Krishna-Godavari

Basin, Andhra Pradesh; TORTONIAN-SERRAVALLIAN – AQUITANIAN-CHATTIAN (ONGC well MNP- A, 520 – 900m, Matsyapuri Sandstone), Krishna-Godavari Basin, Andhra Pradesh; MIDDLE MIOCENE – OLIGOCENE (ONGC well BMP- A, 650 – 1000m), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 81-82, RUPELIAN (EARLY OLIGOCENE) - HOLOCENE ex Mehrotra & Kamla Singh, 2003, Krishna-Godavari Basin, Andhra Pradesh.

Membranilarnacia donaensis Saxena & Rao, 1984.*In*: Saxena & Rao, 1984: 57-58, pl. 2, fig. 24, EARLY MIOCENE (Bhuban Formation), Jaintia Hills, Meghalaya.

Membranilarnacia sp. *In*: Kar, 1979: 35, pl. 4, fig. 72, OLIGOCENE (Maniyara Fort Formation), Kutch, Gujarat. (Reallocated by Jain & Garg, 1991)

TUBOTUBERELLA Vozzhennikova, 1967 emend. Brideaux, 1977 emend. Sarjeant, 1982b emend. Dodekova, 1990.

Tubotuberella apatela (Cookson & Eisenack, 1960b) Ioannides *et al.*, 1977 emend. Sarjeant, 1982b. *In*: Jain *et al*., 1978: 116, pl. 1, fig. 9, LATE JURASSIC {Spiti Shale Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh; Jain *et al*., 1984: 78, pl. 1, fig. 13; pl. 2, fig. 33, KIMMERIDGIAN-MIDDLE TITHONIAN (Spiti Shale Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh; Jain *et al*., 1986: 75, pl. 1, fig. 7, LATE JURASSIC, Kutch, Gujarat; Garg *et al*., 2003: 52-53, pl, III, fig. 3-4, EARLY LOWER TITHONIAN (*Uhligites* Ammonite, Lower part of Middle Division of Spiti Shale Formation, Laptal Section); LATE LOWER TITHONIAN (*Kosmatia* Ammonite, Middle Division, Spiti Shale Formation, Kibber Section of Spiti Valley); LATE LOWER TITHONIAN (*Virgatosphinctes* Ammonite, Upper level of the Middle Division, Spiti Shale Formation, Gate Section of Spiti Valley); LATE LOWER TITHONIAN (*Paraboliceras* Ammonite, Upper part of the Middle Division, Spiti Shale Formation, Kibber Section), Malla Johar area, Kumaon Himalaya.

Tubotuberella dangeardii (Sarjeant, 1968) Stover & Evitt, 1978 emend. Sarjeant, 1982b. *In*: Kumar, 1986b: 403, pl. 4, fig. 6, EARLY KIMMERIDGIAN-TITHONIAN (Jhuran Formation), Kutch, Gujarat; Kumar, 1987a: 599, EARLY KIMMERIDGIAN-TITHONIAN (Jhuran Formation), Kutch, Gujarat.

Tubotuberella eisenackii subsp. *Oligodentata*(Cookson & Eisenack, 1958) Stover & Evitt, 1978. **NOW Gonyaulacysta eisenackii** subsp. **Eisenackii** Autonym.

Tubotuberella sp. *In*: Garg *et al*., 2003: 52-53, pl, I, fig. 4, LATE LOWER TITHONIAN (*Kosmatia* Ammonite, Middle Division, Spiti Shale Formation, Kibber Section of Spiti Valley), Malla Johar area, Kumaon Himalaya.

Tubotuberella sp. **A** *In*: Jain *et al*., 1984: 79, pl. 1, fig. 14, EARLY LATE TITHONIAN (Spiti Shale Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh.

TURBIOSPHAERA Archangelsky, 1969a.

