Archana Tripathi
Vijaya
Ram-Awatar

Atlas of Spores and Pollen from the Triassic Succession of India

Diamond Jubilee Special Publication

Birbal Sahni Institute of Palaeobotany
Lucknow

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ARCHANA TRIPATHI
VIJAYA
RAM-AWATAR

Birbal Sahni Institute of Palaeobotany
53 University Road
Lucknow-226 007
Uttar Pradesh, India

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FOREWORD

The task to collate, edit, update and create a systematic inventory of fossil plants known from 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" by R. N. Lakhanpal *et al.* in 1976. This single volume catalogue included all plant mega- and microfossil records published from 1821 to 1970. As enormous data had subsequently gathered 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 experts 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 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/Atlases 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 individual compilations.

The present "Atlas of Spores and Pollen from Triassic succession of India" by Archana Tripathi, Vijaya & Ram Awatar is a welcome addition to the list of Institute publications. The Atlas incorporates check-list of all the taxa with their taxonomic status, stratigraphic distribution, geographic occurrence and biozonation potential. Such information would surely help enhance their role in biostratigraphy. 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

During the last fifty years since mid Nineteenth Century, much data of spores and pollen in the Mesozoic palynostratigraphy are added to the knowledge. In view of the implication of these palynotaxa in morpho-taxonomy and stratigraphy, an urgent need has arisen to prepare an Atlas. This would certainly facilitate the learning of these time entities and their contribution in palaeobotanical studies. Present compilation has come-up from the palynological information, initially contributed by so many palynologists, working in different parts of the world. Otherwise, this would never had been possible for us to bring this Atlas to the readers in this specialized field. Final preparation of this Atlas has drawn critical attention towards the correct information about each taxon, and putting into systematic style.

We are grateful to Dr. N.C. Mehrotra, Director, Birbal Sahni Institute of Palaeobotany, Lucknow to initiate to prepare the Atlas of Triassic Spores and Pollen. We have worked to the best of our ability to prepare this publication, since the yielding of this idea (January 2006). We hope that this Atlas would certainly facilitate the accruing data in resolution of stratigraphic status of rock strata.

We extend our sincere thanks to Dr Suresh Chandra Srivastava for the critical reviewing and suggestions. Dr. Srikant Murthy has helped unconditionally for searching the required literature from our Institute Library.

Archana Tripathi
Vijaya
Ram-Awatar

CONTENTS

INTRODUCTION

Spore and pollen produced by land plants constitute an important and diverse element (part) of palaeobotanical record from late Early Palaeozoic onwards. Their wide dissemination in continental and marine strata have proven exceptionally useful as biostratigraphic indices (tool).

The rapidly growing data have added more knowledge to palaeobotanical studies, and that have stressed towards the need of indexed information. And this Atlas is independently researched from original palynological literature. The information given here includes the name of the taxa with author(s) citation, details of holotype-locality from where the holotype described, horizon and age of the sample as per original status and diagnostic features. The translation of details of genera into English was done where ever found necessary. The holotype figure is scanned from original publication. In some taxa, where the photograph of genotype is not illustrated, diagrammatic line drawings, mentioned in the Synopsis by Potonié (1956, 1958, 1960, 1966), Jansonious and Hill (1976), are adapted to complete this information.

The names of area, locality and states cited herein are the original, described by the author. Regarding the horizon and age, the Geological age, has been simplified in terms of standard time scale, instead of local age connotations referred in original citations. No further comments are made to morpho-taxonomic status of taxa (Table-1), each taxon is accepted here as commented in latest publication by the author. Under each taxa, its type species is described; further more all the species, recorded from Triassic strata, are listed in Table 1. To supplement the data, species instituted from Indian Triassic sediments are dealt here with their full details. The word *Diagnostic Features,* used here, includes all the relevant characters to identify a genus or species (taxon).

A complete bibliography is also provided that includes all those publications which contain the details about morpho-taxonomy of these spores and pollen, and Triassic palynostratigraphy on Indian subcontinent. To simplify the use of this Atlas, a checklist of spores and pollen, identified in the Triassic succession of India, has been provided alphabetically (Table 1). These are also grouped under different categories following most simplified classification for fossil spores and pollen by Potonié (1956, 1960, 1970, 1975). Besides, there is record of those spores and pollen, which are basically the constituents of the Permian palynoflora, but do continue in the Triassic sediments. These taxa are marked with an asteric in Table 1, to simplify the Triassic palynostratigraphy. The palynological data included here, dates only up to the year 2005.

We also appreciate the commendable job done by some palynostratigraphers – de Jersey, N.J.; Dolby, J.B.; Balme, B.E; Jansonius, J.; Pocock, S.J.A., who had translated the palynological literature from German language, and commented on morpho-taxonomic status of many taxa. This has helped us in extracting the morpho-taxonomic information of various taxa. Our attempt to bring out this Atlas is to provide the status of the palynostratigraphy of the Triassic succession in India. This would certainly enable future workers in this specialized field of Palaeobotany/ Palaeopalynology.

Notwithstanding the problems, palynostratigraphic correlation must be considered as one of the cutting edge discipline, that provided definitive means of dating and correlating terrestrial sequences and

intra- and inter-basinal correlation. Here, a comprehensive palynozonation scheme is given for Triassic palynostratigraphy on Indian peninsula. This scheme is based on qualitative and quantitative aspects of Triassic palynoflora, and the FAD's of index species. Utilization of these characterization in palynozone identification, and also its stratigraphic placement is the pre-requisite.

While preparing this Atlas, the text matter and photographs, extracted from the original publication, have been organized invariably with the help of Computer. With the advancement of the information technology, the computers, it has been possible to complete this synthesis within six months from the inception of the idea of preparing an Atlas on the fossil spores and pollen from Triassic succession of India. Being fully consicious, there may still remain the possibility of leaving any kind of detail. For that we, a team of three persons, is fully responsible. Moreover, we draw the attention of readers to this valuable publication, a symbolic of the Diamond Jubilee of BSIP (1946-2006).

CHECK-LIST OF SPORES AND POLLEN ON RECORD IN THE TRIASSIC SUCCESSION OF INDIA

The survey of the published palynological data from the Triassic succession on Indian peninsula and the Himalaya, shows presence of variety of spore and pollen. Based on the available information, a check-list of all species on record from Triassic succession is given in Table-1. In some cases, where the species could not be determined within a genus, such specimens are listed or described as species in a particular genus. Such cases are listed in the check-list as sp. in a genus if no other species of that genus is recorded from a basin. The names of taxa are arranged in alphabetical order within a group – monolete, simple trilete, cingulate-zonate, striate bisaccate, nonstriate bisaccate, taeniate bisaccate, monosaccate, polysaccate, sulcate (nonsaccate), circumpoll and alete.

Table - 1

MONOLETE SPORE

Genus *Aratrisporites* Leschik emend. Playford and Dettmann 1965
- *A. banksi* Playford 1965
- *A. coryliseminis* Klaus 1960
- *A. fischeri* (Klaus) Playford and Dettmann 1965
- *A. flexibilis* Playford and Dettmann 1965
- *A. granulatus* (Klaus) Playford and Dettmann 1965
- *A. minimus* Schultz 1967
- *A. paenulatus* Playford and Dettmann 1965
- *A. parvispinosus* (Leschik) Playford and Dettmann 1965
- *A. strigosus* Playford 1965
- *A. wallariensis* Helby 1967

Genus *Chasmatosporites* Nilsson 1958
- *C.* sp.

Genus *Columinisporites* Peppers 1964
- *C.* sp.

Genus *Denwasporites* Kumar 1999
- *D. anhonii* Kumar 1999

Genus *Ghoshiasporites* Kar 1969
- *G. didecus* Kar 1969

Genus *Kendosporites* Surange and Chandra 1954*
- *K.* sp.

Genus *Laevigatosporites* Ibrahim 1933*
- *L. colliensis* (Balme and Hennelly) Venkatachala and Kar 1968
- *L.* sp.

Genus *Leschikisporis* Potonié emend. Bharadwaj and Singh 1964
- *L. aduncus* Potonié emend. Bharadwaj and Singh 1964
- *L.* sp.

Genus *Navalesporites* Sarate and Ram-Awatar 1984*
- *N. spinosus* Sarate and Ram-Awatar 1984

Genus *Polypodiisporites* Potonié 1934
- *P. ipsviciensis*(de Jersey) Playford and Dettmann 1965
- *P. mutabilis* Balme 1970
- *P.* sp.

Genus *Punctatosporites* Ibrahim 1933
- *P. walkomi* de Jersey 1962

Genus *Striatosporites* Bhardwaj 1954*
- *S. brazilensis* Bhardwaj, Kar and Navale 1976

Genus *Thymospora* Wilson and Venkatachala 1963*

T. cerebrata Venkatachala and Rawat 1978
T. gondwanensis Bharadwaj and Salujha 1964

SIMPLE TRILETE SPORE

Genus *Alsophilidites* (Cookson) Potonié 1954
A. densus Singh, Srivastava and Roy 1964
A. sp.
Genus *Anapiculatisporites* Potonié and Kremp 1954
A. telephorus Pautsch 1958
Genus *Apiculatisporis* Potonié and Kremp 1956*
A. globosus (Leschik) Playford and Dettmann 1965
A. sp.
Genus *Aulisporites* Leschik emend. Klaus 1960
A. astigmosus (Leschik) Klaus 1960
Genus *Baculatisporites* Thomson and Pflug 1953
B. clavaeoides Sah and Jain 1965
B. sp.
Genus *Biretisporites* Delcourt and Sprumont emend. Delcourt *et al.* 1963
B. dubius Maheshwari and Banerji 1975
B. potoniaei Delcourt and Sprumont 1955
Genus *Brevitriletes* Bharadwaj and Srivastava emend. Tiwari and Singh 1981*
B. communis Bharadwaj and Srivastava emend. Tiwari and Singh 1981
B. levis (Balme and Hennelly) Bharadwaj and Srivastava 1969
B. unicus Bharadwaj and Srivastava emend. Tiwari and Singh 1981
Genus *Cadargasporites* de Jersey and Paten emend. Reiser and Williams 1969
C. baculatus de Jersey and Paten emend. Reiser and Williams 1969
C. granulatus de Jersey and Paten emend. Reiser and Williams 1969
C. reticulatus de Jersey and Paten 1964
C. verrucosus Reiser and Williams 1969
Genus *Calamospora* Schopf, Wilson and Bentall 1944*
C. breviradiata Kosanke 1950
C. imprexa Playford 1965
Genus *Callumispora* Bharadwaj and Srivastava emend. Tiwari *et al.* 1989*
C. barakarensis Bharadwaj and Srivastava emend. Tiwari *et al.* 1989
C. fungosa (Balme) Bharadwaj and Srivastava 1969
C. gretensis (Balme and Hennelly) Bharadwaj and Srivastava emend. Tiwari *et al.* 1989
C. magna Kumaran and Maheshwari 1980
C. tenuis Bharadwaj and Srivastava 1969
C. sp.
Genus *Carnisporites* Mädler 1964
C. hercynicus Mädler 1964
C. mesozoicus (Klaus) Mädler 1964
C. raniganjensis Tiwari and Rana 1980
Genus *Ceratosporites* Cookson and Dettmann 1958
C. helidonensis de Jersey 1971
Genus *Clavatisporites* Kedves and Simoncsics 1964
C. hammenii (Herbst) de Jersey
C. sp.
Genus *Clavatriletes* Herbst 1965
C. pseudocingulatus Venkatachala and Rawat 1978
Genus *Conbaculatisporites* Klaus 1960
C. baculatus Bharadwaj and Singh 1964
C. mesozoicus Klaus 1960
Genus *Concavissimisporites* Delcourt and Sprumont emend. Delcourt, Dettmann and Hughes 1963
C. penolaensis Dettmann 1963
C. subverrucosus Venkatachala 1969
C. sp.
Genus *Converrucosisporites* Potonié and Kremp 1954
C. cameroni (de Jersey) Playford and Dettmann 1965
C. jenensis Rheinhardt 1964
C. lunzensis Bharadwaj and Singh 1964
C. sp.
Genus *Convertubisporites* Banerji and Maheshwari 1975
C. contactus Banerji and Maheshwari 1975
C. densus Banerji and Maheshwari 1975
C. variabilis Kumaran and Maheshwari 1980
Genus *Convolutispora* Hoffmeister, Staplin and Malloy 1955
C. microrugulata Schulz 1967
C. perfecta Kumaran and Maheshwari 1980
C. sp.
Genus *Craterisporites* de Jersey 1970
C. rotundus de Jersey 1970

Genus *Cyathidites* Couper 1953
C. asper (Bolkhovitina) Dettmann 1963
C. australis Couper 1953
C. concavus (Bolkhovitina) Dettmann 1963
Genus *Cyclogranisporites* Potonié and Kremp 1954*
C. arenosus Mädler 1964
C. distinctus Kumaran and Maheshwari 1980
C. gondwanensis Bharadwaj and Salujha 1964
C. triletus Kar 1970
Genus *Cyclotriletes* Mädler 1964
C. oligogranifer Mädler 1964
C. triassicus Mädler 1964
Genus *Decisporis* Kar 1970
D. panchetensis Kar 1970
D. rudis Kar 1970
D. variabilis Kar 1970
Genus *Deltoidospora* Miner emend. Potonié 1956
D. magna (de Jersey) Norris 1956
D. sp.
Genus *Dictyophyllidites* Couper emend. Dettmann 1963
Dictyophyllidites sp. cf. *D. cymbatus* Venkatachala and Góczán 1963
D. decus Kar 1970
D. glabrus Maheshwari and Banerji 1975
D. mortonii (de Jersey) Playford and Dettmann 1965
D. surangei Bhardawaj and Singh 1964
D. sp.
Genus *Dictyotosporites* Cookson and Dettmann 1958
D. complex Cookson and Dettmann 1958
D. filosus Dettmann 1963
D. sp.
Genus *Dictyotriletes* Naumova emend. Potonié and Kremp 1954
D. aulius Rigby 1977
D. sp.
Genus *Didecitriletes* Venkatachala and Kar emend. Tiwari and Singh 1981*
D. horridus Venkatachala and Kar emend. Tiwari and Singh 1981
Genus *Divaripunctites* Kar 1970
D. bifurcatus Banerji and Maheshwari 1975
D. globosus Kar 1970
D. plicatus Kar 1970
Genus *Dubrajisporites* Tiwari and Tripathi 1987
D. bulbosus Tiwari and Tripathi 1987
D. isolatus Tripathi, Tiwari and Kumar 1990
D. triassicus Tiwari and Triptathi 1987
D. unicus Tripathi, Tiwari and Kumar 1990
Genus *Eupunctisporites* Bharadwaj 1962
E. panchetensis Banerji and Maheshwari 1975
E. sp.
Genus *Foveosporites* Balme 1957
F. mimosae de Jersey and Hamilton 1967
F. moratonensis de Jersey 1964
F. triassicus Kumaran and Maheshwari 1980
F. sp.
Genus *Gabonisporis* Boltenhagen 1967
G. papillosus Tripathi, Tiwari and Kumar 1990
G. vigourouxii Boltenhagen 1967
Genus *Grandispora* Hoffmeister, Staplin and Malloy 1955
G. spinosa Hoffmeister, Staplin and Malloy 1955
Genus *Granulatisporites* Ibrahim emend. Potonié and Kremp 1954*
G. asper (Nilsson) Potonié and Kremp 1954
Genus *Guttatisporites* Visscher 1966
G. ambiguus Tiwari and Rana 1980
G. elegans Visscher 1966
G. guttatus Visscher 1966
G. microechinatus Visscher 1966
G. visscheri de Jersey 1968
G. sp.
Genus *Haradisporites* Singh and Kumar 1972
H. mineri Singh and Kumar 1972
H. scabratus Kumar 1973
H. sinuosus Kumar 1973
Genus *Horriditriletes* Bharadwaj and Salujha 1964*
H. curvibaculosus Tiwari 1965
H. novus Tiwari 1965
H. rampurensis Tiwari 1968
Genus *Ischyosporites* Balme 1957
I. sp.
Genus *Klukisporites* Couper 1958
K. variegatus Couper 1958
Genus *Lacinitriletes* Venkatachala and Kar emend. Tiwari and Singh 1981*
L. badamensis Venkatachala and Kar emend. Tiwari and Singh 1981
L. minutus Venkatachala and Kar emend. Tiwari and Singh 1981
Genus *Lapposisporites* Visscher 1966

L. armatus Visscher 1966
L. lapposus Visscher 1966
L. villosus Visscher 1966
Genus *Leptolepidites* Couper 1953
L. argentaeformis (Bolkhovitina) Morbey 1975
Leptolepidites sp. cf. *L. bossus*
Genus *Lophotriletes* (Naumova) Potonié and Kremp 1954*
L. minimus Salujha 1965
L. rectus Bharadwaj and Salujha 1964
L. sp.
Genus *Lycopodiacidites* Couper emend. Potonié 1956
L. kuepperi Klaus 1960
L. rugulatus (Couper) Schultz 1967
L. sp.
Genus *Lycopodiumsporites* Thiergart ex Delcourt and Sprumont 1955
Lycopodiumsporites sp. cf. *L. austroclavatidites*
Genus *Microbaculispora* Bharadwaj 1962*
M. tentula Tiwari 1965
M. sp.
Genus *Microfoveolatispora* Bharadwaj 1962*
M. foveolata Tiwari emend. Tiwari and Singh 1981
Genus *Microreticulatisporites* Knox emend. Potonié and Kremp1954
M. sp.
Genus *Neoraistrickia* Potonié 1956
N. taylorii Playford and Dettmann 1965
N. sp.
Genus *Novitasporites* Tiwari and Rana 1981
N. triangularis Tiwari and Rana 1981
N. triassicus Tiwari and Rana 1981
Genus *Orbella* Maljavkina 1949
O. indica Tiwari and Rana 1980
Genus *Osmundacidites* Couper 1953
O. baculatus Tiwari and Ram-Awatar 1989
O. panchetensis Kar 1970
O. pilatus Tiwari and Rana 1981
O. senectus Balme 1963
O. wellmanii Couper 1953
O. sp.
Genus *Plicatisporites* Lele and Makada 1972*
P. distinctus Lele and Makada 1972
Genus *Punctatisporites* Ibrahim emend. Potonié and Kremp 1954*
P. indicus Tiwari 1968
P. fungosus Balme 1970
P. maiturensis Maheshwari and Banerji 1975
P. uniformis Tiwari 1968
Genus *Pustulatisporites* Potonié and Kremp 1954
P. blackstonensis de Jersey 1970
Genus *Pyramidosporites* Segroves 1967
P. racemosus Balme 1970
Genus *Reticulatisporites* Ibrahim emend. Potonié and Kremp 1954
R. sp.
Genus *Retitriletes* (Hammen) ex Pierce 1961
R. huttonensis McKellar 1974
Genus *Retusotriletes* Naumova 1953
R. dejerseyi Venkatachala and Rawat 1978
Genus *Rugulatisporites* Pflüg and Thomson in Thomson and Pflüg 1953
R. trisinus de Jersey and Hamilton 1967
R. sp.
Genus *Scabratisporites* Visscher 1966
S. scabratus Visscher 1966
Genus *Subverrusporis* Kar 1970
S. rudis Kar 1970
Genus *Tigrisporites* Klaus 1960
T. halleinis Klaus 1960
T. playfordii de Jersey and Hamilton 1967
T. sp.
Genus *Todisporites* Couper 1958
T. major Couper 1958
T. minor Couper 1958
T. sp.
Genus *Trilites* Couper emend. Potonié 1956
T. tuberculiformis Cookson 1947
Genus *Triplexisporites* Foster 1979
T . playfordii (de Jersey and Hamilton) Foster 1979
Genus *Triquitrites* Wilson and Coe emend. Schopf, Wilson and Bentall 1944
T. proratus Balme 1970
T. sp.
Genus *Undulatisporites* Pflüg *in* Thomson and Pflug 1953
U. dilucidus Kraeusel and Leschik 1955
U. sp.
Genus *Uvaesporites* Döring 1965
U. glomeratus Döring 1965
U. verrucatus (de Jersey) Helby *in* Jansonius 1971
Genus *Verrucosisporites* Ibrahim emend. Smith 1971
V. bosei Maheshwari and Banerji 1975

V. carnarvonensis de Jersey and Hamilton 1967
V. contactus Clarke 1965
V. densus Bharadwaj and Tiwari 1977
V. distinctus Tiwari 1965
V. donarii Potonié and Kremp 1955
V. kazigaonensis Tripathi, Tiwari and Kumar 1990
V. morulae Klaus 1960
V. narmianus Balme 1970
V. racemus (Peppers) Smith 1971
V. surangei Maheshwari and Banerji 1975
Verrucosisporites sp. cf. *V. thuringiacus*
V. triassicus Bharadwaj and Tiwari 1977
V. varians Volkheimer 1972
V. sp.

Genus *Zebrasporites* Klaus 1960
Z. sp.

CINGULATE-ZONATE TRILETE SPORE

Genus *Aequitriradites* Delcourt and Sprumont 1955
A. minor Mädler 1964

Genus *Angulisporites* Bhardwaj 1954
A. triassicus Venkatachala and Rawat 1978

Genus *Annulispora* de Jersey 1959
A. folliculosa (Rogalska) de Jersey 1959

Genus *Antulsporites* Archangelsky and Gamerro 1966
A. bihariensis Venkarachala and Rawat 1978

Genus *Camarozonosporites* Potonié emend. Klaus 1960
C. clivosus McKeller 1974
C. rudis (Leschik) Klaus 1960

Genus *Chasmatosporites* (Nilsson) Pocock and Jansonius 1969
C. apertus (Rogalska) Nilsson 1958
C. hians Nilsson 1958

Genus *Cingutriletes* Pierce emend. Dettmann 1963
C. clavus (Balme) Dettmann 1963
C. sp.

Genus *Cingulizonates* Dybova and Jachowitz emend. Butterworth *et al.* 1964
C. indicus Kumaran and Maheshwari 1980
C. rhaeticus (Reinhardt) Schultz 1967
C. verrucosus Kumaran and Maheshwari 1980

Genus *Densoisporites* Weyland and Krieger emend. Dettmann 1963
D. complicatus Balme 1970
D. contactus Bharadwaj and Tiwari 1977
D. mesozoicus Singh, Srivastava and Roy 1964
D. nejburgii Balme 1970
D. novicus Kumar 1973
D. playfordii (Balme) Dettmann 1963
D. poatinaensis Playford 1965
D. velatus Weyland and Krieger 1953
D. sp.

Genus *Densosporites* Berry emend. Potonié and Kremp 1954
D. raceviewensis de Jersey 1971
D. sp.

Genus *Distalanulisporites* Klaus 1960
D. sp.

Genus *Duplexisporites* Deák emend. Playford and Dettmann 1965
D. gyratus Playford and Dettmann 1965

Genus *Foraminisporis* Krutzsch 1959
F. sp.

Genus *Gondisporites* Bharadwaj 1962*
G. raniganjensis Bharadwaj 1962
G. reticulatus Tiwari and Ram-Awatar 1989
G. sp.

Genus *Indotriradites* Tiwari 1964*
I. mammilatus Bharadwaj and Tiwari 1977
I. saeptatus (Balme) Bharadwaj and Tiwari 1977
I. verrucifer de Jersey and Hamilton 1967
I. wargalensis (Balme) Bharadwaj and Tiwari 1977

Genus *Iraquispora* Singh 1964*
I. labrata Singh 1964

Genus *Kraeuselisporites* Leschik 1955
K. cuspidus Balme1963
K. rallus Balme 1970
K. saeptatus Balme1963
K. verrucifer de Jersey and Hamilton 1967
K. wargalensis Balme 1970
K. sp.

Genus *Limatulasporites* Helby and Foster *in* Foster 1979
L. fossulatus (Balme) Helby and Foster *in* Foster 1979
L. limatulus (Playford) Helby and Foster *in* Foster 1979

Genus *Lundbladispora* Balme emend. Playford 1965
L. baculata Bharadwaj and Tiwari 1977
L. brevicula Balme 1963
L. bullata Venkatachala and Rawat 1978
L. densispinosa Bharadwaj and Tiwari 1977
L. microconata Bharadwaj and Tiwari 1977
L. obsoleta Balme 1963
L. raniganjensis Tiwari and Rana 1981
L. recurvata Venkatachala and Rawat 1978
L. reticulata Tiwari and Rana 1980
L. warti Tiwari and Rana 1981
L. willmotti Balme 1963
L. sp.
Genus *Lycospora* Schopf, Wilson and Bentall emend. Potonié and Kremp 1954
L. sp.
Genus *Muerrigerisporites* Krutsch 1963
M. sp.
Genus *Nevesisporites* de Jersey and Paten 1964
N. fossulatus Balme 1970
N. limatulus Playford 1965
N. vallatus de Jersey and Paten 1964
Genus *Polycingulatisporites* Simoncsics and Kedves emend. Playford and Dettmann 1965
P. crenulatus Playford and Dettmann 1965
P. densatus (de Jersey) Playford and Dettmann 1965
P. sp.
Genus *Potonieitriradites* Bharadwaj and Sinha 1969*
P. subtilis Sinha 1972
Genus *Rajmahalispora* Tiwari, Tripathi and Kumar 1984
R. reticulata Tiwari, Tripathi and Kumar 1984
R. rugulata Tiwari, Tripathi and Kumar 1984
R. triassicus Tiwari, Tripathi and Kumar 1984
Genus *Reticulatisporites* (Ibrahim) Potonié and Kremp 1954
R. sp.
Genus *Rewanispora* de Jersey 1970
R. foveolata de Jersey 1970
Genus *Ringosporites* Tiwari and Rana 1981
R. fossulatus (Balme) Tiwari and Rana 18981
R. ringus Tiwari and Rana 1981
R. sp.
Genus *Semiretisporis* Reinhardt 1961
S. denmeadi de Jersey emend. de Jersey 1970
Genus *Simeonospora* Balme 1970
S. khlonovae Balme 1970
Genus *Spinotriletes* Mädler 1964
S. echinoides Mädler 1964
S. senecioides Mädler 1964
S. sp.
Genus *Taurocusporites* Stover emend. Playford and Dettmann 1965
T. verrucatus Schultz 1967
Genus *Tethysispora* Vijaya and Tiwari *in* Vijaya *et al.* 1988
T. playfordii Vijaya and Tiwari *in* Vijaya *et al.* 1988
T. unica Vijaya and Tiwari 1988 *in* Vijaya *et al.* 1988
T. sp.
Genus *Tikisporites* Kumaran *in* Kumaran and Maheshwari 1980
T. balmei Kumaran *in* Kumaran and Maheshwari 1980
T. complicatus Kumaran *in* Kumaran and Maheshwari 1980
Genus *Uvaesporites* Döring 1965
U. verrucosus (de Jersey) Helby *in* de Jersey 1971

STRIATE BISACCATE POLLEN

Genus *Crescentipollenites* Bharadwaj emend. Bharadwaj, Tiwari and Kar 1974*
C. amplus (Balme and Hennelly) Tiwari and Rana 1980
C. *bengalensis* (Maheshwari and Banerji) Tiwari and Rana 1981
C. fuscus (Bharadwaj) Bharadwaj, Tiwari and Kar 1974
C. hirsutus (Kar) Bharadwaj, Tiwari and Kar 1974
C. sp.
Genus *Distriatites* Bharadwaj 1962*
D. bilateris Bharadwaj 1962
D. insculptus (Playford and Dettmann) Bharadwaj and Srivastava 1969
D. sp.
Genus *Faunipollenites* Bharadwaj 1962*
F. bharadwajii Maheshwari 1967
F. gopadensis Bharadwaj and Srivastava 1969
F. perexiguus Bharadwaj and Salujha 1965
F. singrauliensis Sinha 1972
F. varius Bharadwaj emend. Tiwari *et al.* 1989

F. sp.

Genus *Gondwanipollenites* Bose and Maheshwari emend. Maheshwari and Banerji 1975*
G. bengalensis Maheshwari and Banerji 1975
G. diffusus (Bharadwaj and Salujha) Maheshwari and Banerji 1975
G. magnificus (Bharadwaj and Salujha) Bose and Maheshwari 1968
G. multistriatus Banerji and Maheshwari 1975

Genus *Hamiapollenites* Wilson 1962*
H. sp.

Genus *Hindipollenites* Bharadwaj 1962*
H. indicus Bharadwaj 1962

Genus *Lahirites* Bharadwaj 1962*
L. incertus Bharadwaj and Salujha 1964
L. naviculus Venkatachala and Kar 1968
L. raniganjensis Bharadwaj 1962
L. rarus Bharadwaj and Salujha 1964
L. *singularis* Bharadwaj and Salujha 1964
L. triassicus Bharadwaj and Tiwari 1977

Genus *Protohaploxypinus* Samoilovich emend. Morbey 1975*
P. goraiensis (Potonié and Lele) Hart 1964
P. microcorpus (Schaarschmidt) Balme 1970
P. samoilovichii Jansonius 1962
P. varius (Bharadwaj) Balme 1970
P. sp.

Genus *Rhizomaspora* Wilson 1962*
R. biharia Banerji and Maheshwari 1975
R. costa Venkatachala and Kar 1968
R. divaricata Wilson 1962
R. indica Tiwari 1965
R. triassica Tiwari and Rana 1981

Genus *Schizopollis* Venkatachala and Kar 1964*
S. disaccoides Venkatachala and Kar 1964
S. distinctus Sinha 1972

Genus *Striapollenites* Bharadwaj 1962*
S. monosaccoides Tiwari and Rana 1981
S. obliquus Bharadwaj and Salujha 1964

Genus *Striatites* Pant emend. Bharadwaj 1962*
S. cancellatus (Balme and Hennelly) Potonié 1958
S. communis Bharadwaj and Salujha 1964
S. gopalensis Srivastava 1970
S. levistriatus Bharadwaj and Tiwari 1977
S. notus Bharadwaj and Salujha 1964
S. panchetensis Tiwari and Rana 1981
S. sidhiensis Bharadwaj and Srivastava 1969
S. solitus Bharadwaj and Salujha 1964
S. subtilis Bharadwaj and Salujha 1964
S. varius Kar 1968
S. sp.

Genus *Striatoabietites* Sedova emend. Hart 1964*
S. aytugii Visscher 1966
S. multistriatus Balme and Hennelly 1955

Genus *Striatopiceites* Sedova 1956*
S. clarus Kar 1970
S. minutus Venkatachala and Kar 1968

Genus *Striatopodocarpites* Soritschewa and Sedova emend. Bharadwaj 1962*
S. auriculatus Vijaya and Tiwari *in* Vijaya, Kumar, Singh and Tiwari 1988
S. crassistriatus Lele and Srivastava 1977
S. decorus Bharadwaj and Salujha 1964
S. diffusus Bharadwaj and Salujha 1964
S. dubrajpurensis Tripathi, Tiwari and Kumar 1990
S. labrus Tiwari 1965
S. magnificus Bharadwaj and Salujha 1964
S. nidpurensis Bharadwaj and Srivastava 1969
S. oblongatus (Bose and Maheshwari) Tiwari and Rana 1981
S. ovalis Sinha 1972
S. ovatus (Maheshwari) Tiwari and Rana 1980
S. rotundus (Maheshwari) Bharadwaj and Dwivedi 1981
S. tiwarii Bharadwaj and Dwivedi 1981
S. venustus Bharadwaj and Salujha 1965

Genus *Striasulcites* Venkatachala and Kar 1968*
S. ovatus Venkatachala and Kar 1968

Genus *Striatisaccus* Mädler 1964
S. sp.

Genus *Strotersporites* Wilson 1962*
S. raniganjensis Kar 1970
S. sp.

Genus *Tumoripollenites* Bharadwaj 1962*
T. baculosus Bharadwaj 1962

Genus *Verticipollenites* Bharadwaj 1962*
V. crassus Bharadwaj and Salujha 1964
V. debilis Venkatachala and Kar 1968
V. finitimus Bharadwaj and Salujha 1964
V. gibbosus Bharadwaj 1962
V. oblongus Bharadwaj 1962
V. secretus Bharadwaj 1962
V. subcircularis Bharadwaj and Salujha 1964
V. sp.

NON-STRIATE BISACCATE POLLEN

Genus *Accinctisporites* Leschik 1955
A. ligatus Leschik 1955
A. sp.
Genus *Alisporites* Daugherty emend. Jansonius 1971
A. asansoliensis Maheshwari and Banerji 1975
A. circulicorpus Clarke 1965
A. damudicus Tiwari and Rana 1981
A. grandis (Cookson) Dettmann 1963
A. grauvogelii Klaus 1964
A. grobus Bharadwaj and Tiwari 1977
A. indicus Bharadwaj and Srivastava 1969
A. landianus Balme 1970
A. minutisaccus Clarke 1965
A. opii Daugherty 1971
A. ovalis Kumar 1973
A. parvus Thiergart and Fratz 1962
A. plicatus Kar, Kieser and Jain 1962
A. tenuicorpus Balme 1970
A. sp.
Genus *Angustisulcites* Freudenthal emend. Visscher 1966
A. grandis (Freudenthal) Visscher 1966
A. klausii Freudenthal 1964
Genus *Ashmoripollis* Helby 1987
A. reducta Helby 1987
Genus *Brachysaccus* Mädler 1964
B. eskensis de Jersey 1962
B. indicus Kumaran and Maheshwari 1980
B. ovalis Madler 1964
B. triassicus Tripathi, Tiwari and Kumar 1990
B. sp.
Genus *Caytonipollenites* Couper 1958
C. sp.
Genus *Cedripites* Wodehouse 1933
C. priscus Balme 1970
C. sp.
Genus *Colpectopollis* Pflüg emend.Visscher 1966
C. sp.
Genus *Cristatisaccus* Mädler 1964
C. cristatus Mädler 1964
Genus *Cuneatisporites* Leschik 1955*
C. mirabilis Tiwari and Rana 1981
C. radialis Leschik 1955
C. rarus Kar 1968
C. sp.
Genus *Cyclosaccus* Mädler 1964
C. podocarpoides Mädler 1964
Cyclosaccus sp. cf. *C. radialis* Leschik 1955
Genus *Falcisporites* Leschik emend. Klaus 1963
F. australis (de Jersey) Stevens 1981
F. minutosaccus Kumaran and Maheshwari 1980
F. nidpurensis (Bharadwaj and Srivastava) Kumaran and Maheshwari 1980
F. nuthalensis (Clarke) Balme 1970
F. snopkovae Visscher 1966
F. stabilis Balme 1970
F. sp.
Genus *Granosaccus* Mädler 1964
Granosaccus sp. cf. *G. ornatus* (Pautch) Pautch 1978
G. reniformis Misra, Prasad and Rawat 1996
Genus *Ibisporites* Tiwari 1968*
I. diplosaccus Tiwari 1968
Genus *Illinites* Kosanke emend. Klaus 1964*
I. sp.
Genus *Jugasoporites* Leschik emend. Klaus 1964*
J. sp.
Genus *Klausipollenites* Jansonius 1962
K. decipiens Jansonius 1962
K. schaubergeri Potonié and Klaus emend. Jansonius 1962
K. staplinii Jansonius 1962
K. sulcatus Kar, Kieser and Jain 1972
K. vestitus Jansonius 1962
Genus *Krempipollenites* Tiwari and Vijaya 1995
K. indicus Tiwari and Vijaya 1995
K. sp.
Genus *Limitisporites* Leschik emend. Potonié 1958
L. sp.
Genus *Minutosaccus* Mädler 1964
M. acutus Mädler 1964
M. crenulatus Dolby *in* Dolby and Balme 1976
M. maedleri Kumaran and Maheshwari 1980
Minutosaccus sp. cf. *M. potoniaei*
M. sp.
Genus *Nidipollenites* Bharadwaj and Srivastava 1969
N. monoletus Bharadwaj and Srivastava 1969
N. sp.
Genus *Ovalipollis* Krutzch emend. Pocock and Jansonius 1969
O. rarus Klaus 1960

O. pseudoalatus (Thiergart) Schuurmann 1975
Genus *Pinuspollenites* Raatz 1937
P. thoracatus Balme 1970
P. sp.
Genus *Platysaccus* Naumova emend. Potonié and Klaus 1954*
P. fuscus Goubin 1965
P. queenslandi de Jersey 1962
P. sp.
Genus *Plicatisaccus* Pautsch 1971
P. badius Pautsch 1971
Genus *Podocarpeaepollenites* Thiergart 1949
P. sp.
Genus *Podocarpidites* Cookson emend. Couper 1953
P. alareticulatus Sah and Jain 1965
P. grandis Sah and Jain 1965
P. rarus Singh *et al.* 1964
P. typicus Sah and Jain 1965
P. vermiculatus Kumar 1973
P. sp.
Genus *Rimaesporites* Leschik 1955
R. aquilonalis Goubin 1965
R. potoniei Leschik 1955
R. sp.
Genus *Sahnites* Pant emend. Tiwari and Singh 1984*
S. panchetensis Tiwari and Singh 1984
S. sp.
Genus *Samaropollenites* Goubin 1965
S. indicus Misra, Prasad and Rawat 1996
S. speciosus Goubin 1965
S. sp.
Genus *Satsangisaccites* Bharadwaj and Srivastava 1969
S. nidpurensis Bharadwaj and Srivastava 1969
S. triassicus Bharadwaj and Srivastava 1969
S. sp.
Genus *Scheuringipollenites* Tiwari 1973*
S. barakarensis (Tiwari) Tiwari 1973
S. maximus (Hart) Tiwari 1973
S. royii (Bharadwaj and Srivastava) Tiwari 1973
S. tentulus (Tiwari) Tiwari 1973
S. triassicus (Bharadwaj and Srivastava) Tiwari 1973
S. sp.
Genus *Staurosaccites* Dolby in Dolby and Balme 1976
S. densus Kumaran and Maheshwari emend. Tripathi, Tiwari and Kumar 1990
S. marginalis Kumaran and Maheshwari 1980
S. minutus Kumaran and Maheshwari 1980
S. ovalis Kumaran and Maheshwari 1980
S. quadrifidus Dolby *in* Dolby and Balme 1976
S. tharipatharensis Kumaran in Maheshwari and Kumaran 1979
S. sp.
Genus *Triadispora* Klaus 1964
Triadispora sp. cf. *T. crassa*
T. plicata Klaus 1964
T. vilis Scheuring 1970
Genus *Vesicaspora* Schemel emend. Mädler 1964*
V. sp.
Genus *Vestigisporites* Balme and Hennelly emend. Tiwari and Singh 1984*
V. sp.
Genus *Vitreisporites* Leschik emend. Jansonius 1962
V. pallidus Reissinger 1940
V. savitrii Kumar 2000
V. sp.
Genus *Voltziaceaesporites* Klaus 1964
V. heteromorpha Klaus 1964

TAENIATE BISACCATE POLLEN

Genus *Arcuatipollenites* Tiwari and Vijaya 1995
A. asansoliensis (Tiwari and Rana) Tiwari and Vijaya 1995
A. damudicus (Tiwari and Rana) Tiwari and Vijaya 1995
A. ovatus (Goubin) Tiwari and Vijaya 1995
A. paliensis (Tiwari and Ram-Awatar) Tiwari and Vijaya 1995
A. pellucidus (Goubin) Tiwari and Vijaya 1995
A. tethysensis (Vijaya and Tiwari) Tiwari and Vijaya 1995
A. sp.
Genus *Chordasporites* Klaus 1960
C. australiensis de Jersey 1962
C. klausii Kumaran and Maheshwari 1980
C. magnus Klaus 1964
C. minutus Kar, Kieser and Jain 1972
C. raniganjensis Maheshwari and Banerji 1975
C. singulichorda Klaus 1960
C. voltziaformis Visscher 1966

C. sp.
Genus *Corisaccites* Venkatachala and Kar 1966*
C. alutas Venkatachala and Kar 1966
C. sp.
Genus *Dicappipollenites* Tiwari and Vijaya 1995*
D. balmei Tiwari and Vijaya 1995
D. sp.
Genus *Guttulapollenites* Goubin 1965*
G. hannonicus Goubin 1965
G. sp.
Genus *Infernopollenites* Scheuring 1970
I. claustratus Dolby and Balme 1976
I. janarensis Kumaran and Maheshwari 1980
I. parvus Scheuring 1970
I. pseudoclaustratus Kumaran and Maheshwari 1980
I. simplex Kumaran and Maheshwari 1980
I. sulcatus (Pautsch) Scheuring 1970
Genus *Lueckisporites* Potonié and Klaus emend. Klaus 1963*
L. crassus Sinha 1972
L. junior Klaus 1960
L. nyakapendensis Hart 1964
L. singhii Balme 1970
L. virkkiae Potonié and Klaus1954
Genus *Lunatisporites* Leschik emend. Scheuring 1970
L. acutus Leschik emend. Scheuring 1970
L. gopadensis Bharadwaj and Srivastava 1969
L. noviaulensis Leschik 1955
L. novimundi (Jansonius) Kumaran and Maheshwari 1980
L. pellucidus (Goubin) Maheshwari and Banerji 1975
L. rhaeticus (Schultz) Warrington 1974
Genus *Taeniaesporites* Leschik emend. Klaus 1963
T . obex Balme 1963
T. rhaeticus Schultz 1967
T. sp.
Genus *Trabeculosporites* Trivedi and Misra emend. Tiwari and Ram-Awatar 1992
T. gopadensis Trivedi and Misra emend. Tiwari and Ram-Awatar 1992

MONOSACCATE POLLEN

Genus *Barakarites* Bharadwaj and Tiwari 1964*
B. indicus Bharadwaj and Tiwari 1964
B. triquetrus Tiwari 1965
B. sp.
Genus *Callialasporites* Dev 1961
C. dampieri (Balme) Dev 1961
C. microvelatus Schultz 1966
C. trilobatus (Dev) Bharadwaj and Kumar 1972
C. turbatus (Balme) Schultz 1967
C. sp.
Genus *Cannanoropollis* Potonié and Sah 1960*
C. densus (Lele) Bose and Maheshwari 1968
C. mehtae (Lele) Bose and Maheshwari 1968
Genus *Crustaesporites* Leschik 1954
C. trilobatus Venkatachala and Rawat 1978
Genus *Densipollenites* Bharadwaj 1962*
D. annulatus Jha 1995
D. densus Bharadwaj and Srivastava 1969
D. indicus Bharadwaj 1962
D. invisus Bharadwaj and Salujha 1964
D. magnicorpus Tiwari and Rana 1981
D. minimus Venkatachala and Kar 1968
D. pullus Segroves 1969
D. sp.
Genus *Divarisaccus* Venkatachala and Kar 1966*
D. lelei Venkatachala and Kar 1966
D. strengeri Bose and Kar 1966
Genus *Enzonalasporites* Leschik emend. Scheuring 1970
E. densus (Leschik) Dolby and Balme 1976
E. ignacii (Leschik) Maheshwari and Kumaran 1979
E. leschikii Mädler 1964
E. vigens Leschik 1955
Genus *Goubinispora* Tiwari and Rana 1981
G. indica Tiwari and Rana 1981
G. morondavensis (Goubin) Tiwari and Rana 1981
G. sp.
Genus *Kamthisaccites* Srivastava and Jha 1986*
K. kamthiensis Srivastava and Jha 1986
K. sp.
Genus *Parasaccites* Bharadwaj and Tiwari 1964*
P. bilateralis Tiwari 1965
P. korbaensis Bharadwaj and Tiwari 1964
P. obscurus Tiwari 1965
Genus *Patinasporites* Leschik emend. Klaus 1960
P. iustus Klaus 1960
Genus *Playfordiaspora* Maheshwari and Banerji emend. Vijaya 1995

P. annulata Tiwari and Rana emend. Vijaya 1995
P. cancellosa Maheshwari and Banerji emend. Vijaya 1995
P. crenulatus (Wilson) Vijaya 1995
P. hexagonalis (Klaus) Vijaya 1995
P. velata (Leschik) Vijaya 1995
P. sp.

