

Mabeshwariella spinicornuta, a new gymnospermous seed from the Karharbari Formation

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ABSTRACT

Maheshwari, Hari K. & Tewari, Rajni (1986). *Mabeshwariella spinicornuta*, a new gymnospermous seed from the Karharbari Formation. *Palaeobotanist* 35(1) : 69-72.

Mabeshwariella spinicornuta sp. nov. is established for an orthotropous, platyspermic, bilaterally symmetrical seed having two long tubular expansions ('horns') at the micropylar end. The 'horns' have characteristic spinate appendages. In this character this species differs from the type species, viz., *M. bicornuta* Pant & Nautiyal. On the basis of overall morphology, *Cornucarpus (Cordaicarpus) furcata* (Surange & Lele) Maithy is transferred to the genus *Mabeshwariella*. Certain dispersed seeds ascribed by Pant and Nautiyal to *Buriadia 'heterophylla'* are found to be indistinguishable from *M. bicornuta*.

Key-words—*Mabeshwariella*, *Buriadia*, Seed, Karharbari Formation, Lower Permian (India).

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सारांश

माहेश्वरीयैल्ला स्पाइनीकोर्नुटा, करहरबारी शैल-समूह से एक नया अनावृतबीजी बीज

हरिकृष्ण माहेश्वरी एवं रजनी तिवारी

माहेश्वरीयैल्ला स्पाइनीकोर्नुटा नव जाति एक ऋजु, बहुबीजी, द्विपार्श्वीय सममित बीज है जिसके अंडद्वार पर दो लम्बे नालाकार प्रवर्ध (श्रंगी) विद्यमान हैं। ये श्रंगी लक्षणिक कंटकी उपांगों से युक्त हैं जिसके आधार पर यह जाति माहेश्वरीयैल्ला बाइकोर्नुटा पन्त व नौटियाल से भिन्न है। समय आकृति-वर्णना के आधार पर कोर्नुकार्पस (कोर्दायकार्पस) फर्कटा (सुरंगे व लेले) माइती को माहेश्वरीयैल्ला प्रजाति में स्थानान्तरित कर दिया गया है। पन्त एवं नौटियाल द्वारा बुरियाडिआ हैट्रोफिल्ला के नाम से वर्णित किये गये कुछ विकरणीत बीज माहेश्वरीयैल्ला बाइकोर्नुटा से अविभेद्य पाये गये हैं।

INTRODUCTION

A NUMBER of compressed seed genera of gymnospermous affinities have been described from the Lower Gondwana of India notably by Feistmantel (1880), Seward and Sahni (1920), Saksena (1955), Lele (1953, 1963, 1966, 1969) Surange and Lele (1957), Maithy (1965), Surange (1957), Pant and Nautiyal (1960, 1963, 1965), Pant and Srivastava (1963), Surange and Singh (1952), Srivastava and Chandra (1982), and others. The epidermal features of almost all the genera are now known, though some are relatively better known.

During the course of bulk acid processing of samples for the recovery of megaspores from the Karharbari Formation of a number of coalfields, a few seeds were also recovered. One of the types is interesting and forms the content of this paper. The seed is referable to the genus *Mabeshwariella* Pant & Nautiyal, 1963.

REMARKS

Seeds of the genus *Mabeshwariella* resemble those of the genus *Cornucarpus*, which was proposed by Arber (1914) for the platyspermic compressed seeds earlier described by Lindley and Hutton (1831-37) as *Cardiocarpon acutum*. However, there is a major difference between the diagnosis of *Cornucarpus* and the description of *Cardiocarpon acutum*. Former has a broad apex, bifurcated into long horns, and a broad base, while the latter has an acute apex, which is not bifurcated into horns and has an obtuse base. Seward (1919) also opined that the two were different. The seeds (belonging to the specimens of Kidston collection) described by Seward (1919) are broadly oval, have an obtuse base and two divergent acute processes at the apex suggesting that they are of *Cornucarpus* type.

Separation of bicornute seeds from other genera was also supported by Halle (1927). According to him, "It is

undoubtedly desirable to divide the large number of seeds, which do not show the internal structure, into form-genera on the basis of characters which in the majority of cases can be recognised in specimens preserved as impressions or casts. Such characters as symmetry, and the differentiation of the integument, while of greater systematic importance, very often cannot be recognised in material of this kind, and it would seem to be a practical advantage to be able to sort out the bicornute forms, which are as a rule, easily recognisable."

Halle (1927) mentioned that in "*Cornucarpus* the horns are prolongations of a narrow wing which continues round almost the whole seed." Here, however, he did not include *Samaropsis* seeds with the wings merely notched at the apex, e.g. *S. emarginata*.

