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Denwasporites gen. nov. : A prepollen from the Upper Triassic of India

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ABSTRACT

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Denwasporites a new prepollen genus is recorded from the Upper Triassic Denwa Formation of the Satpura Basin. It is a monolete form with weak intrapunctate exine.

Key-words — Prepollen, Upper Triassic (Denwa Formation), India.

सारांश

डेनवास्पोराइटीज़ नव वंश : उपरिट्रायसिकयुगीन भारत से प्राप्त एक प्रारंभिक परागकण

प्रमोद कुमार

डेनवास्पोराइटीज़ सतपुड़ा द्रोणी के उपरिट्रायसिकयुगीन डेनवा शैलसमूह से अंकित किया गया एक नवीनतम प्रारंभिक परागकण है। यह कमजोर एक्साइन से युक्त एक एकअरीय रूप है।

INTRODUCTION

SOME fossil miospores bearing a monolete-mark are recorded from the clay beds (Text-figure 1; Sample no.7 of Kumar & Kumar, 1999 in the Denwa Formation exposed in an artesian well cutting south of the village of Anhoni in the Chhindwara District, Madhya Pradesh. Monolete spores are known from the Upper Carboniferous-Permian and younger strata in the dispersed condition. These are referred to such miospore genera as *Laevigatosporites* Ibrahim, 1933, *Punctatosporites* Ibrahim, 1933, *Latosporites* Potonié & Kremp, 1954, *Leschikisporis* Bharadwaj & Singh, 1964 and *Monoletes* Cookson ex Potonié, 1956.

Other monolete forms bearing a proximal suture have been reported *in situ* from the genus *Medullosa*, and these prepollen have been described as *Monoletes* Van der Hammen, 1954 (=*Schopfipollenites* Potonié & Kremp, 1954) from the Upper Carboniferous of Germany. Surange and Chandra (1974) described monolete, sculptured spores as *Kendosporites* from the cone of *Kendostrobus* from Permian beds of the Raniganj Coalfield of Damodar Basin in India.

In the present paper, *Denwasporites* is a monolete-sutured prepollen which is described below following detailed study.

SYSTEMATICS

Turma—MONOLETES Ibrahim, 1933

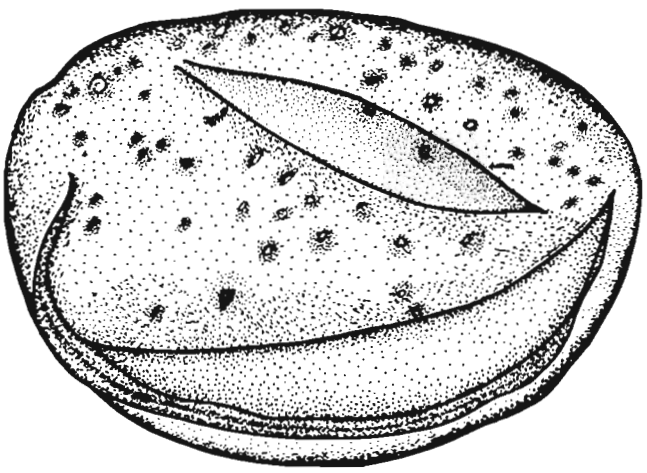
Suprasubturma—ACAVATOMONOLETES Dettmann, 1963

Subturma—AZONOMONOLETES Luber 1935

Infraturma—LAEVIGATOMONOLETI Dybová & Jachowicz, 1957

Genus—DENWASPORITES gen. nov.

Etymology—Denwa Formation, Satpura Basin, M.P., India.



Text-figure 1—Diagrammatics sketch of *Denwasporites* gen. nov.

Diagnosis—Spores bilaterally symmetrical, equatorial outline oval; bearing proximally monolete suture. Exine smooth to weakly intrapunctate, folded along peripheral margins.

Description—Spores broadly oval in equatorial outline. Proximal face plano-concave or-convex, bearing monolete suture, labra smooth, simple thin. Distal face distinctly convex. Exine smooth to faintly intrapunctate, folded, puncta small and shallow. *Extrema lineamenta* smooth. Size 70-82 µm long and 48-64 µm broad.

Type species—Denwasporites anhonii gen. *et* sp. nov.

Comparison—Denwasporites gen. nov. is clearly distinct from *Latosporites* Potonié & Kremp, 1954 which has broadly oval to near circular amb and distal side strongly inflated; polar axis 1/2 - 1/1 of the longer axis in the equatorial plane; and shorter laesura. *Monoletes* Cookson ex Potonié, 1956 known from the Tertiary beds, has an oval amb meridian about half circular, and smooth but rigid exine. *Laevigatosporites* Ibrahim, 1933 is a bean-shaped spore and hence is not comparable with *Denwasporites* gen. nov. *Leschikisporis* Potonié emend. Bharadwaj and Singh, 1964 has an asymmetrical trilete mark with granulate exine and circular amb. *Punctatosporites* Ibrahim, 1933 is bean-shaped with punctate exine (like fine sand-paper); hence, it is quite different from *Denwasporites* gen. nov. The *in situ* spore genus *Kendosporites* Surange & Chandra, 1974 differs from the studied spores in featuring a patterned exine (i.e., ridges and grooves) running parallel to the longitudinal axis.

DENWASPORITES ANHONII sp. nov.
Pl. 1, figs 1-3

1969 *Laevigatosporites* sp. Bharadwaj & Srivastava, Pl. 24, fig. 3.

1973 *Laevigatosporites ovatus* Wilson & Webster in Kumar; Pl. 4, fig. 90.

