
Palynological recognition of the Karharbari-Barakar Formations in the sub-surface sediments of Wardha Coalfield, Maharashtra, India

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Palynological investigation of coal and associated sediments in two bore-holes MWS-23 and MWS-33 from Wardha Valley Coalfield, Maharashtra has been done. Results indicate the presence of Upper Karharbari and Lower Barakar Formations in the coalfield.

Key-words—Palynostratigraphy, Karharbari Formation, Barakar Formation, Lower Permian, Wardha Valley, India.

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सारांश

महाराष्ट्र (भारत) में वर्धा कोयला-क्षेत्र के उपसतही अवसादों में करहरबारी-बराकार शैल-समूहों की विद्यमानता के परागाणविक प्रमाण

अनन्त प्रसाद भट्टाचार्य

महाराष्ट्र में वर्धा घाटी कोयला-क्षेत्र के एम-डब्ल्यू-एस० 23 एवं 33 नामक दो वेध-छिद्रों के कोयले और सहयुक्त अवसादों का परागाणविक अन्वेषण किया गया। उपलब्ध परिणामों से इस कोयला-क्षेत्र में उपरि करहरबारी एवं अधरि बराकार शैल-समूहों की उपस्थिति व्यक्त होती है।

THE Wardha Valley Coalfield, north-western extension of the Godavari Valley coalfields, preserves a rock sequence from Early Permian to Early Cretaceous. The coal-bearing tracts under active mining are confined to a narrow peripheral part along the western fringes of the basin where coal occurs at shallower depths. The geology of the coal-bearing eastward tract on dip side is little known due to wide-spread overlap of Kamthi sediments. The succession of the Gondwana sequence in the Wardha Valley Coalfield is given below (after Raja Rao, 1982) :

Maleri Formation

----- U n c o n f o r m i t y -----

Kamthi Formation

----- U n c o n f o r m i t y -----

Barakar Formation

Talchir Formation

----- U n c o n f o r m i t y -----

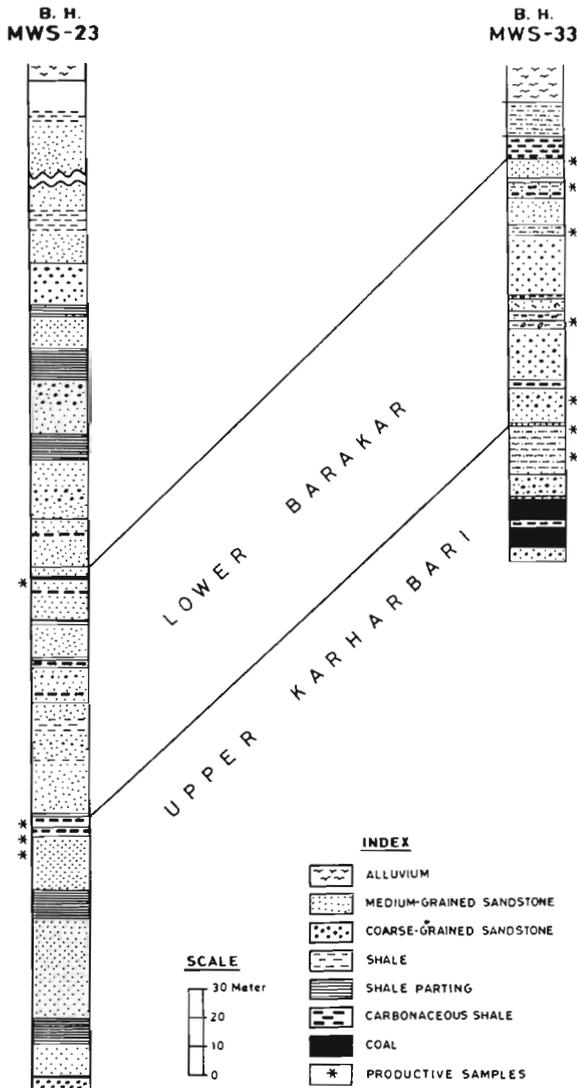
Sullavi Formation

Pakhal Formation

Palynofossils from the Permian of Chandrapur District have been described by Lele (1984), Agashe and Chitnis (1970), Agashe and Geetha (1979), Agashe and Suresh (1979) and Agashe *et al.* (1984). Anand-Prakash and Khare (1970) reported palynology and petrographic characters of the working coal seams.

The present palynological investigation has been carried out on the coal and associated sediments in the two bore holes MWS-23 and MWS-33 drilled by Mineral Exploration Corporation Limited. Both bore holes, according to MECL, pass through Kamthi, Maitur and Barakar Formations (Text-figure 1). MECL, supplied shale and carbonaceous shales of the drill cores for palynological investigation to ascertain the age of these sediments.

Lithologically there is no marked distinction for the Karharbari and Barakar sediments in the subsurface samples but the palynological investigation supports their distinct presence.



Text-figure 1—Showing details of lithology of Bore-holes MWS-23 and MWS-33.