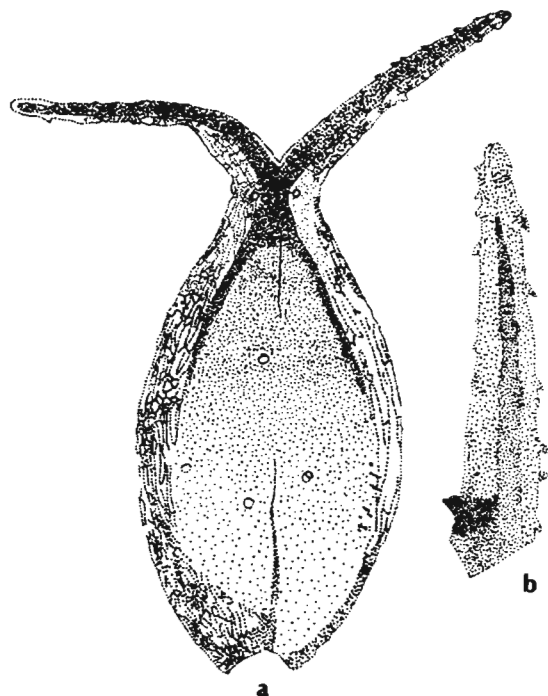
In view of the above description of the genus *Cornucarpus*, it is now possible to differentiate it from the seed genus *Mabeshwariella*. Both the genera, though at a glance, look similar in their morphography in having bifurcated horns at their apices, they are essentially different in the respect that in the former the horns are prolongations of wings, while in the latter the wing is absent and horns are two distinct, elongated tubular processes of the integument. Moreover, the micropylar neck is very narrow in the latter so that a deep curve is formed in between the horns and rest of the body of seed.

On the basis of the above differentiation between the two genera, it is hereby proposed that *Cornucarpus furcata* (Maithy, 1965, text-fig. 4, pl. 1, fig. 5) and *Cornucarpus* sp. (Du Toit, 1927, pl. XLI, fig. 11) should be transferred to the genus *Mabeshwariella*.

Pant and Nautiyal (1967) described some attached and detached seeds of *Buriadia heterophylla*. The detached seeds are similar to *Mabeshwariella bicornuta* in having bifurcated horns and hairs on narrow marginal borders. Therefore, it is assumed that the detached seeds of *B. heterophylla* are referable to *Mabeshwariella*. Pant and Nautiyal (1967) have also mentioned that out of the two bifurcations at micropylar end, one is stalk and the other is horn. Micropyle lies in between the stalk and the horn. Since, the structure of both is similar, they should be regarded as horns.

Mabeshwariella spinicornuta sp. nov.

Pl. 1, figs 1-4; Text-fig. 1a-b



Text-fig. 1—*Mabeshwariella spinicornuta* sp. nov.: (a) Complete seed showing narrow micropylar end bifurcated into two long tubular horns, broad chalazal end and narrow marginal border. Outer surface of seed showing monosaccate and disaccate pollen grains; and (b) a horn enlarged to show spines.

Diagnosis—Seeds platyspermic, almond-shaped, bilaterally symmetrical, orthotropous. Seed coat 2-layered, having outer integumental cuticle and inner nucellar cuticle, micropylar neck narrow, chalazal end broad, former bifurcated into two, long, distinct tubular processes—broad at base, narrow at apex—formed by prolongation of bifid nucellar beak and integumental cuticle, narrow border present on the margins on either side of seed, discontinuous ridge present on flattened surface of seed, margins of outer sides of horns show spines directed backwards.

Description—There are only two specimens, of which only one is complete. The complete seed (Pl. 1, fig. 1) is 6 mm long, 2.5 mm broad, micropylar neck is 1 mm wide, bifurcated into two horns, each ca 750 μ m long, 480 μ m wide at base, acute at apex; the spines (Pl. 1, fig. 3) present on the horns vary in length from 38 to 58 μ m and in width from 38 to 48 μ m at base and are

PLATE 1

Mabeshwariella spinicornuta sp. nov.

1. Complete seed showing micropylar horns, Slide no. BSIP 8338. \times 20.
2. Apical portion of seed in fig. 1 enlarged to show marginal border on sides. \times ca 40.
3. Single horn showing presence of backward directed spines on the outer sides. \times ca 100.
4. Macerated seed showing outer integumental and inner nucellar cuticle, Slide no. BSIP 8339. \times 15.

