CRUCIFEROSPERMUM ARABIA GEN.E.T. NOV FORM THE DECCAN INTERTRAPPEN BEDS OF SINGAPORE M. P. INDIA

Pandey I. J.
Department of Botany
C.J. Patel College, Tirora, Dist.Gondia
Email: ipandey1974@gmail.com

Abstract :

The intertrappean beds of Singapore Tehsil, Nagpur (Lat. 22°01' N; Long. 79°01' E), Maharashtra, India, yielded a dicotyledonous winged seed that was in good condition. The current fossil specimen is one of numerous seeds that have been found in various fossiliferous locations in India's Deccan Intertrappean beds. The seed has pronounced lateral wings and is long and non-endospermic. The wing can be divided into two pieces. The micropylar and chalazal ends of the unitegmic seed are well delineated. The embryo is not well kept, and the seed coat has two layers. Asclepiadaceous, Crucifer, Rosacea, Chenopodiaceous, Scrophulariaceae, Rubiaceae, and Bignoniaceous are among the families whose features are similar to those of the fossil seed. Cruciferspermum arabii produces elongated, non-endospermic, winged seeds with two separate sections on the lateral wings. While the outer layer is made up of rounded to polygonal parenchymatous cells, the inner layer is made up of densely packed elongated cells. The seed coat is thick and composed of parenchymatous cells, and the seed is unitegmic. The embryo is not well preserved. Comparatively, the ancient seed exhibits strong similarities to the traits of the current Crucifer family, especially the genus Arabia.

Keywords : Cruciferospermum Deccan Intertrappean, Dicotyledonous seed, winged seed, embryo ill preserved. Unitegmic

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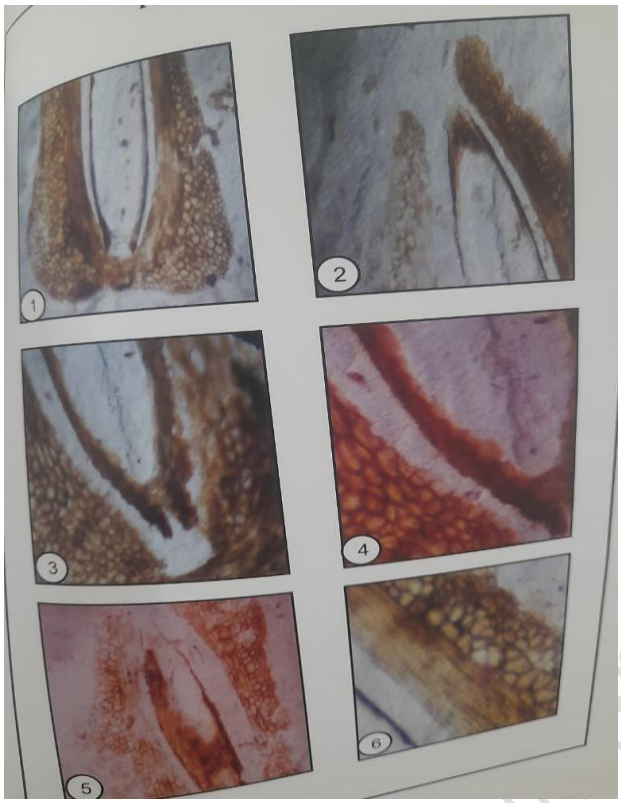
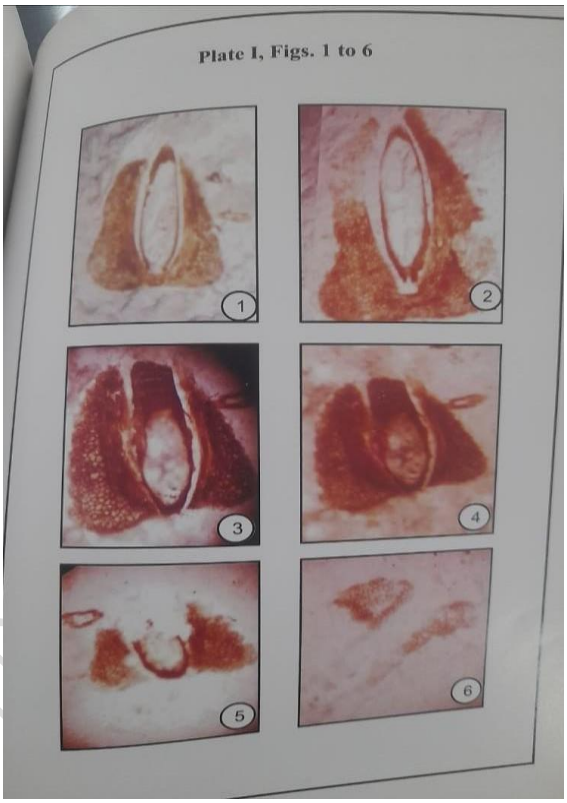
Introduction :