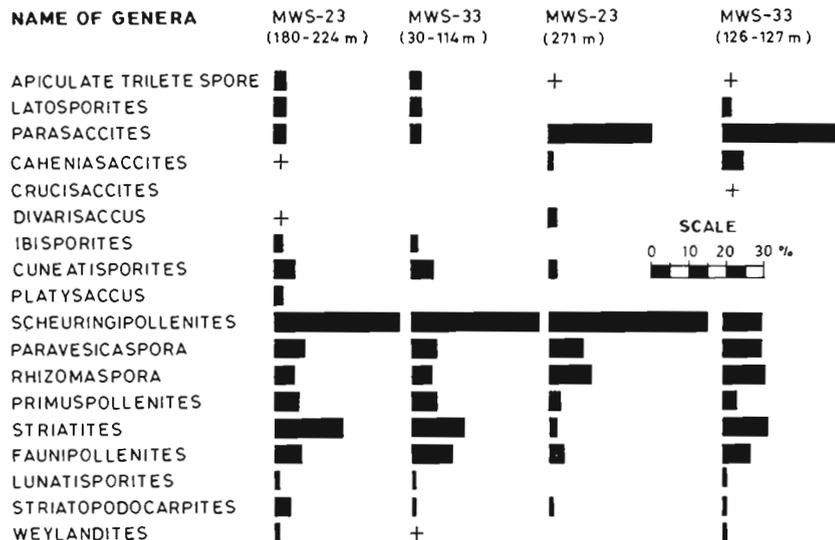
PALYNOLOGICAL ASSEMBLAGES

Studies of the composition of palynofossils (Text-figure 2) indicate two distinct assemblages. They have been described as Assemblage A and B.

Assemblage A—In the bore-hole MWS-33, at the depth of 126-127 m, a palynofossil assemblage is found showing 33 per cent of *Parasaccites* in association with non-striate bisaccate pollen (52%). The non-striate bisaccates are represented by *Scheuringipollenites*, *Paravescaspora*, *Rhizomaspora* and *Primuspollenites*. The Karharbari forms—*Crucisaccites* and *Caheniasaccites* are also present. The striate bisaccate forms constitute only 10 per cent of the assemblage.

In the bore-hole MWS-23, at the depth 271 m, a comparable assemblage is known which shows the presence of 28 per cent radial monosaccate *Parasaccites* in association with nonstriate bisaccates (65%). The striate bisaccates are only 5 per cent of the assemblage. In the overall composition both the assemblages resemble each other, particularly in the predominance of *Parasaccites* and non-striate bisaccates, and paucity of striate bisaccates.

Assemblage B—In bore holes MWS-33 (at the depth of 30-114 m) and MWS-23 (at a depth of 18-224 m), the palynological assemblages are nearly alike in composition. The assemblage contains apiculate trilete spores, monolete spores, nonstriate bisaccate pollen, striate bisaccate pollen and sulcate



Text-figure 2—Distribution of pollen and spores in Bore-holes MWS-23 and MWS-33 from Wardha Valley Coalfield.

forms. Nonstriate bisaccate pollen are nearly 55 per cent, of these the most common form is *Scheuringipollenites* (34%). The striate bisaccates are 18 per cent of the total. Besides, the assemblage has nearly each of 5 per cent apiculate trilete spores, monolete *Latosporites* and radial monosaccate pollen *Parasaccites*.

COMPARISON

Bharadwaj (1974) on the basis of qualitative and quantitative occurrence of *Sporae dispersae* suggested a palynological zonation of the Lower Gondwana. According to his scheme the Assemblage - A recorded in the bore holes is palynologically comparable to that of the Upper Karharbari Formation in the presence of radial monosaccates and non-striate disaccate rich assemblage. On the other hand, the Assemblage B compares to Barakar-I palynozone having a non-striate and striate bisaccate rich assemblage. On the basis of palynoassemblage, the sediments at the depth of 180-224 m in MWS-23 correlate with that from the depth 30-114 m in MWS-33 and represent the Lower Barakar Formation. The sediments at depth of 126-127 m in MWS-33 correlate with those at the depth of 271 m in MWS-23 and thus represent the Karharbari Formation.

REFERENCES

- Agashe SN & Chitnis SR 1972. Palynology of a Permian coal seam from Hindustan Lalpeth Colliery, Chandrapur District, Maharashtra, India. In : Ghosh AK *et al.* (Editors)—*Proceedings of the Seminar on Paleopalynology and Indian Stratigraphy* : 21-29.
- Agashe SN & Geetha KR 1979. Palaeopalynological studies of Lower Gondwana strata with particular reference to certain coal seams from Kamptee Coalfield, Nagpur District, Maharashtra State. *Geophytology* 9(1-2) : 116-123.
- Agashe SN, Gowda PRN, Suresh FC & Geetha KR 1984. Recent advances in palaeobotanical studies on Lower Gondwana strata of Chandrapur District, Maharashtra. In : Sharma AK *et al.* (Editors)—*Proceedings of Symposium on Evolutionary botany and biostratigraphy, Calcutta 1979. Current Trends In Life Sciences* 10 : AK Ghosh Commemoration Vol. : 369-382. Today's & Tomorrow Printers & Publ., New Delhi.
- Agashe SN & Suresh FC 1979. Palaeopalynological studies on the Lower Gondwana strata with particular reference to coal bearing beds in Chandrapur District, Maharashtra State, India. *Geophytology* 9(1-2) : 121-129.
- Anand-Prakash & Khare RC 1976. Petrology and palynostratigraphy of some Wardha Valley coals, Maharashtra, India. *Palaeobotanist* 23(2) : 124-138.
- Bharadwaj DC 1974. Palynological subdivision of Damuda Valley. In : Surange KR, Bharadwaj DC & Lakhanpal RN (Editors)—*Aspects & appraisal of Indian palaeobotany* : 392-396. Birbal Sahni Institute of Palaeobotany, Lucknow.
- Lele KM 1984. Studies in the Talchir flora in India-12. Basal Talchir palynofossils from Penganga Valley and their biostratigraphic value. In : Sharma AK *et al.* (Editors)—*Proceedings of Symposium on Evolutionary botany and biostratigraphy, Calcutta 1979. Current trends in life sciences* 10 : AK Ghosh Commemoration Vol. : 262-267. Today & Tomorrows Printers & Publ., New Delhi.
- Raja Rao CS 1982. Coal resources of India (Tamil Nadu, Andhra Pradesh, Orissa and Maharashtra). *Bull. geol. Surv. India, ser. A* 40(2) : 184-194.