Turbiosphaera filosa (Wilson, 1967a) Archangelsky, 1969a. *In*: Jain & Garg, 1986b: 122, pl. 3, fig. 1, LATE PALAEOCENE, Vriddhachalam area, Cauvery Basin, Tamil Nadu; Mathur, 1986: 200, LUTETIAN--BARTONIAN (Kalol Formation, well no. 100), Cambay Basin, Gujarat; Singh & Tripathi, 1987: 302, LATE EOCENE (Kopili Formation), Meghalaya; Tripathi, 1989: 65, pl. 1, figs 2, 8; pl. 2, fig. 11, LATE EOCENE (Kopili Formation), Meghalaya.

Turbiosphaera galatea Eaton, 1976. *In*: Mathur, 1986: 201, LUTETIAN-BARTONIAN (Kalol Formation, well no. 109), Cambay Basin, Gujarat.

Turbiosphaera sp. cf. **T**. **galatea** Eaton, 1976. *In*: Dutta & Jain, 1980: 66, pl. 7, figs 61-61a, EARLY-MIDDLE EOCENE (Sylhet Formation), Jaintia Hills, Meghalaya.

Turbiosphaera proximata Tripathi, 1989. *In*: Tripathi, 1989: 64-65, pl. 1, figs 9, 12; pl. 2, figs 6, 10: pl. 3, fig. 6, LATE EOCENE (Kopili Formation), Meghalaya.

Turbiosphaera sp. *In*: Jain & Tandon, 1981: 13-14, pl. 2, figs 26-27, MIDDLE EOCENE (Harudi Formation), Kutch, Gujarat.

Turbiosphaera sp. *In*: Kar, 1985: 196, pl. 43, figs 5-6, MIDDLE EOCENE (Harudi Formation), Kutch, Gujarat, (reproduction from Jain & Tandon, 1981).

Turbiosphaera sp. **A** *In*: Mathur, 1986: 200, LUTETIAN--BARTONIAN (Kalol Formation, well no. 100), Cambay Basin, Gujarat.

Turbiosphaera sp. **B** *In*: Mathur, 1986: 201, LUTETIAN--BARTONIAN (Kalol Formation, well no. 100), Cambay Basin, Gujarat.

VALENSIELLA Eisenack, 1963 emend. Courtinat, 1989.

Valensiella griphus Norvick, 1976. *In*: Khowaja-Ateequzzaman & Garg, 2002: 137, pl.1, fig. 2, LATE TURONIAN (Kulakkalnattam Sandstone Member, Garudamangalam Formation), Cauvery Basin, southern India.

Valensiella punctata Jain, 1977b. *In*: Jain, 1977b: 180, pl. 4, fig. 44, EARLY ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

Valensiella sp. *In*: Mehrotra & Aswal, 2003: 98, pl. 33, figs 1 & 3, VALANGINIAN (ONGC well DRK- A, 2000 – 2005m, Raghavapuram Formation), Krishna-Godavari Basin, Andhra Pradesh; LATE KIMMERIDGIAN (ONGC well MVD- A, 2395 – 2400m, Golapalli Formation), Krishna-Godavari Basin, Andhra Pradesh.

Valensiella sp. A. *In*: Khowaja-Ateequzzaman & Jain, 1992: 175, pl. 10, fig. 12, HAUTERIVIAN-BARREMIAN (CGWB borehole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu.

WALLODINIUM Loeblich Jr. & Loeblich III, 1968 emend. Riding, 1994.

Wallodinium anglicum (Cookson & Hughes, 1964) Lentin & Williams, 1973. *In*: Mehrotra & Sarjeant, 1986: 722--723, pl. 10, fig. 1, APTIAN (Periyavadavadi shallow well- 1), Cauvery Basin, Tamil Nadu.

Wallodinium glaessneri (Cookson & Eisenack, 1960b) Loeblich Jr. & Loeblich III, 1968. *In*: Kumar, 1986a: 32, VALANGINIAN-HAUTERIVIAN (ONGC bore core no. 4), Krishna-Godavari Basin, Andhra Pradesh, (Garg *et al.*, 1988 reassessed the age of this assemblage to be Hauterivian-Barremian).

