

## MATONIDIUM CINGULATUM N. SP. FROM KACHCHH, INDIA

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### ABSTRACT

*Matonidium cingulatum* n. sp. is based on detached sterile and fertile pinnae collected from three different localities in Kachchh. The specimens, in external features, resemble *M. goepperti* (Ettingshausen) Schenk described by Harris (1961), but they differ from the latter in the details of spore character. In *M. cingulatum* the spores have a narrow cingulum and they do not show any thickening of exine around the trilete mark.

*Key-words* — *Matonidium*, Pteridophytes, Upper Jurassic, Kachchh (India).

### सारांश

कच्छ, भारत से मेटोनिडियम सिंगुलेटम को एक नई जाति — जेबा बानो एवं महेन्द्र नाथ बोर

कच्छ में तीन भिन्न स्थानों से एकत्रित मेटोनिडियम सिंगुलेटम न० जा० विलग्न बंध्य एवं अबंध्य पिच्छकों पर आघारित है। बाह्य लक्षणों में ये प्रादश हेरिस (1961) द्वारा वर्णित मे० गोपरटाई एंटीगशासेन से मिलते-जुलते हैं परन्तु बीजाणु-लक्षणों में ये हेरिस द्वारा वर्णित प्रादशों से भिन्न हैं। मे० सिंगुलेटम के बीजाणुओं में एक सकरा चोल पाया जाता है तथा ये त्रिअरीय-चिन्ह के चारों ओर बाह्यचोल का कोई स्थूलन भी प्रदर्शित नहीं करते।

### INTRODUCTION

FROM Kachchh the genus *Matonidium* was first reported by Roy (1968) from Trambau. He, however, did not describe or figure any of his specimens. During the last two years several detached pinnae of *Matonidium* have been collected from Walkamota, Dharesi and Trambau in Kachchh. Most of the specimens collected are preserved in the form of incrustation. Spores could be isolated only from a few fertile pinnae from Walkamota and Trambau.

