

Palynology of the Permian coal from Barjora of West Bengal, India

Chhaya Pal & S.K. Roy

Pal Chhaya & Roy SK 1998. Palynology of the Permian coal from Barjora of East Bengal, India. *Palaeobotanist* 47 : 29-31.

Palynological investigations carried out on bore-hole BRJ-003 Barjora of Bankura District in West Bengal, India shows that the assemblage is rich in disaccate pollen grains with predominance of *Scheuringipollenites*, *Straitopodocarpites*, *Striatopiceles*, *Labirites* along with a few trilete-tetrahedral spores and monosulcates. The general characteristics of the assemblage indicate Barakar palynoflora.

Key-words—Palynology, Barakar Formation, Permian, India.

Chhaya Pal & S.K. Roy, Department of Botany, Burdwan University, Burdwan 713 104, India.

सारांश

पश्चिम बंगाल (भारत) में बरजोरा से एकत्र परमियन युगीन कोयलों का परागणविक अध्ययन

छाया पाल एवं एस.के. रॉय

पश्चिम बंगाल (भारत) में बाँकुरा जनपद में बरजोरा के समीप बी.आर.जे. 003 नामक वेध-छिद्र से प्राप्त नमूनों के परागणविक अन्वेषण से व्यक्त होता है कि इस समुच्चय में कुछ त्रिअरीय-चतुर्शीर्ष बीजाणु और एककोष्ठियों के साथ-साथ श्यौरिंगीपोलिनाइटिस, स्ट्रिएटोपोडोकार्पाइटिस, स्ट्रिएटोपाइसिटीज और लाहिराइटिस की बाहुल्यता से युक्त द्विकोष्ठीय परागकण विद्यमान हैं। सम्पूर्ण प्राप्त समुच्चय इन अवसादों की बराकार आयु इंगित करते हैं।

PALYNOLOGICAL investigations on various Lower Gondwana coal basins have been done earlier by a number of workers like Bhattacharya (1982), Karmakar and Roy (1984), Lele (1974), Lakhnupal, Maheshwari and Awasthi (1971), Srivastava (1991) and Tiwari (1974a, b & c). So far, more than 550 species of spora-dispersae have been described from various Lower Gondwana formations. The palynological investigation on Barjora Basin was previously undertaken by Karmakar and Roy (1984), Das, Karmakar and Roy (1987) and Kulshrestha (1990).

In the present investigation, the authors studied palynoflora from 9-coal seams occurring within Bore-core BRJ-3 in Barjora Basin and 32 genera have been identified. Tiwari (1974) summarized the knowledge about palynoflora recovered from Barakar Formation of different basins in India.

The dispersed spores and pollen grains have been arranged according to Potonie.

List of spora-dispersae

Psilalacinites sp.

Callumispora sp.

Acanthotriletes sp.

Lophotriletes sp.

Lobatisporites sp.

Microbaculispora sp.

Brevitriletes sp.

Indospora sp.

Microfoveolatispora sp.

Densosporites sp.

Altimonoletes sp.

Ghosiasporites sp.

Densipollenites densus Bharadwaj & Srivastava 1969

Densipollenites sp.

Plicatipollenites indicus Lele 1964

Potoniesporites neglectus Potonie & Lele 1961

Potoniesporites sp.

Barakarites sp.

Vestigisporites sp.

Scheuringipollenites sp.

Scheuringipollenites barakarensis Tiwari 1964

Vesicaspora sp.

Cuneatisporites sp.