Genus *Potonieisporites* Bhardwaj emend. Bhardwaj 1955*
p. sp.

Genus *Plicatipollenites* Lele 1964*
P. indicus Lele 1964

Genus *Pseudenzonalasporites* Scheuring 1970
Pseudenzonalasporites sp. cf. *P. summus* Scheuring 1970

Genus *Striomonosaccites* Bharadwaj 1962*
S. circularis Bharadwaj and Salujha 1964
S. *ovatus* Bharadwaj 1962
Striomonosaccites sp. cf. *S. ovatus* Venkatachala and Rawat 1978

POLYSACCATE POLLEN

Genus *Dacrycarpites* Cookson and Pike 1953
D. europaeus Mädler 1964

Genus *Tetrasaccus* Pant ex Maithy 1965
T. sp.

Genus *Trisaccites* Cookson and Pike 1954
T. variabilis (Dev) Haskell 1968

Genus *Trochosporites* Wilson 1962
T. reniformis Wilson 1962
T. sp.

SULCATE (NONSACCATE) POLLEN

Genus *Aumancisporites* (Alpern) Jansonious 1962
A. indicus Bharadwaj and Srivastava 1969

Genus *Cycadopites* Wodehouse emend. Wilson and Webster 1946
C. coxii Visscher 1966
C. follicularis Wilson and Webster 1946
C. grandis de Jersey and Hamilton 1967
C. stonei Helby 1987
C. sp.

Genus *Ephedripites* Bolkhovitina ex Potonié 1958
E. sp.

Genus *Ginkgocycadophytus* Samoilovich 1953
G. nitidus (Balme)Venkatachala and Góczán 1964
G. sp.

Genus *Ginkgoretectina* Malawkina 1953
G. sp.

Genus *Labiipollis* Mädler 1964
L. granulatus Mädler 1964

Genus *Monosulcites* Cookson ex Couper 1953
M. minimus Cookson 1947
M. perforatus Mädler 1964

Genus *Praecolpatites* Bharadwaj and Srivastava 1969*
P. nidpurensis Bharadwaj and Srivastava 1969
P. sinuosus (Balme and Hennelly) Bharadwaj and Srivastava 1969

Genus *Pretricolpipollenites* Danze-Corsin and Lavine 1963
P. bharadwajii Balme 1970
P. sp.

Genus *Weylandites* Bharadwaj and Srivastava 1969
W. bilateralis Bharadwaj and Srivastava 1969
W. circularis Bharadwaj and Srivastava 1969
W. indicus Bharadwaj and Srivastava 1969
W. irregularis Bharadwaj and Srivastava 1969
W. lucifer (Bharadwaj and Salujha) Bharadwaj and Srivastava 1969
W. minutus Bharadwaj and Srivastava 1969
W. sp.

CIRCUMPOLL GROUP

Genus *Camerosporites* Leschik emend. Scheuring 1970
C. minor Kumaran and Maheshwari 1980
C. pseudoverrucatus Scheuring 1970
C. secatus Leschik emend. Scheuring 1970
C. verrucatus de Jersey 1971
C. sp.

Genus *Classopollis* Pflüg emend. Pocock and Jansonius 1961
C. anasillos Filatoff 1975
C. harrisii Muir and Konij-Cittert 1970
C. meyeriana (Klaus) de Jersey 1974
C. simplex Reiser and Williams 1969
C. sp.

Genus *Discisporites* Leschik emend. de Jersey 1964

D. psilatus de Jersey 1964
D. triassicus Kar 1970
Genus *Duplicisporites* Leschik emend. Klaus 1960
D. granulatus Leschik 1955
D. sp.
Genus *Granuloperculatipollis* Venkatachala and Góczán 1964
G. distinctus Kumaran *in* Maheshwari and Kumaran 1979
G. flavatus Kar 1970
G. problematicus Kar1970
G. sp.
Genus *Rhaetipollis* Schultz 1967
R. germanicus Schultz 1967

ALETE

Genus *Araucariacites* (Cookson) Couper 1958
A. australis Cookson 1947
A. fissus Rieser and Williams 1969
A. sp.
Genus *Bartenia* Helby 1987
B. communis Helby 1987
Genus *Brazillea* Tiwari and Navale 1967*
B. punctata Tiwari and Navale 1967
Genus *Cerebropollenites* Nilsson emend. Singh and Kumar 1969
C. nilssoni Singh and Kumar 1969
C. sp.
Genus *Circulisporites* de Jersey 1962
C. parvus de Jersey 1962
Genus *Conaletes* Reinhardt and Schön 1967
C. gondwanensis Kumaran and Maheshwari 1980
Genus *Conipollenites* Cameron 1974
C. arabicus Cameron 1974
Genus *Densostriapollis* Tiwari and Rana 1981
D. damudicus Tiwari and Rana 1981
Genus *Equisetosporites* Daugherty 1941
E. sp.
Genus *Graminoides* Goubin 1965
G. cernes Goubin 1965
Genus *Grebespora* Jansonius 1962
G. concentrica Jansonius 1962
Genus *Hemisphaeridium* Hemmer and Nygreen emend. Sinha 1969*
H. signum Hemmer and Nygreen 1967
H. singrauliensis Sinha 1969
H. sp.
Genus *Inaperturopollenites* Thomson and Pflüg emend. Potonié 1958
I. nebulosus Balme 1970
I. sp.
Genus *Laricoidites* Potonié 1931
L. desquamatus Goubin 1965
L. gigantus Brenner 1963
L. intragranulatus Bharadwaj and Singh 1964
L. magnus Potonié, Thomson and Thiergart 1950
L. sp.
Genus *Lecaniella* Cookson and Eisenack 1962
L. foveolatus Filatoff 1975
Genus *Leiosphaeridia* Eisenack emend. Downie and Sarjeant 1963
L. sp.
Genus *Maculatasporites* Tiwari 1965*
M. indicus Tiwari 1965
M. sp**.**
Genus *Peltacystia* Balme and Sergroves 1966*
P. venosa Balme and Sergroves 1966
P. sp.
Genus *Pilasporites* Balme and Hennelly emend. Tiwari and Navale 1967*
P. bharadwajii Balme 1970
P. crateraformis Jain 1968
P. plurigenus Balme and Hennelly 1956
Genus *Quadrisporites* Hennelly emend. Potonié 1961*
Q. horridus Potonié and Lele 1961
Genus *Rimaspora* Kar 1970*
R. plicata Kar 1970
Genus *Schizosporis* Cookson and Dettmann 1959*
S. reticulatus Cookson and Dettmann 1959
Genus *Tasmanites* Newton emend. Eisenack 1958*
T. suevicus (Eisenack) Wall 1965

DESCRIPTIONS OF GENERA AND SPECIES

In this chapter, all those genera have been dealt which are recorded from the Triassic succession on Indian peninsula. The criteria for the descriptions given in following pages are: (I) type species of all the genera given in the check-list, are described irrespective of their type locality and country. This is to enable the user to identify the same from other species in a genus; (II) all those species given in check-list, which are instituted from Indian Gondwana strata are dealt here in; (III) the details of those species, which are instituted from the Permian rock succession, and do occur into the Triassic strata, are not included in this chapter. This is because of their relatively less significance in the stratigraphic determination of the Triassic palynoflora.

The type species of each genus on record is described with the details of -- holotype and the variations in morphographic characters within the species, along with locality, horizon and age, from where it is instituted. This is in view to facilitate the understanding of variations within a genus, and the comparison and identification of the species of a genus. The details of morphographic features described here are the features which can pin point the identification of a genus and species.

Efforts have been made to illustrate the holotype of all species described herein, either by the photograph or the text-figure given by the author (s). However, in some cases no illustration is given, because it could not be retrieved due to bad quality. The text-figures and photographs illustrated here in, are not to the scale.

MONOLETE SPORE

Genus *Aratrisporites* Leschik emend. Playford and Dettmann 1965

Type Species: *Aratrisporites parvispinosus* Leschik 1955

Locality: Neuewelt bei Basel, Switzerland

Horizon and Age: Keuper, Late Triassic

Diagnostic Features: Zonate, bilateral, broadly oval spore; monolete, rays enclosed within elevated lips; exine two-layered, cavate, loosely enveloping, proximally attached to a homogeneous inner layer; outer layer finely patterned, and sculpturaled with grana, coni, spinulae, spinae and saetae.

Aratrisporites parvispinosus Leschik 1955

Holotype: Leschik1955; pl. 5, figs. 2, 4; size 62.5 x 56 μm

Locality: Neuewelt bei Basel, Switzerland

Horizon and Age: Keuper, Late Triassic

Diagnostic Features: Size 50-70 μm; body 46 x 36.5 μm, exine 1 μm thick, outer layer finely patterned, 4-16.5 μm broad; sculptural elements grana, coni (1 x 2.5 μm), closely placed.

Genus *Chasmatosporites* Nilsson 1958

Type Species: *Chasmatosporites major* Nilsson 1958

Locality: Schonen, Sandakra

Horizon and Age: Liassic, Late Triassic

Diagnostic Features: ± Oval to subcircular spore; monolete to half trilete; exine infrareticulate, proximally rough.

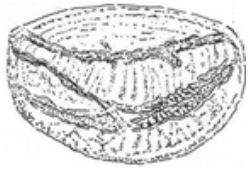
Chasmatosporites major Nilsson 1958

Holotype: Nilsson 1958; pl. 3, fig. 12; size 77 μm

Locality: Schonen, Sandakra
Horizon and Age: Liassic, Late Triassic
Diagnostic Features: Horizontally oval; size 75-80 μm; monolete extend 4/5 along longer axis; exine less than 1 μm, finely infrareticulate.

Genus *Columnisporites* Peppers 1964
Type Species: *Columnisporites ovalis* Peppers 1964
Locality: Illinois, USA
Horizon and Age: Late Pennsylvanian, Carboniferous
Diagnostic Features: Bilateral, bean shaped to elleptical; probably monolete; exine thick, covered overall with three to many elevated anastomosing and branching ridges running parallel to the longer axis, in between many closely placed vertical grooves.

Columnisporites ovalis Peppers 1964
Holotype: Peppers 1964; pl. 1; fig. 11; size 30 x 37 μm



Locality: Illinois, USA
Horizon and Age: Late Pennsylvanian, Carboniferous
Diagnostic Features: Size 37-81 μm in longest dimension; exine 1-2 μm thick, 3-10 horizontal ridges, 2.5 μm wide x 1 μm high, vertical grooves 1 μm wide.

Genus *Denwasporites* Kumar 1999
Type Species: *Denwasporites anhonii* Kumar 1999
Locality: Anhoni Village, Chhindwara District, Madhya Pradesh, India
Horizon and Age: Denwa Formation, Late Triassic
Diagnostic Features: Bilateral, oval-concavo-convex monolete spore; exine infrapunctate.

Denwasporites anhonii Kumar 1999
Holotype: Kumar 1999; pl. 1, fig. 1; size 74 x 51 μm; Slide No. BSIP 12257

Locality: Anhoni Village, Chhindwara District, Madhya Pradesh, India
Horizon and Age: Denwa Formation, Late Triassic
Diagnostic Features: Size 70-80 x 50-60 μm; exine infrapunctate, folded along margin.

Genus *Ghoshiasporites* Kar 1969
Type Species: *Ghoshiasporites didecus* Kar 1969
Locality: Bore-core no. K 2, 275.62-275.72 m, North Karanpura Coalfield, Bihar, India
Horizon and Age: Raniganj Formation, Late Permian
Diagnostic Features: Bilateral, oval monolete spore; exine proximally laevigate, distally sculptured with coni, spine and verrucae.

Ghoshiasporites didecus Kar 1969
Holotype: Kar 1969; pl. 1, fig. 10; size 61 x 50 μm; Slide No. BSIP 3331
Locality: Bore-core no K 2, 275.62-275.72 μm, North Karanpura Coalfield, Bihar, India
Horizon and Age: Raniganj Formation, Late Permian
Diagnostic Features: Size 80 x 55 μm; exine 2-3 μm thick, coni 1-2 μm, mixed with spines, verrucae.

Genus *Laevigatosporites* (Ibrahim) Schopf, Wilson and Bentall 1944
Type Species: *Laevigatosporites vulgaris* Ibrahim 1933
Locality: Ruhrgebiet, Flöz Ägir, Germany
Horizon and Age: Westphalian B/C, Late Carboniferous
Diagnostic Features: Bilatreral, elliptical spore; monolete mark distinct, along longer axis; exine proximally smooth, indistinctly punctate on distal face.

Laevigatosporites vulgaris (Ibrahim) Ibrahim 1933
Holotype: Ibrahim 1933; pl. 2, fig. 16; size 54 x 69.5 μm

Locality: Ruhrgebiet, Flöz Ägir, Germany
Horizon and Age: Westphalian B/C, Late Carboniferous
Diagnostic Features: Horizontally oval; size 35-77 μm; monolete mark weak; exine indistinctly punctate.

Genus *Leschikisporis* Potonié emend. Bharadwaj and Singh 1964
Type Species: *Leschikisporites* (*Punctatosporites*) *aduncus* Leschik 1955
Locality: Neuewelt bei Basel, Switzerland
Horizon and Age: Keuper, Late Triassic
Diagnostic Features: Rounded to oval spore; mono - to asymmetrical trilete mark, one ray being shorter than other two; exine beset with fine granular sculpture.

Leschikisporites aduncus Potonié emend. Bharadwaj and Singh 1964
Holotype: Leschik 1955; pl. 3, fig. 17; size 43 μm

Locality: Neuewelt bei Basal, Switzerland
Horizon and Age: Keuper, Late Triassic
Diagnostic Features: Subcircular; size 33-48 μm; exine less than 1 μm, sculptured with grana, less than 0.5 μm.

Genus *Polypodiisporites* Potonié 1934
Type Species: *Polypodiisporites favus* Potonié 1934
Locality: Ville, Beisselsgrube, Germany
Horizon and Age: Eocene
Diagnostic Features: Bilateral, oval, bean-shaped spore; faint monolete; exine thick, with sub-verrucate sculpture.

Polypodiisporites favus Potonié 1934
Holotype: Potonié 1934; pl. 1, figs. 19, 20; size 57 μm

Locality: Ville, Beisselsgrube Germany
Horizon and Age: Eocene
Diagnostic Features: Bean shaped, notched along longer axis; size 40-55 μm; monolete mark 5-6 μm long; exine thick with sub-verrucate sculpture, 2-3 μm in diameter.

Genus *Punctatosporites* Ibrahim 1933
Type Species: *Punctatosporites minutus* Ibrahim 1933
Locality: Ruhrgebiet, Flöz Ägir, Germany
Horizon and Age: Westphalian B/C, Late Carboniferous
Diagnostic Features: Bitateral, oval spore; monolete; exine thin, with granular sculpture.

Punctatosporites minutus Ibrahim 1933
Holotype: Ibrahim 1933; pl. 5, fig. 33; size 22.5 x 25.5 μm

Locality: Ruhrgebiet, Flöz Ägir, Germany
Horizon and Age: Westphalian B/C, Late Carboniferous
Diagnostic Features: Horizontally oval; size 16- 25 μm; exine less than 1 μm thick, grana 0.5 μm in diameter.

Genus *Thymospora* Wilson and Venkatachala 1963
Type Species: *Laevigatosporites thiessenii* (Kosanke) Wilson and Venkatachala 1963
Locality: Pennsylvania, USA
Horizon and Age: Late Carboniferous – Permian
Diagnostic Features: Oval to bean shaped spore; simple monolete; exine 1-2 μm thick, verrucose, obvermiculate to rugose.

Thymospora thiessenii Wilson and Venkatachala 1963
Holotype: Wilson and Venkatachala 1963; pl. 1, fig. 1; size 18 μm

Locality: Pennsylvania, USA
Horizon and Age: Late Carboniferous-Permian
Diagnostic Features: Size 18-44 μm; exine 1-2 μm thick, verrucose, verrucae 1-2 μm in diameter.

Thymospora gondwanensis Bharadwaj and Salujha 1964
Holotype: Bharadwaj 1962; pl. 5, fig. 80; size 28 μm

Locality: Raniganj Coalfield, West Bengal, India
Horizon and Age: Raniganj Formation, Late Permian
Diagnostic Features: Size 22-34 μm; monolete up to 3/4 of length; exine beset with verrucae, 2 μm broad, sharp tipped, 25-35 verrucae on periphery.

Thymospora cerebrata Venkatachala and Rawat 1978
Holotype: Venkatachala and Rawat 1978, pl. 1, fig. 27; size 30 x 40 μm
Locality: Purnea Basin, Bihar, India
Horizon and Age: Early Triassic
Diagnostic Features: Size 36 x 40 x 48 μm; monolete extend more than 1/2 in length; exine 4 μm thick, proximally granulose, distally low verrucae forming pseudoreticulum.

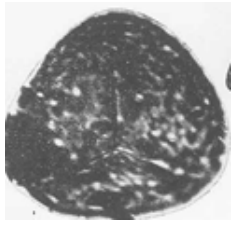
SIMPLE TRILETE SPORE

Genus *Alsophilidites* (Cookson) Potonié 1954
Type Species: *Alsophilidites kerguelensis* Cookson 1947
Locality: Cumberland Bay, Kerguelen-Archipelago
Horizon and Age: Tertiary
Diagnostic Features: Subtriangular spore; faint trilete, rays reach up to equator; exine thin, smooth.

Alsophilidites kerguelensis Cookson 1947
Holotype: Cookson 1947; pl. 16, fig. 69; size 52 μm

Locality: Cumberland Bay, Kerguelen-Archipelago
Horizon and Age: Tertiary
Diagnostic Features: Size 34.5-61 x 32-61 μm; subtriangular; faint trilete, rays reach up to equator; exine thin, smooth.

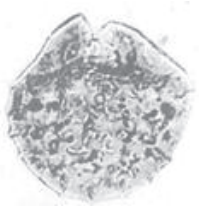
Alsophilidites densus Singh, Srivastava and Roy 1964
Holotype: Singh, Srivastava and Roy 1964; pl. 2, fig. 15; size 80 μm; Slide No. BSIP 1790



Locality: Umia beds, Cutch, India
Horizon and Age: Wealden, Early Cretaceous
Diagnostic Features: Size 60-80 μm; subtriangular with broadly rounded apex; rays extend up to equator; exine thick, infrapunctate.

Genus *Anapiculatisporites* Potonié and Kremp1954
Type Species: *Anapiculatisporites isselburgensis* Potonié and Kremp 1954
Locality: Ruhrgebiet, Bohrung Isselburg, Germany
Horizon and Age: Lower Westphalian B, Carboniferous
Diagnostic Features: Sub-rounded spore; trilete distinct, rays reaching up to equator; exine proximally smooth, beset with coni on distal face and equator.

Anapiculatisporites isselburgensis Potonié and Kremp 1954
Holotype: Potonié and Kremp 1954; pl. 20, fig. 97; size 56 μm



Locality: Ruhrgebiet, Bohrung Isselburg, Germany
Horizon and Age: Lower Westphalian B, Late Carboniferous
Diagnostic Features: Size 50-80 μm; exine proximally smooth, ± 25 coni on distal face and equator.

Genus *Apiculatisporis* Potonié and Kremp 1956
Type Species: *Apiculatisporis aculeatus* (Ibrahim) Potonié and Kremp 1956
Locality: Ruhrgebiet, Flöz Ägir, Germany
Horizon and Age: Westphalian B/C, Late Carboniferous
Diagnostic Features: Circular spore; trilete indistinct; exine sculptured with small coni.

Apiculatisporis aculeatus (Ibrahim) Potonié 1956
Holotype: Ibrahim 1933; pl. 6, fig. 57; size 53 μm

Locality: Ruhrgebiet, Flöz Ägir, Germany
Horizon and Age: Westphalian B/C, Late Carboniferous
Diagnostic Features: Size 48-53 μm; trilete faint, rays 1/3 of radius; exine 2 μm thick, sculptured with small coni 2-4 μm high x 1-2 μm wide, about 40 coni all over.

Genus *Aulisporites* Leschik emend. Klaus 1960
Type Species: *Aulisporites canalis* Leschik 1955
Locality: Neuewelt bei Basal, Switzerland
Horizon and Age: Keuper, Late Triassic
Diagnostic Features: ± Circular spore; trilete faint, ray-ends curvaturate; exine thick, smooth to finely punctuate.

Aulisporites canalis Leschik 1955
Holotype: Leschik 1955; pl. 2, fig. 18; size 63 μm

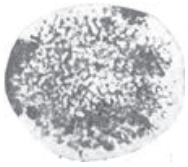
Locality: Neuewelt bei Basal, Switzerland
Horizon and Age: Keuper, Late Triassic
Diagnostic Features: Size 43-63 μm; oval spore; trilete faint, one ray smaller, 4-5 μm than other two, contact area 10 μm in diameter; exine 1.5 μm thick, smooth to finely punctuate.

Genus *Baculatisporites* Thomson and Pflug 1953
Type Species: *Baculatisporites primarius* Wolff 1934
Locality: Grube Freigericht bei Dettingen, Germany
Horizon and Age: Pliocene, Tertiary
Diagnostic Features: Circular spore; trilete distinct, rays extend up to equator; exine beset with small bacula and coni.

Baculatisporites primarius Wolff 1934
Holotype: Wolff 1934; pl. 4, fig. 8; size 47 μm

Locality: Grube Freigericht bei Dettingen, Germany
Horizon and Age: Pliocene, Tertiary
Diagnostic Features: Size 20-70 μm; exine beset with 3 μm long x 1 μm wide bacula and coni.

Baculatisporites clavaeoides Sah and Jain 1965
Holotype: Sah and Jain 1965; pl. 1, fig. 28; size 68 μm; Slide No. BSIP 3110-3/4



Locality: Sakrigalighat, Rajmahal Hills, Bihar, India
Horizon and Age: Bajocian to Oxfordian, Jurassic

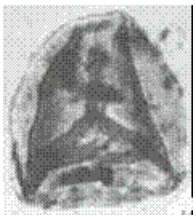
Diagnostic Features: Size 50-68 μm; trilete distinct, rays 3/4 of radius; exine 1.5-2 μm thick, densely baculate, bacula 2-3 μm long x 1 μm wide with rounded to truncate apex.

Genus *Biretisporites* Delcourt and Sprumont emend. Delcourt, Dettmann and Hughes 1963
Type Species: *Biretisporites potoniaei* Delcourt and Sprumont 1955
Locality: Hainaut, Belgium
Horizon and Age: Wealdien, Early Cretaceous
Diagnostic Features: Approximately triangular spore; trilete distinct, rays small, narrow, prominent ridge encircle rays ends along the equator; exine thick, faintly scabrate to smooth.

Biretisporites potoniaei Delcourt and Sprumont 1955
Holotype: Delcourt and Sprumont 1955**;** pl. 41, fig. 10; size 99.5 x 53.1 μm

Locality: Hainaut, Belgium
Horizon and Age: Wealdien, Early Cretaceous
Diagnostic Features: Size 50-60 μm; trilete distinct, prominent ridge encircle rays ends along the equator; exine thick, faintly scabrate to smooth.

Biretisporites dubius Maheshwari and Banerji 1975
Holotype: Maheshwari and Banerji 1975; pl. 1, fig. 12; size 70 μm; Slide No. BSIP 4580-3



Locality: North-western branch of Nonia Nala, East of Kumarpur, District Burdwan, West Bengal, India
Horizon and Age: Panchet Formation, Early Triassic
Diagnostic Features: Size 70-90 μm; subtriangular; trilete prominent, rays associated with raised lips; exine ± 2 μm thick, infolds present in inter-radial areas.

Genus *Cadargasporites* de Jersey and Paten emend. Reiser and Williams 1969
Type Species: *Cadargasporites baculatus* de Jersey and Paten 1964
Locality: Charleys Creek, Scout Bore No.19, 70-80 ft, Queensland, Australia
Horizon and Age: Jurassic
Diagnostic Features: Circular to sub-circular spore; trilete distinct, rays extending up to margin; exine thin except a sharply defined contact area on proximal face around the laesurae, sculptured with granulate, reticulate, verrucate, spinulate pattern allover the body.

Cadargasporites baculatus de Jersey and Paten emend. Reiser and Williams 1969
Holotype: de Jersey and Paten 1964; pl. 2, fig. 5; size 71 μm

Locality: Charleys Creek, Scout Bore No.19, 70-80 ft, Queensland, Australia
Horizon and Age: Jurassic
Diagnostic Features: Size 40-86 μm; exine dominantly sculptured with baculae 2 μm long x 1 μm wide.

Genus *Calamospora* Schopf *in* Schopf, Wilson and Bentall 1944
Type Species: *Calamospora hartungiana* Schopf *in* Schopf, Wilson and Bentall 1944
Locality: Illinois, Vermilion County, Salt Fark, NW Faimont, USA
Horizon and Age: Palaeozoic
Diagnostic Features: Spherical spore with crescentic folds; trilete rays short, less than 1/2 spore radius; exine less than 2 μm thick, smooth, minutely granulate-rugose.

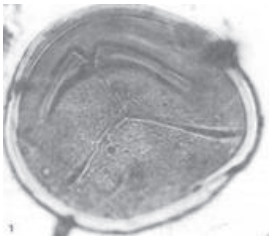
Calamospora hartungiana Schopf *in* Schopf, Wilson and Bentall 1944
Holotype: Schopf *in* Schopf, Wilson and Bentall 1944, pl. 51, fig. 1; size 100 μm

Locality: Illinois, Vermilion County, Salt Fark, NW Faimont, USA

Horizon and Age: Palaeozoic
Diagnostic Features: Size 80-100 μm; exine much folded; trilete rays about 1/4 of radius; exine less than 1 μm thick, smooth to minutely granulate.

Genus *Callumispora* Bharadwaj and Srivastava emend. Tiwari, Srivastava, Tripathi and Vijaya 1989
Type Species: *Callumispora barakarensis* Bharadwaj and Srivastava 1969
Locality: Nandira Colliery, Talcher Coalfield, Orissa, India
Horizon and Age: Barakar Formation, Early Permian
Diagnostic Features: Radial spore; trilete mark with distinct labra; exine laevitgate, infrapunctate structured.

Callumispora barakarensis Bharadwaj and Srivastava emend. Tiwari, Srivastava, Tripathi and Vijaya 1989
Holotype: Bharadwaj and Srivastava 1969; pl. 1, fig. 1; size 117 μm; Slide No. BSIP 2904

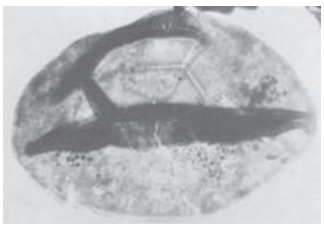


Locality: Nandira Colliery, Talcher Coalfield, Orissa, India
Horizon and Age: Barakar Formation, Early Permian
Diagnostic Features: Size 88-140 μm; subcircular; trilete rays 1/2 - 3/4 of radius; exine 4-6 μm thick, stratified, laevigate to infrapunctate, microverrucose in inter-ray area.

Callumispora fungosa (Balme) Bharadwaj and Srivastava 1969
Holotype: *Punctatisporites fungosus* Balme 1963; pl. 4, fig. 10; size 114 μm

Locality: Well at point 217, Upper Greenough River area, Sample 44070, Western Australia
Horizon and Age: Kockatea Shale, Early Triassic
Diagnostic Features: Size 83-119 μm; exine 6-7 μm thick, infrapunctate with irregularly dispersed shallow pits, less than 1 μm, forming anastomosing channels.

Callumispora magna Kumaran and Maheshwari 1980
Holotype: Kumaran and Maheshwari 1980; pl. 1, fig. 6; size 160 μm; Slide No. BSIP 5975



Locality: Eastern bank of Janar Nala about 2 km southeast of Bijouri, District Shahdol, Madhya Pradesh, India
Horizon and Age: Tiki Formation, Late Triassic
Diagnostic Features: Size 100-160 μm; circular to subcircular; exine 1-2 μm thick with small puncta and sparse microverrucae, 1-2.5 μm in diameter, frequently associated with distinct folds.

Genus *Carnisporites* Mädler 1964
Type Species: *Carnisporites* (*Retusotriletes*) *mesozoicus* Klaus 1960
Locality: Sphaerosiderit ausdem Bergbau Seekopf bei Lunz, Austria
Horizon and Age: Carnian, Late Triassic
Diagnostic Features: Roundly circular spore; trilete rays extending up to equator to form perfect curvaturae; exine scabrate, infraguanulose, proximally smooth in contact area.

Carnisporites mesozoicus (Klaus) Mädler 1964
Holotype: Klaus1960; pl. 28, fig. 6; size 45 μm

Locality: Sphaerosiderit ausdem Bergbau Seekopf bei Lunz, Austria
Horizon and Age: Carnian, Late Triassic
Diagnostic Features: Size 35-55 μm; exine ±3 μm thick; trilete rays thick-lipped forming perfect curvaturae; exine scabrate, infraguanulose, proximally smooth in contact area.

Carnisporites raniganjensis Tiwari and Rana 1980
Holotype: Tiwari and Rana 1980; pl. 1**,** figs. 12, 13; size 60 μm; Slide No. BSIP 5557

Locality: Borehole no. RNM-4, sample no. 5, Depth 59 m, Raniganj Coalfield, West Bengal, India
Horizon and Age: Mahadeva Formation, Middle Triassic
Diagnostic Features: Size 60-72 μm; exine 5 μm thick; trilete rays 4/5 of the radius, associated with 5-7 μm wide labra, ends forming 5 -7 μm wide well-marked arcuate rim, contact area finely infragranulose.

Genus *Ceratosporites* Cookson and Dettmann 1958
Type Species: *Ceratosporites equalis* Cookson and Dettmann 1958
Locality: Wonthaggi State Coal Mine area, S. Australia
Horizon and Age: Cretaceous
Diagnostic Features: Convexly triangular to sub-circular spore; trilete rays up to 2/3 of radius; exine proximally smooth, bacula and spines on distal face.

Ceratosporites equalis Cookson and Dettmann 1958
Holotype: Cookson and Dettmann 1958; pl. 14, figs. 17-19; size 36 μm

Locality: Wonthaggi State Coal Mine area, S. Australia
Horizon and Age: Cretaceous
Diagnostic Features: Convexly triangular; size 36-50 μm; trilete rays thick lipped; exine sculputured with blunt headed bacula, ± 1 μm broad x 3-4 μm long.

Genus *Clavatisporites* Kedves and Simoncsics 1964
Type Species: *Clavatisporites clarus* Kedves and Simoncsics 1964
Locality: Urkut, Hungry
Horizon and Age: Jurassic
Diagnostic Features: Subtriangular-circular spore; trilete distinct, rays reaching up to ± 2/3 equator; exine thick, beset with clava.

Clavatisporites clarus Kedves and Simoncsics 1964
Holotype: Kedves and Simoncsics 1964; pl. 8, fig. 10; size 50 μm

Locality: Urkut, Hungry
Horizon and Age: Jurassic
Diagnostic Features: Broadly subtriangular; trilete rays extend up to equator; exine ± 1 μm thick, clava ± 1 μm broad at base x 2-3 μm high.

Genus *Clavatriletes* Herbst 1965
Type Species: *Clavatriletes hammenii* Herbst 1965

Locality: Son Juan Province, Argentina
Horizon and Age: Norian, Late Triassic
Diagnostic Features: Triangular to roundly triangular spore; trilete distinct, rays extend up to equator; exine thick, sculptured with big clavae.

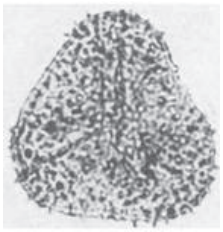
Clavatriletes hammenii Herbst 1965
Holotype: Herbst 1965; pl. 2, figs. 14,15; size 45 μm
Locality: Son Juan Province, Argentina

Horizon and Age: Norian, Late Triassic
Dignostic Features: More or less triangular; size 39-47 μm; trilete ray do not reach equator, slightly thickend; exine 2.5 μm thick, covered with clavae, often densely distributed and touch at the tips; clavae 4.5-7 μm long x 2.8-3.7 μm wide.

Clavatriletes pseudocingulatus Venkatachala and Rawat 1978
Holotype: Venkatachala and Rawat 1978; pl. 1, fig. 12; size 40 μm
Locality: Purnea Well, Purnea, Bihar, India
Horizon and Age: Early Triassic
Dignostic Features: Roundly triangular; size 40-42 μm; contact area laevigate-scabrate; sculuptural elements clavae 4-8 μm long x 3 μm wide, arising from outer limit of contact-area, distally clavae short-stalked, forming reticulum.

Genus *Conbaculatisporites* Klaus 1960
Type Species: *Conbaculatisporites mesozoicus* Klaus 1960
Locality: Salzbergwerk Hallein-Durnberg bei Salzburg Knorr-Schachtricht, 44 m nach Sprengmittelmagazin, Austria
Horizon and Age: Keuper, Late Triassic
Diagnostic Features: Subtriangular spore; trilete distinct, rays 2/3 of spore radius; exine baculate on both faces.

Conbaculatisporites mesozoicus Klaus 1960
Holotype: Klaus 1960; pl. 29, fig. 15; size 33 μm x 50 μm



Locality: Salzbergwerk Hallein-Durnberg bei Salzburg Knorr-Schachtricht, 44 m nach Sprengmittelmagazin, Austria
Horizon and Age: Keuper, Late Triassic
Diagnostic Features: Size 39-48 μm; trilete rays 2/3 of spore radius; exine baculate, bacula on both faces, ± 1 x 2 μm in size.

Genus *Concavissimisporites* Delcourt and Sprumont emend. Dettmann 1963
Type Species: *Concavissimisporites verrucosus* Delcourt and Sprumont 1955
Locality: Hainaut, Belgium
Horizon and Age: Wealden, Early Cretaceous
Diagnostic Features: Triangular spore, broad and rounded apex with concave inter-radial sides; trilete distinct, rays 2/3 of radius; exine sculptured with verrucae of varied size and shape.

