PALMS THROUGH AGES IN SOUTHERN INDIA – A RECONNAISSANCE

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A NEW ARCHAEAN STROMATOLITE FROM THE CHITRADURGA GROUP, DHARWAR CRATON, INDIA AND ITS SIGNIFICANCE

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(Received 21 June 2000; revised version accepted 08 March 2004)

ABSTRACT

Sharma M & Shukla M 2004. A new Archaean stromatolite from the Chitradurga Group, Dharwar Craton, India and its significance. Palaeobotanist 53(1-3) : 5-16.

The present paper deals with the systematics, morphogenesis and depositional environment of a new stromatolite morphotype *Batiola indica* from the ~ 2.6 Ga old Archaean sediments of the Chitradurga Group, Dharwar Craton, India. It has been grouped under family Cryptophytonidae. Its morphological features are attributed to both biotic and environmental factors and considered to have been formed in a tidal regime.

Key-words—Stromatolite, Archaean, Chitradurga, Dharwar, India.

A NOTE ON THE GEOGRAPHIC AND STRATIGRAPHIC DISTRIBUTION OF JURINODENDRON IN CHINA

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(Received 07 July 2003; revised version accepted 20 May 2004)

ABSTRACT

Feng, Li, Shen & Wang 2004. A note on the geographic and stratigraphic distribution of *Jurinodendron* in China. Palaeobotanist 53 (1-3) : 17-20.

Cyclostigma. Haughton ex. Heer 1871, which is a homonym of modern botany, should be abandoned. Doweld proposed *Jurinodendron* Doweld to replace it. This paper shows the geographic and stratigraphic distribution of *Jurinodendron* in P.R. China, which adds to the current knowledge of the distribution of *Jurinodendron* Doweld and its significance as a cosmopolitan taxon.

Key-words—*Jurinodendron*, homonym, geographic and stratigraphic distribution, P.R. China.

DENSOISPORITES POLAZNAENSIS SP. NOV. : WITH COMMENTS ON ITS RELATION TO VIATCHESLAVIA VORCUTENSIS ZALESSKY

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(Received 24 September 2003; revised version accepted 20 May 2004)

ABSTRACT

Naugolnykh SV & Zavialova NE 2004. *Densoisporites polaznaensis* sp. nov. with comments on its relation to *Viatcheslavia vorcutensis* Zalessky. Palaeobotanist 53 (1-3): 21-33.

A new species of lycopsid microspores, *Densoisporites polaznaensis*., is described. The spores were extracted from clayey matrix containing stems and phylloids of *Viatcheslavia vorcutensis* Zalessky, a characteristic lepidophyte of the lowermost Upper Permian (Solikamskian) of the Ural Mountains and Russian Platform. The fossils studied came from the Polazna Locality of the Ufimian (Roadian) age, situated near Perm City, Russia. The spores of *D. polaznaensis* are 30-69 µm, round to subtriangular, having almost smooth proximal side with clearly visible trilete scar with rays extended to the spore equator. Distal side of the spores has a fine granulate relief, formed by widely spaced distinct granulae. The sporoderm is two-layered; the outer layer consists of numerous interlaced lamellae and the inner layer includes a single lamella. At some sections, in the central region of spores, "laminated zones" were detected in the inner layer. There is a weakly developed cavity in the sporoderm. *Viatcheslavia vorcutensis* is represented by wide stem fragments (up to 30 cm in diameter). Leaf cushions are present on old lowermost stem parts, but any attached phylloids/sporophylls were not found, the phylloids/sporophylls obviously were shed. Leaf cushions usually are round, with clear scar of leaf attachment and ligular depression on the upper margin of the cushion. Two small areas of parenchymatous tissues (possible parichnos) are occasionally seen. On the basis of co-occurrences and typological extrapolation with related taxa of lycophytes belonging to the family Pleuromeiaceae, it is suggested that microspores of *Densoisporites polaznaensis* were produced by *Viatcheslavia vorcutensis*. The palaeoecology of *Viatcheslavia vorcutensis* interpreted as a halophytic plant is discussed.

Key-words—Permian, Russian Platform, Lycophytes, *Viatcheslavia,* Palaeoecology, *Densoisporites*.