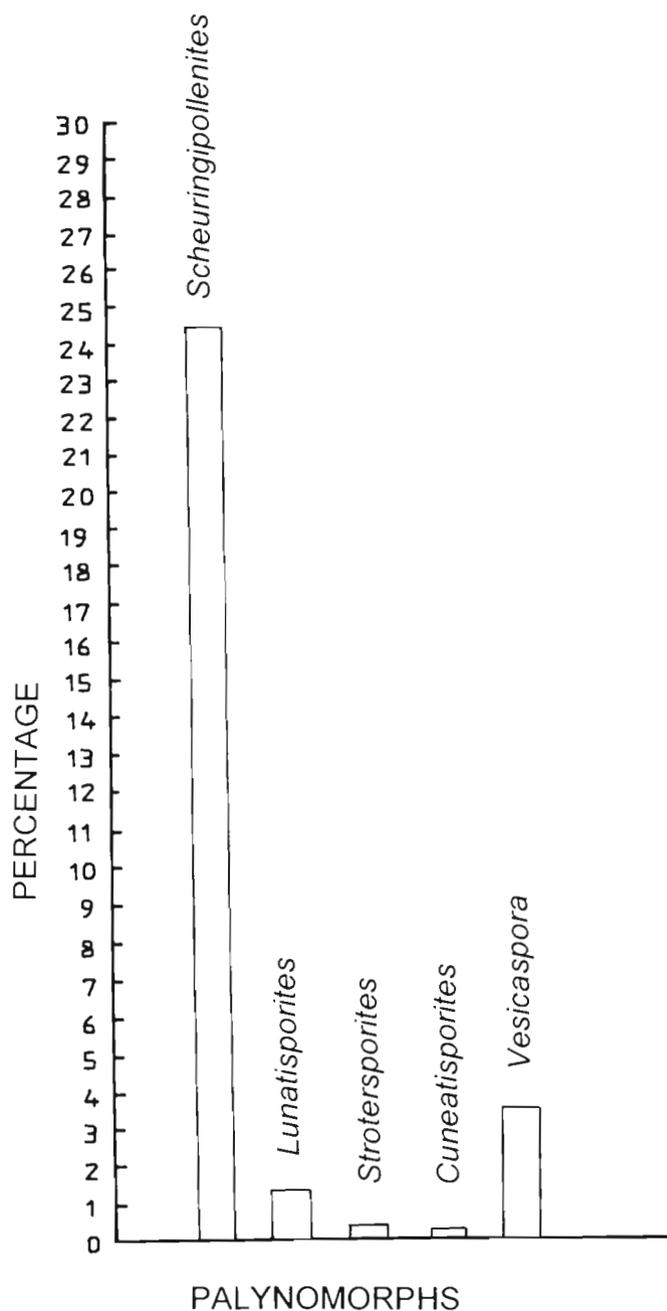
Rhizomaspora sp.

Faunipollenites singrauliensis Sinha 1972
Faunipollenites sp.
Striatopiceites digredius Kar 1968a
Striatopiceites granulatus Kar 1968a
Striatopiceites varius (Bharadwaj) Venkatachala & Kar 1967
Striatopiceites sp.
Striatopodocarpites labrus Tiwari 1956
Striatopodocarpites sp. A
Striatopodocarpites sp.
Strotersporites sp.
Lahirites rarus Bharadwaj & Salujha 1964
Lahirites parvus Bharadwaj & Salujha 1964
Lahirites sp.
Lunatisporites sp.
Striatites subtilis Bharadwaj & Salujha 1964
Striatites sp.
Hindipollenites sp.
Verticypollenites crassus Bharadwaj & Salujha 1964
Verticypollenites gibbosus Bharadwaj 1962
Verticypollenites sp.
Gnetaceaepollenites sp.

DISCUSSION

So far 127 genera of palynomorphs have been described from Barakar Formation in different Lower Gondwana basins in India. A critical qualitative and quantitative analysis of microspores recovered from the coal-seams demonstrate that there are 32 genera in all; out of which, 12 genera are cryptogamic; 4 are monosaccates; 10 are striate disaccates; 5 are non-striate disaccate and *Gnetaceaepollenites* belonging to plicates.

Kulshrestha (1990) identified 3 distinct palynological assemblages in Barjora Basin, Lower Gondwana Formation where he demonstrated that Assemblage-A is dominated by *Scheuringipollenites* with *Faunipollenites* as sub-dominated. This he regards as Lower Barakar stage. Assemblage-B shows predominance of *Faunipollenites* over *Scheuringipollenites* which he regards as Upper Barakar stage and Assemblage-C with preponderance of *Densipollenites* in association with *Faunipollenites* and *Striatopodocarpites* as belonging to Barren-Measures stage. The



Text-figure 1— Percentage distribution of different pollen genera.