Concavissimisporites verrucosus Delcourt and Sprumont 1955
Holotype: Delcourt and Sprumont 1955; pl. 2, fig. 1; size 90 μm

Locality: Hainaut, Belgium
Horizon and Age: Wealden, Early Cretaceous
Diagnostic Features: Size 40-45 μm**;** broadly triangular; trilete rays 2/3 of radius; exine verrucose, verrucae 1.5-2 μm.

Concavissimisporites subverrucosus Venkatachala 1969

Holotype: Venkatachala 1969; pl. 1, fig. 17; size 70 x 80 μm; Slide No. BSIP Bha 8/2

Locality: Pur river section, near Bhuj, Kutch, India
Horizon and Age: Bhuj Formation, Early Cretaceous
Diagnostic Features: Size 80-100 μm; trilete rays 3/4 of radius; exine 4-6 μm thick, sculptured with low verrucae.

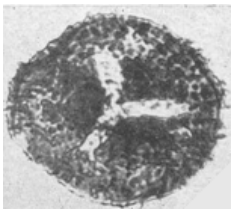
Genus *Converrucosisporites* Potonié and Kremp 1954
Type Species: *Converrucosisporites* (*Verrucosisporites*) *triquetrus* (Ibrahim) Potonié and Kremp 1954
Locality: Ruhrgebiet, Flöz Ägir, Germany
Horizon and Age: Westphalian B/C, Late Carboniferous
Diagnostic Features: Sub-triangular spore; trilete distinct; exine sculptured with verrucae of varied size and shape.

Converrucosisporites triquetrus (Ibrahim) Potonié and Kremp 1954
Holotype: Ibrahim 1933; pl. 7, fig. 61; size 38.5 x 42.5 μm

Locality: Ruhrgebiet, Flöz Ägir, Germany
Horizon and Age: Westphalian B/C, Late Carboniferous
Diagnostic Features: Size 38.5-58.5 μm; trilete rays extend up to equator; exine sculptured with 3-4 μm big verrucae, projected.

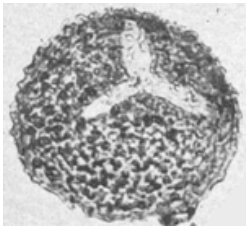
Genus *Convertubisporites* Banerji and Maheshwari 1975
Type Species: *Convertubisporites contactus* Banerji and Maheshwari 1975
Locality: South bank of Sukri River, 0.8 km from Kaima, Auranga Coalfield, Bihar, India
Horizon and Age: Panchet Formation, Early Triassic
Diagnostic Features: Subcircular to subtriangular spore; trilete distinct, rays extending up to 2/3 of radius; exine predominantly sculptured with tubercles, coni and verrucae all over and weekly developed in inter-ray area.

Convertubisporites contactus Banerji and Maheshwari 1975
Holotype: Banerji and Maheshwari 1975; pl. 1, fig. 11; size 67 x 75 μm; Slide No. BSIP 4703-7



Locality: South bank of Sukri River, 0.8 km from Kaima, Auranga Coalfield, Bihar, India
Horizon and Age: Panchet Formation, Early Triassic
Diagnostic Features: Size 60-80 μm; exine densely tuberculate, tubercles 2-3 μm long x 1 μm wide, 45-55 in number.

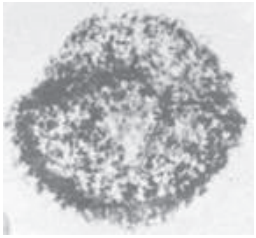
Convertubisporites densus Banerji and Maheshwari 1975
Holotype: Banerji and Maheshwari 1975; pl. 1, fig. 8; size 70 μm; Slide No. BSIP 4691-15



Locality: South bank of Sukri River, 0.8 km from Kaima, Auranga Coalfield, Bihar, India
Horizon and Age: Panchet Formation, Early Triassic
Diagnostic Features: Size 70-88 μm; exine 1-2 μm thick, ornamented with tubercles, verrucae and coni, closely placed and equally strong.

Convertubisporites variabilis Kumaran and Maheshwari 1980

Holotype: Kumaran and Maheshwari 1980; pl. 3, fig. 13; size 60 μm; Slide No. BSIP 5954



Locality: Eastern bank of Janar Nala about 2 km south-east of Bijouri, District Shahdol, Madhya Pradesh, India

Horizon and Age: Tiki Formation, Late Triassic

Diagnostic Features: Size 50-72μm; trilete rays sometimes associated with membraneous lips; exine 1-2 μm thick, sometimes sculptural elements at equator associated with papillae, elements less than 0.5 μm apart, 2-4 μm long x 1.2 μm wide.

Genus *Convolutispora* Hoffmeister, Staplin and Malloy 1955

Type Species: *Convolutispora florida* Hoffmeister, Staplin and Malloy 1955

Locality: Illinois, USA

Horizon and Age: Hardinsburg Formation, Mississippian

Diagnostic Features: Circualr to subcircular spore; trilete rays up to 3/4 of equator; exine 2-3 μm thick, ornamented with overlapping vermiculate ridge like processes, closely anastomosing muri forming incomplete, coarse reticulum on surface.

Convolutispora florida Hoffmeister, Staplin and Malloy 1955

Holotype: Hoffmeister, Staplin and Malloy 1955; pl. 38, figs. 5-6; size 49 μm

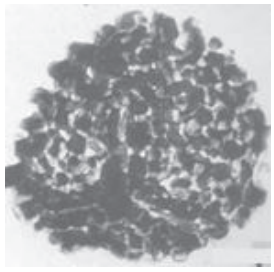
Locality: Illinois, USA

Horizon and Age: Hardinsburg Formation, Mississippian

Diagnostic Features: Size 39-50 μm; circualr to subcircular spore; trilete rays up to 3/4 of equator; exine 2-3 μm thick, ornamented with closely anastomosing, coarse oververmiculate, convoluted ridges on surface, ridges 2.8 - 6.3 μm wide.

Convolutispora perfecta Kumaran and Maheshwari 1980

Holotype: Kumaran and Maheshwari 1980; pl. 3, fig. 13; size 78 μm; Slide No**.** BSIP 5966



Locality: Eastern bank of Janar Nala about 2 km south-east of Bijouri, District Shahdol, Madhya Pradesh, India

Horizon and Age: Tiki Formation, Late Triassic

Diagnostic: Size 61-78 μm; exine 2-3 μm thick, ornamented with anastomosing muri forming an imperfect reticulum, 1-2 μm wide lumina, muri 2-3.5 μm broad, 3-5 μm high, projecting beyond equatorial margin in polar view.

Genus *Craterisporites* de Jersey 1970

Type Species: *Craterisporites rotundus* de Jersey 1970

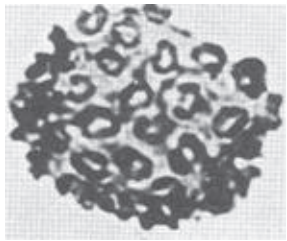
Locality: N.S. 272, 1600 ft, Moreton Basin, Queensland, Australia

Horizon and Age: Raceview Formation, Late Triassic

Diagnostic Features: Subcirculat to convexly subtriangular spore; trilete indistinct due to sculpture, rays thick lipped, extend up to equator; exine proximally smooth, on distal face and equator sculptured dominantly with ring shaped projections, regularly distributed.

Craterisporites rotundus de Jersey 1970

Holotype: de Jersey 1970; pl. 1, fig. 8; size 37 μm



Locality: N.S. 272, 1600 ft, Moreton Basin, Queensland, Australia
Horizon and Age: Raceview Formation, Late Triassic
Diagnostic Features: Size 33-53 μm; trilete rays lipped, 1.5-2 μm thick; ring projections 2.5-7 μm in basal diameter, 1.5-2 μm high.

Genus *Cyathidites* Couper 1953
Type Species: *Cyathidites australis* Couper 1953
Locality: Ohika beds L12 (type); Garvey Creek Hawks Crag breccia L55; Paparoa beds, L1, 27, New Zealand
Horizon and Age: Jurassic to Early Cretaceous
Diagnostic Features: Subtriangular spore with broadly rounded apices, concave sides; trilete distinct, rays 2/3 of radius; exine psilate to indistinctly scabrate.

Cyathidites australis Couper 1953
Holotype: Couper 1953; pl. 2, figs. 11, 12; size 60 μm

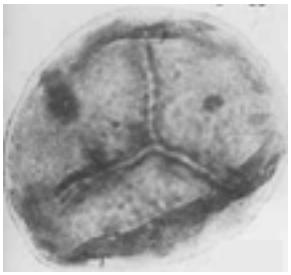
Locality: Ohika beds L12 (type); Garvey Creek Hawks Crag breccia L55; Paparoa beds, L1, 27, New Zealand
Horizon and Age: Jurassic to Early Cretaceous
Diagnostic Features: Size 54-77 μm; broadly sub-triangular with deeply concave inter-radial sides; trilete rays extend up to 4/5 of radius; exine less than 1μm thick, feebly scabrate.

Genus *Cyclogranisporites* Potonié and Kremp 1954
Type Species: *Cyclogranisporites* (*Granulatisporites*) *leopoldi* (Kremp) Potonié and Kremp 1954
Locality: Ruhrgebiet, Flöz Ägir, Germany
Horizon and Age: Wesphalian B/C, Late Carboniferous
Diagnostic Features: Circular spore, trilete distinct, rays 1/2 of radius; exine beset with grana allover.

Cyclogranisporites leopoldi (Kremp) Potonié and Kremp 1954
Holotype: Potonié and Kremp 1954; pl. 20, fig. 103; size 33 μm

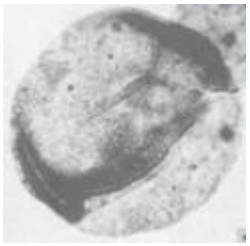
Locality: Ruhrgebiet, Flöz Ägir, Germany
Horizon and Age: Wesphalian B/C, Late Carboniferous
Diagnostic Features: Size 25-35 μm; exine beset with grana allover, grana size less than 1 μm, about 65 grana on periphery.

Cyclogranisporites triletus Kar 1970
Holotype: Kar 1970; pl. 1, fig. 13; size 60 μm; Slide No. BSIP 3463.



Locality: Bore-core No. RE9, depth 83 m, Raniganj Coalfield, West Bengal, India
Horizon and Age: Panchet Formation, Early Triassic
Diagnostic Features: Size 45-70 μm; trilete rays broad, well developed; exine granulose, grana closely placed.

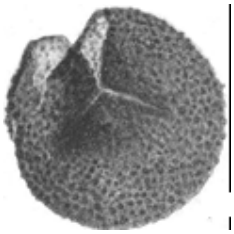
Cyclogranisporites distinctus Kumaran and Maheshwari 1980
Holotype: Kumaran and Maheshwari 1980; pl. 2, fig. 3; size 60 μm; Slide No. BSIP 5914



Locality: Eastern bank of Janar Nala about 2 km southeast of Bijouri, District Shahdol, Madhya Pradesh, India
Horizon and Age: Tiki Formation, Late Triassic
Diagnostic Features: Size 53-65 μm; exine 1.5-2 μm thick, grana ± 1 μm in diameter, closely spaced, uniformly disposed forming a negative reticulum.

Genus *Cyclotriletes* Mädler 1964
Type Species: *Cyclotriletes granulatus* Mädler 1964
Locality: Jena, Thuringia, Germany
Horizon and Age: Buntsandstein, Early Triassic
Diagnostic Features: Circular spore; trilete rays without curvaturae; exine thick beset with variable small grana and coni.

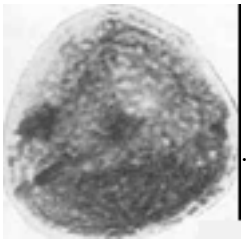
Cyclotriletes granulatus Mädler 1964
Holotype: Mädler 1964; pl. 1, fig. 4; size 74 μm



Locality: Jena, Thuringia, Germany
Horizon and Age: Buntsandstein, Early Triassic
Diagnostic Features: Size 55-75 m; trilete rays without curvaturae; exine ± 2 μm thick beset with 3-4 μm big grana and coni.

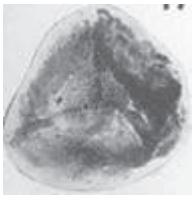
Genus *Decisporis* Kar 1970
Type Species: *Decisporis variabilis* Kar 1970
Locality: Bore-core No. RE9, depth 84 m, Raniganj Coalfield, West Bengal, India
Horizon and Age: Panchet Formation, Early Triassic
Diagnostic Features: Triangular-subtriangular spore; with or without inner body; trilete well developed; exine laevigate proximally, variously sculptured with grana, microverrucae, coni, spines, bacula on distal face; exoexine may form incipient flange in some cases.

Decisporis variabilis Kar 1970
Holotype: Kar 1970; pl. 1, fig. 18; size 47 μm; Slide No. BSIP 3477



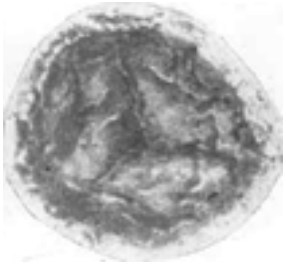
Locality: Bore-core No. RE9, depth 84 m, Raniganj Coalfield, West Bengal, India
Horizon and Age: Panchet Formation, Early Triassic
Diagnostic Features: Size 38-56 μm; trilete rays sinuous, extending up to equator; exine proximally laevigate, distally sculptured mostly with spines; interspinal space granulose-microverrucose.

Decisporis panchetensis Kar 1970
Holotype: Kar 1970; pl. 1, fig. 22; size 50 μm; Slide No. BSIP 3475



Locality: Bore-core No. RE9, depth 82.5 m, Raniganj Coalfield, West Bengal, India
Horizon and Age: Panchet Formation, Early Triassic
Diagnostic Features: Size 40-62 μm; exine 2.5 μm thick, distally closely sculptured with grana and microverrucae.

Decisporis rudis Kar 1970
Holotype: Kar 1970; pl. 1, fig. 20; size 54 μm; Slide No. BSIP 3471



Locality: Bore-core No. RE9, depth 82.5 m, Raniganj Coalfield, West Bengal, India
Horizon and Age: Panchet Formation, Early Triassic

Diagnostic Features: Size 45-65 μm; exine distally variously sculptured, minutely folded to appear as rugose; exoexine generally forms an incipient, inconsistent flange.

Genus *Deltoidospora* Miner emend. Potonié 1956
Type Species: *Deltoidospora hallii* Miner 1935
Locality: Casade County, Montona, Greenland
Horizon and Age: Kootenai Formation, Cretaceous
Diagnostic Features: Triangular to deltoid spore; trilete rays extend 2/3 of radius, inter-radial sides concave to convex; exine smooth.

Deltoidospora hallii Miner 1935
Holotype: Miner 1935; pl. 24; fig. 7; size 30 μm

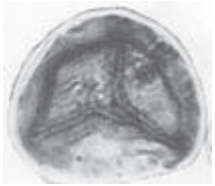
Locality: Casade County, Montona, Greenland
Horizon and Age: Kootenai Formation, Cretaceous
Diagnostic Features: Size 33-39 μm; deltoid-triangular spore; trilete simple, rays extend 2/3 of radius; exine smooth, less than 1 μm thick.

Genus *Dictyophyllidites* Couper emend. Dettmann 1963
Type Species: *Dictyophyllidites harrisii* Couper 1958
Locality: Yorkshire, Gristhorpe Beds, UK
Horizon and Age: Bajocian, Middle Jurassic
Diagnostic Features: Triangular spore; trilete distinct, thickened along rays, elevated lips, extending 3/4 of radius; exine smooth to faintly patterned.

Dictyophyllidites harrisii Couper 1958
Holotype: Couper 1958; pl. 21, fig. 6; size 50 μm

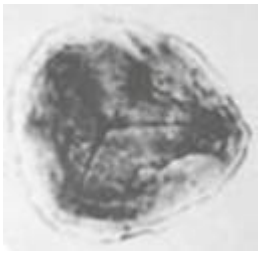
Locality: Yorkshire, Gristhorpe Beds, UK
Horizon and Age: Bajocian, Middle Jurassic
Diagnostic Features: Size 36-56 μm; triangular spore with concave sides; trilete rays extending 3/4 of radius; exine $\pm$2 μm thick, smooth to faintly patterned.

Dictyophyllidites decus Kar 1970
Holotype: Kar 1970; pl. 1, fig. 2; size 50 μm; Slide No. BSIP 3461



Locality: Bore-core No. RE9, depth 82.5 m, Raniganj Coalfield, West Bengal, India
Horizon and Age: Panchet Formation, Early Triassic
Diagnostic Features: Size 40-68 μm; exine sculptured with verrucae, grana around haptotypic mark, laevigate in rest area.

Dictyophyllidites glabrus Maheshwari and Banerji 1975
Holotype: Maheshwari and Banerji 1975; pl. 1, fig. 3; size 62 μm; Slide No. BSIP 4588-19

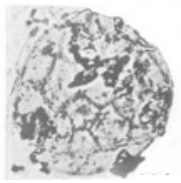


Locality: North-western branch of Nonia Nala, East of Kumarpur, District Burdwan, West Bengal, India
Horizon and Age: Panchet Formation, Early Triassic
Diagnostic Features: Size 58-70 μm; roundly triangular; trilete rays extending 3/4 of the radius bordered by exinal thickening; exine 2-3 μm thick.

Genus *Dictyotriletes* Naumova emend. Potonié and Kremp 1954
Type Species: *Dictyotriletes* (*Sporonites*) *bireticulatus* (Ibrahim) Potonié and Kremp 1955
Locality: Ruhrgebiet, Flöz Ägir, Germany
Horizon and Age: Westphalian B/C, Carboniferous

Diagnostic Features: Broadly triangular spore; trilete indistinct due to reticulum; lumen with high muri on exine surface, outline irregular.

Dictyotriletes bireticulatus (Ibrahim) Potonié and Kremp 1955
Holotype: Potonié and Kremp 1955; pl. 16, fig. 296; size 57.5 μm



Locality: Ruhrgebiet, Flöz Ägir, Germany
Horizon and Age: Westphalian B/C, Carboniferous
Diagnostic Features: Size 40-60 μm; trilete ray 2/3 radius long; exine surface with 7-15 μm wide lumen, 1-1.5 μm high muri and outline irregular.

Genus *Dictyotosporites* Cookson and Dettmann 1958
Type Species: *Dictyotosporites speciosus* Cookson and Dettmann 1958
Locality:Victoria, Wonthaggi State, Coal Mine Area, Australia
Horizon and Age: Pre-Albian, Early Cretaceous
Diagnostic Features: Broadly subtriangular to circular spore; trilele distinct, sometimes invisible due to sculpture; exine thick, surface reticulum composed of terminal branches, discrete or coalescent, elevated all over.

Dictyotosporites speciosus Cookson and Dettmann 1958
Holotype: Cookson and Dettmann 1958; pl. 16, fig. 5; size 43 μm

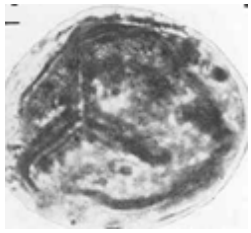
Locality: Victoria, Wonthaggi State, Coal Mine Area, Australia
Horizon and Age: Pre-Albian, Early Cretaceous
Diagnostic Features: Size 40-50 μm; subcircular; trilete rays associated with thickening; exine 2-3 μm thick; muri ± 1 μm thick enclosing 1-3 μm wide lumen.

Genus *Divaripunctites* Kar 1970
Type Species: *Divaripunctites globosus* Kar 1970
Locality: Bore-core No. RE9, depth 82.5 m, Raniganj Coalfield, West Bengal, India
Horizon and Age: Panchet Formation, Early Triassic
Diagnostic Features: Circular to subcircular spore; trilete strongly developed; exine proximally punctate, distally laevigate with or without folds.

Divaripunctites bifurcatus Banerji and Maheshwari 1975
Holotype: Banerji and Maheshwari 1975; pl. 1, fig. 4; size 70 μm; Slide No. BSIP 4700-6

Locality: South bank of Sukri River, 0.8 km from Kaima, Auranga Coalfield, Bihar, India
Horizon and Age: Panchet Formation, Early Triassic
Diagnostic Features: Size 55-75 μm; trilete distinct, rays bifurcate at the ends; exine 1 μm thick, proximally punctate, generally with microfolds on distal face.

Divaripunctites globosus Kar 1970
Holotype: Kar 1970; pl. 1, figs. 6a-6b; size 62 μm; Slide No. BSIP 3472



Locality: Bore-core No. RE9, depth 82.5 m, Raniganj Coalfield, West Bengal, India
Horizon and Age: Panchet Formation, Early Triassic

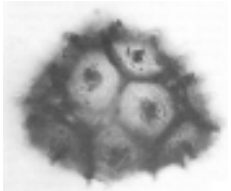
Diagnostic Features: Size 45-70 μm; trilete rays 3-10 μm long; exine 2-4 μm thick, proximally punctate, distally laevigate.

Divaripunctites plicatus Kar 1970
Holotype: Kar 1970; pl. 1, figs. 9a-9b; size 50 μm; Slide No. BSIP 3464

Locality: Bore-core No. RE9, depth 83 m, Raniganj Coalfield, West Bengal, India
Horizon and Age: Panchet Formation, Early Triassic
Diagnostic Features: Size 40-65 μm; exine up to 1.5 μm thick, distally laevigate, much folded.

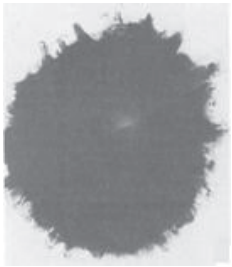
Genus *Dubrajisporites* Tiwari and Tripathi 1987
Type Species: *Dubrajisporites triassicus* Tiwari and Tripathi 1987
Locality: Borehole RJR-2, sample No. 32, depth 398.20-398.99 m, near Kazigaon, Rajmahal Basin, Bihar, India
Horizon and Age: Dubrajpur Formation, Late Triassic
Diagnostic Features: Circular to subtriangular spores, trilete distinct, rays 2/3 of radius; exine with coarse reticulum on both surfaces except on the contact area, sculptural elements coni, spinae, verrucae and processes with globular heads in the lumina, muri constructed by discrete, partially fused or composite sculptural elements; inner body present, smooth, unstructured.

Dubrajisporites triassicus Tiwari and Tripathi 1987
Holotype:Tiwari and Tripathi 1987; figs. 8A-D; size 71.5 μm; Slide No. BSIP 9323



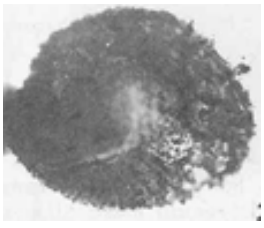
Locality: Borehole RJR-2, sample no. 32, depth 398.20-398.99 m, near Kazigaon, Rajmahal Basin, Bihar, India
Horizon and Age: Dubrajpur Formation, Late Triassic
Diagnostic Features: Size 66-90 μm; exine 2-4 μm thick, sculptured with coarse reticulum, lumina 13-20 μm wide, larger sculptural elements 6-8 μm long x 2.5-4.0 μm wide, smaller elements 1-5 μm long x 1-2.5 μm wide.

Dubrajisporites bulbosus Tiwari and Tripathi 1987
Holotype: Tiwari and Tripathi 1987; fig. l0 A; size 83 μm; Slide No. BSIP 9321



Locality: Borehole RJR-2, sample No. 32, depth 398.20-398.99 m, near Kazigaon, Rajmahal Basin, Bihar, India
Horizon and Age: Dubrajpur Formation, Late Triassic
Diagnostic Features: Size 63-81 μm; exine 2-3 μm thick, lumina 8-20 μm, sculptural elements finger-shaped and round-headed spines and processes with simple or lobed tips, larger elements 6-12 μm long x 3-5 μm wide, smaller elements 2-5 μm long x 1.5-5 μm wide, muri enclosing large, straight or curved process, may be bi-to tetra lobed.

Dubrajisporites isolatus Tripathi, Tiwari and Kumar 1990
Holotype: Tripathi, Tiwari and Kumar 1990; pl. 1, fig. 20; size 65 μm; Slide No. BSIP 9323



Locality: Borehole RJR-2, sample no. 32, depth 398.20-398.99 m, near Kazigaon Rajmahal Basin, Bihar, India
Horizon and Age: Dubrajpur Formation, Late Triassic
Diagnostic Features: Size 53-68.5 μm; exine sculptured all over with isolated coni, spines and verrucae, arranged in reticuloid pattern to enclose polygonal areas, sculptural elements in polygonal areas 2-5.5 μm long x 1-4.5 μm wide at the base.

Dubrajisporites unicus Tripathi, Tiwari and Kumar 1990
Holotype: Tripathi, Tiwari and Kumar 1990; pl. 1, fig. 18; size 58.0 μm; Slide No.BSIP 9323

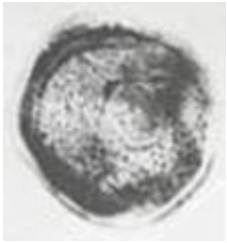
Locality: Borehole RJR-2, sample no. 32, depth 398.20-398.99 m, near Kazigaon, Rajmahal Basin, Bihar, India
Horizon and Age: Dubrajpur Formation, Late Triassic
Diagnostic Features: Size 58-81 μm; exine 2-3 μm thick, bigger sculptural elements 4-7 μm long x 1.5-3 μm wide, smaller elements 1.5-2.5 μm long x 1-2.5 μm wide.

Genus *Eupunctisporites* Bharadwaj 1962
Type Species: *Eupunctisporites poniatiensis* Bharadwaj 1962
Locality: Poniati Seam, Poniati Mine, East Raniganj Coalfield, West Bengal, India
Horizon and Age: Raniganj Formation, Late Permian
Diagnostic Features: Circular spore; trilete distinct, rays lips elevated; exine thick, distinctly punctate.

Eupunctisporites poniatiensis Bharadwaj 1962
Holotype: Bharadwaj 1962; pl. 1, fig. 4; size 90 μm

Locality: Poniati Seam, Poniati Mine, East Raniganj Coalfield, West Bengal, India
Horizon and Age: Raniganj Formation, Late Permian
Diagnostic Features: Size 75-100 μm; trilete rays 3/4 of radius, lips elevated; exine 4-6 μm thick, distinctly punctate, puncta ± 1 μm, irregularly shaped, 2-3 μm apart.

Eupunctisporites panchetensis Maheshwari and Banerji 1975
Holotype: Maheshwari and Banerji 1975; pl. 1, fig. 7; size 60 μm; Slide No. BSIP 4588-21



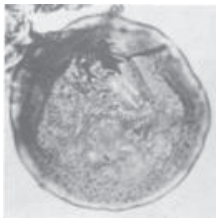
Locality: North-western branch of Nonia Nala, East of Kumarpur, District Burdwan, West Bengal, India
Horizon and Age: Panchet Formation, Early Triassic
Diagnostic Features: Size 60-73 μm; exine thin, puncta ± 1 μm, folds present on the surface.

Genus *Foveosporites* Balme 1957
Type Species: *Foveosporites canalis* Balme 1957
Locality: Murphy's Shaft near Donnybrook, Perth Basin, Western Australia
Horizon and Age: Donnybrook Sandstone, Early Cretaceous (?)
Diagnostic Features: Circular to roundly triangular; trilete rays extend up to periphery; exine 2 μm thick, ornamented with irregularly disposed pits or short channels.

Foveosporites canalis Balme 1957
Holotype: Balme 1957; pl. 1, fig. 15; size 34 μm

Locality: Murphy's Shaft near Donnybrook, Perth Basin, Western Australia
Horizon and Age: Donnybrook Sandstone, Early Cretaceous (?)
Diagnostic Features: Size 30-37 μm; roundly triangular with convex sides; trilete rays with raised lips; exine 2 μm thick, ornamented all over with irregularly disposed pits of ± 1 μm diameter, may coalesce to form short channels.

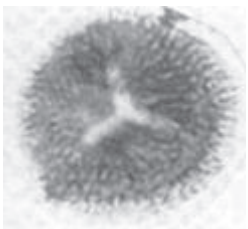
Foveosporites triassicus Kumaran and Maheshwari 1980



Holotype: Kumaran and Maheshwari 1980; pl. 4, fig. 1; size 78 μm; Slide No. BSIP 5991
Locality: Eastern bank of Janar Nala about 2 km south-east of Bijouri, District Shahdol, Madhya Pradesh, India
Horizon and Age: Tiki Formation, Late Triassic
Diagnostic Features: Size 65-80 μm; exine 1.5 μm thick, foveolae ± 1.5 μm, densly placed.

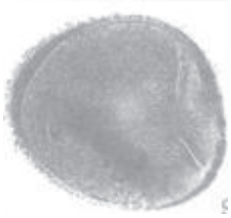
Genus *Gabonisporis* Boltenhagen 1967
Type Species: *Gabonisporis vigourouxii* Boltenhagen 1967
Locality: Gabon, Pointe-Clairette, Africa
Horizon and Age: Senomanian, Late Cretaceous
Diagnostic Features: Subtriangular to subspherical spore; trilete distinct to invisible due to sculputures, rays thick lipped extended up to 3/4 of radius; perine present, ornamented with setae and bacula**.**

Gabonisporis vigourouxii Boltenhagen 1967
Holotype: Boltenhagen 1967; pl. 1, fig. 1; size 35 μm



Locality: Gabon, Pointe-Clairette, Africa
Horizon and Age: Senomanian, Late Cretaceous
Diagnostic Features: Size 30-45 μm; subspherical spore; perine ornamented with setae, bacula (papillae), 4-7 μm long, forming negative reticulum on surface.

Gabonisporis papillosus Tripathi, Tiwari and Kumar 1990
Holotype: Tripathi, Tiwari and Kumar 1990; pl. 1, fig. 9; size 70 μm; Slide No. BSIP 9322



Locality: Borehole RJR-2, sample no. 32, depth 398.20-398.99 m, near Kazigaon, Rajmahal Basin, Bihar, India
Horizon and Age: Dubrajpur Formation, Late Triassic
Diagnostic Features: Size 70-90 μm; perisporial covering frilly, enveloping the body completely or sometimes leaving the contact area free; densely ornamented with tongue shaped papillae, verrucae, 1-3 μm in size.

Genus *Grandispora* Hoffmeister, Staplin and Malloy 1955
Type Species: *Grandispora spinosa* Hoffmeister, Staplin and Malloy 1955
Locality: Kentucky, Webster County, USA
Horizon and Age: Hardingsburg Formation, Late Mississippian, Carboniferous
Diagnostic Features: Circular spore; trilete mark weak, rays reaching up to the body equator; central body enclosed in a bladder; body exine and bladder, both laegivate? or punctuate to granulose with small scattered spines.

Grandispora spinosa Hoffmeister, Staplin and Malloy 1955
Holotype: Hoffmeister, Staplin and Malloy 1955; pl. 39, fig. 10; size 118 μm

Locality: Kentucky, Webster County, USA
Horizon and Age: Hardingsburg Formation, Late Mississippian, Carboniferous
Diagnostic Features: Size100-140 μm; central body 84-100 μm, exine spinose, spines 2-8 μm long, 8-25 μm apart.

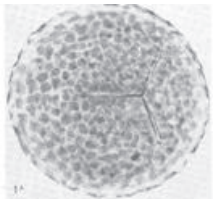
Genus *Granulatisporites* Ibrahim 1933 emend. Potonié and Kremp 1954
Type Species: *Granulatisporites granulatus* Ibrahim 1933
Locality: Ruhrgebiet, Flöz Ägir, Germany
Horizon and Age: Westphalian B/C, Late Carboniferous
Diagnostic Features: Subtriangular spore; trilete distinct to indistinct, rays 2/3 of the radius; exine thick, beset with grana.

Granulatisporites granulatus Ibrahim 1933
Holotype: Ibrahim 1933; pl. 6, fig. 51; size 30 x 31 μm

Locality: Ruhrgebiet, Flöz Ägir, Germany
Horizon and Age: Westphalian B/C, Late Carboniferous
Diagnostic Features: Size 25-34 μm; subtriangular spore; trilete rays 2/3 of the equator; exine 2-3 μm thick; grana less than 1 μm, to punctate on both faces.

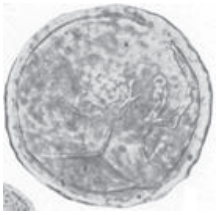
Genus *Guttatisporites* Visscher 1966
Type Species: *Guttatisporites guttatus* Visscher 1966
Locality: Boring 31, K.N.Z., Hengelo, depth 405.50 m (Röt salinar), The Netherlands
Horizon and Age: Upper Bunter, Early Triassic
Diagnostic Features: Circular to subtriangular spore; trilete distinct, rays extend up to the equator; exine covered with irregularly shaped verrucae, elements polygonal to crenulate.

Guttatisporites guttatus Visscher 1966
Holotype: Visscher 1966; pl. 2, figs. 1A, B; size 95 μm



Locality: Boring 31, K.N.Z., Hengelo, depth 405.50 m (Röt salinar), The Netherland
Horizon and Age: Upper Bunter, Early Triassic
Diagnostic Features: Circular spore; trilete sub- dued, rays 2/3 to 3/4 of radius; exine 3.5 μm thick, densely covered with irregularly shaped verrucae, $\pm$ 1 μm high x 3-4 μm at base, form a negative reticulum.

Guttatisporites ambiguus Tiwari and Rana 1980
Holoype: Tiwari and Rana 1980; pl. 1, fig. 7; size 92 μm; Slide No. BSIP 5550



Locality: Boreho1e RNM-4, sample no. 5, depth 59.00 m, Raniganj Coalfield, West Bengal, India
Horizon and Age: Mahadeva Formation, Middle Triassic
Diagnostic Features: Exine 4-7 μm thick, covered with 1-1.5 μm high verrucae, giving a non-uniform pattern on exine surface.

Genus *Haradisporites* Singh and Kumar 1972
Type Species: *Haradisporites mineri* Singh and Kumar 1972
Locality: Harad River near Hathnapur, Narsinghpur District, Madhya Pradesh, India
Horizon and Age: Jabalpur Formation, Early Cretaceous
Diagnostic Features: Triangular spore with straight to ± convex inter-apical sides; sharply rounded apex, trilete rays more than 3/4 of radius, sinuous near the apex; exine thin, irregularly folded, smooth to faintly sculptured.

Haradisporites mineri Singh and Kumar 1972
Holotype: Singh and Kumar 1972; pl. 1, figs. 1-2; size 34 x 32 μm; Slide No. BSIP 3417/8

Locality: Harad River near Hathnapur, Narsinghpur District, Madhya Pradesh, India
Horizon and Age: Jabalpur Formation, Early Cretaceous
Diagnostic Features: Size 25-42 μm; deltoid spore with straight to ± convex inter-apical sides; trilete rays more than 3/4 of radius, sinuous near the apex; exine thin, less than 1 μm thick, irregularly folded.

Haradisporites scabratus Kumar 1973
Holotype: Kumar 1973; pl. 1, figs. 7-8; size 30 x 30 μm; Slide No. BSIP 3421/5

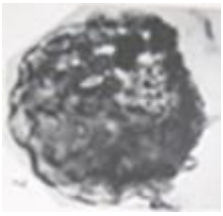
Locality: Harad River near Hathnapur, Narsinghpur District, Madhya Pradesh, India
Horizon and Age: Jabalpur Formation, Early Cretaceous
Diagnostic Features: Size 25-34 μm; subdeltoid; rays slightly sinuous; exine 1-1.5 μm thick, faintly sculptured.

Haradisporites sinuosus Kumar 1973
Holotype: Kumar 1973; pl. 1, figs. 12-13; size 46 x 41 μm; Slide No. BSIP 3421 / 7

Locality: Harad River near Hathnapur, Narsinghpur District, Madhya radesh, India
Horizon and Age: Jabalpur Formation, Early Cretaceous
Diagnostic Features: Size 38-48 μm; apex broadly rounded; rays sinuous, slightly crumpled; exine thin, less than 1 μm.

Genus *Klukisporites* Couper 1958
Type Species: *Klukisporites variegatus* Couper 1958
Locality: Yorkshire, Lower Deltaic, UK
Horizon and Age: Bajocian, Middle Jurassic
Diagnostic Features: Triangular spore, trilete distinct, rays 2/3 of radius; exine sculptured with granules or verrucae on proximal face, distally coarse foveo-reticulate.

Klukisporites variegatus Couper 1958
Holotype: Couper 1958; pl. 19, fig. 7; size 56 μm

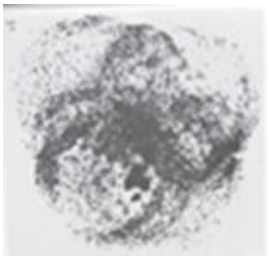


Locality: Yorkshire, Lower Deltaic, UK
Horizon and Age: Bajocian, Middle Jurassic
Diagnostic Features: Size 45-110 μm; exine 3-5 μm thick, sculptured with granules or verrucae on proximal face, distally with coarse foveo-reticulate, 2.5- 7 μm wide pits, muri 2-5 μm thick.

Genus *Lapposisporites* Visscher 1966
Type Species: *Lapposisporites lapposus* Visscher 1966
Locality: Boring 31, K.N.Z., Hengelo, depth 392.00 m (Röt Salinar), The Netherlands
Horizon and Age: Upper Bunter, Early Triassic

Diagnostic Features: Tetrahedral tetrad spore; trilete distinct; exine covered with scabrae, grana, gemmae, verrucae, echinae in different combinations.

Lapposisporites lapposus Visscher 1966
Holotype: Visscher 1966; pl.3, figs. 1A, B; size 98 μm



Locality: Boring 31, K.N.Z., Hengelo, depth 392.00 m (Röt Salinar), The Netherlands
Horizon and Age: Upper Bunter, Early Triassic
Diagnostic Features: Exine densely ornamented with scabrae and 1.5 μm grana and gemmae.

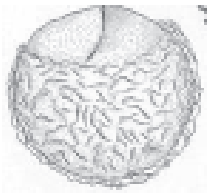
Genus *Leptolepidites* Couper 1953
Type Species: *Leptolepidites verrucatus* Couper 1953
Locality: Ohika beds, L 12 (type), Garvey Creek Hawks Crag Breccia L 55, New Zeland
Horizon and Age: Jurassic
Diagnostic Features: Subtriangular to circular spore, convex to concave inter-radial sides; trilete distinct, rays long; exine thick, sculptured with irregularly shaped verrucae, equally on both faces.

Leptolepidites verrucatus Couper 1953
Holotype: Couper 1953; pl. 2, fig. 14, 15; size 31 μm

Locality: Ohika beds, L12 (type), Garvey Creek Hawks Crag Breccia L 55, New Zeland
Horizon and Age: Jurassic
Diagnostic Features: Size 31-35 μm; subcircular; exine $\pm$ 3 μm thick, sculptured with irregularly shaped verrucae, $\pm$ 5-6 μm in diameter, equally on both faces.