PERMIAN GONDWANA MEGASPORES FROM WARDHA Basin, India

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(Received 29 January 2004; revised version accepted 20 May 2004)

ABSTRACT

Tewari R, Rajanikanth A & Jha N 2004. Permian Gondwana megaspores from Wardha Basin, India. Palaeobotanist 53 (1-3) : 35-50.

A rich megaspore assemblage has been recorded from the Early Permian Barakar Formation of Umrer Coalfield, Wardha Basin. The assemblage is represented by nine genera and thirteen species : *Bokarosporites rotundus*, *Banksisporites indicus, B. utkalensis, Duosporites congoensis, D. irregularis, Duosporites* sp*., Barakarella pantii, Talchirella trivedii, Jhariatriletes baculosus,* two new species—*Biharisporites umrerensis* and *B. waigaoensis* besides the taxa *Lagenoisporites* sp. and *Setosisporites hirsutus.*The last two are reported for the first time from India*.* Preponderance of trilete and gulate megaspores indicates a dominance of Cryptogams and an association of gulate forms, in particular, suggests lycopsid affinity. The assemblage indicates prevalence of marshy and humid environmental conditions of deposition.

Key-words—Megaspores, Early Permian, Barakar Formation, Wardha Basin, India.

PALYNOSTRATIGRAPHY OF SUB-SURFACE LOWER GONDWANA, PALI SEDIMENTS, SOHAGPUR COALFIELD, M.P., INDIA

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ABSTRACT

Ram-Awatar, Mukhopadhyay A & Adhikari S 2003. Palynostratigraphy of sub-surface Lower Gondwana, Pali sediments, Sohagpur Coalfield, M.P., India. Palaeobotanist 53 (1-3) : 51-59.

Two palynoassemblages have been identified in B.H. SKM 6, from Mithauri-Kelmania Sector of Sohagpur Coalfield, M.P. The Palynoassemblage I (254.00-163.40 m), of Late Early Permian age reveals the dominance of *Scheuringipollenites* and *Faunipollenites* in association with *Barakarites, Parasaccites, Ibisporites, Rhizomaspora, Potonieisporites, Arcuatipollenites, Tiwariasporis* and *Brevitriletes*. The Palynoassemblage II (157.40-77.90 m), contains striate disaccate pollen, viz., *Faunipollenites, Striatopodocarpites* and *Crescentipollenites* in prominence. Besides, *Arcuatipollenites, Densipollenites,*

Gondisporites, Distriatites, Striatites, Hamiapollenites, Guttulapollenites, Dicappipollenits and *Alisporites* have also been recorded, with sporadic occurrence of *Goubinispora,* ?*Brachysaccus, Trabeculosporites, Densoisporites, Playfordiaspora, Lundbladispora, Satsangisaccites, Krempipollenites, Falcisporites, Nidipollenites* and *Kamthisaccites* which suggest a Late Permian age of the assemblage. The significant outcome of the present study is recorded by identifying the Late Permian palynofloral assemblage for the first time in this part of the Sohagpur Coalfield, which is corroborate with the Middle Pali Member of the Pali Formation, in the South Rewa Basin, M.P.
Key-words—Palynostratigraphy, Pali Formation, Late Permian, Sohagpur Coalfield.

PALYNOLOGICAL DATING OF COAL-BEARING SEDIMENTS FROM THE BOTTAPAGUDEM AREA, CHINTALPUDI SUB-BASIN, ANDHRA PRADESH

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(Received 28 May 2002; revised version accepted 08 May 2003)

ABSTRACT

Jha N 2004. Palynological dating of coal-bearing sediments from the Bottapagudem area, Chintalpudi sub-basin, Andhra Pradesh. Palaeobotanist 53 (1-3) : 61-67.