Wallodinium cf. **luna** (Cookson & Eisenack, 1960a) Lentin & Williams, 1973. *In*: Mehrotra & Sarjeant, 1986; 723, pl. 3, fig. 3, APTIAN (Periyavadavadi shallow well- 1), Cauvery Basin, Tamil Nadu.

WANAEA Cookson & Eisenack, 1958 emend. Fensome, 1981.

Wanaea clathrata Cookson & Eisenack, 1958. *In*: Jain *et al.*, 1984: 78, pl. 1, figs 5-6, EARLY TITHONIAN (Spiti Shale Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh.

Wanaea digitata Cookson & Eisenack, 1958 emend Woollam, 1982. *In*: Garg *et al.*, 2003: 52-53, pl, V, fig. 11, LATE LOWER TITHONIAN (*Paraboliceras* Ammonite, Upper part of the Middle Division, Spiti Shale Formation, Kibber Section), Malla Johar area, Kumaon Himalaya.

cf. **Wanaea** Cookson & Eisenack, 1958 emend. Fensome, 1981.

cf. *Energlynia* Sarjeant, 1976. *In*: Jain *et al.*, 1984: 78, pl. 5. fig. 109, EARLY LATE TITHONIAN (Spiti Shale Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh.

Wanaea sp.

Energlynia sp. *In*: Garg *et al*., 2003: 52-53, pl, II, figs 11-12, LATE UPPER TITHONIAN – BERRIASIAN-EARLY VALANGINIAN (*Pterolytoceras* Ammonite, Upper levels of the Upper Division, Spiti Shale Formation), Malla Johar area, Kumaon Himalaya.

Wanaea sp. A. *In*: Jain *et al*., 1984: 78, pl. 4, fig. 81, LATE JURASSIC (Spiti Shale Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh.

WETZELIELLA Eisenack, 1938b emend. Williams & Downie, 1966b emend. Lentin & Williams, 1976.

Wetzeliella articulata Eisenack, 1938b. *In*: Mehrotra *et al*., 2005: 82, YPRESIAN (53 Ma), Mumbai Offshore.

Wetzeliella meckelfeldensis Gocht, 1969. *In*: van Erve *et al*., 1980: 623, pl. 3, figs 1-3, EARLY EOCENE (Subathu Formation), Simla Hills, Himachal Pradesh.

Wetzeliella cf. **meckelfeldensis** Gocht, 1969. *In*: van Erve *et al*., 1980: 625-626, pl. 3, figs 4-5, EARLY EOCENE (Subathu Formation), Simla Hills, Himachal Pradesh.

Wetzeliella sp. *In*: Jain & Tandon, 1981: 14, pl. 3, figs 40--41, MIDDLE EOCENE (Harudi Formation), Kutch, Gujarat.

Wetzeliella sp. *In*: Kar, 1985: 197, pl. 43, fig. 9, MIDDLE EOCENE (Harudi Formation), Kutch, Gujarat, (reproduction from Jain & Tandon, 1981).

Wetzeliella sp. *In*: Mehrotra & Kamla Singh, 2003: 92, pl. 14, fig. 3, THANETIAN (ONGC well Chintalapalli- A, 3430 – 3435m, Razole Formation), Krishna-Godavari Basin, Andhra Pradesh.

cf. **Wetzeliella sp.** *In*:Jain & Garg, 1986b: 122-I 23, pl. 4, fig. 4, LATE PALAEOCENE, Vriddhachalam area, Cauvery Basin, Tamil Nadu.

WILSONIDIUM Lentin & Williams, 1.976.