### DESCRIPTION

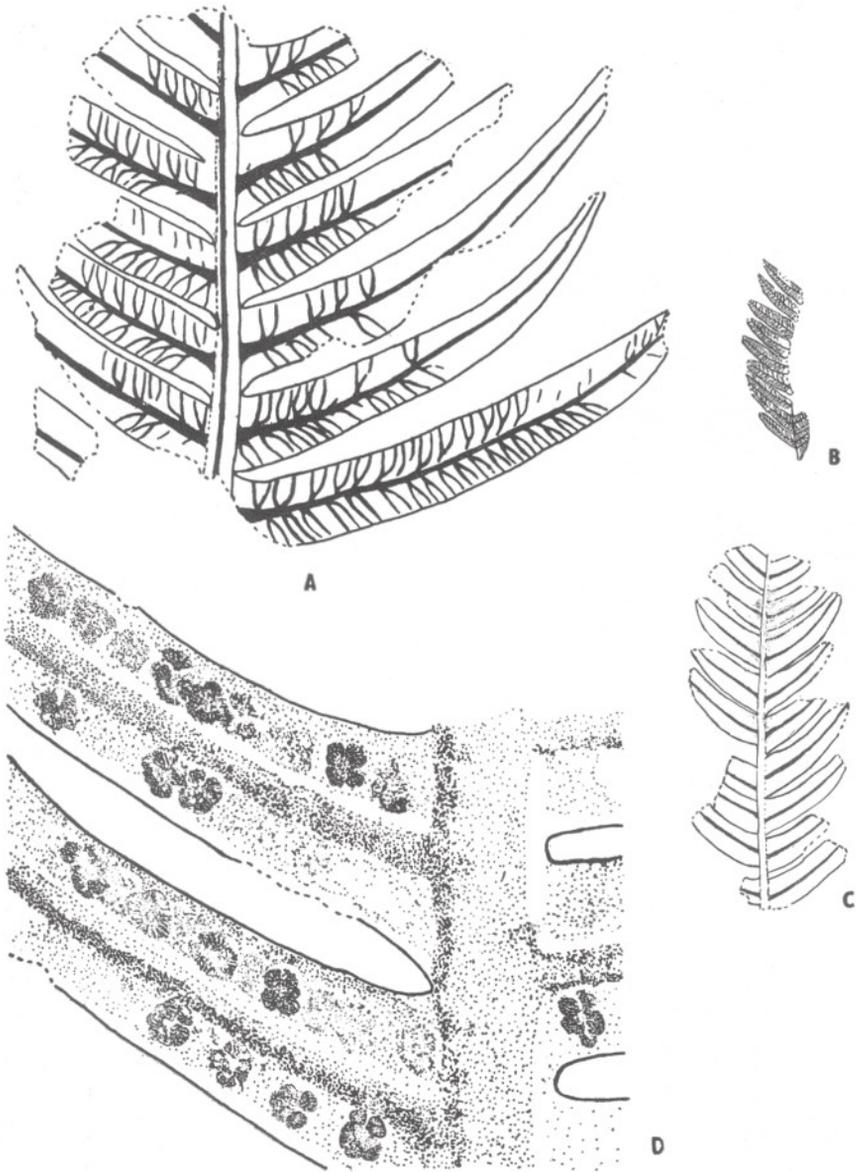
Genus — *Matonidium* Schenk, 1871

*Matonidium cingulatum* n. sp.

Pl. 1, figs 1-11; Text-figs 1A-D, 2A-F

*Diagnosis* — Detached sterile and fertile pinnae, substance of lamina thick. Pinnae linear, gradually narrowing towards base and

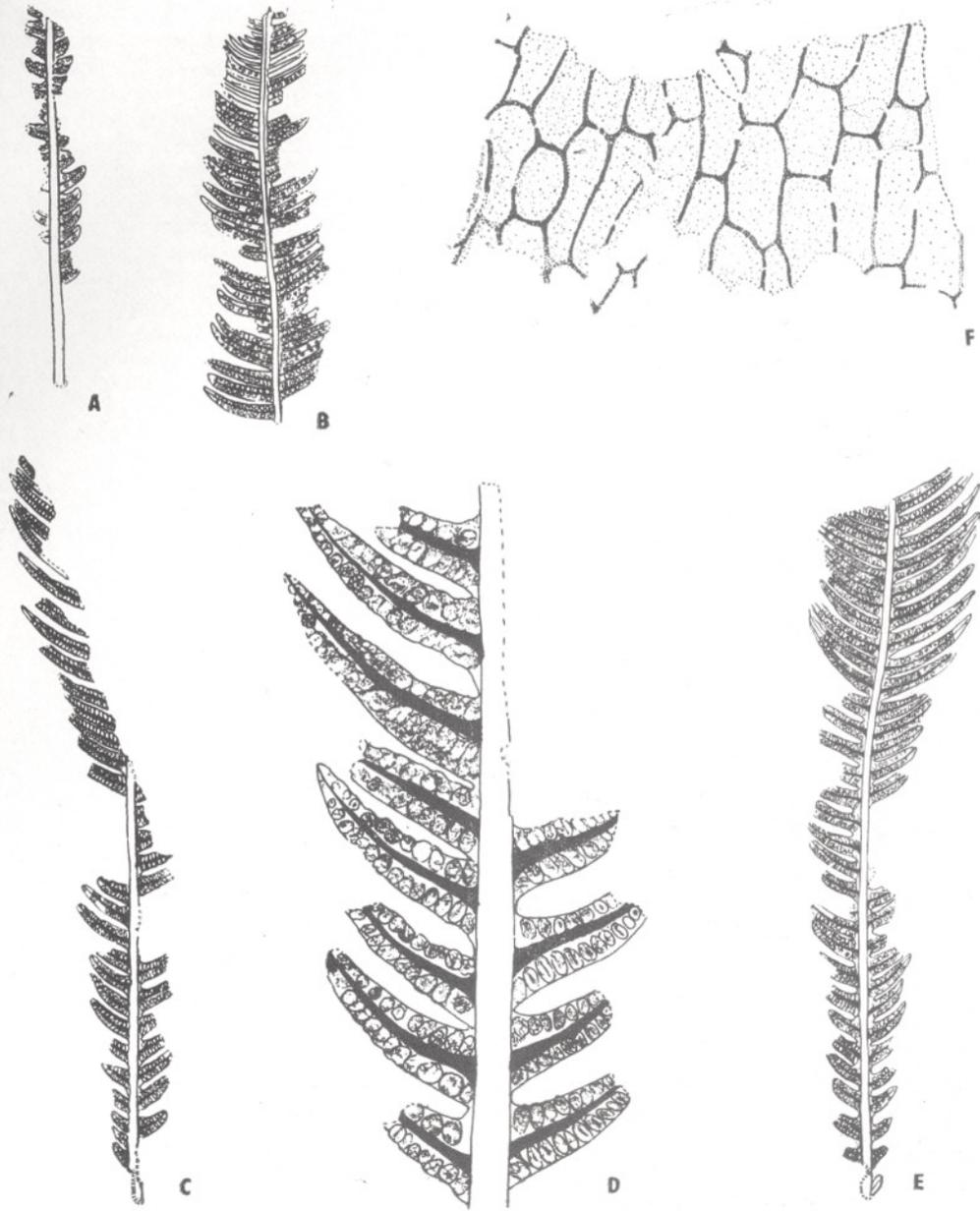
apex, largest specimen measuring 12.6 cm in length and 2.7 cm in width. Pinna rachis slender, about 2 mm wide, basal part (about 1.3-1.5 cm in length) devoid of pinnules, grooved. Pinnules closely set, mostly subopposite, at places opposite or alternate, contiguous, narrow, linear-falcate slightly convex. Basal pinnules deltoid in shape, 2.5-4 mm long and 2.0-2.5 mm broad near base; pinnules of middle region linear, falcate, 1.5-2.3 cm long and 0.5-0.2 cm broad near base, gradually tapering towards apex, apical pinnules smaller in size, narrow, 4.0-6.0 mm in length and 1.5 mm in breadth. Pinnules attached to rachis by their entire base at an angle of 55°-80°, bases of adjoining pinnules mostly joining each other; apex acute, sometimes subacute; margin entire, thick. Midrib prominent, slightly depressed, traversing from base to apex; lateral veins arising at an angle of 85°-90° from midrib at a concentration of 2 per mm, mostly forking once either just after emergence or slightly away from midrib, each branch reaching up to margin.