Genus *Lycopodiacidites* Couper emend. Potonié 1956
Type Species: *Lycopodiacidites bullerensis* Couper 1953
Locality: Ohika beds, L12 (type), Garvey Greek Hawks Crag Breccia, L15, New Zealand
Horizon and Age: Jurassic
Diagnostic Features: Triangular to subcircular spore; trilete faint, rays reaching up to equator; exine proximally smooth or with reduced sculpture, distal face clearly and heavily sculptured with verrucae of varied size and shape.

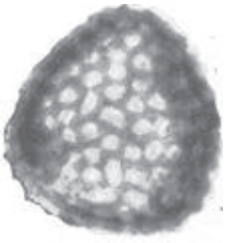
Lycopodiacidites bullerensis Couper 1953
Holotype: Couper 1953; pl. 1, fig. 9; size 41 μm



Locality: Ohika beds, L12 (type), Garvey Greek Hawks Crag Breccia, L15, New Zealand
Horizon and Age: Jurassic
Diagnostic Features: Size 37-43 μm; exine thickness not discernible, proximally smooth, distal face with hyaline outer coat thrown into low closely spaced convolutions' giving 'ragged' appearance.

Genus *Lycopodiumsporites* Thiergart 1938
Type Species: *Lycopodiumsporites* (*Sporites*) *agathoecus* (Potonié) Thiergart 1938
Locality: Geiseltal bei Merseburg, Grube Cecilie, Germany
Horizon and Age: Eocene
Diagnostic Features: Subtriangular spore; triletes, rays enclosed in membranous elevated lips, extend up to equator; exine thick, smooth proximally, reticulate sculptured both equatorially and distally.

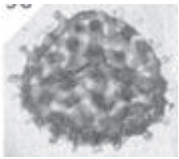
Lycopodiumsporites agathoecus (Potonié) Thiergart 1938
Lectotype: Potonié 1934; pl. 1, fig. 25; size 87 μm



Locality: Geiseltal bei Merseburg, Grube Cecilie Germany
Horizon and Age: Eocene
Diagnostic Features: Size 36.6 x 73.4 μm; reticulum coarse, muri 3 μm high, 3-4 μm wide, lumen circular to oval, 5-12 μm in diameter.

Genus *Neoraistrickia* Potonié 1956
Type Species: *Neoraistrickia* (*Trilites*) *truncatus* Cookson 1953
Locality: South Australia
Horizon and Age: Comaum, Pre-Tertiary
Diagnostic Features: Broadly triangular to subcricular; trilete distinct, rays extend up to equator; exine beset with straight, truncate-headed bacula all over the surface.

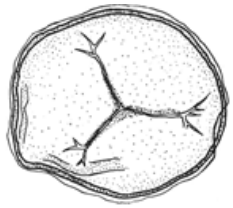
Neoraistrickia truncatus (Cookson) Potonié 1956
Holotype: Cookson 1953; pl. 2, fig. 36; size 31.7 μm



Locality: South Australia
Horizon and Age: Comaum, Pre-Tertiary
Diagnostic Features: Size 31- 55 μm; exine beset with evenly placed truncate headed bacula all over, 3.5 μm long.

Genus *Novitasporites* Tiwari and Rana 1981
Type Species: *Novitasporites triassicus* Tiwari and Rana 1981
Locality: Borehole, RD-I, sample no. 5, depth 600.58 m, Raniganj Coalfield, West Bengal, India
Horizon and Age: Panchet Formation, Early Triassic
Diagnostic Features: Roundly triangular to subcircular spore with a psilate perisporial covering; trilete distinct, rays in branching fashion with bi- to multifurcate ends; exine thick, psilate, infrapunctate.

Novitasporites triassicus Tiwari and Rana 1981
Holotype: Tiwari and Rana 1981; pl. 2, fig. 26; size 96 μm; Slide No. BSIP 5627



Locality: Borehole RD-I, sample no. 5, depth 600.58 m, Raniganj Coalfield, West Bengal, India
Horizon and Age: Panchet Formation, Early Triassic
Diagnostic Features: Size 96-120 μm; circular to subcircular; exine 2-5 μm thick, infrapunctate, covered tightly with a hyaline, unstructured perisporial covering, unevenly 1-3 μm wide.

Novitasporites triangularis Tiwari and Rana 1981
Holotype: Tiwari and Rana 1981; pl. 2, fig. 33; size 70 x 74 x 66 μm; Slide No. BSIP 5626

Locality: Borehole RD-1, sample no. 5, depth 600.58 m, Raniganj Coalfield, West Bengal, India
Horizon and Age: Panchet Formation, Early Triassic
Diagnostic Features: Size 66-105 μm; triangular to roundly triangular spore; perine distinct, up to 4 μm wide; exine 2-4 μm thick, infrapunctate.

Genus *Orbella* Maljavkina 1949
Type Species: *Orbella colliculoides* Maljavkina 1949
Locality: W-Sibirien, Nasiwaewskaja, USSR
Horizon and Age: Early Cretaceous
Diagnostic Features: Circular spore; trilete distinct, rays 3/4 radius long, encircling contact area; exine laevigate.

Orbella colliculoides Maljavkina 1949
Holotype: Maljavkina 1949; pl. 9, fig. 5; size 35 μm

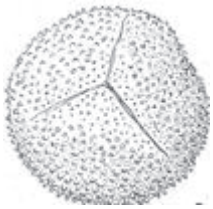
Locality: W-Sibirien, Nasiwaewskaja, USSR
Horizon and Age: Early Cretaceous
Diagnostic Features: Size 20-35 μm; exine finely scabrate.

Orbella indica Tiwari and Rana 1981
Holotype: Tiwari and Rana 1981; pl. 1, fig. 1; size 22 μm; Slide No. BSIP 5636

Locality: Borehole RD-1, sample no. 5, depth 600.58 m, Raniganj Coalfield, West Bengal, India
Horizon and Age: Panchet Formation, Early Triassic
Diagnostic Features: Size 24-32 μm; subcircular; exine thin, less than 1 μm, infragranulose in inter-ray area.

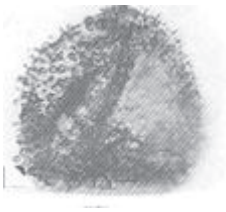
Genus *Osmundacidites* Couper 1953
Type Species: *Osmundacidites wellmanii* Couper 1953
Locality: Ohika beds, L12 (type), Garvey Greek Hawks Crag, Breccia, L55, New Zealand
Horizon and Age: Jurassic
Diagnostic Features: Subcircular spore; trilete distinct occasionally subdued due to sculptures, rays moderalety long; exine thin, granular-papillate, sculpture reduced on proximal face.

Osmundacidites wellmanii Couper 1953
Holotype: Couper 1953; pl. 1, fig. 5; size 44 μm



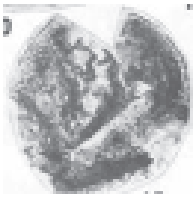
Locality: Ohika beds, L12 (type), Garvey Greek Hawks Crag, Breccia, L55, New Zealand
Horizon and Age: Jurassic
Diagnostic Features: Size 40-63 μm; exine 1.5 μm thick, granular to papillate, sculpture ± 1 μm, reduced on proximal face.

Osmundacidites baculatus Tiwari and Ram-Awatar 1989
Holotype: Tiwari and Ram-Awatar 1989; pl. 1, fig. 12; size 53 μm; Slide No. BSIP 9052



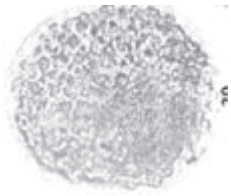
Locality: Near Dargaon Village, Johilla River Section, Johilla Coalfield, Madhya Pradesh, India
Horizon and Age: Pali Formation, Late Permian / Early Triassic
Diagnostic Features: Size 50-60 μm; exine ± 1 μm thick; sculptural elements predominantly round headed bacula, 3-5 μm long x 1-1.5 μm broad, intermixed with less than 1 μm coni and spines.

Osmundacidites panchetensis Kar 1970
Holotype: Kar 1970; pl. 1, fig. 15; size 70 μm; Slide No. BSIP 3468



Locality: Bore-core No. RE9, depth 83 m, Raniganj Coalfield, West Bengal, India
Horizon and Age: Panchet Formation, Early Triassic
Diagnostic Features: Size 60-90 μm; exine 2 μm thick with spines, papilla and coni, evenly distributed.

Osmundacidites pilatus Tiwari and Rana 1981
Holotype: Tiwari and Rana 1981; pl. 2, fig. 30; size 48 x 49 μm; Slide No. BSIP 5641



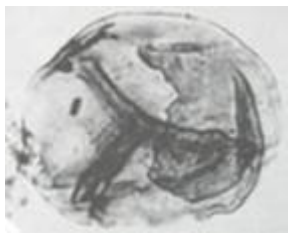
Locality: Borehole RD-l, sample no. 5, depth 600.58 m, Raniganj Coalfield, West Bengal, India
Horizon and Age: Panchet Formation, Early Triassic
Diagnostic Features: Size 45-50 μm; trilete not prominent; exine 1 μm thick, sculptured with 3.5 μm broad x 5 μm high and round-headed pila, intermixed with few verrucae, closely placed allover the body.

Genus *Punctatisporites* Ibrahim emend. Potonié and Kremp 1955
Type Species: *Punctatisporites punctatus* Ibrahim 1933
Locality: Ruhrgebiet, Flöz Ägir, Germany
Horizon and Age: Westphalian B/C, Late Carboniferous
Diagnostic Features: Circular spore; trilete distinct, rays 2/3 of radius; exine proximally smooth, distally punctate, infragranulose.

Punctatisporites punctatus Ibrahim emend. Potonié and Kremp 1955
Holotype: Ibrahim 1933; pl. 2, fig. 18; size 77 μm

Locality: Ruhrgebiet, Flöz Ägir, Germany
Horizon and Age: Westphalian B/C, Late Carboniferous
Diagnostic Features: Size 50-77 μm; rays up to equator; exine 1-2 μm thick, proximally smooth, distally punctate, infragranulose.

Punctatisporites maiturensis Maheshwari and Banerji 1975
Holotype: Maheshwari and Banerji 1975; pl. 1, fig. 10; size 77.5 μm; Slide No. BSIP 4604-9



Locality: North-western branch of Nonia Nala, East of Kumarpur, District Burdwan, West Bengal, India
Horizon and Age: Maitur Formation, Early Triassic
Diagnostic Features: Size 60-90 μm; trilete distinct, commissures sinuous, ray end some times forked; exine 2 μm thick, irregularly infolded, puncta often well developed in inter-radial areas.

Genus *Pyramidosporites* Segroves 1967
Type Species: *Pyramidosporites cyathodes* Segroves 1967
Locality: Bore No. 4, 93 feet, Woolaga Creek, Perth Basin, Western Australia
Horizon and Age: Wagina Sandstone, Late Permian
Diagnostic Features: Obligate tetrahedral tetrad; germinal aperture not seen; each member unsculptured, bound to each other by a prominent, heavy thickening.

Pyramidosporites cyathodes Segroves 1967
Holotype: Segroves 1967; pl. 1, fig. 14; size 95 μm

Locality: Bore No. 4,93 feet, Woolaga Creek, Perth Basin, Western Australia
Horizon and Age: Wagina Sandstone, Late Permian
Diagnostic Features: Size 74-105 μm, spore originally spheroidal; exine 2-4 μm thick, sometimes punctate, often with secondary pitting, and many folds.

Genus *Retitriletes* Hammen ex Pierce 1961
Type Species: *Retitriletes globosus* Pierce 1961
Locality: Minnesota, USA
Horizon and Age: Early Late Cretaceous
Diagnostic Features: Triangular spore with convex-concave sides; trilete rays up to equator; exine beset with reticulum.

Retitriletes globosus Pierce 1961
Holotype: Pierce 1961; pl. 1, fig. 14; size 39 μm

Locality: Minnesota, USA
Horizon and Age: Early Late Cretaceous
Diagnostic Features: Size 35-40 μm; exine reticulum with muri less than 1 μm wide, lumen irregular in shape and size.

Genus *Retusotriletes* Naumova 1953
Type Sepcies: *Retusotriletes simplex* Naumova 1953
Locality: Kaluga-Gebiet, UdSSR
Horizon and Age: Upper Givetien, Middle Devonian
Diagnostic Features: Subtriangular to circular spore; trilete distinct, ray ends forming imperfcet to complete curvaturae; exine schagrinate.

Retusolriletes simplex Naumova 1953
Holotype: Naumova 1953; pl. 2, fig. 9; size 30 μm

Locality: Kaluga-Gebiet, UdSSR
Horizon and Age: Upper Givetien, Middle Devonian
Diagnostic Features: Size 30-35 μm; trilete rays 2/3 of radius, distinct contact-area in centre, ray ends join to form perfect curraturae; exine ± 1 μm thick, indistinctly structured.

Retusotriletes dejerseyi Venkatachala and Rawat 1978
Holotype: Venkatachala and Rawat 1978; pl. 1, fig. 16; size 25 μm
Locality: Purnea Well, Purnea, Bihar, India
Horizon and Age: Early Triassic
Diagnostic Features: Size 25-28 μm; circular; trilete rays sinuous, extremities forming curvaturae; exine 1-5 μm thick, contact area scabrate.

Genus *Rugulatisporites* Pflüg and Thomson *in* Thomson and Pflüg 1953
Type Species: *Rugulatisporites quintus* Pflüg and Thomson *in* Thomson and Pflüg 1953
Locality: Braunkohle der Ville, Germany
Horizon and Age: Chatt-Aquitan, Tertiary
Diagnostic Features: Circular spore; trilete faint, rays indistinct; exine with small muri and irregular or broken warts.

Rugulatisporites quintus Pflüg and Thomson *in* Thomson and Pflüg 1953
Holotype: Thomson and Pflüg 1953; pl. 2, fig. 46; size 72 μm

Locality: Braunkohle der Ville, Germany
Horizon and Age: Chatt-Aquitan, Tertiary
Diagnostic Features: Size 40-80 μm, circular; rays 2/3 of radius; exine 1 μm thick, rugulae irregular, 2-3 μm wide x 1 μm high muri.

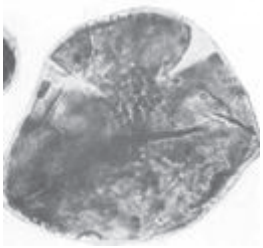
Genus *Scabratisporites* Visscher 1966
Type Species: *Scabratisporites scabratus* Visscher 1966
Locality: Boring 31, K.N.Z., Depth 405.50 m, Hengelo, The Netherlands
Horizon and Age: Upper Bunter, Early Triassic
Diagnostic Features: Circular spore; trilete mark distinct, rays extend 2/3 of radius; exine thick, ornamented with more or less regularly distributed scabrae.

Scabratisporites scabratus Visscher 1966
Holotype: Visscher 1966; pl. 5, fig. 4; size 48 μm

Locality: Boring 31, K.N.Z., Depth 405.50 m, Hengelo, The Netherlands
Horizon and Age: Upper Bunter, Early Triassic
Diagnostic Features: Size 44-50 μm, exine 1.5-2 μm thick, surface folded.

Genus *Subverrusporis* Kar 1970
Type Species: *Subverrusporis rudis* Kar 1970
Locality: Bore-core No. RE9, depth 82.5 m, Ranigani Coalfield, West Bengal, India
Horizon and Age: Panchet Formation, Early Triassic
Diagnostic Features: Triangular-subtriangular spore; trilete faint, rays extend 2/3 of radius; exine thin, subverrucose.

Subverrusporis rudis Kar 1970
Holotype: Kar 1970; pl. 2, fig. 48; size 98 μm; BSIP Slide No. 3473



Locality: Bore-core No. RE9, depth 82.5 m, Raniganj Coalfield, West Bengal, India
Diagnostic Features: Size 100-160 μm; trilete indistinct; exine ± 2 μm thick, subverrucose, sculptures sparsely and uniformly distributed.

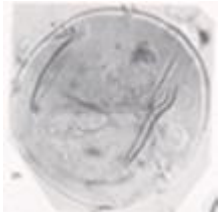
Genus *Tigrisporites* Klaus 1960
Type Species: *Tigrisporites halleinis* Klaus 1960
Locality: Sammlung Geologische Bundesanstalt, Wien, Austria
Horizon and Age: Keuper, Late Triassic
Diagnostic Features: Tringular spore with bluntly rounded apices; trilete mark distinct, rays extend up to equator, join at ends to form incomplete curvaturae; exine sculptured with radially arranged rugulae on both faces.

Tigrisporites halleinis Klaus 1960
Holotype: Klaus 1960; pl. 31, fig. 28; 55-60 μm

Locality: Sammlung Geologische Bundesanstalt, Wien, Austria
Horizon and Age: Keuper, Late Triassic
Diagnostic Features: Size 48-60 μm; exine 1-2 μm thick, beset with 1.5 μm wide x up to 10 μm long rugulae all over surface.

Genus *Todisporites* Couper 1958
Type Species: *Todisporites major* Couper, 1958
Locality: Yorkshire, Gristhorpe Beds, UK
Horizon and Age: Bajocian, Middle Jurassic
Diagnostic Features: ± Spherical spore; trilete rays up to equator; exine thin, finely scabrate.

Todisporites major Couper 1958
Holotype: Couper 1958; pl. 16, fig. 6; size 70 μm

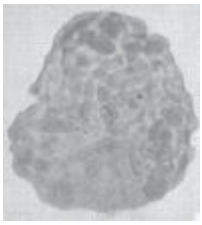


Locality: Yorkshire, Gristhorpe Beds, UK
Horizon and Age: Bajocian, Middle Jurassic
Diagnostic Features: Size 52-78 μm; ± circular, frequently equatorially folded; exine 1-1.5 μm thick, smooth.

Genus *Trilites* Cookson ex Couper emend. Dettmann 1963
Type Species: *Trilites tuberculiformis* Cookson 1947
Locality: Kerguelen, Archipelago
Horizon and Age: Tertiary

Diagnostic Features: Triangular spore; trilete distinct; exine differentially thickend in equatorial and radial regions, proximal contact area smooth to scabrate, distally sculptured with elongated verrucae, rugulae.

Trilites tuberculiformis Cookson 1947
Holotype: Cookson 1947; pl. 16, figs. 61; size 63 μm



Locality: Kerguelen, Archipelago
Horizon and Age: Tertiary
Diagnostic Features: Size 42-59 x 31-39 μm; concavely triangular; trilete rays 3/4 of radius; exine 2-3 μm thick, in interradial region 4 μm thick, rugulae to verrucae 3 μm wide x 3-10 μm long.

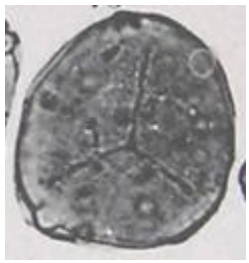
Genus *Triplexisporites* Foster 1979
Type Species: *Triplexisporites* (*Tigrisporites*) *playfordii* de Jersey and Hamilton 1967
Locality: D.R.D.9, 305 ft. 5 in, Bowen Basin, Queensland, Australia
Horizon and Age: Moolayember Formation, Middle Triassic
Diagnostic Features: Triangular spore with slightly concave sides; trilete mark distinct, rays elevated, extend up to 3/4 of radius, exine sculptured with radially arranged rugulae, originate from proximal inter-radial areas, continue to distal face, may bifurcate and anastomose occasionally.

Triplexisporites playfordii de Jersey and Hamilton 1967
Holotype: de Jersey and Hamilton 1967; pl. 5, fig. 5; size 41 μm

Locality: D.R.D.9, 305 ft. 5 in, Bowen Basin, Queensland, Australia
Horizon and Age: Moolayember Formation, Middle Triassic
Diagnostic Features: Size 20-41 μm; proximal and distal surfaces ornamented with numerous subparallel, low rugulae, ± 0.5 μm high and wide.

Genus *Undulatisporites* Pflüg *in* Thomson and Pflüg 1953
Type Species: *Undulatisporites microcutis* Pflüg *in* Thomson and Pflüg 1953
Locality: Wehmingen bei Sarstedt, Hannover, Germany
Horizon and Age: Dan (?) – Palaeocene
Diagnostic Features: Broadly triangular spore; trilete mark distinct, rays undulated reaching up to 3/4 of radius; body surface highly folded, exine scabrate.

Undulatisporites microcutis Pflüg *in* Thomson and Pflüg 1953
Holotype: Pflüg *in* Thomson and Pflüg 1953; pl. 1, fig. 81; size 30 μm



Locality: Wehmingen bei Sarstedt, Hannover, Germany
Horizon and Age: Dan (?) – Paleocene
Diagnostic Features: Size 30-50 μm; exine 3 μm thick, surface highly undulated.

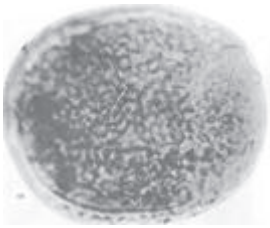
Genus *Uvaesporites* Döring 1965
Type Species: *Uvaesporites glomeratus* Döring 1965
Locality: Westmecklenburg, Werle, Germany
Horizon and Age: Wealden, Early Cretaceous
Diagnostic Features: Broadly circular spore; trilete distinct; proximally flat, distally weak area where element indiscriminately forming kidney shape bunch, irregular.

Uvaesporites glomeratus Döring 1965
Holotype: Döring 1965; pl. 9, figs. 1-4; size 47 μm

Locality: Westmecklenburg, Werle, Germany
Horizon and Age: Wealden, Early Cretaceous
Diagnostic Features: Broadly triangular; trilete rays thick lipped, extend up to equator; exine beset with irregular shaped, big elements 2-20 μm in diameter.

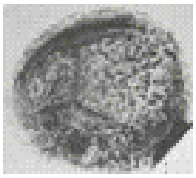
Genus *Verrucosisporites* Ibrahim emend. Smith 1971
Type Species: *Verrucosisporites verrucosus* Ibrahim *in* Potonié, Ibrahim and Loose 1932
Locality: Agir Seam, Wehofen Colliery, Ruhr Coalfield, Germany
Horizon and Age: Westfal B/C, Late Carboniferous
Diagnostic Features: Circular to roundly triangular spore; trilete simple, ray-length variable 1/2 to full radius; exine pre-dominantly verrucate, but may include rugulae, coni, size reduced in contact area.

Verrucosisporites verrucosus Ibrahim 1932
Holotype: Ibrahim *in* Potonié, Ibrahim and Loose 1932; pl. 15, fig. 17; size 65.5 x 77.0 μm



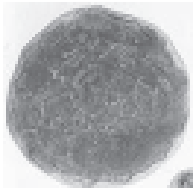
Locality: Agir Seam, Wehofen Colliery, Ruhr Coalfield, Germany
Horizon and Age: Westfal B/C, Late Carboniferous
Diagnostic Features: Size 58-108 μm; oval to ball shape spore; trilete mark distinct 2/3 of radius; exine beset with 2-4 μm, big warts.

Verrucosisporites bosei Maheshwari and Banerji 1975
Holotype: Maheshwari and Banerji 1975; pl. 2, fig. 25; size 77 μm; Slide No. BSIP 4607-2



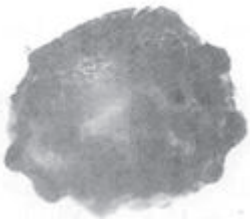
Locality: North - western branch of Nonia Nala, east of Kumarpur, District Burdwan, West Bengal, India
Horizon and Age: Panchet Formation, EarlyTriassic
Diagnostic Features: Size 50-90 μm; circular; exine 4 μm thick, verrucose, verrucae 3-8 μm big, irregularly folded.

Verrucosisporites densus Bharadwaj and Tiwari 1977
Holotype:Bharadwaj and Tiwari 1977; pl. 3, fig. 33; size 100 μm; Slide No. BSIP 5/1 - 4669



Locality: Borehole NCRD-6, sample no. 5, depth 86 m, Raniganj Coalfield, West Bengal, India
Horizon and Age: Panchet Formation, Early Triassic
Diagnostic Features: Size 70-140 μm; triangulo-circular; ray lips slightly thickened; exine with massive verrucae allover, 3-6 high x 8-12 wide μm, partially fused, dark brown and compact in distribution.

Verrucosisporites kazigaonensis Tripathi, Tiwari and Kumar 1990
Holotype: Tripathi, Tiwari and Kumar 1990; pl. 1, fig. 7; size 61.5 μm; Slide No. BSIP 8474



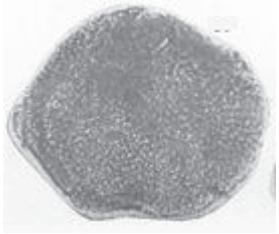
Locality: Borehole RJR-2, sample no. 41, depth 441.40-441.90 m, near Kazigaon, Rajmahal Basin, Bihar, India
Horizon and Age: Dubrajpur Formation, Late Triassic

Diagnostic Features: Size 61.5-71.0 μm; trilete rays thick-lipped 1-2 μm wide, wavy; exine 2-3 μm thick, with tubercles 3-5 μm high x 7-11 μm wide and verrucae 1-3 μm, at places low verrucae, fuse to form a rugulate pattern.

Verrucosisporites surangei Maheshwari and Banerji 1975
Holotype: Maheshwari and Banerji 1975; pl. 2, fig. 23; size 77 μm; Slide No. BSIP 4590-9

Locality: North-western branch of Nonia Nala, East of Kumarpur, District Burdwan, West Bengal, India
Horizon and Age: Panchet Formation, Early Triassic
Diagnostic Features: Size 60-90 μm; exine verrucose, verrucae comparatively robust at proximal apical areas.

Verrucosisporites triassicus Bharadwaj and Tiwari 1977
Holotype: Bharadwaj and Tiwari 1977; pl. 2, fig. 31; size 110 μm; Slide No. BSIP 5/3 - 4671



Locality: Borehole NCRD-6, sample no. 5, depth 86 m, Raniganj Coalfield, West Bengal, India
Horizon and Age: Panchet Formation, Early Triassic
Diagnostic Features: Size 65-88 μm; exine 3 μm thick, closely packed with 2-3 μm long conically rounded verrucae allover except around the apical region.

Genus *Zebrasporites* Klaus 1960
Type Species: *Zebrasporites kahleri* Klaus 1960
Locality: Bleiberg in Karnten, Germany
Horizon and Age: Ostalpine, Triassic
Diagnostic Features: Triangular spore with perine, convex sides; trilete distinct, rays up to equator; proximally smooth, distal face with approximately rounded beaded thick ribs (rugae).

Zebrasporites kahleri Klaus 1960
Holotype: Klaus 1960; pl. 30, fig. 18-20; size 32 μm

Locality: Bleiberg in Karnten, Germany
Horizon and Age: Ostalpine, Triassic
Diagnostic Features: Size 42-50 μm; distal face with triangular well marked radial ridges made from approximately rounded beads (6-7).

CINGULATE-ZONATE TRILETE SPORE

Genus *Angulisporites* Bhardwaj 1954
Type Species: *Angulisporites splendidus* Bhardwaj 1954
Locality: Pfalz, Labachgrube bei Breitenbach, Germany
Horizon and Age: Stephanian C, Late Carboniferous
Diagnostic Features: Cingulate, broadly triangular spore; trilete mark indistinct, rays thin, extend up to equator; exine sculptured with grana.

Angulisporites splendidus Bhardwaj 1954
Holotype: Bhardwaj 1954; fig. 3; size 84 μm

Locality: Pfalz, Labachgrube bei Breitenbach, Germany
Horizon and Age: Stephanian C, Late Carboniferous

Diagnostic Features: Size 70-90 μm; body faint, 50-70 μm; exine very finely granulose, less than 0.5 μm in diameter.

Angulisporites triassicus Venkatachala and Rawat 1978
Holotype: Venkatachala and Rawat 1978, pl. 2, fig. 40; size 50 μm
Locality:Purnea Basin, Bihar, India
Horizon and Age: Early Triassic
Diagnostic Features: Size 45-55 μm; cingulum 5 μm wide.

Genus *Annulispora* de Jersey 1959
Type Species: *Annulispora* (*Sporites*) *folliculosa* (Rogalska) de Jersey 1959
Locality: Blanowice, Silesia, Poland
Horizon and Age: Liassic, Early Jurassic
Diagnostic Features: Cingulate, circular to roundly triangular spore; trilete mark distinct, rays extend up to 2/3 of radius; exine smooth or faintly rough; on distal face thickened subcircular ring with sharp inner boundary, outer margin gradually demarcated.

Annulispora folliculsa (Rogalska) de Jersey 1959
Holotype: Rogalska 1954; pl. 12, fig. 8

Locality: Blanowice, Silesia, Poland
Horizon and Age: Liassic, Late Triassic
Diagnostic Features: Size range 20-48 μm; exine 2-3 μm thick; distal subcircular ring 2-5 μm wide, inner diameter of ring 7-17 μm.

Genus *Antulsporites* Archangelsky and Gamerro 1966
Type Species: *Antulsporites* (*Heliosporites*) *baculatus* Archangelsky and Gamerro 1966
Locality: Santa Cruz, Argentina
Horizon and Age: Early Cretaceous
Diagnostic Features: Cingulate, subtriangular spore; trilete distinct, rays extend 2/3 of radius; exine thick, stratified, proximally reduced sculpture, on distal face mixed ornament of baculae, spinae and verrucae.

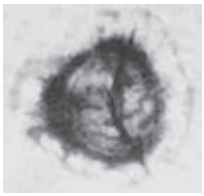
Antulsporites baculatus Archangelsky and Gamerro 1966
Holotype: Archangelsky and Gamerro 1966; pl. 1, figs. 12-14; size 36 μm

Locality: Santa Cruz, Argentina
Horizon and Age: Early Cretaceous
Diagnostic Features: Size 35.2-40 μm; exine 1 μm thick, beset with bacula, element base polygonal to irregular, 1.6-4.8 μm high x 2.8-4.3 μm broad; cingulum 2.4-5 μm thick.

Antulsporites beharensis Venkatachala and Rawat 1978
Holotype: Venkatachala and Rawat 1978, pl. 1, fig. 20; size 30 μm
Locality: Purnea Basin, Bihar, India
Horizon and Age: Early Triassic
Diagnostic Features: Size 25-35 μm; exine sculptured with 1-2 μm wide verrucae on distal face forming pseudoreticulum; cingulum 3 μm wide.

Genus *Aequitriradites* Delcourt and Sprumont emend. Cookson and Dettmann 1961
Type Species: *Aequitriradites dubius* Delcourt and Sprumont emend. Delcourt, Dettmann and Hughes 1963
Locality: Hainaut, Belgium
Horizon and Age: Wealdien, Early Cretaceous
Diagnostic Features: Cingulate, subtriangular spore; trilete mark faintly represented, prominent in subequatorial region, rays extend in to zona; exine variously sculptured with spines, coni, verrucae on both faces; distally irregular hilum present due to exinal breakdown.

Aequitriradites dubius Delcourt and Sprumont emend. Delcourt, Dettmann and Hughes 1963
Holotype: Delcourt and Sprumont 1955; pl. 3, fig. 7; size 125 μm



Locality: Hainaut, Belgium
Horizon and Age: Wealdien, Early Cretaceous
Diagnostic Features: Size 60-125 μm, trilete mark distinct, rays prominent reaching up to zona periphery; zona broad, radially oriented ridges on zona in inter ray area.

Genus *Camarozonosporites* Potonié emend. Klaus 1960
Type Species: *Camarozonosporites* (*Rotaspora*) *cretaceous* (Weyland and Kreiger) Potonié 1956
Locality: Aachen, Basiston, Germany
Horizon and Age: Middle Senomanian, Cretaceous
Diagnostic Features: Cingulate, circular spore; trilete distinct, rays 2/3 of equator; exine proximally finely scabrate, distally equatorially thick with strong rugae.

Camarozonosporites cretaceous (Weyland and Kreiger) Potonié emend. Klaus 1960
Holotype: Weyland and Kreiger 1953; pl. 3, fig. 27; size 25 μm

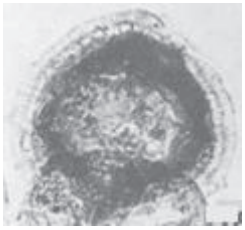
Locality: Aachen, Basiston, Germany
Horizon and Age: Middle Senomanian, Cretaceous
Diagnostic Features: Size 20-28 μm; trilete rays widely open; rugae prominently visible.

Genus *Cingulizonates* Dybova and Jachowitz emend. Butterworth, Jansonius, Smith and Staplin 1964
Type Species: *Cingulizonates tuberosus* Dybova and Jachowitz 1957
Locality: Silesian Coal Measures
Horizon and Age**:** Carboniferous
Diagnostic Features: Zonate-cingulate, convexly triangular to subcircular spore; trilete distinct, rays exted up to inner margin of cingulum; exine two layered, inner body thin, proximally smooth, equatorially cingulate, cingulated zone vacuolate, tapering to zona.

Cingulizonates tuberosus Dybova and Jachowitz 1957
Holotype: Dybova and Jachowitz 1957**;** pl. 53, fig. 1; size 60 μm

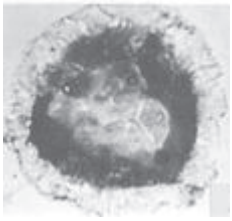
Locality: Silesian Coal Measures
Horizon and Age: Carboniferous
Diagnostic Features: Convexly triangular; size 60-65 μm; cingulum tapering into zona, uniformly wide.

Cingulizonates indicus Kumaran and Maheshwari 1980
Holotype: Kumaran and Maheshwari 1980; pl. 4, fig. 16; size 63 μm; Slide No. BSIP 5921



Locality: Eastern bank of Janar Nala about 2 km south-east of Bijouri, District Shahdol, Madhya Pradesh, India
Horizon and Age: Tiki Formation, Late Triassic
Diagnostic Features: Size 63-78 μm; zona 6-10 μm broad, infragranulate having 5 μm wide vacuoles in innermost region; central body distally sculptured with verrucae, 2-4 μm broad x1.5 μm high, coni, bacula up to 6 μm high.

Cingulizonates verrucosus Kumaran and Maheshwari 1980
Holotype: Kumaran and Maheshwari 1980; pl. 4, fig. 21; size 70 μm; Slide No. BSIP 5953



Locality: Eastern bank of Janar Nala about 2 km south-east of Bijouri, District Shahdol, Madhya Pradesh, India
Horizon and Age: Tiki Formation, Late Triassic
Diagnostic Features: Size 63-70 μm; zona 4-8 μm broad, hyaline, intragranulate with vacuoles of 1 μm diameter in innermost region; distally densely sculptured with verrucae, sometimes puncta and coni also seen near body equator, 1-2 μm high x 1-4 μm broad, comparatively robust at body equator.

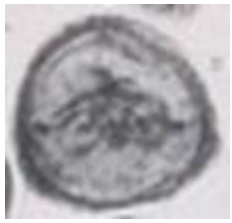
Genus *Cingutriletes* Pierce emend. Dettmann 1963
Type Species: *Cingutriletes congruens* Pierce 1961
Locality: Minnesota, USA
Horizon and Age: Early Late Cretaceous
Diagnostic Features: Broadly biconvex, subcircular spore; trilete rays extended 3/4 of radius; exine proximally smooth, cingulum wide, radially striated; thickened circular area present on distal face.

Cingutriletes congruens Pierce 1961
Holotype: Pierce 1961; pl. 1, fig. 1; size 32 μm

Locality: Minnesota, USA
Horizon and Age: Early Late Cretaceous
Diagnostic Features: Broadly subtriangular, size 30-35 μm; trilete rays extend only 1/2 of radius; associated with filmsy folds; cingulum uniformaly wide, on distal face thickened circular area present.

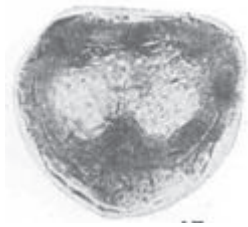
Genus *Densoisporites* Weyland and Krieger emend. Dettmann 1963
Type Species: *Densoisporites velatus* Weyland and Krieger 1953
Locality: Aachener, Baniston
Horizon and Age: Senomanian, Cretaceous
Diagnostic Features: Cingulate, broadly rounded spore; trilete distinct, rays 2/3 of radius, thin or slightly thick lipped, ending with broadened and thickened ends, forming curvaturae around contact-area; exine two layered, cavate, outer sculptured layer, loosely enveloping, proximally attached to thinner inner layer, equatorially thickened with finely patterned surface.

Densoisporites velatus Weyland and Krieger 1953
Holotype: Weyland and Krieger 1953; pl. 4, figs. 12-14; size 35 μm



Locality: Aachener, Baniston
Horizon and Age: Senonian, Cretaceous
Diagnostic Features: Size 25-35 μm; roundly triangular; rays 2/3 of radius; body equatorially 2-3 μm thick, cingulum 8 μm wide radially.

Densoisporites contactus Bharadwaj and Tiwari 1977
Holotype: Bharadwaj and Tiwari 1977; pl. 2, fig. 19; size 64 μm; Slide No.BSIP 5/3- 4671



Locality: Borehole NCRD-6; Lab. sample no. 5, depth 86 m, Raniganj Coalfield, West Bengal, India
Horizon and Age: Panchet Formation, Early Triassic
Diagnostic Features: Size 52-73 μm; cingulum 3-6 μm wide.

Genus *Densosporites* Berry emend. Potonié and Kremp 1954

Type Species: *Densosporites covensis* Berry 1937
Locality: Rhea County, Tennessee, USA
Horizon and Age: Pennington Kohle
Diagnostic Features: Cingulate, broadly triangular spore; trilete mark distinct, rays extend up to cingulum; exine thickness vary from polar area towards equator, massive cingulum, partly thinning divides into two zones.

Densosporites covensis (Berry) Potonié and Kremp 1954
Holotype: Potonié and Kremp 1954; fig. 57; size 32.5 μm

Locality: Rhea County, Tennessee, USA
Horizon and Age: Pennington Kohle
Diagnostic Features: Broadly triangular, size 30-35 μm; trilete ray reaching up to equator; cingulum tapering into narrow zona.

Genus *Distalanulisporites* Klaus 1960
Type Species: *Distalanulisporites punctus* Klaus 1960
Locality: Sammlung Geologische Bundesanstalt, Wien, Austria
Horizon and Age: Keuper, Late Triassic
Diagnostic Features: Cingulate, rounded to broadly triangular spore; trilete mark distinct, rays extend more than half of radius, forming indistinct curvaturae; exine granulate to punctate, centrally placed ring on distal face.

Distalanulisporites punctus Klaus 1960
Holotype: Klaus 1960; pl. 28, fig. 8; size 78 μm

Locality: Sammlung Geologische Bundesanstalt, Wien, Austria
Horizon and Age: Keuper, Late Triassic
Diagnostic Features: Size 25-60 μm; trilete ray ends thickened at curvaturate turn; exine finely punctate, puncta less than 0.5 μm in diameter; on distal face distinctly thick central ring present.

Genus *Duplexisporites* Deák emend. Playford and Dettmann 1965
Type Species: *Duplexisporites generalis* Deák 1962
Locality: Hungary
Horizon and Age: Aptian, Early Cretaceous
Diagnostic Features: Convexly subtriangular spore; trilete distinct, rays usually lipped; exine sculptured distally and equatorially with muri to form irregular reticulum on proximal face tangential murus on equatorial margin; cingulum subdued due to reticulation.