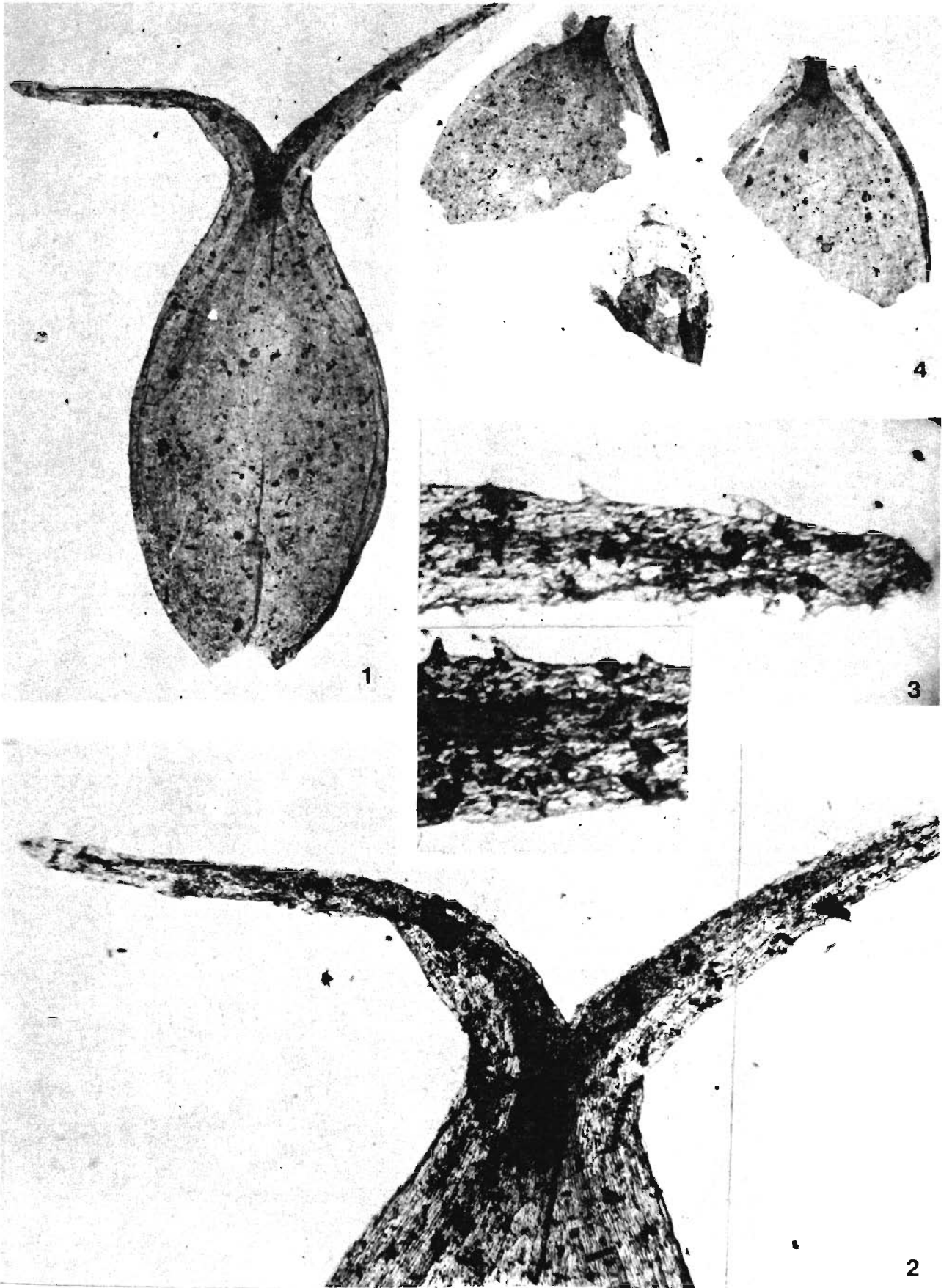


PLATE 1

directed backwards. A narrow border (Pl. 1, fig. 2), about 124 μm wide, is present on margins of the seed. Monosaccate and disaccate pollen grains are present on outer surface of the seeds, former ranging in size from 105-115 \times 106-125 μm while the latter are 105 \times 112—122 \times 80 μm in size.

Seed cuticle shows rectangular thin-walled cells, longitudinally arranged, ranging in length from 44-69 μm , average width being 25 μm . Only one integument of seed is present of which the outer cuticle is visible and the inner cuticle could not be recovered. Cells of marginal border are narrow-elongate, trapezoidal, average size being 124 \times 12 μm . Cells of micropylar horns are polygonal, 38-76 μm long, 19-32 μm broad. Cells of nucellar cuticle are polygonal, 44-82 μm long and 32-50 μm broad.

Comparison—The seeds described above are comparable to *Mabeshwariella bicornuta* Pant & Nautiyal, 1963 and attached seeds of *Buriadia heterophylla* (Pant & Nautiyal, 1967) from both of which these differ in the absence of an inner cuticle of the integument and hair-like processes on narrow marginal borders.

Holotype—Slide no. BSIP 8338; Ganjra Nalla beds near its confluence with Jöhilla River, Birsinghpur-Pali, Shahdol District, Madhya Pradesh; Karharbari Formation, Lower Permian.

Mabeshwariella furcata (Surange & Lele) comb. nov.

1957 *Cordaicarpus furcata* Surange & Lele, *Palaeobotanist* 5(2), p. 84, pl. 1, figs 9, 10; text-fig. 2.

1965 *Cornucarpus furcata* (Surange & Lele) Maithy, *Palaeobotanist* 13(1), p. 47, pl. 1, fig. 5; text-fig. 4.

Diagnosis—Seeds platyspermic, oval, orthotropus, unwinged, somewhat flattened at base with bifid apex, single integument present which prolongs into two small horns at micropylar end.

Holotype—Specimen no. BSIP 5225; Goraia, Shahdol District, Madhya Pradesh; Talchir Formation, Lower Permian.

Distribution—Central pit, Jubilee pit and Srirampur open quarry, Giridih Coalfield, Bihar, Karharbari Formation, Lower Permian.

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