TEXT-FIG. 1 — A-C. *Matonidium cingulatum* n. sp., showing a few detached sterile pinnae; B.S.I.P. nos 287/521, 15/2085 and 99/2001; A  $\times$  4; B  $\times$  1 and C  $\times$  2. D. Showing a few sori; B.S.I.P. no. 112/2001  $\times$  10.

Fertile pinnules having uniformly arranged sori on either side of midrib, cover almost entire length of pinnule. Sori about 8-10 in basal pinnules and 16-20 per pinnule near middle region, placed in between margin and mid-vein, circular to elliptical in shape, slightly bulging upward from sur-

face of lamina. Each sori having about 4-5 sporangia with prominent annulus, arranged more or less in a ring, showing a central rounded scar probably of placenta. Each sporangia having a rounded-tetrahedral spore mass, about  $100\ \mu\text{m}$  in size. Spores triangular-subtriangular,  $45\ \mu\text{m}$  in size,



TEXT-FIG. 2 — A-E. *Matonidium cingulatum* n. sp., showing a few detached fertile pinnae; B.S.I.P. nos 1/2001, 65/2001, 33/878, 33/878 and 31/878; A-C, E  $\times 1$ ; D  $\times 4$ . F. Showing cells of rachis; B.S.I.P. slide no. 22/878-(2)  $\times 250$  (Text-fig. 2C is the basal part of the specimen figured in Pl. 1, fig. 5).

apices angular, interapical margins straight or convex. Trilete rays narrow, equal, extending up to three-fourth radius; commissure distinct. Cingulum narrow, slightly

broader at apices; exine laevigate and interpunctate,  $2 \mu\text{m}$  thick.

Epidermal cells of rachis square to rectangular in shape, serially arranged, anticlinal

wall straight or slightly wavy, unevenly thickened; surface smooth.

*Holotype* — No. 65/2001 of Birbal Sahni Institute of Palaeobotany, Lucknow.

*Locality* — Walkamota, Trambau (Type locality) and Dharesi, Kachchh.

*Horizon & Age* — Bhuj Formation (Biswas, 1977); ?Upper Jurassic.

*Comparison* — In general morphology of pinnae and pinnules *Matonidium cingulatum* resembles closely *M. indicum* Sahni (1936) described by Banerji *et al.* (in Press) from Lower Cretaceous of Himmatnagar and Than, Kathiawar. In the latter species the pinnae bases join together to form a sort of "funnel" just at the top of petiole. In *M. indicum* the number of sporangia in each sorus and nature of the spores is not known. In the present species the

pinnae are detached, therefore, the nature of attachment of pinnae bases to the petiole is not known. In general morphology of pinnae and pinnules, *M. cingulatum* looks like *M. goepperti* (Ettingshausen) Schenk described by Harris (1961) from Jurassic of Yorkshire and Appert (1973) from Madagascar. The Yorkshire specimens have typically about 10 sporangia in each sorus, whereas, in *M. cingulatum* the number of sporangia is 4-5. The spores of *M. goepperti* described by Harris (1961) differ in having broad and strongly thickened borders, also they are devoid of cingulum. Like *M. cingulatum*, the fertile pinnules of *M. goeppertii* from Madagascar have occasionally 5 sporangia in each sorus. The spores from the latter species have so far not been described.