Duplexisporites generalis Deák 1962
Holotype: Deák 1962; pl. 20; fig. 9; size 45 μm

Locality: Hungary
Horizon and Age: Aptian, Early Cretaceous
Diagnostic Features: Size 45-50 μm; trilete rays bordered with thin lips, extend 3/4 of radius; exine 1-2 μm thick, sculptured with 3-4 μm wide and low muri.

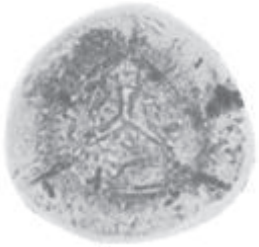
Genus *Foraminisporis* Krutzsch 1959
Type Species: *Foraminisporis foraminis* Krutzsch 1959
Locality: Geiseltal, Germany
Horizon and Age: Eocene
Diagnostic Features: Cingulate, ± circular-biconvex spore; trilete rays up to margin with crenulate ends; exine thick, two layered, inner layer infrapunctate, outer layer narrowly sculptured with ± conical to elongated warts of varied shape and size, overlap scarcely on proximal face, foraminate in nature.

Foraminisporis foraminis Krutzsch 1959
Holotype: Krutzsch 1959; pl. 19, figs. 203-206; size 45 μm

Locality: Geiseltal, Germany
Horizon and Age: Eocene
Diagnostic Features: Sub-circular; size 40-50 μm; trilete ray ends forming imperfect curvaturae; exine 1-2 μm thick, sculptured with blunt to curved apices, 1-2 μm in size.

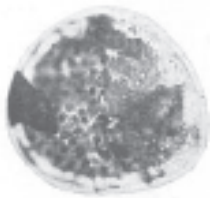
Genus *Indotriradites* Tiwari 1964
Type Species: *Indotriradites korbaensis* Tiwari 1964
Locality: Borehole G-2, 208 (II Seam) E, Korba Coalfield, Madhya Pradesh, India
Horizon and Age: Barakar Formation, Early Permian
Diagnostic Features: Zonate, roundly triangular spore; trilete mark well defined, rays continuing to extend beyond the body margin into the flange, mostly in the form of folds; exine cavate, distinct inner body, and restricted ornament of coni or spines on distal face, broad flange.

Indotriradites korbaensis Tiwari 1964
Holotype: Tiwari 1964; pl. 1, fig. 4; size 71 μm



Locality: Borehole G-2, 208 (II Seam) E, Korba Coalfield, Madhya Pradesh, India
Horizon and Age: Barakar Formation, Early Permian
Diagnostic Features: Size 42-77 μm; subtriangular; flange 7-13 μm broad with 2-4 μm wide thicker region; body covered with 2-6 μm long broad, closely set coni or spines on distal face.

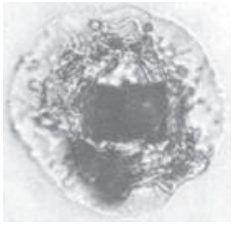
Indotriradites mamillatus Bharadwaj and Tiwari 1977
Holotype: Bharadwaj and Tiwari 1977; pl. 2, fig. 23; size 68 μm; Slide No. BSIP 5/1 – 4669



Locality: Borehole NCRD-6, Lab sample no. 7, depth 123.5 m, Raniganj Coalfield, West Bengal, India
Horizon and Age: Panchet Formation, Early Triassic
Diagnostic Fatures: Size 67-80 μm; flange 5-8 μm wide; central body 50-60 μm; distal processes spino-mamillate, 1.5 to 5 μm long x 2-5 μm wide at base, with round bulbous base and long narrow apex.

Genus *Kraeuselisporites* Leschik 1955
Type Species: *Kraeuselisporites dentatus* Leschik 1955
Locality: Neuewelt bei Basel, Switzerland
Horizon and Age: Keuper, Late Triassic
Diagnostic Features: Zonate, broadly triangular spore; trilete distinct, ray reaching up to central body only; exine two layered, outer membranous zone; central body on distal face punctate with strong coni, apiculae and spines.

Kraeuselisporites dentatus Leschik 1955
Holotype: Leschik 1955, pl. 4, fig. 21; size 49 μm



Locality: Neuewelt bei Basel, Switzerland
Horizon and Age: Keuper, Late Triassic
Diagnostic Features: Exine proximally smooth, 1.5 μm thick, sculptural elements 3-5 μm long x 2 μm wide; zona 7 μm broad.

Genus *Limatulasporites* Helby and Foster *in* Foster 1979
Type Species: *Limatulasporites limatus* (Playford) Helby and Foster *in* Foster 1979
Locality: Poatina, Tasminia

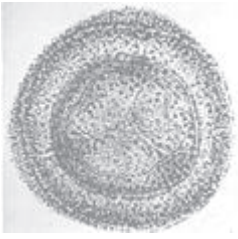
Horizon and Age: Tiers Formation, Late Triassic
Diagnostic Features: Subcircular to roundly subtriangular, cingulate spore; trilete mark distinct, rays reaching up to inner margin of cingulum with straight to sinuous labra ending in curvaturae; exine thin, bearing low grana or other apiculate sculpture in contact area, elsewhere laevigate; cingulum ± uniformly thick.

Limatulasporites limatus (Playford) Helby and Foster *in* Foster 1979
Holotype: Playford 1965; pl. 8, fig. 17; size 41 μm

Locality: Poatina, Tasminia
Horizon and Age: Tiers Formation, Late Triassic
Diagnostic Features: Size 36-47 μm; grana uniformly distributed, 0.5-1 μm in diameter; cingulum 2-6 μm wide.

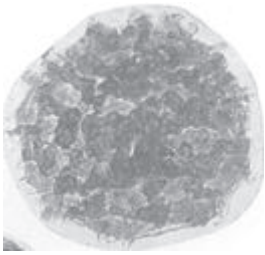
Genus *Lundbladispora* Balme emend. Playford 1965
Type Species: *Lundbladispora willmotti* Balme 1963
Locality: Kockatea Creek No.19 Bore, 139-190 ft, Upper Greenough River area (sample 43305), Western Australia
Horizon and Age: Kockatea Shale, Early Triassic
Diagnostic Features: Broadly triangular spore; trilete, rays extending up to equator; exine cavate, finely structured enclosing a thin walled inner body; exoexine scabrate, spongy with a narrow equatorial thickening, exine beset with spines, coni, or grana; considerably reduced on the proximal surface.

Lundbladispora willmotti Balme emend. Playford 1965
Holotype: Balme 1963; pl. 5, figs 1-2; size 78 μm



Locality: Kockatea Creek No.19 Bore, 139-190 ft, Upper Greenough River area (sample 43305) Western Australia
Horizon and Age: Kockatea Shale, EarlyTriassic
Diagnostic Features: Size 71-86 μm; cingulam 4-6 μm thick; distal face and equator sculptured with 1-3 μm broad and long spines and coni.

Lundbladispora baculata Bharadwaj and Tiwari 1977
Holotype: Bharadwaj and Tiwari 1977; pl. 3, fig. 37; size 102 μm; Slide No. BSIP 5/3 – 4671



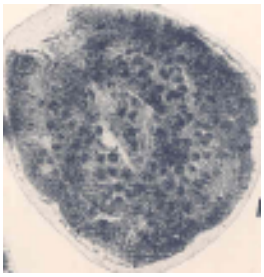
Locality: Borehole NCRD-6; Lab. sample no. 5, depth 86 m, Raniganj Coalfield, West Bengal, India
Horizon and Age: Panchet Formation; Early Triassic.
Diagnostic Features: Size 80-120 μm; circulo-triangular spore; distal face showing big, baculate or sub-baculate, finger-shaped to pila-like, 3-9 μm long x 3-6 μm wide processes.

Lundbladispora bullata Venkatachala and Rawat 1978
Holotype: Venkatachala and Rawat 1978; pl. 1, fig. 8; size 50 x 60 μm
Locality: Purnea Basin, Bihar, India
Horizon and Age: Early Triassic
Diagnostic Features: Size 55-75 μm; exine beset with gemmae, each element 3 μm in diameter, irregularly distributed; cingulum 3 μm wide.

Lundbladispora densispinosa Bharadwaj and Tiwari 1977
Holotype: Bharadwaj and Tiwari 1977; pl. 1, figs. 7-8; size 70 μm; Slide No. 5/3 - 4671

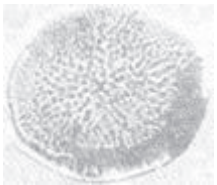
Locality: Borehole NCRD-6, Lab. sample no. 5, depth 86 m, Raniganj Coalfield, West Bengal, India
Horizon and Age: Panchet Formation, Early Triassic
Diagnostic Feature: Size 64-76 μm; cingulum thick, 8-12 μm wide; distal ornament massive, spines with rounded base and prickle-like apex, sometimes finger-like processes, 2-5 μm wide and 4 to 8 μm long, arranged in radiating pattern with the bases exhibiting negatively reticulate appearance.

Lundbladispora microconata Bharadwaj and Tiwari 1977
Holotype: Bharadwaj and Tiwari 1977; pl. 1, fig. 10; size 68 μm; Slide No. 7/1 - 4673



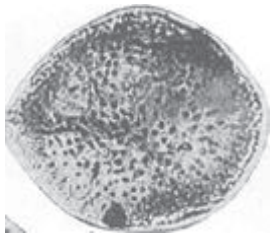
Locality: Borehole NCRD-6, Lab. sample no. 7, depth 123.5 m, Raniganj Coalfield, West Bengal, India
Horizon and Age: Panchet Formation, Early Triassic
Diagnostic Features: Size 65-80 μm; convexo-triangular with broadly rounded angles; central body 41-51 μm, bacula short and rare, 1 x 1 μm coni.

Lundbladispora recurvata Venkatachala and Rawat 1978
Holotype: Venkatachala and Rawat 1978; pl. 1, fig. 10; size 50 μm



Locality: Purnea Basin, Bihar, India
Horizon and Age: Early Triassic
Diagnostic Features: Size 60-62 μm; exine sculptured with densely spaced spines having bulbous base, 1-5 μm in diameter.

Lundbladispora raniganjensis Tiwari and Rana 1981
Holotype: Tiwari and Rana 1981; pl. 1, fig. 3; size 60 μm; Slide No. BSIP 5640



Locality: Borehole, RD-1, sample no. 4, depth 532.8 m; Raniganj Coalfield, West Bengal, India
Horizon and Age: Mahadeva Formation, Middle Triassic
Diagnostic Features: Size 53-76 μm; spines with bulbous bases having beak-like elongated apical portion, few coni, processes 1-3 μm long x 2-3 μm wide; cingulum thick, ± 4-8 μm wide; inner body 38- 66 μm without papillae.

Lundbladispora reticulata Tiwari and Rana 1980
Holotype: Tiwari and Rana 1980; pl. 1, figs. 7, 8; size 78 μm; Slide No. BSIP 5555

Locality: Borehole RNM-4, sample no. 5, depth 59 m, Raniganj Coalfield, West Bengal, India
Horizon and Age: Mahadeva Formation, Middle Triassic
Diagnostic Features: Size 60-80 μm; cingulum 10-20 μm wide, spines 6-15, massive, finger-shaped or conical processes, 3-10 μm long x 3-6 μm wide.

Lundbladispora warti Tiwari and Rana 1981
Holotype: Tiwari and Rana 1981; pl. 1, fig. 4; size 86 μm; Slide No. BSIP 5639

Locality: Borehole RD-l, sample no. 5, depth 600.58 m, Raniganj Coalfield, West Bengal, India

Horizon and Age: Panchet Formation, Early Triassic
Diagnostic Features: Size 84 - 87 μm; subtriangular; trilete rays prominent, 4 μm thick laesurae; exine on distal face having 4-10 μm wide x 4-7 μm high massive wart-like, rounded, flat- topped to irregular processes; cingulum thickened unevenly with partially fused warts.

Genus *Lycospora* Schopf, Wilson and Bentall emend. Potonié and Kremp 1954
Type Species: *Lycospora* (*Cirratriradites*) *micropapillatus* Schopf, Wilson and Bentall 1944
Locality: What Cheer, Keokuk County, Iowa, USA
Horizon and Age: Des Moines Series, Westfal
Diagnostic Features: Cingulate, subcircular spore; trilete distinct, rays extended up to flange; exine two layred, granulose to infragranulose.

Lycospora micropapillatus (Wilson and Coe) Schopf, Wilson and Bentall emend. Potonié and Kremp 1954
Holotype: Wilson and Coe 1940; pl. 1, fig. 6; size 15 μm

Locality: What Cheer, Keokuk County, Iowa, USA
Horizon and Age: Des Moines Series, Westfal
Diagnostic Features: Size 15-16 μm; no frills on equatorial flange; exine micropapillate.

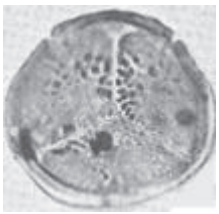
Genus *Muerrigerisporis* Krutzsch 1963
Type Species: *Muerrigerisporis* (*Cingulatisporites*) *muerrigeri* Pflanzl *in* Murriger and Pflanzl 1955
Locality: Hessen, Germany
Horizon and Age: Oligocene
Diagnostic Features: Cingulate, broadly triangular spore; trilete distinct, spike on proximal and distal face irregular, assymetrical and diffused circumstancially.

Muerrigerisporis muerrigeri Pflanzl 1955
Holotype:Pflanzl 1955; pl. 5, figs. 4a-b; size 50 μm

Locality: Hessen, Germany
Horizon and Age: Oligocene
Diagnostic Features: Broadly circular; size 45-55 μm; spike 4-6 μm.

Genus *Nevesisporites* de Jersey and Paten 1964
Type Species: *Nevesisporites vallatus* de Jersey and Paten 1964
Locality: Durabilla, West Queensland, Australia
Horizon and Age: Jurassic
Diagnostic Features: Cingulate, circular to subcircular spore; trilete distinct, rays extend up to cingulam; exine equatorially thick, smooth or faintly rough on distal face, proximally sculptured with granules, verrucae, spinules.

Nevesisporites vallatus de Jersey and Paten 1964
Holotype: de Jersey and Paten 1964; pl. 5, figs. 11, 12; size 40 μm



Locality: Durabilla, West Queensland, Australia
Horizon and Age: Jurassic
Diagnostic Features: Size 35-47 μm; cingulam 2-3 μm wide; exine granulate, grana 0.5-1.5 μm grading into bacula 2 x 1 μm.

Genus *Polycingulatisporites* Simoncsics and Kedves emend. Playford and Dettmann 1965
Type Species: *Polycingulatisporites circulus* Simoncsics and Kedves 1961
Locality: Urkut, Hungary
Horizon and Age: Late Jurassic – Early Cretaceous
Diagnostic Features: Cingulate, radial spore; trilete distinct, rays simple or lipped; exine smooth to scabrate; distal-face with a circumpolar ridge which concentrically encircles a polar or sub-polar thickening.

Polycingulatisporites circulus Simoncsics and Kedves emend. Playford and Dettmann 1965
Holotype: Simoncsics and Kedves 1961; pl. 6, figs. 1-6

Locality: Urkut, Hungary
Horizon and Age: Late Jurassic to Early Cretaceous
Diagnostic Features: Size 35-50 μm; equatorial thickening and circumpolar ridge present on distal face.

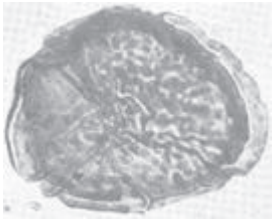
Genus *Pustulatisporites* Potonié and Kremp 1954
Type Species: *Pustulatisporites pustulatus* Potonié and Kremp 1954
Locality: Flöz Ägir, Germany
Horizon and Age: Westphalion B/C, Late Carboniferous
Diagnostic Features: Cingulate, subcircular spore; trilete indistinct due to sculpture; exine beset with large, discrete, verruca like sculpture, flat topped on equator and distal face, proximally scabrate.

Pustulatisporites pustulatus Potonié and Kremp 1954
Holotype: Potonié and Kremp 1954; pl. 20, fig. 93; size 66 μm

Locality: Flöz Ägir, Germany
Horizon and Age: Westphalion B/C, Late Carboniferous
Diagnostic Features: Size 65-70 μm; exine folded along equator, verrucae sub-crescentric, ± 5 μm high x 8-10 μm basal diameter.

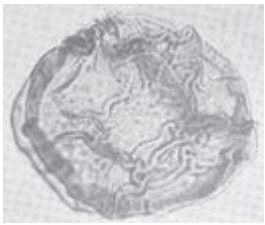
Genus *Rajmahalispora* Tiwari, Tripathi and Kumar 1984
Type Species: *Rajmahalispora rugulata* Tiwari, Tripathi and Kumar 1984
Locality: Borehole RJR-2, sample no. 108, depth 836-842 m, Rajmahal Basin, Bihar, India
Horizon and Age: Dubrajpur Formation, Late Triassic
Diagnostic Features: Cingulate, triangular to subcircular spore; trilete mark distinct, rays with thin lips, slightly elevated, sinuous, reaching up to outer margin of cingulum; exine, rugulate, sometimes anastomose to form reticulation; central body distinct; cingulum smooth, unstructured, usually denser towards the peripheral region.

Rajmahalispora rugulata Tiwari, Tripathi and Kumar 1984
Holotype: Tiwari, Tripathi and Kumar 1984; pl. 1, figs. 1-3; size 69.5 μm; Slide No. BSIP 8089



Locality: Borehole RJR-2, sample no. 108, depth 836-842 m, Rajmahal Basin, Bihar, India
Horizon and Age: Dubrajpur Formation, Late Triassic
Diagnostic Features: Size 62 x 70 μm; trilete rays appearing to exhibit area contagionis at their ends, hence at times a notched condition simulated; exine proximally as well as distally regulate, regulae dense, of various shapes and sizes, straight, curved or wavy, simple or bifurcated, 3 to 2 μm in length and 2 to 3 μm in width; cingulum 2.5 - 8 μm wide.

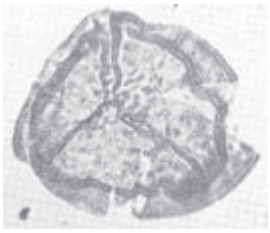
Rajmahalispora reticulata Tiwari, Tripathi and Kumar 1984
Holotype: Tiwari, Tripathi and Kumar 1984; pl. 1, figs. 8, 9; size 59 μm; Slide No. BSIP 8087



Locality: Borehole RJR-2, sample no. 108, depth 836-842 m, Rajmahal Basin, Bihar, India
Horizon and Age: Dubrajpur Formation, Late Triassic

Diagnostic Features: Size 59-67 μm; exine proximally and distally rugulate, some rugulae anastomose to form incomplete to complete reticulum, rugulae 0.6-4 μm wide and 1-3 μm high; cingulum well-defined, 2.5-4.5 μm wide; limbus-like equatorial thickening less than 1 μm thick.

Rajmahalispora triassicus Tiwari, Tripathi and Kumar 1984
Holotype: Tiwari, Tripathi and Kumar 1984; pl. 1, fig. 6; size 68 μm; Slide No. BSIP 8088



Locality: Borehole RJR-2, sample no. 108, depth 836-842 m, Rajmahal Basin, Bihar, India
Horizon and Age: Dubrajpur Formation, Late Triassic
Diagnostic Features: Size 62-77 μm; exine proximally and distally rugulate, rugulae sparse, very few in number may be straight, curved or wavy, simple or bifurcated, 3-6 μm in length and 1-3 μm in width, cingulum well-defined, 3-12.5 μm wide.

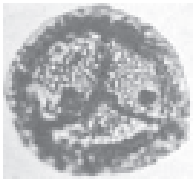
Genus *Reticulatisporites* (Ibrahim) Potonié and Kremp 1954
Type Species: *Reticulatisporites reticulatus* Ibrahim 1933
Locality:Flöz Ägir, Germany
Horizon and Age: Westphalian, B/C, Carboniferous
Diagnostic Features: Cingulate, roundly triangular spore; trilete distinct, rays extend 2/3 of radius; exine with differentially thickend cingulum, peripheral band of thickening in inter-radial part; on distal face with network of muri.

Reticulatisporites reticulatus Ibrahim 1933
Holotype: Ibrahim 1933; pl. 1, fig. 3; size 73 x 81 μm

Locality:Flöz Ägir, Germany
Horizon and Age: Westphalian, B/C, Carboniferous
Diagnostic Features: Size 77-84.5 x 73-100 μm; 2-4 μm wide membranous perisporial thickening around body, reticulum, coarse, lumen 15-23 μm in diameter, muri 3 μm thick.

Genus *Rewanispora* de Jersey 1970
Type Species: *Rewanispora foveolata* de Jersey 1970
Horizon and Age: Rewan Formation, Early Triassic
Locality: Bowan Basin, Australia
Diagnostic Features: Circular to convexly sub-triangular spore; trilete distinct, rays extending almost up to equator; exine two layered, intexine thin, proximally smooth to finely sculptured, on distal face foveolate to vermiculate of variable shape and size, cingulum uniform in thickness.

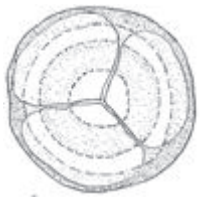
Rewanispora foveolata de Jersey 1970
Holotype: de Jersey 1970; pl. 3, figs. 6,7; size 40 μm



Horizon and Age: Rewan Formation, Early Triassic
Locality: Bowan Basin, Australia
Diagnostic Features: Size 33-61 μm; exoexine cingulate, 3-8 μm wide, distally foveolae 1-2 μm, with vermiculae of variable length and 1-2 μm wide.

Genus *Ringosporites* Tiwari and Rana 1981
Type Species: *Ringosporites ringus* Tiwari and Rana 1981
Locality: Borehole RD-I, sample no. 5, depth 600.58 m, Raniganj Coalfield, West Bengal, India
Horizon and Age: Panchet Formation, Early Triassic
Diagnostic Features: Circular, subcircular to circulo-triangular spore; trilete mark distinct, ray-ends mostly forming curvaturae; exine laevigate on proximal as well as distal side; on distal face equatorial cingulum, a circumpolar and polar radial thickening.

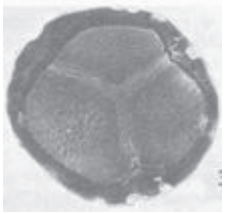
Ringosporites ringus Tiwari and Rana 1981
Holotype: Tiwari and Rana 1981; pl. 1, fig. 17; size 38 x 40 μm, Slide No. BSIP 5642



Locality: Borehole RD-I, sample no. 5, depth 600.58 m, Raniganj Coalfield, West Bengal, India
Horizon and Age: Panchet Formation, Early Triassic
Diagnostic Features: Size 26-40 μm; sub-equatorial thickening 3-4 μm wide, distally situated immediately along the equatorial region, one annular ring 3-5 μm wide on distal face.

Genus *Simeonospora* Balme 1970
Type Species: *Simeonospora khlonovae* Balme 1970
Locality: U.W-A. 57828, Field no K 12-6, Landa Pusha, Surghar Range, West Pakistan
Horizon and Age: Mianwali Formation, Early Triassic
Diagnostic Features: ± Circular spore; trilete distinct, rays with strongly defined sunken areas; exine fairly thick as false equatorial rim; contact area sculptured with flattened rugulae and verrucae.

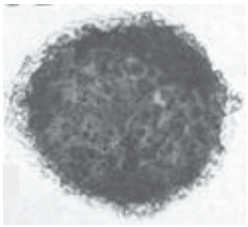
Simeonospora khlonovae Balme 1970
Holotype: *Simeonospora khlonovae* Balme 1970, pl. 2, fig. 3; size 65 μm



Locality: U.W-A. 57828, Field no K 12-6, Landa Pusha, Surghar Range, West Pakistan
Horizon and Age: Mianwali Formation, Early Triassic
Diagnostic Features: Size 65-73 μm; contact area rounded to pentagonal; exine 3-5 μm thick, laevigate out side of contact area, low rugulae on distal face, sculptural elements 0.5-2 μm in diameter.

Genus *Spinotriletes* Mädler 1964
Type Species: *Spinotriletes echinoides* Mädler 1964
Locality: Jena, Thuriangia, Germany
Horizon and Age: Oberer Bunsandstein, Early Triassic
Diagnostic Features: Broadly circular spore; trilete distinct, ray ends forming contact area; exine flanged, sculptured with coni of varied shape and size.

Spinotriletes echinoides Mädler 1964
Holotype: Mädler 1964; pl. 1, fig. 12; size 80 μm



Locality: Jena, Thuriangia, Germany
Horizon and Age: Oberer Bunsandstein, Early Triassic
Diagnostic Features: Size 60-80 μm; coni 4 μm high and wide, 35 in number all over the body.

Genus *Taurocusporites* Stover 1962 emend. Playford and Dettmann 1965
Type Species: *Taurocusporites segmentatus* Stover 1962
Locality: Prince Georges County, Maryland, USA
Horizon and Age: Early Cretaceous
Diagnostic Features: Cingulate, radial broadly subtriangular spore; trilete distinct, rays simple or lipped, a ring-like subequatorial ridge on the distal surface concentrically surrounds a distal polar thickening; proximal exine conspicuously sculptured.

Taurocusporites segmentatus Stover 1962
Holotype: Stover 1962**;** pl. 1, fig. 1; size 44 μm

Locality: Prince Georges County, Maryland, USA
Horizon and Age: Early Cretaceous
Diagnostic Features: Size 40-48 μm; trilete ray thick lipped; exine 2-4 μm thick sculptured with segmented elements of medium size.

Genus *Tethysispora* Vijaya and Tiwari *in* Vijaya, Kumar, Singh and Tiwari 1988

Type Species: *Tethysispora unica* Vijaya and Tiwari *in* Vijaya, Kumar, Singh and Tiwari 1988

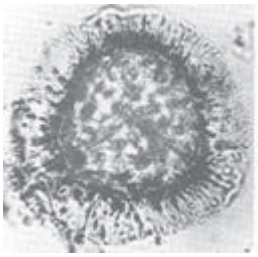
Locality: Sample No. 1, Kalapani Limestone, Malla Johar area, Tethys Himalaya, India

Horizon and Age: Kalapani Limestone Formation, Middle Triassic

Diagnostic Features:Triangular to broadly subtriangular, zonate spore; trilete mark distinct, rays thick lipped,extend up to zona; exine equatorially 1-2 μm thick, proximally micropunctate, on distal face coni, mammoid-shape spines which become bigger and denser at equator; zona thin, associated with ridges.

Tethysispora unica Vijaya and Tiwari *in* Vijaya, Kumar, Singh and Tiwari 1988

Holotype: Vijaya and Tiwari *in* Vijaya, Kumar, Singh and Tiwari 1988; pl. 2, fig. 1; size 65 x 65 μm; Slide No. BSIP 9499



Locality: Sample No. 1, Kalapani Limestone, Malla Johar area,Tethys Himalaya, India

Horizon and Age: Kalapani Limestone Formation, Middle Triassic

Diagnostic Features: Size 46-75 μm; central body 38-50 μm, ornamentation on distal face coni 1.5-2 μm long x 1-2 μm wide and spines 3-7 μm long x 1-2 μm wide; zona 5-17 μm wide.

Genus *Tikisporites* Kumaran *in* Kumaran and Maheshwari 1980

Type Species: *Tikisporites balmei* Kumaran *in* Kumaran and Maheshwari 1980

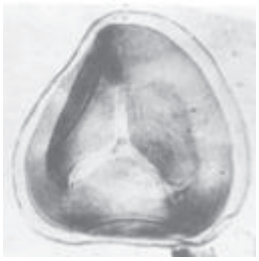
Locality: Eastern bank of Janar Nala about 2 km south-east of Bijouri, District Shahdol, Madhya Pradesh, India

Horizon and Age: Tiki Formation, Late Triassic

Diagnostic Features: Cingulate, triangular to subtriangular spore; trilete mark distinct, rays 2/3 of spore radius or reaching up to central body margin; central body triangular to sub-triangular, exine 2-3 μm thick, distally laevigate and often with kyrtomic folds, proximally laevigate to infrapunctate; cingulum 5-10 μm wide.

Tikisporites balmei Kumaran *in* Kumaran and Maheshwari 1980

Holotype: Kumaran *in* Kumaran and Maheshwari 1980; pl. 5, fig. 7; size 84 μm, Slide No. BSIP 6002



Locality: Eastern bank of Janar Nala about 2 km south-east of Bijouri, District Shahdol, Madhya Pradesh, India

Horizon and Age: Tiki Formation, Late Triassic

Diagnostic Features: Size 75-90 μm; cingulum 5-8 μm; central body exine 1-2 μm thick.

Tikisporites complicatus Kumaran *in* Kumaran and Maheshwari 1980

Holotype: Kumaran *in* Kumaran and Maheshwari 1980; pl. 5, fig. 11; size 90 μm; Slide No. BSIP 5955

Locality: Eastern bank of Janar Nala about 2 km south-east of Bijouri, Shahdol District, Madhya Pradesh, India

Horizon and Age: Tiki Formation, Late Triassic

Diagnostic Features: Size 80-100 μm; central body triangular to subtriangular, exine 2-3 μm thick, both proximally and distally laevigate; distally with regular or irregular, 5-15 μm broad, inter-radial folds, often continue around apices, cingulum 3-8 μm broad, wavy or regular.

STRIATE BISACCATE POLLEN

Genus *Faunipollenites* Bharadwaj emend. Tiwari, Srivastava, Tripathi and Vijaya 1989

Type Species: *Faunipollenites varius* Bharadwaj 1962

Locality: Samla Seam, Samla-Kendra Colliery, East Raniganj Coalfield, West Bengal, India

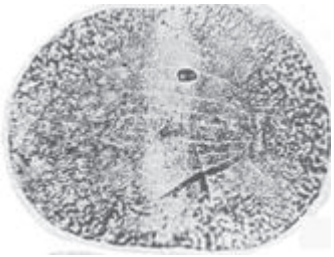
Horizon and Age: Raniganj Formation, Late Permian

Diagnostic Features: Bisaccate, bilateral haploxylonoid pollen; central body ill defined, exine inframicroreticulate, simple or forked horizontal striations on proximal face; distal sulcus uniformly wide, ill defined.

Faunipollenites varius Bharadwaj 1962

Holotype: Bharadwaj 1962; pl. 18, fig. 230 (not traceable); size 106 μm

Lectotype: Bharadwaj 1962; pl. 18, fig. 232; size 64 x 106 μm; Slide No BSIP 9903



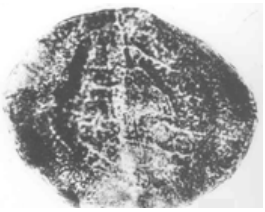
Locality: Samla Seam, Samla-Kendra Colliery, East Raniganj Coalfield, West Bengal, India

Horizon and Age: Raniganj Formation, Late Permian

Diagnostic Features: Horizontally oval; size 60-160 x 70-45 μm; 6-8 horizontal striations, unforked.

Faunipollenites gopadensis Bharadwaj and Srivastava 1969

Holotype: Bharadwaj and Srivastava 1969; pl. 26, fig. 42; size 130 x 107.5 μm; Slide No. BSIP 3199-2



Locality: Nidpur, Sidhi District, Madhya Pradesh, India

Horizon and Age: Nidpur, Early Triassic

Diagnostic Features: Size 127.5-130 x 102.5-107.5 μm; central body transversely oval to rhomboidal, exine microverrucose; sulcus 5-7.5 μm wide.

Genus *Gondwanipollenites* Bose and Maheshwari emend. Maheshwari and Banerji 1975

Type Species: *Gondwanipollenites congoensis* Bose and Maheshwari 1968

Locality: Lunda, after the fall (about 2-1/2 ft thick bed), South of Albertville, Congo, Africa

Horizon and Age: Lukuga Series, Early Permian

Diagnostic Features: Bisaccate, bilateral, usually diploxylonoid pollen; central body distinct, variable in shape, exine inframicroreticulate, simple or forkedd horizontal striations on proximal face, with or without cross-connections; sacci hemispherical to sub-spherical, distal attachment full length, straight or convex, sometimes associated with arcuate folds.

Gondwanipollenites congoensis Bose and Maheshwari emend. Maheshwari and Banerji 1975

Holotype: Bose and Maheshwari 1968; pl. 19, fig. 1; size 192 μm

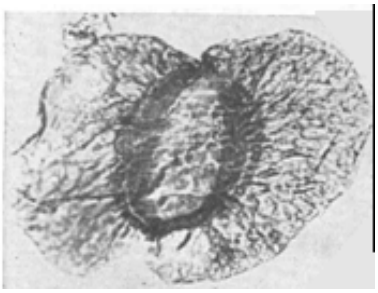
Locality: Lunda, after the fall (about 2-1/2 ft thick bed), South of Albertville, Congo, Africa

Horizon and Age: Lukuga Series, Early Permian
Diagnostic Features: Diploxylonoid; size 192- 217 x 140-172 μm; central body circular, 92-112 x 102-105 μm, proximally 6-11 simple or branched striations; very narrow sulcus.

Gondwanipollenites bengalensis Maheshwari and Banerji 1975
Holotype: Maheshwari and Banerji 1975; pl. 5, fig. 73; size 55 x 87.5 μm; Slide No. BSIP 4573- 47

Locality: North-western branch of Nonia Nala, East of Kumarpur, District Burdwan, West Bengal, India
Horizon and Age: Panchet Formation, Early Triassic
Diagnostic Features: Diploxylonoid; size 80-95 μm, central body circular to vertically oval, 38-57 x 40-53 μm, proximally bearing 6-8 horizontal, simple or forked striation; distal saccus-free-area 20-35 μm wide.

Gondwanipollenites multistriatus Banerji and Maheshwari 1975
Holotype: Banerji and Maheshwari 1975; pl. 3, fig. 31; size 110 μm; Slide No. BSIP 4693-5
Locality: South bank of Sukri River, 0.8 km from Kaima, Auranga Coalfield, Bihar, India
Horizon and Age: Panchet Formation, Early Triassic



Diagnostic Features: Diploxylonoid; size 100-114 μm; central body subcircular to vertically oval, 42-50 μm long, 52-62 μm high, proximally with 10-15 simple or branched horizontal striations, usually with several vertical cross-connections; distal saccus-free-area biconvex, 17-22 μm wide.

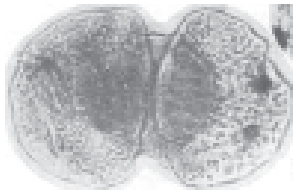
Genus *Hamiapollenites* Wilson 1962
Type Species: *Hamiapollenites saccatus* Wilson 1962
Locality: Flowerpot Shale, Greer County, USA
Horizon and Age: Flowerpot Formation, Permian
Diagnostic Features: Bisaccate bilateral, diploxylonoid pollen; central body circular to oval, exine finely reticulate, proximal surface with 8-12 ribs oriented in long axial direction, slightly taper towards end; sacci reniform; distal surface with 6 to 10 ribs oriented at right angles to the proximal, tapered at ends; distal sulcus obscure to distinct.

Hamiapollenites saccatus Wilson 1962
Holotype: Wilson 1962; pl. 3, fig. 7; size 43.7 x 71.3 μm

Locality: Flowerpot Shale, Greer County, USA
Horizon and Age: Flowerpot Formation, Permian
Diagnostic Features: Size 47-75 μm; central body 31-47 μm long, 30-36 μm wide; sacci 8-24 μm long, 25-30 μm wide.

Genus *Lahirites* Bharadwaj 1962
Type Species: *Lahirites raniganjensis* Bharadwaj 1962
Locality: Dobrana Seam, North Chora Colliery, East Raniganj Coalfield, India
Horizon and Age: Raniganj Formation, Late Permian
Diagnostic Features: Bisaccate, bilateral, diploxylonoid pollen; central body circular to oval, exine infrapunctate to laevigate, horizontal striations on proximal face, occasionally with vertical partitions; distal saccus-free-area wide.

Lahirites raniganjensis Bharadwaj 1962
Holotype: Bharadwaj 1962; pl. 12, fig. 172; size 114 μm



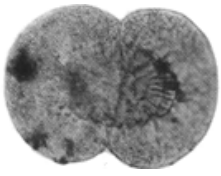
Locality: Dobrana Seam, North Chora Colliery, East Raniganj Coalfield, West Bengal, India
Horizon and Age: Raniganj Formation, Late Permian
Diagnostic Features: Size 120-140 x 65-80 μm; central body circular, exine infrapunctate, 7-9 horizontal striations with many vertical partitions.

Lahirites triassicus Bharadwaj and Tiwari 1977
Holotype: Bharadwaj and Tiwari 1977; pl. 7, fig. 78; size 100 x 60 μm, central body 62 X 50 μm; Slide No. BSIP 5/3 – 4671

Locality: Borehole NCRD-6, sample no. 5, depth 86 m, Raniganj Coalfield, West Bengal, India
Horizon and Age: Panchet Formation, Early Triassic
Diagnostic: Size 100-120 x 58-68 μm; central body subcircular to horizontally elongate with flat ends laterally, 6-9 striations on proximal face; distal saccus-free-area straight, 20-30 μm wide.

Genus *Rhizomaspora* Wilson 1962
Type Species: *Rhizomaspora radiata* Wilson 1962
Locality: Flowerpot Shale, Greer County, USA
Horizon and Age: Flowerpot Formation, Permian
Diagnostic Features: Bisaccate, monosaccoid to diploxylonoid pollen; central body distinct, bears smooth or minutely pitted radiating ribs; saccus reniform, proximally equatorially attached, distally deeply inserted on central body; sulcus narrow.

Rhizomaspora radiata Wilson 1962
Holotype: Wilson 1962; pl. 2, fig. 7; size 157.6 x 118.2 μm



Locality: Flowerpot Shale, Greer County, USA
Horizon and Age: Flowerpot Formation, Permian
Diagnostic Features: Size 140-170 x 80-85 μm; central body 70-82 x 108-120 μm, exine 2 μm thick, infrareticulate, irregularly, radially oriented striations.

Rhizomaspora biharia Banerji and Maheshwari 1975
Holotype: Banerji and Maheshwari 1975; pl. 3, fig. 39; size 84 μm; Slide No. BSIP 4699-1
Locality: South bank of Sukri River, 0.8 km from Kaima, Auranga Coalfield, Bihar, India

Horizon and Age: Panchet Formation, Early Triassic
Diagnostic Features: Diploxylonoid; size 80-98 μm long; central body vertically oval, 36-42 μm, proximally with warty projections of irregular shape and size; sacci reniform, 35-66 μm high; distal saccus-free-area biconvex, generally associated with folds.