present authors, however, found that in the coal phase *Scheuringipollenites* is the most dominant taxon followed by *Striatopiceites*, *Lahirites*, *Verticypollenites*, *Striatopodocarpites*, *Faunipollenites*, *Scheuringipollenites* and *Vestigisporites*. Thus it is evident that if we consider the coal seam-9 of

Bore core BRJ-3 belonging to Barakar Formation, only then the sub-dominant forms do not match with the results arrived at by Kulshrestha (1990). It is true that *Scheuringipollenites* is an index fossil of Barakar Formation which is quantitatively represented by little more than 24.5 per cent in the assemblage while *Striatopiceites* is represented by 11.3 per cent. Others mentioned above vary between 5 to 10 per cent in the assemblage. *Cuneatisporites* is the least represented which is less than 1 per cent in the assemblage Text-figure 1. Karmakar and Roy (1984) and Das, Karmakar and Roy (1988) also point out that *Scheuringipollenites* is the most dominant genus in Barakar Formation of Barjora Basin, Bankura District. However, they pointed out that the Apiculate-zonate forms, viz., *Verrucosisporites*, *Lobatisporites* and *Horriditriletes* occur frequently in the samples. We do not find any of these genera except *Lobatisporites*. Moreover, among mono-saccates, we find only *Barakarites*, *Densipollenites*, *Plicatipollenites* and *Potonieisporites* but do not encounter *Kamthisaccites*, *Parasaccites*, *Crucisaccites* and *Divarisaccus* as reported by previous workers. Thus, it is evident that the coal-phase in Bore-hole BRJ-3 had environmental condition of its own and therefore it does not match well with the palynoflora of shale-phase and sandstone-phase.

REFERENCES

- Bhattacharyya AP 1982. Palynology of the Lower Gondwana sedimentary deposits in Bankura District of West Bengal, India. *Ph.D. Thesis*, University of Burdwan, Burdwan.
- Das S, Karmakar SK & Roy SK 1988. Spore-dispersae from carbonaceous shale in Barjora, Bankura District, West Bengal, India. *Geophytology* 18(2) : 169-172.
- Karmakar SK & Roy SK 1984. Megaspores from carbonaceous shale of Indian Gondwana sediments of Bankura District, West Bengal. *Proc. V Indian geophytol. Conf. Lucknow, Spl. Publ.* : 116-118.
- Karmakar SK & Roy SK 1987. Palaeopalynology of the Indian Gondwana sedimentary deposits of Barjora area of Bankura District, West Bengal, India. *Ph.D. Thesis*, University of Burdwan, Burdwan.
- Kulshrestha AK 1990. Palynostratigraphy of the Lower Gondwana sediments in Barjora Coalfield, West Bengal, India. *Biol. Mem.* 16 (1&2) : 18-28.
- Lakhanpal RN, Maheshwari HK & Awasthi N 1971. *A Catalogue of Indian Fossil Plants*. Birbal Sahni Institute of Palaeobotany, Lucknow.
- Lele KM 1974. Palaeozoic monosaccate spores. In : Surange KR, Lakhanpal RN & Bharadwaj DC (Editors)—*Aspects and Appraisal of Indian Palaeobotany* : 253-269. Birbal Sahni Institute of Palaeobotany, Lucknow.
- Srivastava SC 1991. *A catalogue of fossil plants from India- Palaeozoic and Mesozoic spores and pollen grains*. Birbal Sahni Institute of Palaeobotany, Lucknow.
- Tiwari RS 1974a. Palaeozoic cryptogamic spores. In : Surange KR, Lakhanpal RN & Bharadwaj DC (Editors)—*Aspects and Appraisal of Indian Palaeobotany* : 84-99. Birbal Sahni Institute of Palaeobotany, Lucknow.
- Tiwari RS 1974b. Palaeozoic disaccate spores. In : Surange KR, Lakhanpal RN & Bharadwaj DC (Editors)—*Aspects and Appraisal of Indian Palaeobotany* : 253-269. Birbal Sahni Institute of Palaeobotany, Lucknow.
- Tiwari RS 1974c. Interrelationship of palynofloras in the Barakar Stage (Lower Gondwana), India. *Geophytology* 4 (2) : 111-129.