Wi1sonidium lineidentatum (Deflandre & Cookson, 1955) Lentin & Williams, 1976. *In*: Jain & Tandon, 1981: 14, pl. 3, fig. 38, MIDDLE EOCENE (Harudi Formation), Kutch, Gujarat: Kar, 1985: 196-197, pl. 43, fig. 7, MIDDLE EOCENE (Harudi Formation), Kutch, Gujarat. (reproduction from Jain & Tandon, 1981).

Wilsonidium echinosuturatum (Wison, 1967c) Lentin & Williams, 1976. *In*: Garg & Khowaja-Ateequzzaman, 2000: 471, pl. 2, figs 7, 10, LATE THANETIAN (Lakadong Sst Member, Sylhet Limestone Formation), Cherrapunji area, Khasi Hills, Meghalaya.

Wilsonidium sp. cf. **W. nigeriaense** Jan du Chene & Adediran, 1985. *In*: Garg & Khowaja-Ateequzzaman, 2000: 471, LATE THANETIAN (Lakadong Sst Member, Sylhet Limestone Formation), Cherrapunji area, Khasi Hills, Meghalaya.

Wilsonidium sp. A. *In*: Garg & Khowaja-Ateequzzaman, 2000: 471, pl. 2, figs 8, 11-12, LATE THANETIAN (Lakadong Sst Member, Sylhet Limestone Formation), Cherrapunji area, Khasi Hills, Meghalaya.

Wilsonidium sp. B. *In*: Garg & Khowaja-Ateequzzaman, 2000: 471, LATE THANETIAN (Lakadong Sst Member, Sylhet Limestone Formation), Cherrapunji area, Khasi Hills, Meghalaya.

WREVITTIA Helenes & Lucas Clark, 1997.

Wrevittia cassidata (Eisenack & Cookson, 1960) Helenes & Lucas Clark, 1997 emend. Helenes & Lucas Clark, 1997. *In*: Mehrotra *et al*., 2005: 60, BARREMIAN - TURONIAN, Cauvery Basin, Tamil Nadu.

Gonyaulacysta cassidata (Eisenack & Cookson, 1960) Sarjeant, 1966b emend. Sarjeant, 1966b. *In*: Khowaja-Ateequzzaman & Jain, 1992: 157, pl. 12, fig. 10, HAUTERIVIAN-BARREMIAN (CGWB bore-hole near Puduvoyal), Palar Basin, Chingleput, Tamil Nadu; Mehrotra & Aswal, 2003: 58, pl. 3, figs 5 & 6, HAUTERIVIAN – BARREMIAN (ONGC well END- A, 1865 – 1910m, Raghavapuram Formation), Krishna-Godavari Basin, Andhra Pradesh; CENOMANIAN – TURONIAN (ONGC well MVD-A, 1050 – 1600m, Raghavapuram and Tirupati formations), Krishna-Godavari Basin, Andhra Pradesh.

XENASCUS Cookson & Eisenack, 1969 emend. Yun Hyesu, 1981 emend. Stover & Helby, 1987a.

Xenascus asperatus Stover & Helby, 1987a. *In*: Mehrotra & Aswal, 2003:99, pl. 15, figs 1, 4, & 5, LATE MAASTRICHTIAN – CENOMANIAN (ONGC well END- A, 920 – 1325m, Tirupati Formation), Krishna-Godavari Basin, Andhra Pradesh; EARLY CAMPANIAN – ALBIAN (ONGC well DRK-A, 1450 – 1730m, Chintalapalli and Raghavapuram formations), Krishna-Godavari Basin, Andhra Pradesh; CAMPANIAN (ONGC well MVD- A, 880 – 885m, Tirupati Formation), Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et al*., 2005: 61, ALBIAN – LATE MAASTRICHTIAN ex Mehrotra & Aswal, 2003, Krishna-Godavari Basin, Andhra Pradesh.

Xenascus ceratioides (Deflandre, 1937b) Lentin & Williams, 1973. *In*: Khowaja-Ateequzzaman & Garg, 2002: 136, pl. 2, fig 17, 18, EARLY - LATE TURONIAN (Kulakkalnattam Sandstone Member, Garudamangalam Formation), Cauvery Basin, southern India.