Rhizomaspora triassica Tiwari and Rana 1981
Holotype: Tiwari and Rana 1981; pl. 5, fig. 65; size 120.0 x 89.5 μm; Slide No. BSIP 5629

Locality: Borehole RD-l, sample no. 4, depth 532.48 m, Raniganj Coalfield, West Bengal, India
Horizon and Age: Mahadeva Formation, Middle Triassic
Diagnostic Features: Diploxylonoid with big sacci; central body subcircular to oval, 57 x 54 μm in holotype, thin, bearing reticuloid striations on the proximal face; laterally sacci close to each other, saccus reticulation coarse with 2-3 μm wide meshes, thick muri; distal saccus-free-area narrow.

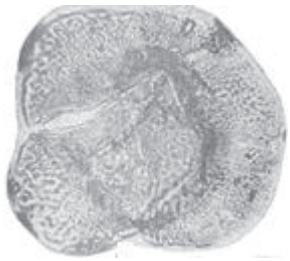
Genus *Striapollenites* Bharadwaj 1962
Type Species: *Striapollenites saccatus* Bharadwaj 1962

Locality: Poniati Seam, Poniati Mines, East Raniganj Coalfield, West Bengal, India
Horizon and Age: Raniganj Formation, Late Permian
Diagnostic Features: Bisaccate, bilateral pollen; central body vertically oval to subcircular, vertically oblique striations on proximal face; distal sulcus ill - defined.

Striapollenites saccatus Bharadwaj 1962
Holotype: Bharadwaj 1962; pl. 21, fig. 273; size 120 x 72 μm, central body 72 x 44 μm

Locality: Poniati Seam, Poniati Mines, East Raniganj Coalfield, West Bengal, India
Horizon and Age: Raniganj Formation, Late Permian
Diagnostic Features: Size 70-120 μm; central body vertically oval with truncate ends, 5-6 vertically oblique striations on proximal face; distal sulcus boat –shaped.

Striapollenites monosaccoides Tiwari and Rana 1981
Holotype: Tiwari and Rana 1981; pl. 4, fig. 56; size 96 x 84 μm, central body 66 μm; Slide No. BSIP 5641



Locality: Borehole RD-l, sample no. 5, depth 600.58 m, Raniganj Coalfield, West Bengal, India
Horizon and Age: Panchet Formation, Early Triassic
Diagnostic Features: Radial monosaccoid pollen; central body subcircular to broadly oval, 8-20 striations on proximal face; saccus with 3 or 4 lobed appearance; distal saccus attachment distinct, biconvex type.

Genus *Striatites* Pant emend. Bharadwaj 1962

Type Species: *Striatites* (*Pityosporites*) *sewardii* (Virkki) Pant 1955
Locality: N.S.W., New Castle, Australia
Horizon and Age: Permo-Carboniferous
Diagnostic Features: Bisaccate, bilateral diploxylonoid pollen; central body oval to circular, exine verrucose, equatorially thick, horizontal striations simple or branched on proximal face with or without vertical partition; distal saccus-free-area furrow like.

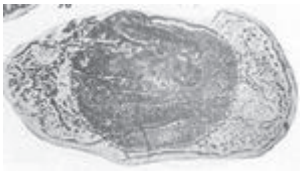
Striatites sewardii (Virkki) Pant 1955
Holotype: Virkki 1937; text-fig. 2A; size 57 μm

Locality: N.S.W., New Castle, Australia
Horizon and Age: Permo-Carboniferous
Diagnostic Features: Size 64-185 μm; central body round, 46-118 μm; distal saccus-free-area narrow longitudinal strip.

Striatites levistriatus Bharadwaj and Tiwari 1977
Holotype: Bharadwaj and Tiwari 1977; pl. 6, fig. 72; size 110 x 60 μm; Slide No. BSIP 5/3-4671

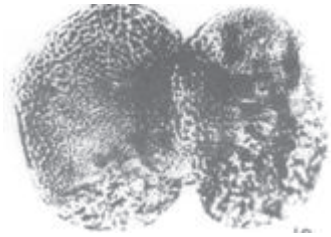
Locality: Borehole NCRD-6, sample no. 5, depth 86 m, Raniganj Coalfield, West Bengal, India
Horizon and Age: Panchet Formation, Early Triassic
Diagnostic Features: Size 83-100 x 54-64 μm; central body circular, 52-64 μm, with 2-3 μm thick equatorial rim, bearing many, faint, indeterminate horizontal striations on proximal face; sacci spherical; distal saccus-free-area 10-16 μm wide.

Striatites panchetensis Tiwari and Rana 1981
Holotype: Tiwari and Rana 1981; pl. 6, fig. 94; size 72 x 48 μm; Slide No. BSIP 5643



Locality: Borehole RD-1, sample no. 5, depth 600.58 m, Raniganj Coalfield, West Bengal, India
Horizon and Age: Panchet Formation, Early Triassic
Diagnostic Features: Size 72-108 μm; central body ± circular, 44-65 μm, 5-7 horizontal striations on proximal face, tendency towards taeniae formation at places; sacci narrow, laterally connected by 1-2 μm wide strip.

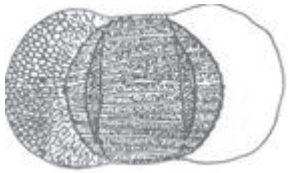
Striatites sidhiensis Bharadwaj and Srivastava 1969
Holotype: Bharadwaj and Srivastava 1969; pl. 25, figs. 18,19; size 127.5 x 65 μm; Slide No. BSIP 3207-4



Locality: Nidpur, Sidhi District, Madhya Pradesh, India
Horizon and Age: Nidpur, Early Triassic
Diagnostic Features: Size 92-127 x 60-85 μm; central body subcircular to vertically oval, 9-10 striations with vertical partitions; sulcus 10-15 μm wide.

Genus *Striatoabietites* Sedova emend. Hart 1964
Type Species: *Striatoabietites brickii* Sedova 1956
Locality: USSR
Horizon and Age: Kazanian-Kungurian, Permian
Diagnostic Features: Bisaccate, diploxylonoid pollen; central body rounded to spherical; exine inframicroreticulate with many horizontal striations, some may be branched, short germinal furrow in between striations on proximal face; sacci hemispherical to semicircular, saccus intrareticulation coarse; sulcus distinct, wide and straight.

Striatoabietites brickii Sedova 1956
Holotype: Sedova 1956; pl. 41, fig. 5; size 120.6 x 71.7 μm



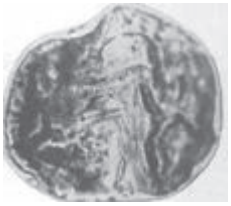
Locality: USSR
Horizon and Age: Kazanian-Kungurian, Permian
Diagnostic Features: Size 99.2-130 μm; central body subcircular, 55.7-71.7 μm, 6 or more horizontal striations; sulcus 20-35 μm wide.

Genus *Striatopiceites* Sedova 1956
Type Species: *Striatopiceites suchonensis* Sedova 1956
Locality: USSR
Horizon and Age: Kajanian, Permian
Diagnostic Features: Bisaccate, haploxylonoid pollen; central body indistinct, vertically oval; exine inframicroreticulate with many horizontal striations; sacci less than hemispherical, saccus intrareticulation medium; sulcus indistinct.

Striatopiceites suchonensis Sedova 1956
Holotype: Sedova 1956; pl. 41, fig. 7; size 83 – 110 μm

Locality: USSR
Horizon and Age: Kajanian, Permian
Diagnostic Features: Size 80-115 μm; zone of saccus attachment accomponied by narrow folds; sulcus 10-15 μm wide.

Striatopiceites clarus Kar 1970
Holotype: Kar 1970; pl. 2, fig. 40; size 72 x 64 μm; Slide No. BSIP 3470



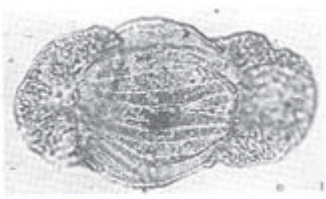
Locality: Bore-core No. RE9, depth 83 m, Raniganj Coalfield, West Bengal, India
Horizon and Age: Panchet Formation, Early Triassic
Diagnostic Features: Size 65-95 x 40-70 μm; central body ill-defined, vertically oval, exine inframicroreticulate, 6-12 horizontal striations; sacci hemispherical, distal attachment distinct and straight.

Genus *Striatopodocarpites* Soritschewa and Sedova emend. Bharadwaj 1962
Type Species: *Striatopodocarpites* (*Taeniaesporites*) *antiquus* Leschik 1956
Locality: Neuhof bei Fulda, Germany
Horizon and Age: Zechstein, Late Permian
Diagnostic Features: Bisaccate, bilateral diploxylonoid pollen; central body circular to vertically oval, exine infra-microreticulate, number of horizontal striations on proximal face; saccus distally inclined leaving wide saccus-free-area.

Striatopodocarpites antiquus (Leschik) Soritschewa and Sedova 1954
Holotype: Leschik 1956; pl. 22, fig. 4; size 140 μm

Locality: Neuhof bei Fulda, Germany
Horizon and Age: Zechstein, Late Permian
Diagnostic Features: Size 101 x 140 μm; central body oval, exine granular, 8-10 striations.

Striatopodocarpites auriculatus Vijaya and Tiwari *in* Vijaya, Kumar, Singh and Tiwari 1988
Holotype: Vijaya and Tiwari 1988; pl. 5, fig. 1; size 46 x 80 μm; Slide No. BSIP 9499

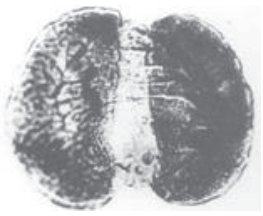


Locality: Sample No. 1, Kalapani Limestone, Malla Johar area, Tethys Himalaya, India
Horizon and Age: Kalapani Limestone Formation, Middle Triassic
Diagnostic Features: Size 42-46 x 78-80 μm; exine 1 μm thick, 10-22 striations, no vertical partitions; sacci auriculate laterally 10-20 μm apart, distally inclined; sulcus 15-25 μm wide.

Striatopodocarpites dubrajpurensis Tripathi, Tiwari and Kumar 1990
Holotype: Tripathi, Tiwari and Kumar 1990; pl. 3, fig. 10; size 91 x 71 μm; Slide No. BSIP 9323

Locality: Borehole RJR-2, sample No.32, depth 398.20-398.99 m, near Kazigaon, Rajmahal Basin, Bihar, India
Horizon and Age: Dubrajpur Formation, Late Triassic
Diagnostic Features: Size 91-126 x 57-67.5 μm; central body circular, bearing 15-21 striations; saccus intrareticulation coarse, muri thick, lumen 3-6 μm in diameter; distal sulcus 15-30 μm wide.

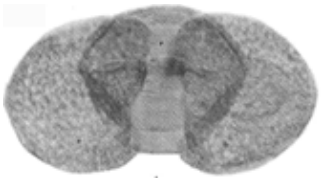
Striatopodocarpites nidpurensis Bharadwaj and Srivastava 1969
Holotype: Bharadwaj and Srivastava 1969; pl. 25, fig. 32; size 105 x 85 μm; Slide No. BSIP 3206



Locality: Nidpur, Sidhi Dstrict, Madhya Pradesh, India
Horizon and Age: Nidhpur, Early Triassic
Diagnostic Features: Size 87.5-130 x 40-85 μm; central body rohmboidal, 45-75 x 40-70 μm, 7-9 horizontal striations; saccus pitcher-shaped; sulcus 5-15 μm wide.

Genus *Strotersporites* Wilson 1962
Type Species: *Strotersporites communis* Wilson 1962
Locality: Flowerpot Shale, Greer County, USA
Horizon and Age: Flowerpot Formation, Permian
Diagnostic Features: Bisaccate, bilateral diploxylonoid pollen; central body distinct, exine laevigate or granular, 10-14 horizontal striations on proximal face, a rupture or striae present in the mideal rib; sacci reniform; sulcus obscure.

Strotersporites communis Wilson 1962
Holotype: Wilson 1962; pl. 2, fig. 1; size 157.5 μm



Locality: Flowerpot Shale, Greer County, USA
Horizon and Age: Flowerpot Formation, Permian
Diagnostic Features: Size 120-185 μm; central body 65-80 μm, proximally ornamented with 10-14 flat ridges, often bifurcate, exine finely pitted; sacci reniform.

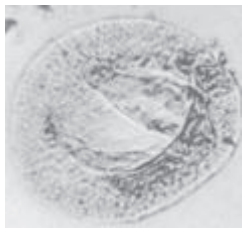
Strotersporites raniganjensis Kar 1970
Holotype: Kar 1970; pl. 2, fig. 37; size 80 x 44 μm, Slide No. BSIP 3478

Locality: Bore-core no. RE 9, depth 84 m, Raniganj Coalfield, West Bengal, India
Horizon and Age: Panchet Formation, Early Triassic
Diagnostic Features: Size 60-90 x 50-78 μm; central body mostly vertically oval, 6-13 horizontal striations.

NONSTRIATE BISACCATE POLLEN

Genus *Accinctisporites* Leschik 1955
Type Species: *Accinctisporites ligatus* Leschik 1955
Locality: Neuewelt bei Basel, Switzerland
Horizon and Age: Keuper, Late Triassic
Diagnostic Features: Circular to oval, bisaccate pollen; central body flat, exine thick, indistinctly sculptured, radially 12 μm wide and parallel encroachment of saccus on body.

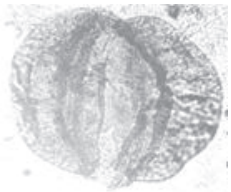
Accinctisporites ligatus Leschik 1955
Holotype: Leschik 1955; pl. 6, fig. 17; size 50 x 42 μm



Locality: Neuewelt bei Basel, Switzerland
Horizon and Age: Keuper, Late Triassic
Diagnostic Features: Circular; central body occupies major part of grain; exine 1.5 μm thick; saccus encroachment around body radially, 12 μm wide.

Genus *Alisporites* Daugherty emend. Jansonius 1971
Type Species: *Alisporites opii* Daugherty 1941
Locality: Versteinerter Wald Nantional Monument, Arizona, USA
Horizon and Age: Chinle Formation, Late Jurassic
Diagnostic Features: Spherical to ovate, bisaccate pollen; central body distinct, vertically oval, exine inframicroreticulate; sacci ± reniform, saccus intrareticulation fine to medium; distal saccus-free-area narrow.

Alisporites opii Daugherty emend. Jansonius 1971
Holotype: Daugherty 1941; pl. 34, fig. 2; size 80 x 100 μm

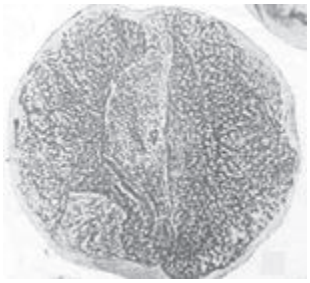


Locality: Versteinerter Wald Nantional Monument, Arizona, USA
Horizon and Age: Chinle Formation, Late Jurassic
Diagnostic Features: Size 100-200 x 60-80 μm; central body oval to circular, 50-75 μm; exine 2 μm thick.

Alisporites asansolensis Maheshwari and Banerji 1975
Holotype: Maheshwari and Banerji 1975; pl. 3, fig. 47; size 67 x 90 μm; Slide No. BSIP 4574-16

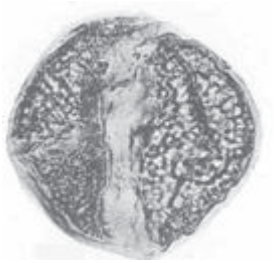
Loca1ity: North-western branch of Nonia Nala, East of Kumarpur, District Burdwan, West Bengal
Horizon and Age: Panchet Formation, Early Triassic
Diagnostic Features: Size 70-108 μm; central body subcircular, 52-60 μm, exine thin, sparsely punctate, usually thickened along periphery; sacci leathery, intrareticulation with thin muri; saccus-free-area often biconvex.

Alisporites damudicus Tiwari and Rana 1981
Holotype: Tiwari and Rana 1981; pl. 6, fig. 90; size 90 x 97.5 μm; Slide No. BSIP 5631



Locality: Borehole RD-l, sample no. 4, depth 532.48 m, Raniganj Coalfield, West Bengal, India
Horizon and Age: Mahadeva Formation, Middle Triassic
Diagnostic Features: Size 60-97.5 μm; subcircular pollen with notched lateral sides; central body apparently vertically oval, thin, without a marked out line.

Alisporites grobus Bharadwaj and Tiwari 1977
Holotype: Bharadwaj and Tiwari 1977; pl. 7, fig. 86; size 85 x 75 μm; Slide No. BSIP 7/1 – 4673



Locality: Borehole NCRD-6, sample no. 7, depth 123.50 m, Raniganj Coalfield, West Bengal, India
Horizon and Age: Panchet Formation, Early Triassic
Diagnostic Features: Size 75-115 x 47-74 μm; circular to sub-oval; central body thin, vertically oval with round ends, exine finely inframicroreticulate; saccus intrareticulation coarse; distal sulcus 8-12 μm wide.

Alisporites indicus Bharadwaj and Srivastava 1969
Holotype: Bharadwaj and Srivastava 1969; pl. 28, fig. 78; size 65 x 47.5 μm; Slide No. BSIP 1943-9

Locality: Nidpur, Sidhi District, Madhya Pradesh, India
Horizon and Age: Nidpur, Early Triassic
Diagnostic Features: Size 42-87.5 μm; central body vertically oval, with broad or truncate ends, exine inframicroreticulate; sacci coarsely intrareticulate; sulcus uniformly broad with thickened edges without median groove.

Alisporites ovalis Kumar 1973
Holotype: Kumar 1973; pl. 5, fig. 112; size 89 x 61.5 μm; Slide No. BSIP 3421/2

Locality: Harad River, near Hathnapur, Narsinghpur District, Madhya Pradesh, India
Horizon and Age: Jabalpur Formation, Jurassic
Diagnostic Features: Size 60-112 x 52.5-65 μm; central body broadly oval, exine 1.5 μm thick; saccus intrareticulation coarse.

Genus *Angustisulcites* Freudenthal emend. Visscher 1966
Type Species: *Angustisulcites klausii* Freudenthal 1964
Locality: Hengelo Salt deposit, south of the city Hengelo, Oerijssel, The Netherland
Horizon and Age: Upper Bunter, Early Triassic
Diagnostic Features: Diploxylonoid, bisaccate pollen; central body oval to rhombic, equatorially thickened, asymmetrical trilete mark on proximal face, two longitudinal sutures situated equatorially; distal sulcus wide associated with folds.

Angustisulcites klausii Freudenthal 1964
Holotype: Freudenthal 1964; pl. 2, fig. 6; size 46 x 74 μm

Locality: Hengelo salt deposit, south of the city Hengelo, Oerijssel, The Netherland
Horizon and Age: Upper Bunter, Early Triassic
Diagnostic Features: Size 57-95 μm; central body rhombic, exine 3- 4.5 μm thick; sacci laterally interconnected; distal sulcus biconvex.

Genus *Ashmoripollis* Helby 1987
Type Species: *Ashmoripollis reducta* Helby 1987
Locality: Briagadier Beds, Carnarvon Basin, Well NR5, 2922 m depth, North-western Australia
Horizon and Age: Rhaetian to basal Hettangian, Late Triassic
Diagnostic Features: Bisaccate, vertically oval pollen, sacci reduced to crescent shaped rim, with inflation usually confined to a small mamillate protrusion in the mid equatorial portion of each saccus; distal surface of body marked by labrate saccus free area (leptoma).

Ashmoripollis reducta Helby 1987
Holotype: Helby 1987; fig. 1A; size 59 x 55 μm

Locality: Briagadier Beds, Carnarvon Basin, Well NR5, 2922 m depth, North-western Australia
Horizon and Age: Rhaetian to basal Hettangian, Late Triassic
Diagnostic Features: Size 43-81 x 41-72 μm; body exine very finely inframicroreticulate; sulcus (leptoma) bounded by labra, up to 7 μm wide, sulcus width vary up to 15 μm in the middle part.

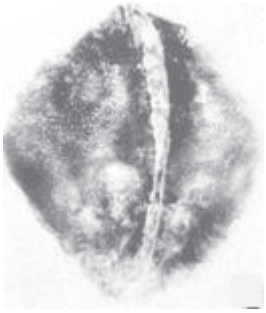
Genus *Brachysaccus* Mädler 1964
Type Species: *Brachysaccus ovalis* Mädler 1964
Locality: Jena, Thuringia, Germany
Horizon and Age: Upper Buntsandstein, Early Triassic
Diagnostic Features: Bisaccate longitudinally oval pollen; central body indistinct, exine inframicroreticulate; sacci less inflated, saccus intrareticulation medium-sized with radially arranged (instead of polygonal) thick muri and elongated lumen giving a columellate appearance to the saccus at the margin; distal sulcus full length, medianly placed.

Brachysaccus ovalis Mädler 1964
Holotype: Mädler 1964; pl. 3, fig. 5; size 166 x 128 μm

Locality: Jena, Thuringia, Germany
Horizon and Age: Upper Buntsandstein, Early Triassic
Diagnostic Features: Size 140-166 μm high x 128-130 μm wide; central body exine thick and fragile

giving a columellate appearance at the margin; sulcus 9-14 μm wide.

Brachysaccus indicus Kumaran and Maheshwari 1980
Holotype: Kumaran and Maheshwari 1980; pl. 7, fig. 2; size 100 μm; Slide No. BSIP 5969



Locality: Eastern bank of Janar Nala about 2 km south-east of Bijouri, District Shahdol, Madhya Pradesh, India
Horizon and Age: Tiki Formation, Late Triassic
Diagnostic Features: Size 100-115 μm long x 92-100 μm broad; exine about 2 μm thick, with fine intrareticulum; sulcus 4-6 μm wide, extending full length of central body.

Brachysaccus triassicus Tripathi, Tiwari and Kumar 1990
Holotype: Tripathi, Tiwari and Kumar 1990; pl. 2, fig. 16; size 87.5 x 92.5 μm; Slide No. BSIP 8472

Locality: Borehole RJR-2, sample no. 32, depth 398.20-398.99 m, near Kazigaon, Rajmahal Basin, Bihar, India
Horizon and Age: Dubrajpur Formation, Late Triassic
Diagnostic Features: Size 92.5-120 μm long x 85-115 μm broad, broadly oval; central body outline generally distinct, sometimes obscure; sulcus10-25 μm wide and full length.

Genus *Caytonipollenites* Couper 1958
Type Species: *Caytonipollenites* (*Pityosporites*) *pallidus* (Reissenger) Couper 1958
Locality: Germany
Horizon and Age: Liassic, Early Jurassic
Diagnostic Features: Bisaccate haploxylonoid pollen; central body oval, exine thin, scabrate to smooth; sacci slightly inclined towards inner side on distal face; sulcus straight, full length.

Caytonipollenites pallidus (Reissenger) Couper 1958
Holotype: Reissinger 1938; not figured

Locality: Germany
Horizon and Age: Liassic, Early Jurassic
Diagnostic Features: Size 20-38 μm; exine 0.5-0.75 μm thick.

Genus *Cedripites* Wodehouse 1933
Type Species: *Cedripites eocenicus* Wodehouse 1933
Locality: Colorado, USA
Horizon and Age: Green River Formation, Eocene
Diagnostic Features: Bisaccate pollen; central body 46 μm, exine finely inframicroreticulate to granulate, a ridge appear around equator; sacci large flaccid, loosely enveloping very close on proximal face.

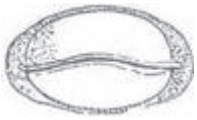
Cedripites eocenicus Wodehouse 1933
Holotype: Wodehouse 1933; pg. 489, fig. 13; size 51-56 μm

Locality: Colorado, USA
Horizon and Age: Green River Formation, Eocene
Diagnostic Features: Size 50-60 μm; central body 45-60 μm, exine 1 μm thick; sacci large, enclosing major part of the central body.

Genus *Colpectopollis* Pflüg emend. Visscher 1966
Type Species: *Colpectopollis occupatus* Pflüg 1953
Locality: Wehmingen bei Sarstedt, Hannover, Germany

Horizon and Age: Liassic, Early Jurassic
Diagnostic Features: Bilateral, elliptical bisaccate haploxylonoid pollen; central body oval, exine thick; sacci less than hemispherical, laterally interconnected; sulcus on distal face indistinct, fusiform.

Colpectopollis occupatus Pflüg 1953
Holotype: Pflüg 1953; pl. 17, figs. 7-9; size 25 μm
Locality: Wehmingen bei Sarstedt, Hannover, Germany



Horizon and Age: Liassic, Early Jurassic
Diagnostic Features: Size 20-30 μm; germinal crest on central body proximally; sacci rudimentary.

Genus *Cristatisaccus* Mädler 1964
Type Species: *Cristatisaccus margaritatus* Mädler 1964
Locality: Jena, Thuringia, Germany
Horizon and Age: Oberer Buntsandstein, Early Triassic
Diagnostic Features: Bisaccate pollen; central body high, margin with perforated papillae or rugulae, wide ridge around body equator; sulcus wide and full length.

Cristatisaccus margaritatus Mädler 1964
Holotype:*Cristatisaccus margaritatus* Mädler 1964; pl. 4, fig. 8; size 78 μm

Locality: Jena, Thuringia, Germany
Horizon and Age: Oberer Buntsandstein, Early Triassic
Diagnostic Features: Size 26 x 38 μm; central body vertically oval, 14 μm broad ridge quatorially; distal sulcus 10-15 μm wide.

Genus *Cuneatisporites* Leschik 1955
Type Species: *Cuneatisporites radialis* Leschik 1955
Locality: Neuewelt, bei Basal, Switzerland
Horizon and Age: Keuper, LateTriassic
Diagnostic Features: Diploxylonoid, bisaccate pollen;central body ovalish to round, exine finely inframicroreticulate; sacci more than hemispherical, laterally connected; sulcus wide, biconcave, associated with semilunar folds.

Cuneatisporites radialis Leschik 1955
Holotype: Leschik 1955; pl. 10, fig. 6; size 70 x 120 μm

Locality: Neuewelt, bei Basal, Switzerland
Horizon and Age: Keuper, LateTriassic
Diagnostic Features: Central body oval, exine 2 μm thick, finely granulose.

Cuneatisporites mirabilis Tiwari and Rana 1981
Holotype:Tiwari and Rana 1981; pl. 6, fig. 85; size 96 x 56.5 μm; Slide No. BSIP 5638

Locality: Borehole RD-l, sample no. 5, depth 600.58 m; Raniganj Coalfield, West Bengal, India
Horizon and Age: Panchet Formation, Early Triassic
Diagnostic Features: Size 96 x 54 μm; slightly diploxylonoid; central body big, subcircular, exine finely inframicropunctate; sacci hemispherical zone of saccus attachment associated with semilunar folds; distal sulcus slightly biconvex, 32 μm wide.

Genus *Cyclosaccus* Mädler 1964
Type Species: *Cyclosaccus podocarpoides* Mädler 1964
Locality: Harz Mountain, 123 km NW Jena, Germany
Horizon and Age: Unterer Keuper, Late Triassic

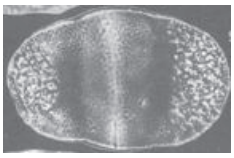
Diagnostic Features: Bisaccate, haploxylonoid pollen; central body big, subcircular, exine rough with mud crack pattern.

Cyclosaccus podocarpoides Mädler 1964
Holotype: Mädler 1964; pl. 12, fig. 10; size 83 μm
Locality: Harz Mountain, 123 km NW Jena, Germany

Horizon and Age: Unterer Keuper, Late Triassic
Diagnostic Features: Size 68-76 μm; central body subcircular, exine 2 μm thick; sulcus ill-defined.

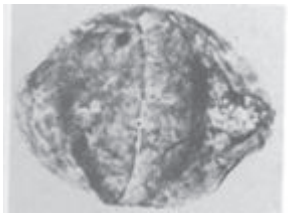
Genus *Falcisporites* Leschik emend. Klaus 1963
Type Species: *Pityosporites zapfei* Potonié and Klaus 1954
Locality: Alpinen Salzgebirges, Austria
Horizon and Age: Buntsandstein, Early Triassic
Diagnostic Features: Bisaccate, globular pollen; central body round to oval, exine thin, faintly scabrate; sacci on distal face convergent; sulcus wide.

Falcisporites zapfei Leschick emend. Klaus 1963
Holotype: *Pityosporites zapfei* Potonié and Klaus 1954; pl. 10, fig. 9; size 112 x 72 μm



Locality: Alpinen salzgebirges, Austria
Horizon and Age: Buntsandstein, Early Triassic
Diagnostic Features: Size 40-70 x 55-120 μm; central body vertically oval; distal sulcus with median groove.

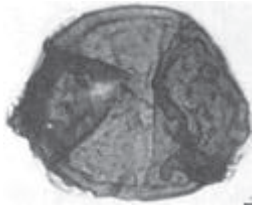
Falcisporites minutisaccus Kumaran and Maheshwari 1980
Holotype: Kumaran and Maheshwari 1980; pl. 7, fig. 7; size 65 μm; Slide No. BSIP 5916



Locality: Eastern bank of Janar Nala about 2 km southeast of Bijouri, District Shahdol, Madhya Pradesh, India
Horizon and Age: Tiki Formation, Late Triassic
Diagnostic Features: Size 63-72 μm; central body distinct, vertically oval, 42-50 μm long, 35-40 μm broad; sacci small and less inflated; distal sulcus distinct, narrow and fusiform.

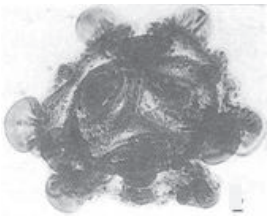
Genus *Granosaccus* Mädler 1964
Type Species: *Granosaccus sulcatus* Mädler 1964
Locality: Harz Mountain, Germany
Horizon and Age: Lower Keuper, Late Triassic
Diagnostic Features: Bisaccate, broadly circular to rounded pollen; central body big, circular to ovalish, exine thick, infragranulose to infrapunctate; sacci rudimentary, covering maximum part of body; distal sulcus narrow to wide.

Granosaccus sulcatus Mädler 1964
Holotype: Mädler 1964; pl. 12, fig. 6; size 60 μm



Locality: Harz Mountain, Germany
Horizon and Age: Lower Keuper, Late Triassic
Diagnostic Features: Size 60-72 x 54-68 μm; exine 3 μm thick, infrapunctate with grana, grana 6 μm in diameter; sulcus 8 μm wide in center, narrowing at lateral ends.

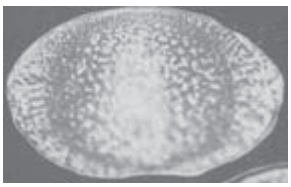
Granosaccus reniformis Misra, Prasad and Rawat 1996
Holotype: Misra, Prasad and Rawat 1996; pl. 1, fig. 2; size 60 x 52 μm



Locality: Jaisalmer Basin, Western Rajasthan, India
Horizon and Age: Carnian, Late Triassic
Diagnostic Features: Generally in tetrad; size 42-51 x 19-24 μm; central body exceptionally large, exine ornamented with varied sculptural elements – gemma, pila and verrucae alongwith 3 to 4 warts of sacci size, inbetween granulate; sacci bean or kidney shaped, 8-12 μm; distally placed, wide sulcus.

Genus *Klausipollenites* Jansonius 1962
Type Species: *Pityosporites schaubergeri* Potonié and Klaus 1954
Locality: Salzberg Hallstatt, Austria
Horizon and Age: Buntsandstein, Early Triassic
Diagnostic Features: Biasccate, bluntly oval pollen; central body oval, exine finely reticulate; sacci crescent to half circular, distally displaced, merging almost with central body outline.

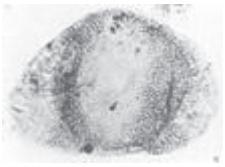
Klausipollenites schaubergeri Potonié and Klaus1954
Holotype: Potonié and Klaus1954; pl. 10, fig. 7; size 40 x 65 μm



Locality: Locality: Salzberg Hallstatt, Austria
Horizon and Age**:** Buntsandstein, Early Triassic
Diagnostic Features: Size 25-70 μm; central body vertically oval, exine less than 1 μm thick with irregular reticulam; distal sulcus wide.

Genus *Krempipollenites* Tiwari and Vijaya 1995
Type Species: *Krempipollenites indicus* Tiwari and Vijaya 1995
Locality: Borehole PGD-2, depth 358.50 m, Panagarh Basin, West Bengal, India
Horizon and Age: Panchet Formation, Early Triassic
Diagnostic Features: Haploxylonoid, bisaccate horizontally oval pollen; central body distinct, exine finely inframicroreticulate; sacci crescent-shaped, sacci bases distally merging with sexine, distal saccus-free-area apparently wide and full-length of the body.

Krempipollenites indicus Tiwari and Vijaya 1995
Holotype: Tiwari and Vijaya 1995; pl. 13, fig. 1; size 44 x 66 μm; Slide No. BSIP 11459



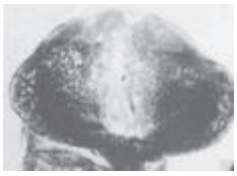
Locality: Borehole PGD-2, depth 358.50 m, Panagarh Basin, West Bengal, India
Horizon and Age: Panchet Formation, Early Triassic
Diagnostic Features: Size 40-80 μm; sacci laterally connected, 1-2 μm wide; distal saccus 10-15 μm broad.

Genus *Minutosaccus* Mädler 1964
Type Species: *Minutosaccus acutus* Mädler 1964
Locality: Jena, Thuringia, Germany
Horizon and Age: Muschelkalk, Middle Triassic
Diagnostic Features: Diploxylonoid, bisaccate pollen; central body distinct, exine inframicroreticulate; sacci small less than hemisphere.

Minutosaccus acutus Mädler 1964
Holotype: Mädler 1964; pl. 7, fig. 7; size 46 μm

Locality: Jena, Thuringia, Germany
Horizon and Age: Muschelkalk, Middle Triassic
Diagnostic Features: Central body 30 x 33 μm; sacci 18-20 x 20-46 μm; sulcus 2 μm wide.

Minutosaccus maedleri Kumaran and Maheshwari 1980
Holotype: Kumaran and Maheshwari 1980; pl. 7, fig. 6; size 65 μm, Slide No. BSIP 5983



Locality: Eastern bank of Janar Nala about 2 km southeast of Bijouri, District Shahdol, Madhya Pradesh, India
Horizon and Age: Tiki Formation, Late Triassic
Diagnostic Features: Size 45-65 μm; central body transversely elongate-oval to subcircular, exine 1-2 μm thick; sacci small, less inflated; distal sulcus 1-4 μm wide.

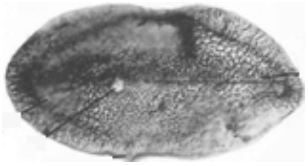
Genus *Nidipollenites* Bharadwaj and Srivastava 1969
Type Species: *Nidipollenites monoletus* Bharadwaj and Srivastava 1969
Locality: Nidpur, Sidhi District, Madhya Pradesh, India
Horizon and Age: Nidpur, Early Triassic
Diagnostic Features: Bisaccate, diploxylonoid pollen; central body vertically oval to sub-circular; exine verrucose, monolet mark on proximal face; saccus thin; distal sulcus wide.

Nidipollenites monoletus Bharadwaj and Srivastava 1969
Holotype: Bharadwaj and Srivastava 1969; pl. 24, fig. 13; size 127.5 x 87.5 μm; Slide No. BSIP 3196-10

Locality: Nidpur, Sidhi District, Madhya Pradesh, India
Horizon and Age: Nidpur, Early Triassic
Diagnostic Features: Size 107-127 x 60-109 μm; central body fusiform, exine thin; saccus intramicroreticulation medimuly coarse, distally saccus attachachment straight; sulcus 12.5 -15 μm wide.

Genus *Ovalipollis* Krutzsch emend. Pocock and Jansonius 1969
Type Species: *Ovalipollis ovalis* Krutzsch 1955
Locality: Bohrung Altmarks, Germany
Horizon and Age: Liassic, Jurassic
Diagnostic Features: Longitudinally oval bisaccate pollen; central body rhomboish to oval, exine thin, infragranulose; straight slit extend on distal face of body.

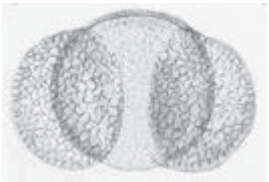
Ovalipollis ovalis Krutzsch 1955
Holotype: Krutzsch 1955; pl. 1, fig. 2; size 17 x 114.4 μm



Locality: Bohrung Altmarks, Germany
Horizon and Age: Liassic, Jurassic
Diagnostic Features: Size 50 x 90-33-60 μm; central body oval, proximally flat, two tenuitas 12-30 μm in diameter at polar ends on proximal face, distally a longitudinal furrow, 39-90 μm long, flanked by lips.

Genus *Pinuspollenites* Raatz 1937
Type Species: *Pinuspollenites* (*Pollenits*) *labdacus* Potonié 1931
Locality: Vilhe b. Köln, Beisslsgrube, Germany
Horizon and Age: (Oligocene) Miocene
Diagnostic Features: Horizontally oval diploxylonoid pollen; central body subcircular, big, exine inframicroreticulate to microverrucose; sacci more than hemispherical, proximally equatorially attached, on distal face pandently hanged.

Pinuspollenites labdacus Raatz 1937
Lectogenotype: Potonié and Venitz 1934; pl. 2, fig. 25; size 72 μm

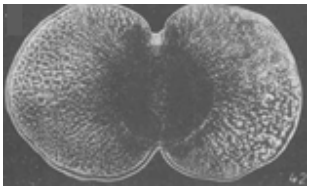


Locality: Vilhe b. Köln, Beisslsgrube, Germany
Horizon and Age: (Oligocene) Miocene

Diagnostic Features: Size 70-100 μm; central body bigger than sacci; saccus intrareticulation coarse, distal sulcus broad at lateral ends.

Genus *Platysaccus* Naumova emend. Potonié and Klaus 1954
Type Species: *Platysaccus papilionis* Potonié and Klaus 1954
Locality: Salzberg Hallstatt, Austria
Horizon and Age: Late Permian
Diagnostic Features: Diploxylonoid, bilateral, bisaccate pollen; central body circular to subcircular, exine inframicroreticulate; sacci more than hemispherical, with medium intrareticulation, distal attachment along a shorter chord.

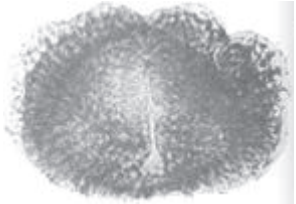
Platysaccus papilionis Potonié and Klaus 1954
Neotype: Potonié and Klaus 1954; pl. 10, fig. 12; size 106 μm



Locality: Salzberg Hallstatt, Austria
Horizon and Age: Late Permian
Diagnostic Features: Size 33-200 μm; central body circular, equatorially thickened; sacci with radial pattern around central body.

Genus *Plicatisaccus* Pautsch 1971
Type Species: *Plicatisaccus badius* Pautsch 1971
Locality: Trzciana bei Mielec, South Poland
Horizon and Age: Keuper, Late Triassic
Diagnostic Features: Bilateral, haploxylonoid, bisaccate pollen; central body vertically oval, exine infragranulose; sacci radially folded, equatorially over-lap as ruff around body.