The Deccan Intertrappean beds' rich vegetation has been studied in a number of locations. The outcrops examined in this study offer important insights into the flora's morphological, anatomical, embryological, and ecological characteristics. In this research, a fossil dicotyledonous seed from the Deccan Intertrappean deposits of Singhpur that dates to the Uppermost Cretaceous is thoroughly examined. Numerous fossil seeds from this area have been documented and examined by different researchers. Wazalwar (1990), Wingospermocarpon arites (Sheikh and Kapgate, 1984), *Ramakonospermus singhpuri* (Sheikh and Kapgate, 2001), *Deccanosperma chitaleyensis* (Juneja, 1993), *Ramakonospermus chitaleyensis* (Kumar, 1984), *Singhpurospermum decani* (Bhowal and Sheikh, 2003), and Narkhede (2009) are notable contributions. Our understanding of winged seeds from the Deccan Intertrappean flora of Singhpur, Madhya Pradesh, has greatly benefited from the discovery of these taxa from the Deccan Intertrappean beds. The current study adds to our knowledge of winged seeds from the Deccan Intertrappean flora of Singhpur, Madhya Pradesh, India.

Materials and methods :

Petrified fruit was gathered from the Singhpure area and displayed in a transverse part of a chart. Important anatomical stages were photographed, camera Lucida sketches were created, and anatomical details from the peel slice were examined. Regretfully, the counterpart is absent.





Cruciferospermum arabii gen, et.sp.nov. Explanation of Plate I and II 6.

Figs 1-6: Details Structure of seed showing all details.

Fig-1 Seed with Wing, Fig –2 Seed wall, Fig-3 Two Cotyledon Seen, Fig-4 Salaried Cells

Fig-5 Seed with wing, Fig -6 Cellular details of wing.

Observation :

The petrified seed, exposed in longitudinal section, is well preserved. The seed is convex in shape and shows a distinct lateral wing-like expansion (Plate I, Figs. 1–4; Text Figs. 1–10). It is small and elongated, and can be divided into two distinct regions: the wing and the seed body. The wing forms an expanded, fleshy mass that surrounds the entire seed body and ends in rounded, blunt margins. The seed body consists of a micropylar end and two to three layers of chalazal tissue, which may represent funicular tissue. It measures approximately 350 µm in length and 100 µm in breadth. The seed is attached at the upper end by means of the fleshy mass (Plate I, Fig. 3; Text Fig. 22). A gap is observed between the seed body and the wing, which may be due to the non-preservation of the soft tissues between them. On the inner side of the seed, some specialized cells are present (Plate I, Fig. 4; Text Fig. 19). The embryo is poorly preserved; however, in a few sections, a dicotyledonous embryo is observed (Plate I, Fig. 2). Anatomically, the seed is unitegmic

and exhibits the following characters.

Wing :

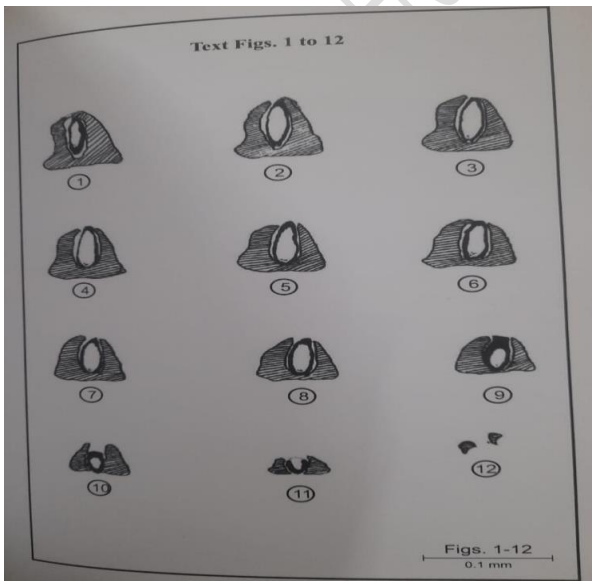
The lateral wings are expanded, fleshy, and terminate in blunt ends (Plate I, Figs. 1–4; Text Figs. 1–9). Each wing measures approximately 170 µm in length and 84 µm in breadth. The wing is differentiated into two distinct regions. The inner region consists of 6–7 compactly arranged layers of vertically elongated cells, measuring about 40 × 20 µm in size. The outer region of the wing is composed of rounded to polygonal parenchymatous cells (Plate I, Figs. 1–6; Text Fig. 21), with each cell measuring approximately 75 µm in diameter.