Reconstruction—Text-fig. 1.

Type species—Denwasporites anhonii gen. *et* sp. nov.

Holotype—Pl. 1, fig. 1; size 74 µm long and 54 µm broad; BSIP No. 12257.

Locus typicus—Anhoni Village, Chhindwara District, Madhya Pradesh, India.

Stratum typicum—Denwa Formation, Mahadeva Group, Middle Gondwana, Satpura Basin, India.

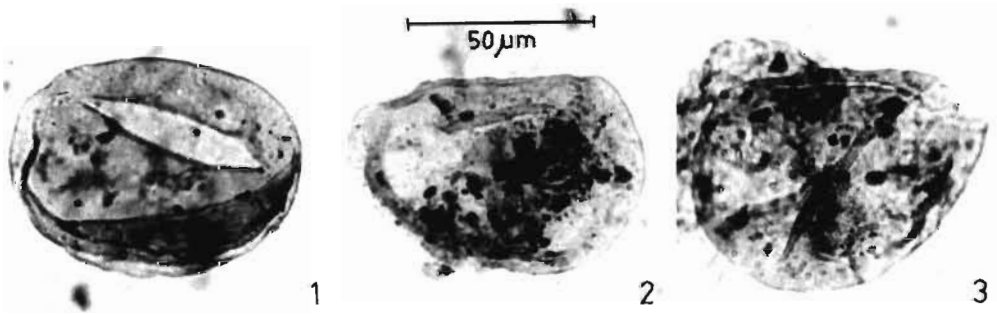


PLATE 1

All photomicrographs x 500. Co-ordinates of the specimens in slides refer to stage of Laborlux D Microscope No. 077055. The figured slides are deposited with the repository of Birbal Sahni Institute of Palaeobotany, Lucknow.

1 *Denwasporites anhonii* gen. *et sp.* nov. Slide no. BSIP 12257 (39 x 107.5).

2. *D. anhonii* Slide no. BSIP 12256 (12.5 x 98.5).

3. *D. anhonii* Slide no. BSIP 12255 (42 x 95.5).

Age—Late Triassic.

Etymology—Village Anhoni, Chhindwara District, M.P.

Diagnosis—Spores bilaterally symmetrical, equatorial outline oval, proximal face plano-concave or slightly convex, but the other (probably distal) face strongly convex, Monolete suture simple on the proximal face, labra thin and simple. Exine slightly intrapunctate, puncta small and folded. *Extrema lineamenta* smooth.

Description—Equatorial outline oval to broadly oval, distally arched face. Monolete-mark, length 2/3 to 3/4 of longitudinal axis, ± straight; labra thin, simple, and open. Exine 1-2.5 μm thick, surface intrapunctate, puncta small and shallow, faintly perceptible and sparse, folded along distal peripheral margin. Size range from 10 specimens; 70-80 μm long and 52-60 μm broad. *Extrema lineamenta* smooth.

Comparison—*Monoletes major* Cookson, 1947 differs from *Denwasporites anhonii* sp. nov. in being smaller (55.5- 77 x 32-42.5μm). *M. indicus* Kumar, 1973 possesses thicker exine (2.5-6.0 μm thick) with larger size range (105-120 x 63-92.5 μm). *M. grandis* Dev, 1961 differs in having intragranulate, transluscent exine and shorter monolete mark. *M. intragranulosus* Singh, Srivastava and Roy, 1964 differs in having finely intragranulate exine and shorter monolete mark. *Monolites* sp. of Kumar (1973) is distinct from *Denwasporites anhonii* in its thicker exine, which is intragranulate with coarse, closely packed grana covering the surface. *Laevigatosporites ovatus* Wilson & Webster in Kumar (1973, Pl. 4, fig. 90) is different in possessing smooth, unfolded exine. *Laevigatosporites* sp. Bharadwaj & Srivastava (1969) is smaller (ca. 50 x 34 μm), than *Denwasporites anhonii*. The *in situ* spore *Kendosporites striatus* Surange & Chandra, 1974, differs in being sculptured with parallel ridges and grooves.

DISCUSSION

Chaloner (1970) defined prepollen as "the microspores of seed plants which must have functioned as pollen but retained the pteridophytic character of proximal germination. It represents an intermediate condition between the microspores of free, sporing plants and the true distally germinating pollen of modern gymnosperm". He further opined that these could be either with or without a saccus. The dispersed prepollen genus *Monoletes* (=*Schopfipollenites*) from the Upper Carboniferous, Germany, is known to occur *in situ* in the vast majority of medullosan pollen organs (Taylor, 1981, p. 353; Stewart & Rothwell, 1993; p. 322). Surange and Chandra (1974; Pl. 2, figs 15 and 18) isolated *in situ* oval-shaped monolete spores having ridged and grooved exinal surface as well as a few smooth walled spores from the cone of *Kendostrobus* belonging to Glossopteridales from the Permian sediments of Raniganj Coalfield, Bengal, India. Bharadwaj and Srivastava (1969) described a monolete spore as *Laevigatosporites* sp. (Pl. 24, fig. 3) from Middle Triassic Nidpur beds, South Rewa Basin in Sidhi District, M.P., India. In (pers. com.) Dr Shyam C. Srivastava has identified monolete spores (similar = *Denwasporites* gen. nov.) in a pollen bearing organ recorded from the Triassic sediments of Nidpur, South Rewa Basin, India.

Occurrences of such monolete spores as *in situ* reported above as well as in dispersed conditions in the Denwa Formation (Upper Triassic) of Indian sediments is suggestive of seed-plants similar to medullosan forms in Satpura Basin, central India.

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