Palynological studies were carried out in bore core MAB-1 from the Bottapagudem area of the Beddadanur Block in Chintalpudi Sub-Basin in order to date and correlate the coal bearing sediments. Three palynological assemblages have been recognised in 220 m thick sedimentary sequence of this bore hole MAB-1. Assemblage I is characterised by dominance of striate disaccates, chiefly *Striatopodocarpites* and *Faunipollenites,* along with some stratigraphically significant taxa, viz., *Falcisporites, Guttulapollenites, Chordasporites, Osmundacidites, Playfordiaspora, Klausipollenites, Strotersporites* and *Vitreisporites.* Assemblage II is also dominated by striate disaccates, together with *Densipollenites* and rare occurrences of palynotaxa like *Falcisporites, Klausipollenites, Playfordiaspora, Lundbladispora, Chordasporites, Strotersporites, Densoisporites* and *Lunatisporites.* Palynoassemblage III is likewise dominated by striate disaccates, with common occurrence of *Crescentipollenites* and less frequent *Falcisporites, Chordasporites, Klausipollenites* and *Strotersporites*. All three assemblages belong to the Raniganj palynosequence and are of Late Permian age. Raniganj palynoflora has been recorded in lithologically designated Barren Measures sequence between 176-220 m.

Key-words—Palynology, Dating, Coal, Gondwana, Late Permian, Raniganj, Godavari Graben.

ENVIRONMENTAL IMPLICATIONS OF GONDWANA WOOD STUDIES IN INDIA

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ABSTRACT

Rajanikanth A & Tewari R 2004. Environmental implications of Gondwana wood studies in India. Palaeobotanist 53 (1-3) : 69-81.

A synthesis of fossil gymnospermous woods from various Gondwana basins of India is presented, and characters of growth rings in the secondary wood, particularly tracheidal cell characters, are evaluated for possible palaeoclimatic signals. Permian fossil woods are mostly recorded from the Damuda, Wardha and Pranhita-Godavari basins. Growth rings are common in many of these species and suggest strong seasonality. Triassic woods are poorly known from the South Rewa Gondwana Basin; the paucity of growth rings suggests a lack of marked seasons. Available evidence on Jurassic woods from the Pranhita-Godavari Graben indicates lack of consistency in the growth ring distribution. Early Cretaceous fossil woods recorded from the Damuda, Pranhita-Godavari, East-Coast and Kutch basins mostly show growth rings, which suggest prevalence of distinct seasons. Ecological factors coupled with phenotypic plasticity, i.e., variation with the same genotype as a function of environmental differences (genetic flexibility) probably dictated wood accumulation patterns in Indian Gondwana woods. However, palaeo-latitudinal and palaeo-physiographic constraints influenced habitats, and subsequent taphonomic processes resulted in incomplete understanding of palaeoclimate. In the absence of contemporary meteorological data during Gondwana times on what is now on the Indian continent, fossil woods constitute an important tool for understanding the past impact of climate on tree growth.

Key-words—Wood, Gondwana, Palaeoclimate, Growth rings, Seasons.

NEW JURASSIC PROTOCYCADALEAN OVULIPHORES AND THE ORIGINS OF THE CYCADALES

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(Received 24 September 2003; revised version accepted 20 May 2004)

ABSTRACT

Krassilov VA & Doludenko MP 2004. New Jurassic protocycadalean ovuliphores and the origins of the Cycadales. Palaeobotanist 53(1-3) : 83-89.
Ovuliferous spikes with two lateral rows of ovules are described from the Callovian of Georgia. The ovules are large, orthotropous, oblique to the stout rachis, with a scar of subtending bract at the base. They show a relatively thin integument and a bulky nucellus topped by a broad nucellar beak. This find constitutes a new genus *Baruligyna* gen. nov. closely related to the previously described *Semionogyna* Krassilov et Bugdaeva from the Lower Cretaceous of Transbaikalia. Both are associated with pteridosperm-like foliage. In the case of *Baruligyna*, the associated leaves are of a *Pachypteris* morphotype, bipinnate with thick leathery pinnules similar to the ovules in shape and dimensions. This group of Mesozoic plants is considered as transitional between the Permian callipterids and the Mesozoic cycads indicating the origin of *Cycas*-type ovuliphores ("macrosporophylls") form planated bracteate strobili.
Key-words—Cycadales, Jurassic, Plant Morphology, Phylogeny.