Xenascus sp. *In*: Mehrotra & Aswal, 2003:100, pl. 15, figs 2 & 3, EARLY – LATE CAMPANIAN (ONGC well RCPM- A, 1100 – 1105m, Tirupati formation), Krishna-Godavari Basin, Andhra Pradesh.

XIPHOPHORIDIUM Sarjeant, 1966b.

Xiphophoridium alatum (Cookson & Eisenack, 1962b) Sarjeant, 1966b. *In*: Khowaja-Ateequzzaman & Garg, 2002: 136, pl. 2, fig. 12, LATE TURONIAN (Kulakkalnattam Sandstone Member, Garudamangalam Formation), Cauvery Basin, southern India.

XYLOCHOARION Erkmen & Sarjeant, 1978.

cf. **Xylochoarion sp**. *In*: Jain *et al*., 1984: 78, pl. 5, fig. 88, LATE JURASSIC (Spiti Shale Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh.

YALKALPODINIUM Morgan, 1980.

Yalkalpodinium indicum (Jain & Taugourdeau-Lantz, 1973) Morgan, 1980.

Ovoidinium indicum Jain & Taugourdeau-Lantz, 1973. *In*: Jain & Taugourdeau-Lantz, 1973: 64, pl. 4, figs 1-2, EARLY CRETACEOUS (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

Dinocyst type 1. *In*: Saxena & Rao, 1984: 58, pl. 2, fig. 28, OLIGOCENE (Laisong Formation), Jaintia Hills, Meghalaya.

Dinocyst type 1. Mehrotra *et al*., 1996: 687, LUTETIAN - PRIABONIAN (ONGC well Gulf- 3, Tarapur Shale Formation), Gulf of Cambay, Gujarat.

Dinocyst type 2. *In*: Saxena & Rao, 1984: 58, pl. 2, figs 25--26, EARLY MIOCENE (Bhuban Formation), Jaintia Hills, Meghalaya and Cachar, Assam.

Dinocyst type 2. *In*: Saxena *et al*., 1987: 152, pl. 2, fig. 10, EARLY MIOCENE (Bhuban Formation), Jaintia Hills, Meghalaya and Cachar, Assam.

Dinocyst type 2. *In*: Mehrotra *et al*., 1996: 687, LUTETIAN - PRIABONIAN (ONGC well Gulf- 3, Tarapur Shale Formation), Gulf of Cambay, Gujarat.

Dinocyst type 3. *In*: Saxena & Rao, 1984: 58-59, pl. 2, fig. 27, MIOCENE (Bhuban Formation), Jaintia Hills, Meghalaya and Cachar, Assam.

Dinocyst type 3. *In*: Mehrotra *et* al., 1996: 687, LUTETIAN - PRIABONIAN (ONGC well Gulf- 3, Tarapur Shale Formation), Gulf of Cambay, Gujarat.

Dinoflagellate new sp. *In*: Banerjee & Misra, 1972: 211, pl. 1, fig. 6, EOCENE-MIOCENE, Assam and Tripura.

Dinoflagellate cyst. *In*: Gupta & Khandelwal, 1990: 387, pl. 3, figs 14-19, QUATERNARY (Balugaon profile), Chilka Lake, Orissa.

Dinoflagellate cyst type A. *In*: Kumar, 1986b: 403-404, pl. 6, fig. 7, text-fig. 12, EARLY KIMMERIDGIAN- TITHONIAN (Jhuran Formation), Kutch, Gujarat.

Dinoflagellate cyst type A. *In*: Kumar, 1987a: 598, EARLY KIMMERIDGIAN-TITHONIAN (Jhuran Formation), Kutch, Gujarat.

Forma A. *In*: Jain *et al*., 1975: 13, pl. 7, fig. 80, Meghalaya.