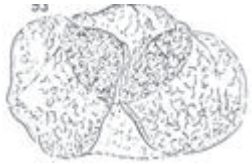
Plicatisaccus badius Pautsch 1971
Holotype: Pautsch 1971; pl. 18, fig. 5; size 60 μm



Locality: Trzciana bei Mielec, South Poland
Horizon and Age: Keuper, Late Triassic
Diagnostic Features: Size 53-73 μm; central body 35-45 μm, saccus equatorially overlap, 4-8 μm wide; on distal face narrow longitudinal slit.

Genus *Podocarpeaepollenites* Thiergart 1949
Type Species: *Podocarpeaepollenites* (*Pollenites*) *trialatus* Thiergart 1949
Locality: Blatt Langenhagen, Germany
Horizon and Age: Dögger, Jurassic
Diagnostic Features: Bisaccate diploxylonoid big pollen; central body broadly circular; sacci more than hemispherical, attached with shorter axis on body.

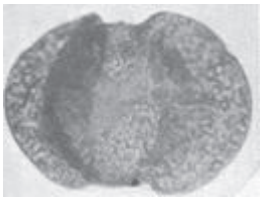
Podocarpeaepollenites trialatus Thiergart 1949
Holotype: Thiergart 1949; pl. 2, fig. 20; size 110 μm



Locality: Blatt Langenhagen, Germany
Horizon and Age: Dögger, Jurassic
Diagnostic Features: Size 70-110 μm; central body relatively small, 30-35 μm; exine $\pm$ 1 μm thick, infragranulose; sacci widely separated on distal face.

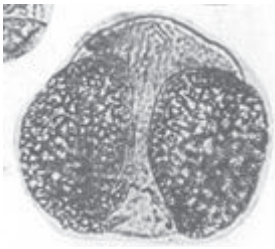
Genus *Podocarpidites* Cookson ex Couper 1953
Type Species: *Podocarpidites ellipticus* Cookson 1947
Locality: Kerguelen, Archipelago
Horizon and Age: Tertiary
Diagnostic Features: Bisaccate, circular to broadly elliptical pollen; central body circular to oval, exine smooth to granular, indistinct to prominent, marginal crest around body; sacci attached not to full length of body height; sulcus wide.

Podocarpidites ellipticus Cookson 1947
Holotype: Cookson 1947; pl. 13, figs. 5-7; size 45-61 μm
Lectotype: Cookson 1947; pl.13, fig.6



Locality: Kerguelen, Archipelago
Horizon and Age: Tertiary
Diagnostic Features: Size 29-42 x 26-40 μm; central body slightly angular, exine finely granular; sulcus 18 μm wide.

Podocarpidites alareticulosus Sah and Jain 1965
Holotype: Sah and Jain 1965; pl. 6, fig. 119; size 72 x 60 μm; Slide No. BSIP 28038-82/ 7



Locality: Basko, Rajmahal Hills, Bihar, India
Horizon and Age: Rajmahal Formation, Jurassic
Diagnostic Features: Diploxylonoid, size 112-130 x 70-100 μm; central body oblong; sacci much smaller than the body, intrareticulation coarse; distal sulcus wide.

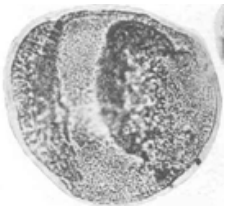
Podocarpidites grandis Sah and Jain 1965
Holotype: Sah and Jain 1965; pl. 6, fig. 115; size 68 x 120 μm; Slide No. BSIP 3110-62/ 7

Locality: Sakrigalighat, Rajmahal Hills, Bihar
Horizon and Age: Rajmahal Formation, Jurassic
Diagnostic Features: Size 68 x 52 – 48 x 72 μm; central body ± rounded, 60-68 μm; sacci inflated, distal saccus attachment straight, 2/3 of central body.

Podocarpidites rarus Singh, Srivastava and Roy 1964
Holotype: Singh, Srivastava and Roy 1964; pl. 8, fig. 103; Slide No. BSIP 1805

Locality: Umaia Bed, Trambu and Ghuneri (?), Kutch
Horizon and Age: Umia Bed, Early Cretaceous
Diagnostic Features: Size 82-98 μm; central body subcircular to vertically oval, ± 66 μm, exine finely granulose; distal sulcus ± 18 μm.

Podocarpidites typicus Sah and Jain 1965
Holotype: Sah and Jain 1965; pl. 6, fig. 121; size 80 μm; Slide No. BSIP 28038-86/9



Locality: Basko, Rajmahal Hills, Bihar, India
Horizon and Age: Rajmahal Formation, Jurassic
Diagnostic Features: Size 60-80 μm; central body ± rounded or oblong; sacci smaller than body, flattened.

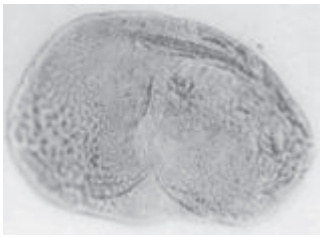
Podocarpidites vermiculatus Kumar 1973
Holotype: Kumar 1973; pl. 6, fig. 126; size 65 x 36 μm; Slide No. BSIP 3421/ 2

Locality: Harad River, near Hathnapur, Narsinghpur District, Madhya Pradesh, India
Horizon and Age: Jabalpur Formation, Early Cretaceous

Diagnostic Features: Size 44-82.5 x 30- 53 μm; central body roundly oval, exine thin, vermiculate.

Genus *Rimaesporites* Leschik 1955
Type Species: *Rimaesporites potoniei* Leschik 1955
Locality: Neuewelt bei Basal, Switzerland
Horizon and Age: Keuper, Late Triassic
Diagnostic Features: Bisaccate, laterally flattened oval pollen; sacci generally merge with central body on distal face, leaving narrow to wide sulcus.

Rimaesporites potoniei Leschik 1955



Type Species: Leschik 1955; pl. 10, fig. 7; size 140 x 100 μm
Locality: Neuewelt bei Basal, Switzerland
Horizon and Age: Keuper, Late Triassic
Diagnostic Features: Size 115-125 μm; sacci on distal face leaving about 50 μm wide sulcus.

Genus *Sahnites* Pant emend. Tiwari and Singh 1984
Type Species: *Sahnites* (*Pityosporites*) *gondwanensis* Mehta 1944
Locality: Pali Bed, South Rewa Basin, Madhya Pradesh, India
Horizon and Age: Pali Formation, Late Permian
Diagnostic Features: Bisaccate, haploxylonoid pollen; central body vertically oval with flat-ends to rhomboid; exine inframicroreticulate, linear scar or distinct trilete -mark of variable length on proximal face, distal saccus-free-area broad, straight to convex and associated with semilunar folds; sacci less than hemispherical, often continued laterally by a narrow strip.

Sahnites gondwanensis (Mehta) Pant emend. Tiwari and Singh 1984
Holotype: Mehta 1944; pl.1, fig.1
Neotype: Tiwari and Singh 1984; pl. 4, fig. 24; size 113.5 x 56 μm; Slide No. BSIP 8449

Locality: Pali Bed, South Rewa Basin, Madhya Pradesh, India
Horizon and Age: Pali Formation, Late Permian
Diagnostic Features: Size 81-150 x 46-90 μm; central body oval to circular, 49-93 μm, exine inframicroreticulate with linear scar, 15-29 μm long; sacci often continued laterally by a 3-5 μm wide strip; distal saccus-free-area, straight to convex, 16-20 μm wide.

Sahnites panchetensis Tiwari and Singh 1984
Holotype: Tiwari and Singh 1984; pl. 6, figs. 51, 52; size 88 x 55 μm; Slide No. BSIP 8447

Locality: Borehole RAD-4, sample No 13, depth 377 m, Raniganj Coalfield, West Bengal, India
Horizon and Age: Panchet Formation, Early Triassic
Diagnostic Features: Diploxylonoid; size 50-100 x 35-60 μm; central body sub-oval to rhombish, 40-62 μm with 2-3 μm wide equatorial rim; on proximal face bi-trilete mark; sacci more than hemispherical, laterally not connected; distal sulcus 10-20 μm wide.

Genus *Samaropollenites* Goubin 1965
Type Species: *Samaropollenites speciosus* Goubin 1965
Locality: Sondages du Bassin, Morondava, Madagascar
Horizon and Age: Middle Triassic
Diagnostic Features: Bisaccate haploxylonoid pollen; central body oval to rhombic, exine infrapunctate; sacci distally inclined leaving narrow saccus-free-area.

Samaropollenites speciosus Goubin 1965
Holotype: Goubin 1965; pl. 6, fig. 2; size 75 μm

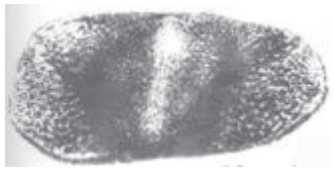
Locality: Sondages du Bassin, Morondava, Madagascar
Horizon and Age: Middle Triassic
Diagnostic Features: Size 67-77 μm; central body exine 2-4 μm thick; sacci joined subequatorially by narrow band; saccus intrareticulation with radially arranged muri.

Samaropollenites indicus Misra, Prasad and Rawat 1996
Holotype: Misra, Prasad and Rawat 1996; pl. 2, fig. 2; size 50 x 40 μm

Locality: Jaisalmer Basin, Western Rajasthan, India
Horizon and Age: Carnian, Late Triassic
Diagnostic Features: Size 38-52 x 26-32 μm; central body transversely oval.

Genus *Satsangisaccites* Bharadwaj and Srivastava 1969
Type Species: *Satsangisaccites nidpurensis* Bharadwaj and Srivastava 1969
Locality: Nidpur, Sidhi District, Madhya Pradesh, India
Horizon and Age: Nidpur, Early Triassic
Diagnostic Features: Bisaccate, haploxylonoid pollen; central body rhomboidal to vertically oval; sacci proximally attached, equatorially associated with semilunar fold; distal sulcus fusiform with a median groove extending its whole length.

Satsangisaccites nidpurensis Bharadwaj and Srivastava 1969
Holotype: Bharadwaj and Srivastava 1969; pl. 27, fig. 6; size 144.5 x 86.5 μm; Slide No. BSIP 3213-10 II



Locality: Nidpur, Sidhi District, Madhya Pradesh, India
Horizon and Age: Nidpur, Early Triassic
Diagnostic Features: Size 107.5-152.5 x 65-120 μm; central body rhomboidal or vertically oval, 60-100 x 50-72.5 μm; sacci intrareticulation consisting of narrow muri and broad elongated meshes.

Satsangisaccites triassicus Bharadwaj and Srivastava 1969
Holotype: Bharadwaj and Srivastava 1969; pl. 27, fig. 61; size 47.5 x 35 μm; Slide No. BSIP 1892-3

Locality: Nidpur, Sidhi District, Madhya Pradesh, India
Horizon and Age: Nidpur, Early Triassic
Diagnostic Features: Size 42.5-75 x 25-50 μm; central body 27.5-47.5 x 22.5- 47.5 μm.

Genus *Scheuringipollenites* Tiwari 1973
Type Species: *Scheuringipollenites* (*Vesicaspora*) *maximus* (Hart) Tiwari 1973
Locality: Mchuchuma River Valley, coal 3 ft. above C.S. 12 of McKinlay, Lower Measures, K2, Ketewaka-Mchuchuma Coalfield, Tanganyika
Horizon and Age: Ecca Series (Karroo), Permian
Diagnostic Features: Bisaccate, haploxylonoid, circular to vertical or horizontally oval pollen; central body thin, mostly indistinct, rarely visible; sacci hemispherical, proximally enchroaching the central body and apparently merging without any break, distal attachment mostly faint, close to one another may be accompanied by vertical folds, saccus intrareticulation fine to medium; distal sulcus not defined.

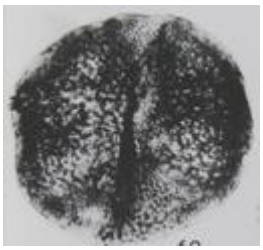
Scheuringipollenites maximus (Hart) Tiwari 1973
Holotype: Hart 1960; pl. 3, fig. 33; size 128 x 122 μm

Locality: Mchuchuma River Valley, coal 3 ft. above C.S. 12 of McKinlay, Lower Measures, K2, Ketewaka-Mchuchuma Coalfield, Tanganyika
Horizon and Age: Ecca Series (Karroo), Permian
Diagnostic Features: Circular to subcircular; size 70-150 μm along horizontal axis.

Scheuringipollenites royii (Bharadwaj and Srivastava) Tiwari 1973
Holotype: Bharadwaj and Srivastava 1969; pl. 28, fig. 71; size 52.5x50 μm; Slide No.BSIP 1894-8

Locality: Nidpur, Sidhi District, Madhya Pradesh, India
Horizon and Age: Nidpur, Early Triassic
Diagnostic Features: Oval to subcircular; size 40-67.5 x 40-60 μm; central body oval; saccus intrareticulation coarse with small bacula within the meshes.

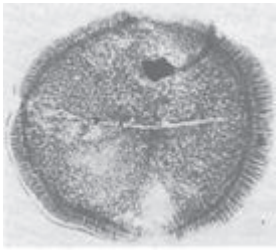
Scheuringipollenites triassicus (Bharadwaj and Srivastava) Tiwari 1973
Holotype: Bharadwaj and Srivastava 1969; pl. 28, fig. 69; size 102.5 x 102.5 μm; Slide No. BSIP 3215-1



Locality: Nidpur, Sidhi District, Madhya Pradesh, India
Horizon and Age: Nidpur, Early Triassic
Diagnostic Features: Circular, size 80-102.5 x 75-102.5 μm; sacci intrareticulation with narrow muri and big meshes with fine bacula.

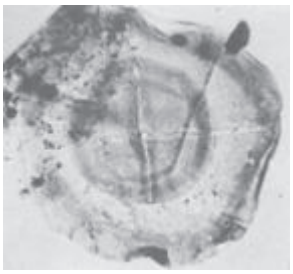
Genus *Staurosaccites* Dolby *in* Dolby and Balme 1976
Type Species: *Staurosaccites quadrifidus* Dolby *in* Dolby and Balme 1976
Locality: Onslow No.1 Well, core 7, sample at 1448.5 m, Carnarvon Basin, western Australia
Horizon and Age: Mungaroo Beds, Middle to Late Triassic
Diagnostic Features: Bisaccate, haploxylonoid, circular or slightly oval pollen; central body dissected into two equal halves by a single, sharply defined, narrow, transverse polar cleft, exine finely and densely columellate; sacci little inflated, saccus exoexine finely columellate and not clearly differentiated from that of central body exine; distal sulcus narrow, linear and full length of the central body, proximal cleft and sulcus form a rectilinear cross.

Staurosaccites quadrifidus Dolby *in* Dolby and Balme 1976
Holotype: Dolby in Dolby and Balme 1976; pl. 1, fig. 17; size 47-78 x 44-71 μm



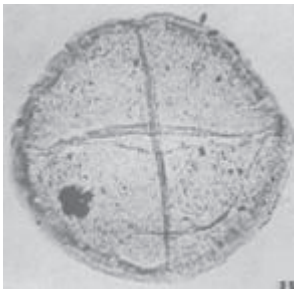
Locality: Onslow No.1 Well, core 7, sample at 1448.5 m, Carnarvon Basin, Western Australia
Horizon and Age: Mungaroo Beds, Middle to Late Triassic
Diagnostic Features: Size 47-78 x 44-71 μm; central body equatorially about 10 μm thick, polar cleft 2-4 μm wide with weakly crenulated margin.

Staurosaccites densus Kumaran and Maheshwari emend. Tripathi, Tiwari and Kumar 1990
Holotype: Kumaran and Maheshwari 1980; pl. 8, fig. 1; size 100 μm; Slide No. BSIP 5980



Locality: Eastern bank of Janar Nala about 2 km south-east of Bijouri, District Shahdol, Madhya Pradesh, India
Horizon and Age: Tiki Formation, Late Triassic
Diagnostic Features: Size 100-120 μm, central body dense, circular conforming to overall shape, 55-75 μm, with 5 μm wide marginal rim, inner body outline indistinct with irregular folds, laevigate.

Staurosaccites marginalis Kumaran and Maheshwari 1980
Holotype: Kumaran and Maheshwari 1980; pl. 8, fig. 10; size 100 μ; Slide No. BSIP 5926

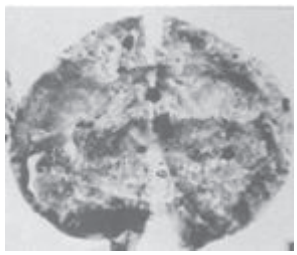


Locality: Eastern bank of Janar Nala about 2 km southeast of Bijouri, District Shahdol, Madhya Pradesh, India
Horizon and Age: Tiki Formation, Late Triassic
Diagnostic Features: Size 90-100 μm; central body circular to rhomboidal, transparent, large and occupying almost the entire space of the pollen grain, leaving 3-10 μm wide body-free equatorial region.

Staurosaccites minutus Kumaran and Maheshwari 1980
Holotype: Kumaran and Maheshwari 1980; pl. 8, fig. 8; size 84 μm; Slide No. BSIP 5999

Locality: Eastern Bank of Janar Nala about 2 km south-east of Bijouri, District Shahdol, Madhya Pradesh, India
Horizon and Age: Tiki Formation, Late Triassic
Diagnostic Features: Size 60-90 μm; central body distinct, horizontally oval to rhomboidal, 55-80 μm, leaving 2-5 μm wide body-free equatorial region, two taeniae formed by transverse polar clefts running transversely over central body.

Staurosaccites ovalis Kumaran and Maheshwari 1980
Holotype: Kumaran and Maheshwari 1980; pl. 8, fig. 11; size 98 μm; Slide No. BSIP 5951



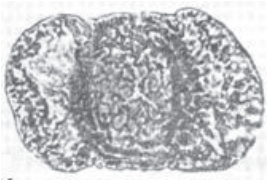
Locality: Eastern bank of Janar Nala about 2 km south-east of Bijouri, District Shahdol, Madhya Pradesh, India
Horizon and Age: Tiki Formation, Late Triassic
Diagnostic Features: Horizontally oval pollen, size 100-120 x 75-95 μm; central body horizontally oval, 65-90 x 50-63 μm, body exine thick with marginal rim.

Staurosaccites tharipatharensis Kumaran *in* Maheshwari and Kumaran 1979
Holotype: Kumaran *in* Maheshwari and Kumaran 1979; pl. 5, fig. 9; size 70 μm; Slide No. BSIP 5670

Locality: Son River Section, West of Tharipathar Village, District Shahdol, Madhya Pradesh, India
Horizon and Age: Tiki Formation, Late Triassic
Diagnostic Features: Circular to slightly rhomboidal, size 58-80 μm; central body conforming overall shape; sacci compact.

Genus *Triadispora* Klaus 1964
Type Species: *Triadispora plicata* Klaus 1964
Locality: Kochendorf bei Heilbronn, Germany
Horizon and Age: Middle Muschelkalk, Middle Triassic
Diagnostic Features: Bisaccate, diploxylonoid pollen; central body oval, small smooth area developed around trilete mark on central body, exine infrapunctate to granulate; saccus attachment subequatorial on proximal face, laterally continuous; sulcus subcircular.

Triadispora plicata Klaus 1964
Holotype: Klaus 1964; pl. 2, fig. 15; size 70 μm



Locality: Kochendorf bei Heilbronn, Germany
Horizon and Age: Middle Muschelkalk, Middle Triassic
Diagnostic Features: Size 65-70 μm; central body exine distinctly granulose; distal sulcus 15-20 μm.

Genus *Vitreisporites* Leschik emend. Jansonius 1962
Type Species: *Vitreisporites signatus* Leschik 1955
Locality: Neuewelt bei Basel, Switzerland
Horizon and Age: Keuper, Late Triassic
Diagnostic Features: Bisaccate, haploxylonoid, bilateral to oval, relatively very small pollen; central body very thin, outline indistinct; saccus more than hemispherical; distal sulcus straight, full length.

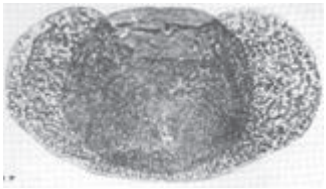
Vitreisporites signatus Leschik 1955
Holotype: Leschik 1955; pl. 8, fig. 10; size 28 μm

Locality: Neuewelt bei Basel, Switzerland
Horizon and Age: Keuper, Late Triassic
Diagnostic Features: Oval, size 21-26 μm; on proximal face very faint trilete mark; 3-5 μm wide thickening at the base of sacci.

Vitreisporites savitrii Kumar 2000
Holotype: Kumar 2000; pl. 1, fig. 9; size 52 x 22 μm; Slide No. BSIP 12256
Locality: Anhoni Village, Chhindwara District, Madhya Pradesh, India
Horizon and Age: Denwa Formation, Late Triassic
Diagnostic Features: Size 52-70.5 x 22-52 μm; exine inframicroreticulation faintly developed; sacci feebly intramicroreticulate, lumen puncta like but feeble.

Genus *Voltziaceaesporites* Klaus 1964
Type Species: *Voltziaceaesporites hetromorpha* Klaus 1964
Locality: Frankreich, Adamswiller, Germany
Horizon and Age: Upper Buntsandstein, Early Triassic
Diagnostic Features: Bisaccate, bilateral haploxylonoid pollen; central body distinct, exine punctate to smooth sometimes with feeble monolete or trilete mark; saccus form highly variable; distal sulcus indistinct, wide and smooth.

Voltziaceaesporites hetromorpha Klaus 1964
Holotype: Klaus 1964; pl. 2, fig. 19; size 125 μm

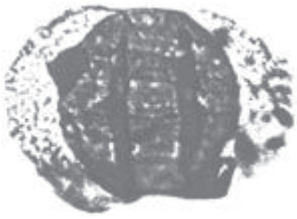


Locality: Frankreich, Adamswiller, Germany
Horizon and Age: Upper Buntsandstein, Early Triassic
Diagnostic Features: Size 70-150 μm; central body exine thickness vary, punctate; distal sulcus broadly oval.

TAENIATE BISACCATE POLLEN

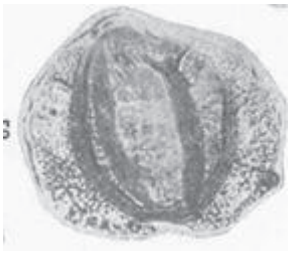
Genus *Arcuatipollenites* Tiwari and Vijaya 1995
Type Species: *Arcuatipollenites* (*Taeniaesporites*) *ovatus* Goubin 1965
Locality: Morondava Basin, LDI, 2484 m, Madagascar
Horizon and Age: Group Sakamena, Middle Triassic
Diagnostic Features: Bisaccate, haplo- or diploxylonoid, bilateral pollen; central body distinct, ovalish-circuloid with slightly curved or flat lateral ends; 4-6 taeniae (may be more) on proximal face, exine inframicroreticulate; sacci less than hemispherical, distal saccus attachment accompanied with lunar folds; sulcus distinct and wide.

Arcuatipollenites ovatus (Goubin) Tiwari and Vijaya 1995
Holotype: Goubin 1965; pl. 2, fig. 3; size 62 μm



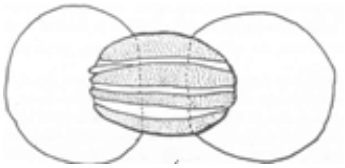
Locality: Morondova Basin, LDI, 2484 m, Madagascar
Horizon and Age: Group Sakamena, Middle Triassic
Diagnostic Features: Size 55-90 μm; central body ovalish-circuloid with slightly curved or flat lateral ends; taeniae 4-6.

Arcuatipollenites asansoliensis (Tiwari and Rana) Tiwari and Vijaya 1995
Holotype: Tiwari and Rana 1981; pl. 4, fig. 59; size 60 μm; Slide No. BSIP 5637



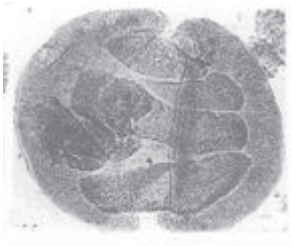
Locality: Borehole RD-l, sample no. 5, depth 600.58 m, Raniganj Coalfield, West Bengal, India
Horizon and Age: Panchet Formation, Early Triassic
Diagnostic Features: Central body vertically elongated and trapezoid, 3-6 μm thick equatorial rim; taeniae 3-4; sacci kidney-shape or crescent-like, not fully blown; sulcus biconcave, 15-27 μm wide.

Arcuatipollenites damudicus (Tiwari and Rana) Tiwari and Vijaya 1995
Holotype: Tiwari and Rana 1980; pl. 2, figs. 48, 49; size 60 x 30 μm; Slide No. BSIP 5550



Locality: Borehole RNM-4, sample no. 5, depth 59.00 m, Raniganj Coalfield, West Bengal, India
Horizon and Age: Mahadeva Formation, Middle Triassic
Diagnostic Features: Pronounced diploxylonoid; central body horizontally oval, dense, 4 to 5 taeniae; sulcus 10 μm wide.

Arcuatipollenites paliensis (Tiwari and Ram-Awatar) Tiwari and Vijaya 1995
Holotype: Tiwari and Ram-Awatar 1989; pl. l, fig. 14; size 40 x 110 μm; Slide No. BSIP 9305



Locality: Borehole JHL - 23, depth 203.0-204.0 m; abut 9 km east from Birsinghpur-Pali, Johilla Coalfield, Madhya Pradesh, India
Horizon and Age: Barakar Formation, Early Permian
Diagnostic Features: Circuloid shape; central body big, subcircular to oval, faintly demarcated; taeniae 3-5; sacci less than hemispherical, distally inclined; sulcus 10-20 μm wide.

Arcuatipollenites pellucidus (Goubin) Tiwari and Vijaya 1995
Holotype: Goubin 1965; pl. 2, fig. 4; size 70 μm

Locality: Morondava Basin, IDI 2484 m, Madagascar,
Horizon and Age: Group Sakamena, Early Triassic
Diagnostic Features: Size 68-85 x 51-60 μm; central body almost indistinct, broadly oval to rhombish, taeniae 4-9.

Arcuatipollenites tethysensis (Vijaya and Tiwari) Tiwari and Vijaya 1995
Holotype: Vijaya and Tiwari *in* Vijaya, Kumar, Singh and Tiwari 1988; pl. 5, fig. 7; size 86 μm; Slide No. BSIP 9499

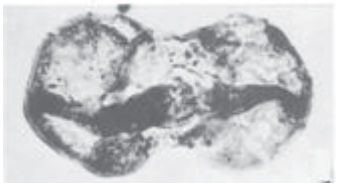
Locality: Sample No.1, Kalapani Limestone, Malla Johar area, Tethys Himalaya, India
Horizon and Age: Kalapani Limestone Formation, Middle Triassic
Diagnostic Features: Size 60-68 μm; central body distinct, oval with broader lateral ends, taeniae 5-6, each taeniae bearing 2-4 faint horizontal striation-like lines; sacci less than hemispherical; sulcus 5- 20 μm wide.

Genus *Chordasporites* Klaus 1960
Type Species: *Chordasporites singulichorda* Klaus 1960
Locality: Bellerophon beds, Southern Alps
Horizon and Age: Carnian, Late Triassic
Diagnostic Features: Bisaccate, horizontally elongated pollen; central body distinct, trapezoid, exine micropunctate to microrugulate, a wavy linear thickening (chord) of exine on proximal face; sacci more than hemispherical; distal sulcus broad.

Chordasporites singulichorda Klaus 1960
Holotype: Klaus 1960; pl. 33, fig. 45; size 70-80 μm

Locality: Bellerophon beds, Southern Alps
Horizon and Age: Carnian, Late Triassic
Diagnostic Features: Size 70-80 μm; equatorial thickening around central body, thin areas adjacent to chord, chord 3-4 μm thick; distinct sulcus 15-20 μm wide.

Chordasporites klausii Kumaran and Maheshwari 1980
Holotype: Kumaran and Maheshwari 1980; pl. 9, fig. 5; size 102 μm; Slide No. BSIP 5918
Locality: Eastern bank of Janar Nala about 2 km southeast of Bijouri, District Shahdol, Madhya Pradesh, India



Horizon and Age: Tiki Formation, Late Triassic
Diagnostic Features: Mostly diploxylonoid, size 85-100 μm; central body subcircular to transversely oval, broader than long, 36-52 x 40-54 μm, exine laevigate or slightly inframicroreticulate; chorda 6-18 μm wide with bulbous intermediary projections and slightly sinuous margins.

Chordasporites raniganjensis Maheshwari and Banerji 1975
Holotype: Maheshwari and Banerji 1975; pl. 4, fig. 52; size 47.5 x 90 μm; Slide No. BSIP 4602-11

Locality: North-western branch of the Nonia Nala, East of Kumarpur, District Burdwan, Bengal, India

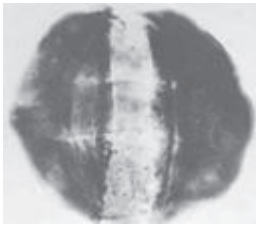
Horizon and Age: Panchet Formation, Early Triassic
Diagnostic Features: Size 80-90 x 40-50 μm; central body distinct, vertically oval to subcircular, 46-52 x 44-52 μm; exine laevigate to feebly infragranulose; saccus distally subequatorial and associated with two vertical infolds.

Genus *Infernopollenites* Scheuring 1970
Type Species: *Infernopollenites* (*Umbrellisaccus*) *sulcatus* (Pautsch) Scheuring 1970
Locality: Pomerania- Kujawy, Anticlinorium, Poland
Horizon and Age: Keuper, Late Triassic
Diagnostic Features: Bisaccate, haplo- diploxylonoid pollen; central body oval, longer than broad, proximally surface clefted in 2-4 taeniae; sacci less than hemispherical, intrareticulation coarse.

Infernopollenites sulcatus (Pautsch) Scheuring 1970
Holotype: Pautsch 1971; pl. 11, fig. 3; size 104 μm

Locality: Pomerania- Kujawy, Anticlinorium, Poland
Horizon and Age: Keuper, Late Triassic
Dianostic Features: Haploxylonoid; size 88-173 x 49-101 μm; central body oval, exine infragranulose, 2-4 clefts on surface; saccus intrareticulation coarse, lumen 2-4 μm wide.

Infernopollenites janarensis Kumaran and Maheshwari 1980
Holotype: Kumaran and Maheshwari 1980; pl.10, fig. 10; size 84 μm; Slide No. BSIP 6119

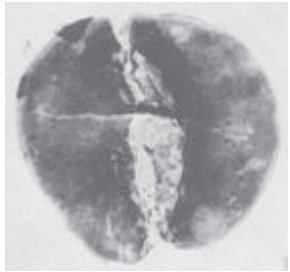


Locality: Eastern bank of Janar Nala about 2 km south-east of Bijouri, District Shahdol, Madhya Pradesh, India
Horizon and Age: Tiki Formation, Late Triassic
Diagnostic Features: Size 80-100 μm; central body subcircular to vertically oval, 45-65 x 40-70 μm, 2-3 narrow proximal transverse clefts dissect into 3-4 taeniae, body exine faintly to distinctly punctate.

Infernopollenites pseudoclaustratus Kumaran and Maheshwari 1980
Holotype: Kumaran and Maheshwari 1980; pl. 10, fig. 7; size 112 μm; Slide No. BSIP 5941

Locality: Eastern bank of Janar Nala about 2 km south-east of Bijouri, District Shahdol, Madhya Pradesh, India
Horizon and Age: Tiki Formation, Late Triassic
Diagnostic Features: Size 105-125 μm; central body transversely oval, 60 x 80-100 μm, body exine 2.5 μm thick, faintly punctate, proximally dissected into 4-5 taeniae by 3-4 transverse clefts, taeniae very closely placed to each other.

Infernopollenites simplex Kumaran and Maheshwari 1980
Holotype: Kumaran and Maheshwari 1980; pl. 10, fig. 3; size 86 μm; Slide No. BSIP 5972

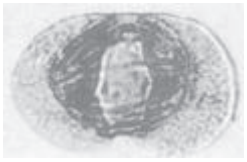


Locality: Eastern bank of Janar Nala about 2 km southeast of Bijouri, Shahdol District, Madhya Pradesh, India
Horizon and Age: Tiki Formation, Late Triassic
Diagnostic Features: Size 85-105 μm; central body horizontally oval to subcircular, proximally dissected by one or two narrow, about 1.5 μm wide clefts into 2-3 broad taeniae; sacci slightly larger

than body, hemispherical or bean-shaped, thick and spongeous.

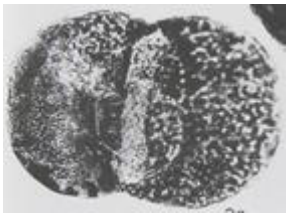
Genus *Lunatisporites* Leschik emend. Scheuring 1970
Type Species: *Lunatisporites acutus* Leschik 1955
Locality: Neuewelt bei Basel, Switzerland
Horizon and Age: Keuper, Late Triassic
Diagnostic Features: Bisaccate, oval, ± haploxylonoid pollen; central body distinct, vertically oval, exine thick, bears 3 taeniae on the proximal face; sulcus wide.

Lunatisporites acutus Leschik 1955
Holotype: Leschik 1955; pl. 7, fig. 24; size 36 x 50 μm



Locality: Neuewelt bei Basel, Switzerland
Horizon and Age: Keuper, Late Triassic
Diagnostic Features: Size 35-52 μm; central body, exine 2 μm thick, 3-4 taeniae on the proximal face, each taeniae ± 10 μm wide; sulcus about 11 μm wide.

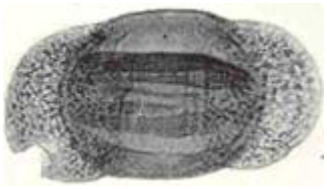
Lunatisporites gopadensis Bharadwaj and Srivastava 1969
Holotype: Bharadwaj and Srivastava 1969; pl.25, fig. 29; size 142.5 x 87.5 μm; Slide No. BSIP 3210-3



Locality: Nidpur, Sidhi District, Madhya Pradesh, India
Horizon and Age: Nidpur, Early Triassic
Diagnostic Features: Size 72.5-142.5 x 70-107.5 μm; central body vertically oval, 5-13 striations; sulcus straight 8-17.5 μm wide.

Genus *Striatisaccus* Mädler 1964
Type Species: *Striatisaccus goswicensis* Mädler 1964
Locality: Thuringia, Germany
Horizon and Age: Buntsandstein, Early Triassic
Diagnostic Features: Haploxylonoid bisaccate pollen; central body subcircular to horizontally oval; approximately 10 wide stripes (taeniae) on proximal face, inbetween stripes longitudinal furrow bears monolete mark; distal sulcus wide.

Striatisaccus goswicensis Mädler 1964
Holotype: Mädler 1964; pl. 2, fig. 14; size 90 μm



Locality: Thuringia, Germany
Horizon and Age: Buntsandstein, Early Triassic
Diagnostic Features: Sacci 50-64 x 38-54 μm; central body horizontally oval, 60 x 50 μm, 6-7 wide stripes (taeniae) on proximal face, longitudinal furrow 18-22 μm long; saccus reticulation mediumly coarse, lumen polygonal, 1-2 μm wide; distal sulcus 15-20 μm wide.

Genus *Taeniaesporites* Leschik 1955
Type Species: *Taeniaesporites kraeuseli* Leschik 1955
Locality: Neuewelt bei Basel, Switzerland
Horizon and Age: Keuper, Late Triassic
Diagnostic Features: Diploxylonoid bisaccate pollen, circular to broadly oval; central body oval, taeniae on proximal face, inbetween taeniae monolete mark present; distal sulcus wide.

Taeniaesporites kraeuseli Leschik 1955
Holotype: Leschik 1955; pl. 8, fig.1; size 47 μm

Locality: Neuewelt bei Basel, Switzerland
Horizon and Age: Keuper, Late Triassic

Diagnostic Features: Size 45-50 μm; 6 or more taeniae on central body proximally; sulcus up to 8 μm wide.

Genus *Trabeculosporites* Trivedi and Misra emend. Tiwari and Ram-Awatar 1992

Type Species: *Trabeculosporites gopadensis* Trivedi and Misra 1970

Locality: Gopad River section, 2.5 km N-NE of Nidpur Village, Sidhi District, Madhya Pradesh, India

Horizon and Age: Nidpur, Early Triassic

Diagnostic Features: Bisaccate, haploxylonoid, oval to subcircular pollen; central body ill-defined, only marked by the end of striniae (striations-taeniae); 6-10 striations appearing taeniae; exine inframicroreticulate; sacci sub-saccate in nature, distally attached all along the corpus, generally sickle shaped equatorially, saccus intrareticulation with thick muri.

Trabeculosporites gopadensis Trivedi and Misra emend. Tiwari and Ram-Awatar 1992

Holotype: Trivedi and Misra 1970; pl. 4, fig. 49, Slide not traceable

Neotype: Tiwari and Ram-Awatar 1992; pl. 1, fig. 1; size 45 x 48 μm; Slide No. BSIP 10573

Locality: Gopad River Section, 2.5 km N-NE of Nidpur Village, Sidhi District, Madhya Pradesh, India

Horizon and Age: Nidpur, Early Triassic

Diagnostic Features: Size 68-130 μm; saccus free area 70-80 μm wide.

MONOSACCATE POLLEN

Genus *Callialasporites* Dev 1961

Type Species: *Callialasporites* (*Zonalapollenites*) *trilobatus* Balme 1957

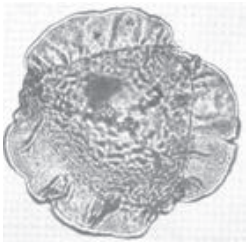
Locality: Broome No. 3 Water Bore, Canning Basin, Australia

Horizon and Age: Jarlemai Siltstone, Oxfordian, Late Jurassic

Diagnostic Features: Circular to oval pollen; central body subcircular-triangular, exine 1-2 μm thick, infragranulose; saccus one bladder notched in three seprate lobes, radially folded to appear frilled.

Callialasporites trilobatus (Balme) Dev 1961

Holotype: Balme 1957; pl. 8, fig. 91; size 72-78 μm



Locality: Broome No. 3 Water Bore, Canning Basin, Australia

Horizon and Age: Jarlemai Siltstone, Oxfordian, Late Jurassic

Diagnostic Features: Size 65-91 μm; rounded to triangular; central body subtriangular with three equatorially attached sacci, sometimes a single trilobed saccus, exine surface rinkled.

Callialasporites dampieri (Balme) Dev 1961

Holotype: Balme 1957; pl. 8, fig. 88; size 60 x 50 μm

Locality: Broome No. 3 Water Bore, Canning Basin, Australia

Horizon and Age: Jarlemai Siltstone, Oxfordian, Late Jurassic

Diagnostic Features: Size 53-78 μm, circular; central body circular to rounded, 37-53 μm; saccus 8-15 μm wide, radially folded.