THE GENUS ARAUCARITES FROM UPPER GONDWANA SUCCESSION (EARLY CRETACEOUS) OF BAIRAM-BELKHER AREA, DISTRICT AMRAVATI, MAHARASHTRA AND DISTRICT BETUL, MADHYA PRADESH

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(Received 22 November 2001; revised version accepted 30 November 2003)

ABSTRACT

Srivastava AK, Manik SR, Patil GV & Gawande RR 2004. The genus *Araucarites* from Upper Gondwana succession (Early Cretaceous) of Bairam-Belkher area district Amravati, Maharashtra and district Betul, Madhya Pradesh. Palaeobotanist 53 (1-3) : 91-95.

The present investigation corroborates with the vegetative counterparts belonging to conifers recovered from the fossiliferous horizons of the Upper Gondwana succession of the Early Cretaceous age. The succession, in addition, to the species of Filicales, Bennettitales, Cycadales and Coniferales, also revealed the rich assemblage of *Araucarites*, viz., *A. cutchensis*, *A. minutus* and *Araucarites* sp.

Key-words—Impressions, Mesozoic conifers, Upper Gondwana, India.

CALLAIOSPHAERIDIUM SCABRATUM SP. NOV. —A NEW DINOFLAGELLATE CYST SPECIES FROM EARLY TURONIAN OF THE CAUVERY BASIN, INDIA

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ABSTRACT

Khowaja-Ateequzzaman & Garg R 2004. *Callaiosphaeridium scabratum* sp. nov. – A new dinoflagellate cyst species from the Early Turonian of the Cauvery Basin, India. Palaeobotanist 53(1-3) : 97-103.

A new dinoflagellate cyst species *Callaiosphaeridium scabratum*, is discovered from the Kulakkalnattam Sandstone Member of the Garudamangalam Formation exposed in the Cauvery Basin, southern India. This striking new species, characterised by a scabrate wall and distally open short and broad tubular paracingular processes, will add greatly to the ability to correlate Lower Turonian strata in the region.

Key-words—Dinoflagellate cyst, Early Turonian, Garudamangalam Formation, Cauvery Basin, India.

CUTICULAR STUDIES ON THE FOSSIL LEAVES FROM CHURIA (SIWALIK) SEDIMENTS OF ARJUN KHOLA SEQUENCE, WESTERN NEPAL

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(Received 08 January 2003; revised version accepted 30 September 2003)

ABSTRACT

Prasad M & Khare EG 2004. Cuticular studies on the fossil leaves from Churia (Siwalik) sediments of Arjun Khola Sequence, western Nepal. Palaeobotanist 53(1-3) : 105-112.

Two fossil leaf impressions along with their cuticle, collected from Middle Siwalik (Upper Miocene) sediments of Arjun Khola Sequence, about 3 km north-west of Lamhi in Deokhuri District of western Nepal, have been identified on the basis of their morphological and cuticular features. They resemble closely with the modern taxa. *Sterculia coccinea* Jack. and *Diospyros toposia* Ham. of the Sterculiaceae and Ebenaceae respectively. The present distribution of the modern equivalent taxa of the fossils and the presence of fungal spores in their cuticle collectively indicate the prevalence of warm humid climate in the area during Upper Miocene.

Key words—Leaf impressions, Cuticles, Miocene, Angiosperm, Churia (Siwalik) Formation, Arjun Khola.

PALYNOLOGY OF THE LAKADONG SANDSTONE (LATE PALAEOCENE) EXPOSED AROUND BHALUKURUNG, NORTH CACHAR HILLS, ASSAM

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ABSTRACT

Chakraborty M 2004. Palynology of Lakadong Sandstone (Late Palaeocene) exposed around Bhalukurung, North Cachar Hills, Assam. Palaeobotanist 53(1-3) : 113-121.

A rich palynoassemblage is recorded from the carbonaceous shale and coal beds in the Lakadong Sandstone exposed around Bhalukurung on the bank of Kopili River, near Umrongso (North Cachar Hills), Assam. The palynoassemblage comprises 40 genera and 60 species. The significant palynotaxa are *Dandotiaspora dilata*, *D. telonata*, *Lycopodiumsporites speciosus, Neocouperipollis kutchensis, Matanomadhiasulcites maximus, Spinizonocolpites echinatus, Proxapertites cursus, Lakiapollis ovatus, Tricolporopollis matanomadhensis* and *Proteacidites protrudus*. The present assemblage has been equated with that of *Lycopodiumsporites speciosus* Cenozone on the basis of palynofloral similarity. The assemblage has been compared with the known contemporaneous palynoassemblages from northeast India and Kutch to assess similarities and differences between them. The palynoflora indicates tropical, warm humid climate and coastal depositional environment with mangrove swamps. The assemblage indicates an Upper Palaeocene (Thanetion) age.