Forma A. *In*: Venkatachala & Kumar, 1980: 104, pl. 6, fig. 182, ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

Forma A. *In*: Kumar, 1982: 175, pl. 2, fig 15, NEOCOMIAN, Krishna-Godavari Basin, Andhra Pradesh.

Forma A. *In*: Jain *et al*., 1984, pl. 5, fig. 89, LATE JURASSIC (Spiti Shale Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh.

Forma A. *In*: Kumar, 1986a: 32, pl. 2, figs 8-10, VALANGINIAN-HAUTERIVIAN (ONGC bore core no. 4), Krishna-Godavari Basin, Andhra Pradesh, (Garg *et al.,* 1988 reassessed the age of this assemblage to be Hauterivian-Barremian).

Forma A. *In*: Kumar, 1987a: 599, pl. 2, figs 1-2, LATE BATHONIAN-CALLOVIAN (Jhurio Formation), Kutch, Gujarat.

Forma A. *In*: Kumar, 1987b: 244, pl. 2, fig. 3, text-fig. 7, EARLY KIMMERIDGIAN-TITHONIAN (Jhuran Formation), Kutch, Gujarat.

Forma A. *In*: Jain & Garg, 1991: 60-61, EARLY EOCENE (Lakhpat bore hole- 1), Kutch, Gujarat.

Heterosphaeridium heteracanthum sub sp. *sparciprocessum* (Verma & Dangwal) Eisenack & Kjellström, 1971. *In*: Kar, 1985: pl. 40, fig. 9, EARLY EOCENE (Lakhpat bore-hole 1), Kutch, Gujarat. (Reallocated by Jain & Garg, 1991)

Forma A *In*: Jain & Garg, 1991: 66-67, OLIGOCENE (Maniyara Fort Formation), Kutch, Gujarat. (Restudy of Kar, 1985)

Polysphaeridium sp**.** *In*: Kar, 1979: 34, pl. 4, fig. 69 OLIGOCENE (Maniyara Fort Formation), Kutch Gujarat. (Reallocated by Jain & Garg, 1991).

Forma A. *In*: Garg *et al*., 2003: 52-53, pl, II, fig. 8, LATE LOWER TITHONIAN (*Virgatosphinctes* Ammonite, Upper level of the Middle Division, Spiti Shale Formation, Gate Section of Spiti Valley); LATE LOWER TITHONIAN (*Paraboliceras* Ammonite, Upper part of the Middle Division, Spiti Shale Formation, Kibber Section); LATE UPPER TITHONIAN (*Blanfordiceras* Ammonite), Malla Johar area, Kumaon Himalaya.

Forma B. *In*: Jain *et al*., 1975: 13, pl. 3, fig 45, Meghalaya.

Forma B. *In*: Venkatachala & Kumar, 1980: 104, pl. 5, fig. 9, ALBIAN (Dalmiapuram Formation), Cauvery Basin, Tamil Nadu.

Forma B. *In*: Jain *et al*., 1984, pl. 5, fig. 91, LATE JURASSIC (Spiti Shale Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh.

Forma B. *In*: Garg *et al*., 2003: 52-53, LATE LOWER TITHONIAN (*Kosmatia* Ammonite, Middle Division, Spiti Shale Formation, Kibber Section of Spiti Valley); Malla Johar area, Kumaon Himalaya.

Forma C. *In*: Jain *et al*., 1975: 13-14, pl. 3, fig. 46, Meghalaya.

Forma C. *In*: Jain *et al*., 1984, pl. 5, fig. 92, LATE JURASSIC (Spiti Shale Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh.

Forma D. *In*: Jain *et al*., 1984, pl. 5, fig. 93, LATE JURASSIC (Spiti Shale Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh.

Forma E. *In*: Jain *et al*., 1984: 78, pl. 5, fig. 94, MIDDLE TITHONIAN (Spiti Shale Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh.