Genus *Crustaesporites* Leschik emend. Jansonius 1962

Type Species: *Crustaesporites globosus* Leschik 1956

Locality: Neuhof bei Fulda, Germany

Horizon and Age: Zechstein, Late Permian

Diagnostic Features: Monosaccate pollen; central body broadly subcircular, bearing number of taeniae on proximal face, exine infrapunctate, equatorial thickening on distal face; saccus intrareticulation coarse, saccus irregularly lobed.

Crustaesporites globosus Leschik 1956

Holotype: Leschik 1956; pl. 21, fig. 2; size 110 μm

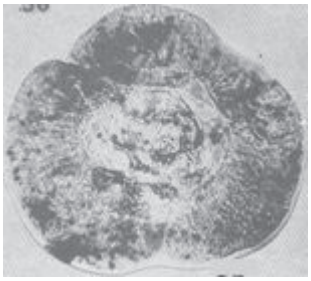
Locality: Neuhof bei Fulda, Germany

Horizon and Age: Zechstein, Late Permian

Diagnostic Features: Size 80-110 x 50-80 μm; taeniae irregular, often short, each taeniae up to 10 μm wide.

Crustaesporites trilobatus Venkatachala and Rawat 1978

Holotype: Venkatachala and Rawat 1978; pl. 3, fig. 58; size 95 x 110 μm



Locality: Purnea Basin, Bihar, India

Horizon and Age: Early Triassic

Diagnostic Features: Size 110-160 μm; central body circular, 78-82 μm; no taeniae; saccus intrareticulation medium.

Genus *Enzonalasporites* Leschik emend. Scheuring 1970

Type Species: *Enzonalasporites vigens* Leschik 1955

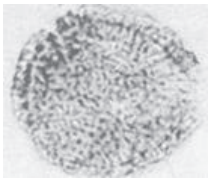
Locality: Neuewelt bei Basel, Switzerland

Horizon and Age: Keuper, Late Triassic

Diagnostic Features: Subcircular pollen with equatorial velum; exine encircling velum 5 μm wide, with irregular imperfect reticulum form by closely spaced muri, elements radial, reducing as 'T' to granulate towards the central region.

Enzonalasporites vigens Leschik emend. Scheuring 1970

Holotype: Leschik 1955; pl. 5, fig. 24; size 38 μm



Locality: Neuewelt bei Basel, Switzerland

Horizon and Age: Keuper, Late Triassic

Diagnostic Features: Size 36- 38 μm; equatorial velum 3.5 μm wide.

Genus *Goubinispora* Tiwari and Rana 1981

Type Species: *Goubinispora indica* Tiwari and Rana 1981

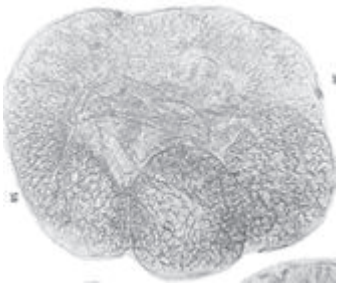
Locality: Borehole RD-l, sample no. 4, depth 532.48 m, Raniganj Coalfield, West Bengal, India

Horizon and Age: Mahadeva Formation, Middle Triassic

Diagnostic Features: Girdling monosaccate pollen; central body circular to oval, distinct or indistinct, may have equatorial rim; faint to clearly marked striations on one face, 'islands' or elongated strips of partly separated exoexine (structurally comparable to the saccus) on other side; saccus intrareticulate, incipiently to markedly polylobed, equatorially attached at striated face, variously encroaching the body subequatorially on the other face, never covering completely.

Goubinispora indica Tiwari and Rana 1981

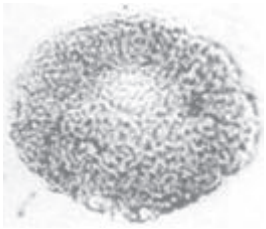
Holotype: Tiwari and Rana 1981; pl. 4, fig. 58; size 144.5 x 192.5 μm



Locality: Borehole RD-l**,** sample no. 4, depth 532.48 m, Raniganj Coalfield, West Bengal, India
Horizon and Age: Mahadeva Formation, Middle Triassic
Diagnostic Features: Size 90-198 μm; central body 45-130 μm, 12-22 simple, rarely forked striations on proximal face, distal islands or elongated stripes of exoexine 18-36 μm wide; saccus intrareticulation coarse, muri 1-2 μm thick, lumen 5-12 μm wide, polygonal with mostly wavy muri.

Genus *Patinasporites* Leschik 1955
Type Species: *Patinasporites densus* Leschik 1955
Locality: Neuewelt bei Basel, Switzerland
Horizon and Age: Keuper, Late Triassic
Diagnostic Features: Subcircular to rounded pollen; central body with broad equatorial zone - velum; exine reticulum with elongated and woven muri.

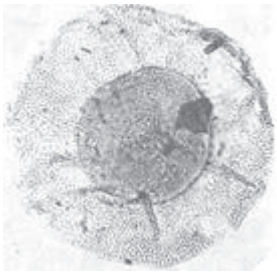
Patinasporites densus Leschik 1955
Holotype: Leschik 1955; pl. 6, fig. 11; size 40 μm



Locality: Neuewelt bei Basel, Switzerland
Horizon and Age: Keuper, Late Triassic
Diagnostic Features: Size 40-55 μm; oval to circular; velum 7-13 μm.

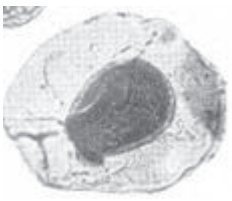
Genus *Playfordiaspora* Maheshwari and Banerji emend. Vijaya 1995
Type Species: *Playfordiaspora* (*Guthoerlisporites*) *cancellosa* Playford and Dettmann 1965
Locality: Leigh Creek, Northern Basin, Leigh Creek Coal Measure, outcrop sample NF 7, South Australia
Horizon and Age: Rhaeto-Liassic, Late Triassic
Diagnostic Features: Radial monosaccate, ± circular pollen; trilete mark distinct, central body thick to thin, more or less circular; exine two-layered, homogeneous, less than 1 μm thick nexine, equatorially detached sexine forming a saccus; saccus eusaccate, single layered, fine and uniform endoreticulaton, hexagonal-polygonal-circular ± 1 μm wide lumen, saccus distally loosely attached on the central part of the nexinal body and proximally extending up to the margins of the trilete.

Playfordiaspora cancellosa (Playford and Dettmann) Maheshwari and Banerji emend. Vijaya 1995
Holotype: Playford and Dettmann 1965; pl. l4, fig. 34; size 91 μm



Locality: Leigh Creek, Northern Basin, Leigh Creek Coal Measures, outcrop sample NF 7, South Australia
Horizon and Age: Rhaeto-Liassic, Late Triassic
Diagnostic Features: Size 72-125 μm; central body circular, thin and uniformly endoreticulate.

Playfordiaspora annulata Tiwari and Rana emend. Vijaya 1995
Holotype: Tiwari and Rana 1980; pl. 2, fig. 37; size 50 x 60 μm; Slide No. BSIP 5550



Locality: Borehole RNM-4, sample no. 5, depth 59 m, Raniganj Coalfield, West Bengal, India

Horizon and Age: Mahadeva Formation, Middle Triassic
Diagnostic Features: Size 60-75 x 44-55 μm; central body subtriangular with a well-defined 2-4 μm thick equatorial rim; trilete rays reaching up to the rim; saccus spread on proximal face up to the margin of trilete ray.

Genus *Pseudenzonalasporites* Scheuring 1970
Type Species: *Pseudenzonalasporites summus* Scheuring 1970
Locality: Bölchentunnel, Basel, Switzerland
Horizon and Age: Keuper, Late Triassic
Diagnostic Features: Circular to subcircular pollen; trilete mark indistinct; exine two layered, on proximal face sculptured with baculae, baculae collectively form negative reticulum all over; on distal face feeble leptoma.

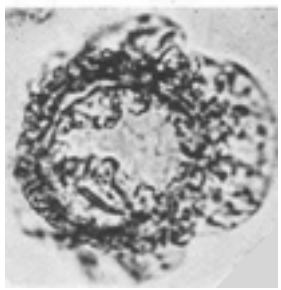
Pseudenzonalasporites summus Scheuring 1970
Holotype: Scheuring 1970; pl. 28, fig. 237; size 38 μm

Locality: Bölchentunnel, Basel, Switzerland
Horizon and Age: Keuper, Late Triassic
Diagnostic Features: Size range 35-40 μm; baculae less than 1 μm high x 1 μm wide, muri thin, enclosing lumen, less then 1 μm in diameter.

POLYSACCATE POLLEN

Genus *Dacrycarpites* Cookson and Pike 1953
Type Species: *Dacrycarpites australiensis* Cookson and Pike 1953
Locality: Tasmania, Australia
Horizon and Age: ? Oligocene
Diagnostic Features: Broadly subcircular, trisaccate pollen; central body sub-rounded with distinct equatorial rim; three sacci closely altogether radially attached on body.

Dacrycarpites australiensis Cookson and Pike 1953
Holotype: Cookson and Pike 1953; pl. 3, fig. 51; size 67 μm



Locality: Tasmania, Australia
Horizon and Age: ? Oligocene
Diagnostic Features: Size 65-100 μm, circular to triangular; central body 30-63 μm in diameter, with 2.5-7 μm wide equarorial rim; exine two layered, rugulate on body surface.

Genus *Trisaccites* Cookson and Pike 1954
Type Species: *Trisaccites microsaccatus* (Couper) Cookson and Pike 1954
Locality: Sub-Piripauan, New Zeland
Horizon and Age: Late Cretaceous
Diagnostic Features: Broadly subcircular, trisaccate pollen; central body subtriangular, exine inframicroreticulate-granulate; sacci rudimentary, distally sacci attached equatorially.

Trisaccites microsaccatus (Couper) Cookson and Pike 1954
Holotype: Couper 1953; pl. 4, fig. 38; size 32.5 μm

Locality: Sub-Piripauan, New Zeland
Horizon and Age: Late Cretaceous
Diagnostic Features: Size 26-33 μm; exine 2 μm thick, inframicroreticulate-granulate; sacci with strongly developed radial thickening.

Trisaccites variabilis (Dev) Haskell 1968
Holotype: Dev 1968; pl. 7, fig. 58; size 36 x 42 μm; Slide No. BSIP 28736-1

Locality: Sehora, Sher River, Narsinghpur District, Madhya Pradesh, India
Horizon and Age: Jabalpur Formation, Early Cretaceous
Diagnostic Features: Size 41-69 x 31-57 μm; central body ± rounded, exine 1.5-2.5 μm thick, inframicrorgranulose; distally sacci attached equatorially.

SULCATE (NONSACCATE) POLLEN

Genus *Aumancisporites* Alpern emend. Jansonius 1962
Type Species: *Aumancisporites striatus* Alpern 1958
Locality: L'Aumance, Saint-Hilaire, France
Horizon and Age: Autunien-Stephanian, Carboniferous
Diagnostic Features: Nonsaccate, oval to subcircular pollen; exine microverrucose; longitudinal ribs or taeniae on proximal face, equatorially continuing; one transverse furrow bordered by thick lips on distal face.

Aumancisporites striatus Alpern 1958
Holotype: Alpern 1958; pl. 2, fig. 53; size 71 x 4 μm

Locality: L'Aumance, Saint-Hilaire, France
Horizon and Age: Autunien-Stephanian, Carboniferous
Diagnostic Features: Size 50-70 μm; furrow with thick lips, seems as taeniae.

Aumancisporites indicus Bharadwaj and Srivastava 1969
Holotype: Bharadwaj and Srivastava 1969; pl. 29, fig. 113; size 56 x 42.5 μm; Slide No. BSIP 1911-17

Locality: Nidpur, Sidhi District, Madhya Pradesh, India
Horizon and Age: Nidpur, Early Triassic
Diagnostic Features: Size 30 - 67 x 22.5 - 47.5 μm; 10 transverse striations with vertical partitions on proximal face, converging towards the poles, all ends join to form one subequatorial rib.

Genus *Cycadopites* Wodehouse ex Wilson and Webster 1946
Type Species: *Cycadopites follicularis* Wilson and Webster 1946
Locality: Fort Union Series, Red Lodge, Carbon County, Montana, USA
Horizon and Age: Tertiary
Diagnostic Features: Monocolpate pollen, spindle shape; exine smooth to scabrate; sulcus along the longer axis, broad.

Cycadopites follicularis Wilson and Webster 1946
Holotype: Wilson and Webster 1946; pl. 1, fig. 7; size 39 μm long, 18 μm wide

Locality: Fort Union Series, Red Lodge, Carbon County, Montana, USA
Horizon and Age: Tertiary
Diagnostic Features: Size 35-40 μm long x 15-20 μm wide; sulcus broad at polar ends.

Genus *Ginkgoretectina* Maljvkina 1953
Type Species: *Ginkgoretectina punctata* Maljvkina 1953

Locality: Embenski-Gebiet, UdSSR
Horizon and Age: Rhaetic, Late Triassic
Diagnostic Features: Boat-shape pollen; exine smooth to infrapunctate; colpus extend longitudinally up to polar ends, slightly wrinkled, narrowing towards poles.

Ginkgoretectina punctata Maljvkina 1953
Holotype: Mawkina 1953; pl.1, fig. 21; size 50 μm

Locality: Embenski-Gebiet, UdSSR
Horizon and Age: Rhaetic, Late Triassic
Diagnostic Features: Size 45-52 μm; exine finely micropunctate; furrow associated with minor folds, maximum width in center 8-10 μm, narrowing at ends.

Genus *Labiipollis* Mädler 1964
Type Species: *Labiipollis mesozoicus* Mädler 1964
Locality: Bad Harzburg, Germany
Horizon and Age: Keuper, Late Triassic
Diagnostic Features: Monocolpate, elongated pollen with oval to round ends; exine 1 μm thick, infrapunctate; colpus along longer axis on distal face, broad.

Labiipollis mesozoicus Mädler 1964
Holotype: Mädler 1964; pl. 12, fig.15; size 39 x 25 μm

Locality: Bad Harzburg, Germany
Horizon and Age: Keuper, Late Triassic
Diagnostic Features: Maxium size 40 μm; colpus 11 μm broad in middle, 8 μm at polar ends.

Genus *Monosulcites* Cookson ex Couper 1953
Type Species: *Monosulcites minimus* Cookson 1947
Locality: Kerguelen-Archipelago
Horizon and Age: Tertiary
Diagnostic Features: Elongate to subcircular, boot shape pollen; exine infrapunctate to infragranulose; sulcus broadest in the centre.

Monosulcites minimus Cookson 1947
Holotype: Cookson 1947; pl. 15, fig. 47; size 30 μm

Locality: Kerguelen-Archipelago
Horizon and Age: Tertiary
Diagnostic Features: Size 29.6-34 μm long x 26.5-29 μm broad; almost circular; exine 2 μm thick; boat-shaped sulcus.

Genus *Praecolpatites* Bharadwaj and Srivastava 1969
Type Species: *Praecolpatites nidpurensis* Bharadwaj and Srivastava 1969
Locality: Nidpur, Sidhi District, Madhya Pradesh, India
Horizon and Age: Nidpur, Early Triassic
Diagnostic Features: Ellipsoid or elongated pollen, twice long as broad; exine inframicroreticulate; one longitudinal furrow on one face, three folds present on other face.

Praecolpatites nidpurensis Bharadwaj and Srivastava 1969
Holotype: Bharadwaj and Srivastava 1969; pl. 29, fig.117; size 115 x 60 μm; Slide No. BSIP 3197-6

Locality: Nidpur, Sidhi District, Madhya Pradesh, India
Horizon and Age: Nidpur, Early Triassic
Diagnostic Features: Oval; size 115-162.5 μm long, 57-80 μm wide.

Genus *Pretricolpipollenites* Danzé-Corsin and Laveine 1963
Type Species: *Pretricolpipollenites ovalis* Danze-Corsin and Laveine 1963
Locality: Hydrequent, Vallee Heureuse, France
Horizon and Age: Late Triassic to Early Jurassic
Diagnostic Features: Fusiform pollen; exine smooth; median furrow prominent associated with fold, slightly wide, 2 less prominent lateral furrows, 2/3 of length, without folds.

Pretricolpipollenites ovalis Danzé-Corsin and Laveine 1963
Holotype: Danzé-Corsin and Laveine 1963; pl. 11, fig. 19; size 30 μm

Locality: Hydrequent, Vallee Heureuse, France
Horizon and Age: Late Triassic to Early Jurassic
Diagnostic Features: Size 28- 32 μm; exine thin, median furrow broad at lateral ends.

Genus *Weylandites* Bharadwaj and Srivastava 1969
Type Species: *Weylandites indicus* Bharadwaj and Srivastava 1969
Locality: Nidpur, Sidhi District, Madhya Pradesh, India
Horizon and Age: Nidpur, Early Triassic
Diagnostic Features: Bilateral, subcircular to circular or transversely oval pollen; exine microverrucose, about 10 to 20 transverse striations on proximal face; many vertical or oblique striations on each side of a biconvex or rectangular sulcus on distal face.

Weylandites indicus Bharadwaj and Srivastava 1969
Holotype: Bharadwaj and Srivastava 1969; pl. 28, fig. 92; size 47.5 x 37 μm; Slide No. 1889-10.

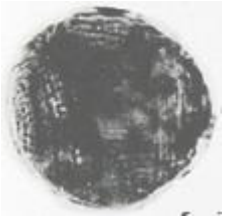
Locality: Nidpur, Sidhi District, Madhya Pradesh, India
Horizon and Age: Nidpur, Early Triassic
Diagnostic Features: Transversely oval; size 45-75 x 30-57.5 μm; proximally 20 horizontal striations, distally 7 vertical striations, sulcus biconvex.

Weylandites bilateralis Bharadwaj and Srivastava 1969
Holotype: Bharadwaj and Srivastava 1969; pl. 29, fig. 105; size 90 x 60 μm; Slide No. BSIP 3193-5

Locality: Nidpur, Sidhi District, Madhya Pradesh, India
Horizon and Age: Nidpur, Early Triassic
Diagnostic Features: Oval pollen; size 50-92.5 x 27.5-60 μm; transverse striations close on both faces, irregularly distributed, converging each side, branched with vertical partitions, sulcus longish.

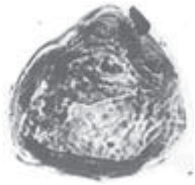
Weylandites circularis Bharadwaj and Srivastava 1969

Holotype: Bharadwaj and Srivastava 1969; pl. 28, fig. 94; size 55 x 50 μm; Slide No. BSIP 1954-5



Locality: Nidpur, Sidhi District, Madhya Pradesh, India
Horizon and Age: Nidpur, Early Triassic
Diagnostic Features: Circular pollen; size 42.5-80 x 42.5-65 μm; proximally 20-22 and distally 6-10 vertical striations, rectangular sulcus on either side.

Weylandites irregularis Bharadwaj and Srivastava 1969
Holotype: Bharadwaj and Srivastava 1969; pl. 29, fig. 110; size 54 x 50 μm; Slide No. BSIP 1888-12



Locality: Nidpur, Sidhi District, Madhya Pradesh, India
Horizon and Age: Nidpur, Early Triassic
Diagnostic Features: Circular, thick rimed pollen; size 32.5-67.5 x 30-52 μm; striated in concentric or circular manner; distal sulcus rectangular to triangular.

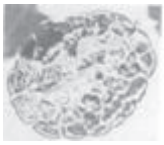
Weylandites minutus Bharadwaj and Srivastava 1969
Holotype: Bharadwaj and Srivastava 1969; pl. 28, fig. 101; size 35 x 27.5 μm; Slide No. BSIP 1889-13

Locality: Nidpur, Sidhi District, Madhya Pradesh, India
Horizon and Age: Nidpur, Early Triassic
Diagnostic Features: Subcircular pollen; size 27.5-55 x 25-40 μm; proximally 9-13 transverse striations with dumb-bell or fusiform thickened area; 4-5 vertical striations on distal face, sulcus ill-defined, broadly biconvex.

CIRCUMPOLL GROUP

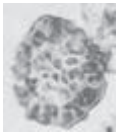
Genus *Camerosporites* Leschik emend. Scheuring 1970
Type Species: *Camerosporites secatus* Leschik 1955
Locality: Neuewelt bei Basel, Switzerland
Horizon and Age: Keuper, Late Triassic
Diagnostic Features: Oval to subcircular pollen; body covered with big and low auriculate processes on proximal face and equator; circum-sulcus on distal face, sometimes ring-tenuitas present adjacent to the equatorial processes.

Camerosporites secatus Leschik 1955
Holotype: Leschik 1955; pl. 5, fig. 11; size 50 μm



Locality: Neuewelt bei Basel, Switzerland
Horizon and Age: Keuper, Late Triassic
Diagnostic Features: Size 50-36 μm; exine 1 μm thick, sculptural elements 2-5 μm in diameter, sulcus 9 x 6 μm.

Camerosporites minor Kumaran and Maheshwari 1980
Holotype: Kumaran and Maheshwari 1980; pl. 10, fig. 15; size 30 μm; Slide No. BSIP 6116



Locality: Eastern bank of Janar Nala about 2 km southeast of Bijouri, District Shahdol, Madhya Pradesh, India
Horizon and Age: Tiki Formation, Late Triassic

Diagnostic Features: Size 20-30 μm; exine about 1 μm thick, proximally sculptured with small verrucae, verrucae 1-2 μm broad x 1 μm high, distal sculpture reduced, with a distal ring tenuitas, 10-15 μm diameter.

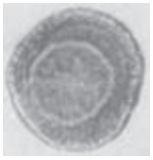
Genus *Classopollis* (Pflüg) Pocock and Jansonius 1961
Type Species: *Classopollis classoides* Pflüg 1953
Locality: Siegelsum, Holstein, Europe
Horizon and Age: Liassic, Late Triassic
Diagnostic Features: ± Spherical pollen; monoporate distally; reduced trilete scar may be present on proximal face; exine two layered, equatorially with a striated band.

Classopollis classoides (Pflüg) Pocock and Jansonius 1961
Holotype: Pflüg 1953; pl. 16, fig. 29-31; size 30 μm

Locality: Siegelsum, Holstein
Horizon and Age: Liassic, Late Triassic
Diagnostic Features: Size 23-27 x 26-29 μm; exine 1.5-2 μm thick, with 2.5-3 μm thick and 7-8 μm broad equatorial striated band; on distal face thin circular area, 5 μm in diameter.

Genus *Discisporites* Leschik emend. de Jersey 1964
Type Species: *Discisporites niger* Leschik 1955
Locality: Neuewelt bei Basel, Switzerland
Horizon and Age: Keuper, Late Triassic
Diagnostic Features: Cingulate, circular to subcircular spore; trilete distinct, rays up to equator; exine scabrate, granulate, verrucose and striated proximally; narrow circular band of thinner exine (ring tenuitas) on distal face.

Discisporites niger Leschik 1955
Holotype: Leschik 1955; pl. 3, fig. 12; size 23 μm



Locality: Neuewelt bei Basel, Switzerland
Horizon and Age: Keuper, Late Triassic
Diagnostic Features: Roundish to oval spore; exine 1 μm thick, finely sculptured, 15 μm wide distinct thickening surrounds 7 μm wide faint zone on distal face.

Discisporites triassicus Kar 1970
Holotype: Kar 1970; pl. 2, figs. 27a-27b; size 41 μm; Slide No. BSIP 3464

Locality: Bore-core No. RE9, depth 83 m, Raniganj Coalfield, West Bengal, India
Horizon and Age: Panchet Formation, Early Triassic
Diagnostic Features: Size 30-50 μm; trilete rays strongly developed; exine thick, mostly verrucose; a circular, thin, depressed area present in central region on distal face.

Genus *Duplicisporites* Leschik emend. Klaus 1960
Type Species: *Duplicisporites granulatus* Leschik 1955
Locality: Neuewelt bei Basel, Switzerland
Horizon and Age: Keuper, Late Triassic
Diagnostic Features: Rounded to subtriangular spore; trilete mark rarely seen on proximal face; exine infrapunctate to infragranulose; on distal face exinal band along equatorial margin and thin area in center.

Duplicisporites granulatus Leschik 1955
Holotype: Leschik 1955; pl. 2, fig. 23; size 36 μm

Locality: Neuewelt bei Basel, Switzerland
Horizon and Age: Keuper, Late Triassic
Diagnostic Features: Broadly triangular spore; trilete mark rarely seen on proximal face; exine infragranulose, three prominent, 4-13 μm wide exinal band around equator on distal face.

Genus *Granuloperculatipollis* Venkatachala and Góczán 1964
Type Species: *Granuloperculatipollis rudis* Venkatachala and Góczán 1964
Locality: Ungarn, Nagylengyel, Hungary
Horizon and Age: Kossen-Facies, Late Triassic
Diagnostic Features: Circular pollen; trilete mark hardly perceptible, operculum and pore clearly delimited; exine granulose.

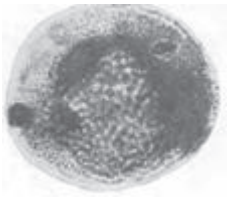
Granuloperculatipollis rudis Venkatachala and Góczán 1964
Holotype: Venkatachala and Góczán 1964; pl. 3, fig. 22; size 40 μm

Locality: Ungarn, Nagylengyel, Hungary
Horizon and Age: Kossen-Facies, Late Triassic
Diagnostic Features: Size 35-40 μm; trilete mark hardly perceptible due to sculptures; exine granulose, grana ± 2 μm, unevenly distributed; operculum and pore clearly delimited.

Granuloperculatipollis distinctus Kumaran *in* Maheshwari and Kumaran 1979
Holotype: Kumaran *in* Maheshwari and Kumaran 1979; pl. 6, fig. 11; size 30 μm; Slide No. BSIP 5653

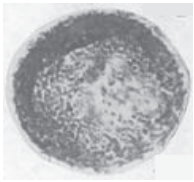
Locality: Son River Section, west of Tharipathar Village, District Shahdol, Madhya Pradesh, India
Horizon and Age: Tiki Formation, Late Triassic
Diagnostic Features: Size 30-45 μm; trilete rays more than 3/4 of radius; exine 3 μm thick, finely granulose, grana less than 1 μm in diameter.

Granuloperculatipollis flavatus Kar 1970
Holotype: Kar 1970; pl. 2, fig. 35; size 58 μm; Slide No. BSIP 3473



Locality: Bore-core No. RE9, depth 82 m, Raniganj Coalfield, West Bengal, India
Horizon and Age: Panchet Formation, Early Triassic
Diagnostic Features: Size 45-65 μm; exine 2.5 μm thick, mostly granulose, evenly distributed; distally operculate.

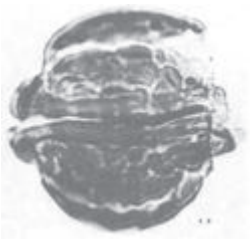
Granuloperculatipollis problematicus Kar 1970
Holotype: Kar 1970; pl. 2, fig. 33; size 62 μm; Slide No. BSIP 3462



Locality: Bore-core No. RE9, Raniganj Coalfield, West Bengal, India
Horizon and Age: Panchet Formation, Early Triassic
Diagnostic Features: Size 48-72 μm; exine 2 μm thick, occasionally folded, bears strongly built coni, interspersed with spines, closely placed, evenly distributed.

Genus *Rhaetipollis* Schulz 1967
Type Species: *Rhaetipollis germanicus* Schulz 1967
Locality: Becken, Germany
Horizon and Age: Rhaetic and Liassic, Late Triassic to Early Jurassic
Diagnostic Features: Bilateral hemispherical pollen; ring-furrow along equator, towards inner side exine beset with warts.

Rhaetipollis germanicus Schulz 1967
Holotype: Schulz 1967; pl. 22, fig. 10; size 40 μm

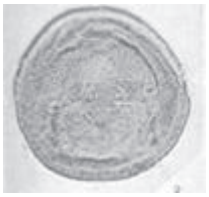


Locality: Becken, Germany
Horizon and Age: Rhaetic and Liassic, Late Triassic to Early Jurassic
Diagnostic Features: Oval to roundish; size 35-40 μm; exine 4 μm thick, inner side irregular, $\pm$6 μm wide warts on exine surface.

ALETE

Genus *Araucariacites* (Cookson) Couper 1958
Type Species: *Araucariacites australis* Cookson 1947
Locality: Waterfall Gorge near Port Jeanne D, Kerguelen Archipelago
Horizon and Age: Tertiary
Diagnostic Features: Originally spherical, frequently folded, alete pollen; exine invariably sculptured with fine grana to scabrate.

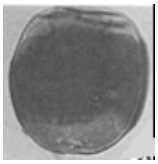
Araucariacites australis Cookson 1947
Holotype: Cookson 1947; pl. 13, figs. 1-4



Locality: Waterfall Gorge near Port Jeanne D, Kerguelen Archipelago
Horizon and Age: Tertiary
Diagnostic Features: Size 39-93 μm; usually flattened, circular; exine $\pm$ 1 μm thick, sculptured with fine grana.

Genus *Bartenia* Helby 1987
Type Species: *Bartenia communis* Helby 1987
Locality: Exmouth Plateau, Carnarvon Basin, Australia
Horizon and Age: Mungaroo Formation, Late Triassic
Diagnostic Features: Subspherical ovoid to cylindrical cysts; cyst wall two layered, cavate; cylindrical thickened area in center.

Bartenia communis Helby 1987
Holotype: Helby 1987; fig 3A; size 34 x 45 μm



Locality: Exmouth Plateau, Carnarvon Basin, Australia
Horizon and Age: Mungaroo Formation, Late Triassic
Diagnostic Features: Size 34-51 μm; central thickened area up to 1.5 μm in diameter; rounded protrusions extending from each cylindrical area.

Genus *Circulisporites* de Jersy 1962
Type Species: *Circulisporites parvus* de Jersey 1962
Locality: Bore N. S. 118, Ipswich Coalfield, Australia
Horizon and Age: Triassic
Diagnostic Features: Circular to subcircular, frequently folded; exine ornamented with concentric low ridges, striae continous and uniform in width.

Circulisporites parvus de Jersey 1962
Holotype: de Jersy 1962; pl. 5, fig. 3; size 20 μm
Locality: Bore N. S. 118, Ipswich Coalfield, Australia

Horizon and Age: Triassic
Diagnostic Features: Size 15-20 μm; exine $\pm$ 1 μm thick, smooth on one face, other face ornamented with 2-6 concentric striae, 1-3 μm wide and up to 1-3 μm apart.

Genus *Conaletes* Reinhardt and Schön 1967
Type Species: *Conaletes apiculatus* Reinhardt and Schön 1967
Locality: Germany
Horizon and Age: Early Triassic

Diagnostic Features: Alete spore, circular to subcircular; exine beset with densely placed coni or bacula.

Conaletes apiculatus Reinhardt and Schön 1967
Holotype: Reinhardt and Schön 1967; pl. 1, fig. 5; size ± 30 μm

Locality: Germany
Horizon and Age: Early Triassic
Diagnostic Features: Size 30-40 μm; exine thin, strongly folded, sculptural elements 0.7 x 0.7-1 μm, 100-120 sculptural elements on surface.

Conaletes gondwanensis Kumaran and Maheshwari 1980
Holotype: Kumaran and Maheshwari 1980; pl. 11, fig. 16; size 60 μm; Slide No. BSIP 5941

Locality: Eastern bank of Janar Nala about 2 km southeast of Bijouri, Shahdol District, Madhya Pradesh, India
Horizon and Age: Tiki Formation, Late Triassic
Diagnostic Features: Size 54-65 μm; exine up to 1.5 μm thick, coni and spinules about 1 μm in basal diameter, up to 1.5 μm high, less than 1 μm apart, about 90 elements projecting at equator.

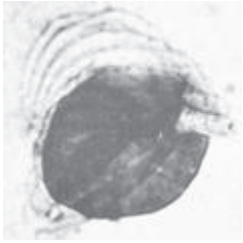
Genus *Conipollenites* Cameron 1974
Type Species: *Conipollenites arabicus* Cameron 1974
Locality: Aramco, ST-17 cuttings (6.36-90 ft.), Arabian Peninsula
Horizon and Age: Jilh Formation, Late Triassic
Diagnostic Features: Alete subtriangular to subcircular pollen; exine unequally ornamented with irregularly arranged conical processes, densely spaced papillae.

Conipollenites arabicus Cameron 1974
Holotype: Cameron 1974; pl. 1, fig. 3; size 77 μm

Locality: Aramco, ST-17 cuttings (6.36-90 ft), Arabian Peninsula
Horizon and Age: Jilh Formation, Late Triassic
Diagnostic Features: Size 66-77 μm; exine beset with 10-11 μm long x 2-4 μm wide conical processes, spaced 10 μm apart, papillae less than 1 μm apart, blunt, segmented, 8 x 2 μm in size.

Genus *Equisetosporites* Daugherty 1941
Type Species: *Equisetosporites chinleana* Daugherty 1941
Locality: Petrified Nation, Arizona, USA
Horizon and Age: Late Triassic
Diagnostic Features: Alete pollen, spherical; exine smooth, thin, encircled with 4 elators.

Equisetosporites chinleana Daugherty 1941
Holotype: Daugherty 1941; pl. 34, fig. 4; size 37.5 μm



Locality: Petrified Nation, Arizona, USA
Horizon and Age: Late Triassic
Diagnostic Features: Size 35-40 μm; encircled with 4 elators side by side, 70 μm long, 4 μm wide, terminating spirally around body.

Genus *Densostriapollis* Tiwari and Rana 1981
Type Species: *Densostriapollis damudicus* Tiwari and Rana 1981
Locality: Borehole RD-1, sample No. 4, 532.8 m, Raniganj Coalfield, West Bengal, India

Horizon and Age: Mahadeva Formation, Middle Triassic

Diagnostic Features: Bilaterally oval to subcircular spore; circular thin area in centre; exine smooth to infrapuctate, striations on both faces of body, converging at ends.

Densostriapollis damudicus Tiwari and Rana 1981

Holotype: Tiwari and Rana 1981; pl. 2, fig. 37; size 62 x 42 μm; Slide No. BSIP 5626

Locality: Borehole RD-1, sample No. 4, 532.8 m; Raniganj Coalfield, West Bengal, India

Horizon and Age: Mahadeva Formation, Middle Triassic

Diagnostic Features: Size 52-70 x 42-62 μm; 4-7 striations, unbranched, inner thin area occupies 2/3 of total diameter.

Genus *Graminoides* Goubin 1965

Type Species: *Graminoides crenes* Goubin 1965

Locality: Morondava Basin, (CDB 4, 162-229m), Medagascar

Horizon and Age: Groupe de 1'Isalo, Late Triassic

Diagnostic Features: Monoporate, spherical spore; exine faintly ornamented.

Graminoides crenes Goubin 1965

Holotype: Goubin 1965; pl. 8; fig. 8; size 57 μm

Locality: Morondava Basin, (CDB 4, 162-229 m), Madagascar

Horizon and Age: Groupe de 1'Isalo, Sakamana, Late Triassic

Diagnostic Features: Size 50-60 μm; exine 3 μm thick, rugulate, forming imperfect reticulum.

Genus *Grebespora* Jansonius 1962

Type Species: *Grebespora concentrica* Jansonius 1962

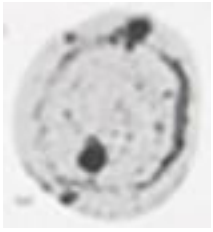
Locality: Imp. 534-2, Peace River area, western Canada

Horizon and Age: Toad/ Grayling Formation, Early Triassic

Diagnostic Features: Circular, spore/pollen; exine thin, single layered, unstructured with concentric fold equatorially.

Grebespora concentrica Jansonius 1962

Holotype: Jansonius 1962; pl. 16, fig. 3; size 118.9 x 38.9 μm



Locality: Imp. 534-2, Peace River area, western Canada

Horizon and Age: Toad/ Grayling Formation, Early Triassic

Diagnostic Features: Size 20-55 μm; exine thin, scabrate to lavigate; 1-4 μm wide, dark concentric fold near equator.

Genus *Laricoidites* Potonié 1931

Type Species: *Laricoidites* (*Sporonites*) *magnus* Potonié, Thomson and Thiergart 1950

Locality: Ville bei Köln, Beisselsgrube, Germany

Horizon and Age: Oligocene, Miocene

Diagnostic Features: Subcircular alete; exine smooth to infrapunctate, variously thinned as secondary features.

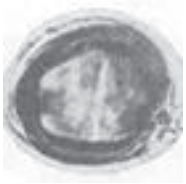
Laricoidites magnus Potonié, Thomson and Thiergart 1950

Holotype: Potonié 1931; fig. 6; size 88 μm

Locality: Ville bei Köln, Beisselsgrube, Germany
Horizon and Age: Oligocene, Miocene
Diagnostic Features: Size 85-90 μm; exine less than 1 μm thick, surface variously folded.

Genus *Rimaspora* Kar 1970
Type Species: *Rimaspora plicata* Kar 1970
Locality: Bore-core No. RE9, depth 83 m, Raniganj Coalfield, West Bengal, India
Horizon and Age: Panchet Formation, Early Triassic
Diagnostic Features: Circular-subcircular spore; a suture present in middle region; exine laevigate, generally folded at equator, hardly rupture in two complete halves.

Rimaspora plicata Kar 1970
Holotype: Kar 1970; pl. 2, fig. 30; size 32 μm; Slide No. BSIP 3466



Locality: Bore-core No. RE9, depth 83 m, Raniganj Coalfield, West Bengal, India
Horizon and Age: Panchet Formation, Early Triassic
Diagnostic Features: Size 38-70 μm; exine 2 μm thick, laevigate to weakly infragranulose.

Genus *Schizosporis* Cookson and Dettmann 1959
Type Species: *Schizosporis reticulatus* Cookson and Dettmann 1959
Locality: Australia
Horizon and Age: Neocomian, Cretaceous
Diagnostic Features: Medium to large spore, with an equatorial furrow which separates into two equal parts.

Schizosporis reticulatus Cookson and Dettmann 1959
Holotype: Cookson and Dettmann 1959; pl. 1, figs. 1-3

Locality: Australia
Horizon and Age: Neocomian, Cretaceous
Diagnostic Features: Size 90-135 μm; circular, biconvex, flattened at poles; exine reticulate, muri 1 μm wide, luminae 5-6 x 8-10 μm in diameter.

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This 'Atlas of Spores and Pollen from the Triassic Succession of India' provides a comprehensive information about the palynofossils from the Triassic rock strata in different Mesozoic sedimentary basins of India. This includes the check-list of all the taxa recorded from the Triassic of India. Details of the genus with their type species; and the species instituted from India are dealt herein. Further, it includes the distribution of various species through Triassic, which enables the identification of a group of species for the palynozonation in the Triassic Sequence. These Groups further enhance their role and use in biostratigraphy.

This Atlas will be useful to the Earth scientist, Researchers, Teachers of various Organizations world over.