Key-words—Palynology, Lakadong Sandstone, Late Palaeocene, North Cachar Hills, Assam (India).

PALYNOLOGICAL INVESTIGATION OF THE SINDHUDURG FORMATION (MIOCENE) EXPOSED AT KALVIWADI, SINDHUDURG DISTRICT, MAHARASHTRA, INDIA

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ABSTRACT

Rao MR 2003. Palynological investigation of the Sindhudurg Formation (Miocene) exposed at Kalviwadi, Sindhudurg District, Maharashtra, India. Palaeobotanist 53 (1-3) : 123-135.

A diversified palynofloral assemblage has been recovered from the Sindhudurg Formation exposed at Kalviwadi, Sindhudurg District, Maharashtra. The palynoflora consists of fungal remains (18 genera and 26 species), pteridophyte spores (5 genera and 5 species) and angiosperm pollen (12 genera and 13 species). Two new species of fossil angiosperm pollen are proposed: *Lakiapollis ratnagiriensis* and *Tricolporopollis sindhudurgensis*. A quantitative analysis of the spores and pollen recovered shows a dominance of fungal remains is a conspicuous feature of the assemblage. The palynomorphs in the assemblage has been compared with pollen and spores of modern taxa. The distribution of the families represented by the fossil assemblage suggests a tropical-subtropical (warm and humid) climate with high rainfall. The depositional environment is interpreted as near shore, coastal with brackish swampy lagoon.
Key-words—Palaeopalynology, Palaeoecology, Sindhudurg Formation, Miocene, Maharashtra (India).

REMARKS ON GLUTOXYLON BURMENSE (HOLDEN) CHOWDHURY FROM LAL MAI HILLS, COMILLA DISTRICT, BANGLADESH

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(Received 28 October 1999; revised version accepted 10 February 2003)

ABSTRACT

Kar RK, Ambwani K, Agarwal A & Saha SK. 2004 Remarks on *Glutoxylon burmense* (Holden) Chowdhury from Lal Mai Hills, Comilla District, Bangladesh. Palaeobotanist 53 (1-3) : 137-141.

A fossil wood resembling the extant wood of *Gluta* of the family Anacardiaceae is described from the Lal Mai Hills, Comilla District, Bangladesh. The Lal Mai Hills belongs to Dupi Tila Formation and is of Late Miocene in age. The fossil wood closely resembles *Gluta* in the presence of mostly solitary vessels with tyloses, xylem rays uni to biseriate, apotracheal- paratracheal parenchyma, fibres arranged in radial rows and radial gum canals. The probable cause of extinction of *Gluta* from the eastern parts of India and Bangladesh has also been discussed.

Key-words—Fossil wood, *Glutoxylon*, Late Miocene, Bangladesh.

AGE AND DEPOSITIONAL ENVIRONMENT OF THE UPPER BHUBAN FORMATION OF CHAMPHAI AREA (EASTERN MIZO HILLS) INDIA—A PALYNOLOGICAL APPROACH

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(Received 30 July 2001; revised version accepted 19 November 2003)

ABSTRACT

Mandaokar BD 2004. Age and depositional environment of the Upper Bhuban Formation of Champhai area (Eastern Mizo hills) India—A palynological approach. Palaeobotanist 53 (1-3) : 143-153.

Palynological analysis of outcropping claystone, shale and alternation of sandstone – siltstone, Upper Bhuban Formation from Champhai, eastern Mizoram, India has been attempted. In all total 47 genera and 60 species are recognised in the assemblage. Of these 8 genera and 11 species are represented by pteridophytic spores and 27 genera and 35 species belong to angiospermic pollen, 6 genera and 6 species to gymnospermous pollen, fungal remains are also encountered. Some significant constituents of the assemblage are *Dictyophyllidites, Pteridacidites, Polypodiisporites, Lycopodiumsporites, Compositoipollenites, Polygonacidites, Malvacearumpollis, Hibisceapollenites, Cupuliferoipollenites, Alnipollenites, Engelhardtioidites, Pinuspollenites*, *Piceaepollenites* and *Podocarpidites.* Quantitative dominance of angiospermous pollen is a conspicuous feature of the assemblage. The recorded palynological assemblage indicates the prevalence of wet semi evergreen type of vegetation with warm and humid tropical-temperate climate with plenty of rainfall during sedimentation. On the basis of comparison of the present assemblage with the palynoassemblages known from Indian Tertiary sediments. An Upper Miocene age has been assigned to the Tertiary sediments of Champhai area of Mizoram.