Forma F. *In*: Jain *et al*., 1984, pl. 5, fig. 95, LATE JURASSIC (Spiti Shale Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh.

Forma G. *In*: Jain *et al*., 1984: 78, pl. 5, fig. 97, KIMMERIDGIAN (Spiti Shale Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh.

Forma H. *In*: Jain *et al*., 1984: 79, pl. 5, fig. 101, EARLY LATE TITHONIAN (Spiti Shale Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh.

Forma I. *In*: Jain *et al*., 1984, pl. 5, fig. 102, LATE JURASSIC (Spiti Shale Formation),

Malla Johar area, Kumaon Himalaya, Uttar Pradesh

Forma J. *In*: Jain *et al*., 1984, pl. 5, fig. 103, LATE JURASSIC (Spiti Shale Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh.

Forma K. *In*: Jain *et al*., 1984, pl. 5, fig. 104, LATE JURASSIC (Spiti Shale Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh.

Forma L. *In*: Jain *et al*., 1984, pl. 5, fig. 108, LATE JURASSIC (Spiti Shale Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh.

Forma M. *In*: Jain *et al*., 1984, pl. 5, fig.110, LATE JURASSIC (Spiti Shale Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh.

Forma N. *In*: Jain *et al*., 1984, pl. 5, fig.112, LATE JURASSIC (Spiti Shale Formation), Malla Johar area, Kumaon Himalaya, Uttar Pradesh.

Forma O. *In*: Jain *et al*., 1984, pl. 4, fig. 78, LATE JURASSIC (Spiti Shale), Malla Johar area, Kumaon Himalaya, Uttar Pradesh.

Hystrichosphaerid. *In*: Biswas, 1962; 42, pl. 7, fig. 41; pl. 8, fig. 45, EARLY EOCENE (Tura Formation), Garo Hills, Meghalaya.

CONCLUSION

Fossil dinoflagellates occur mostly in Mesozoic-Cenozoic rocks. They have proved to be of value as a tool in resolving the problems of palaeoceanography and hydrocarbon exploration through high resolution biostratigraphy, palaeoecology, palaeogeography and palaeoenvironment. Biostratigraphic zones, commonly abbreviated as biozones, most reliably used for determining age and for correlating rocks, can be of several types. However, all are dependent upon the stratigraphic ranges of taxa, individually or collectively. First appearance datums (FADs) and the last appearance datums (LADs) of dinoflagellate cysts when related to standard time scale (dinoflagellate biohorizons) also act as significant biostratigraphic controls. Keeping in mind the significance of stratigraphic ranges of dinoflagellate cyst taxa and their basinal occurrences, all the published records of fossil organic walled dinoflagellate cyst genera, species and infraspecific taxa, described from various sedimentary basins of India during the last three decades, are placed at one place. The Catalogue includes a total number of 1643 entries. In terms of current names of fossil dinoflagellate, acritarch and prasinophyte taxa as recorded in this Catalogue, there are 235 genera (out of which there are 225 organic walled dinoflagellate cyst genera, 9 acritarch genera and one prasinophyte genus) and 663 species. The objective of this compilation is to facilitate the active researchers, engaged in palynological research, in deciphering correct stratigraphic ranges and basinal occurrences of dinoflagellate cysts in India and their proper use in future biostratigraphic analysis.

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All the published records of fossil organic walled dinoflagellate cyst genera, species and infraspecific taxa, described from various sedimentary basins of India during the last three decades, are placed at one place. The objective of this compilation is to facilitate the active researchers, engaged in palynological research, in deciphering correct stratigraphic ranges and basinal occurrences of dinoflagellates cysts in India and their proper use in future biostratigraphic analysis. The Catalogue includes a total number of 1643 entries. In terms of current names of fossil dinoflagellate, acritarch, and prasinophyte taxa as recorded in this Catalogue, there are 235 genera (out of which there are 225 organic walled dinoflagellate cyst genera, 9 acritarch genera and one prasinophyte genus) and 663 species.