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#### EXPLANATION OF PLATE

##### PLATE 1

##### *Matonidium cingulatum* n. sp.

- 1-3. Showing three detached pinnae; nos 1 & 2 are fertile and no. 3 is sterile. B.S.I.P. nos 73/2001, 65/2001 and 22/878.  $\times 1$ .
4. A portion of a sterile pinna showing venation of pinnules. B.S.I.P. no. 287/521.  $\times 4$ .
5. A portion of a fertile pinna showing sori. B.S.I.P. no. 98/878.  $\times 4$ .
6. Showing a spore mass isolated from a sporangium. B.S.I.P. slide no. 65/2001-(1) B.  $\times 200$ .
- 7-11. Showing a few spores. B.S.I.P. slide no. 22/878-(2).  $\times 500$ .

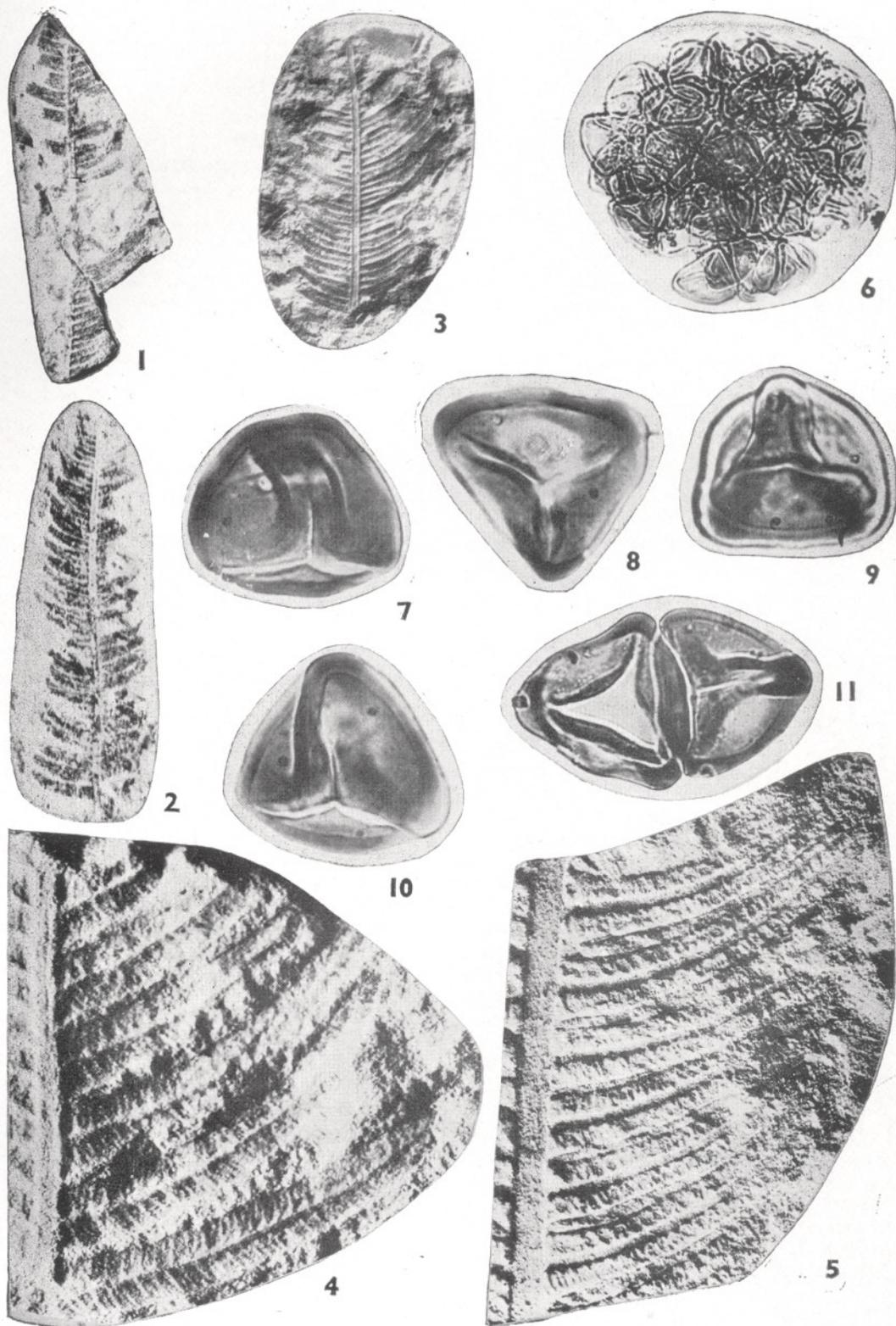


PLATE 1