Key-words—Palynology, Upper Bhuban Formation, Miocene, Champhai, Mizoram, India.

DISPERSED ORGANIC MATTER FROM NEOGENE AND PLEISTOCENE SEDIMENTS OF SITE 218 OF DEEP SEA DRILLING PROJECT LEG 22, BENGAL FAN, INDIAN OCEAN

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(Received 28 August 2001; revised version accepted 8 May 2003)

ABSTRACT

Kumar M, Saxena RK & Chandra A 2004. Dispersed organic matter from Neogene and Pleistocene sediments of Site 218 of Deep Sea Drilling Project Leg 22, Bengal Fan, Indian Ocean. Palaeobotanist 53 (1-3) : 155-160.

Dispersed organic matter has been recorded from the Neogene-Pleistocene sediments of site 218 of the Deep Sea Drilling Project Leg 22, Bengal Fan and depositional environment of the studied sequences has been deduced. An attempt has been made to calibrate frequency abundance of organic matter in order to identify variation at various depth levels. Based on the occurrence and frequency of various types of organic matter the borehole section has been divided into lower, middle and upper zones. The lower zone is rich in biodegraded terrestrial organic matter, whereas the upper zone exhibits abundance of structured terrestrial and black debris. Spores and pollen are poorly represented. Recycled Cretaceous palynofossils have been recorded throughout the sequence. The analysis of lithologic and organic matter data indicates that these sediments were deposited in deltaic environment. The behaviour pattern of biodegraded, structured and black debris indicates reducing condition in the lower zone and oxidizing condition in the upper zone.
Key-words—Dispersed organic matter, Deep Sea Drilling Project, Environment of deposition, Neogene and Pleistocene, Bengal Fan, Indian Ocean.

Wood remains from Ahichchhatra, District Bareilly, Uttar Pradesh (ca. 475 B.C. to A.D. 1280)

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(Received 18 October 2001; revised version accepted 08 May 2002)

ABSTRACT

Srivastava Chanchala 2004. Wood remains from Ahichchhatra, District Bareilly, Uttar Pradesh (ca. 475 B.C. to A.D. 1280). Palaeobotanist 53 (1-3) : 161-168.

The paper describes the anatomical investigation of wood remains from an ancient mound at Ahichchhatra in Bareilly District of Uttar Pradesh along with their archaeological significance. The wood charcoals are the only botanical finds described from this ancient site. The studies have brought to light the exploitation of locally available timbers by the ancient settlers from the surrounding Sal forests in this region of Ganga-Yamuna Doab, from late Painted Grey Ware and Northern Black Polished Ware periods up to Historical levels (approximately from ca. 475 B.C. to A.D. 1280). The taxa recovered viz., *Shorea robusta* (Sal), *Terminalia tomentosa* (Laurel), *Dalbergia sissoo* (Sheesham), *Anogeissus latifolia* (Axle-wood) and *Acacia* sp. (Babul), indicate prevalence of tropical monsoon climate in the ancient times, similar to the present day conditions.

Key-words—Archaeobotany, Wood charcoals, Ahichchhatra, Uttar Pradesh, India.

FURTHER OBSERVATION ON MEYERIPOLLIS BAKSI & VENKATACHALA, 1970

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PODOCARPACEAN WOOD FROM THE CRETACEOUS OF CAUVERY BASIN

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(Received 18 March 2004; revised version accepted 24 May 2004)

PODOCARPOXYLON BANSAENSE N. SP. FROM THE BANSA BEDS, SOUTH REWA GONDWANA BASIN

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(Received 18 March 2004; revised version accepted 20 May 2004)