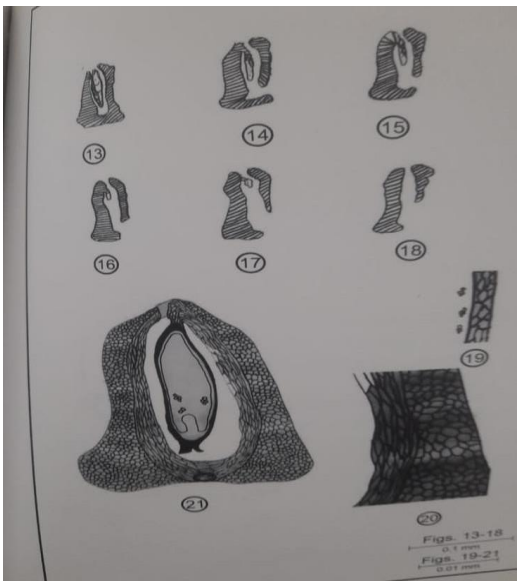
Seed :

The seed is small and elongated and is non-endospermic in nature. It measures approximately 240 µm in length and 150 µm in breadth (Plate I, Figs. 1–2; Text Fig. 22). The seed shows distinct micropylar and chalazal ends. At the micropylar region, the seed coat consists of 3–4 layers of thick-walled parenchymatous cells (Plate I, Figs. 2–3), with each cell measuring about 6 µm in size. Similarly, the chalazal region is composed of 3–4 layers of thick-walled parenchymatous tissue. The seed is attached to the wing on one side by means of a fleshy tissue (Plate I, Fig. 2; Text Fig. 22). On the inner side of the seed, sclereid-like cells are observed (Text Fig. 19).

Seed Coat :

The seed coat is thick, measuring approximately 30 µm in thickness. It is not differentiated into testa and tegmen; instead, the seed is unitegmic and consists of a single integument (Plate II, Figs. 3–4; Text Fig. 20). The seed coat is two-layered and is composed of thick-walled parenchymatous cells.





***Cruciferospermum arabii* gen, et.sp.nov. Explanation of text Figs .13-22**

Figs 13-18 Serial Section of the seed showing Different Stage of the seed

Figs 19 Sclerd cells. **Figs -20** -Seed Coat, **Figs -21** Complete Structure of Seed

Embryo :

The embryo is poorly preserved; however, in some sections a dicotyledonous embryo is observed. The seed is non-endospermic in nature (Plate I, Fig. 2).

Discussion :

The above discussion tells that the fossil specimen is small dicot, unitegmic, orthotropic fleshy expanded winged seed. The winged seed depicts the dispersal of seed by the agencies like wind and animal (corner 1976).

The comparisons are made with living as well as reported fossil seed as follows. All the above characters have been taken into account while working out the affinities of the fossil seed to the living families like Chenopodiaceous, Scrophulariaceae, Rubiaceae, Bignoniaceous, Asclepiadaceous, Cruciferous, for this purpose available literature and standard books on embryology and Taxonomy like Rundle (1963) Mahesh Wari (1950), Eames (1961) were reoffered. But "seed of cotyledons" by Corner (1979) was of great help in tracing the systematic position of the fossil seed.

In Family Chenopodiaceous the genus Salicornia, Coriospermum resembles in having wing but differ from present specimen in having persistent encircling wing. In family Scrophulariaceae, the genus Rhinanthus and Nemesia resembles in having winged seeds but it differs from the present seed in possessing endospermic seed. In Rubiaceae the genus Hypmenodictivon, Rubies resembles in presence of wing, but presence of fleshy endosperm takes it apart from the present fossil seed. In Bignoniaceous the seeds of Tacoma stand and Bignonia resembles in winged nature but differ in linear compressed nature of seed. In Asclepiadaceous the genus Asclepius, Ceropegia, Tope Lia and Stephanotis resembles in having wings but differ in a terminal tuft and silky hair with the present specimen. In family Cruciferous the genus Lepidus and Arabas in having winged but arrangement of wing is different. In Lepidus the seeds have one straight thick edge and other edge is narrowly winged. In Arabas seed is with encircling marginal wing. In family Rosacea the genus Mentz Ella also has winged seeds. The seed of genus Mentz Ella are minute with papillae like appearance. Which is not comparable with the present fossil specimen? The present fossil seed is also compared with reported winged seeds Wingospermocarpon Mohgaonse by sheikh and Kapgate (1984) It has wings and shows spine like projections. Which is not present in fossil specimen. Wingopermocarpon arties by sheikh and Kapgate (2001) resembles in having wing but in Wingopermocarpon arties, aril is present but in present case it is absent.

From the above comparison, it can be concluded that the present fossil seed is different form all the seed of living taxa except with that of family Cruciferous. Where in same respect it resembles, as in with Arabas as in both encircling wing is present so, for time being it can be placed under the family Cruciferous and named as Cruciferospermum arabii gen.et. sp. nov. The genetic name is after the family Cruciferous and specific name is after the genus Arabia.

Diagnosis :

Cruciferospermum gen.nov :

The seed is a long elongated with fleshy wings. The seed is unitegmic with micropyler and chalazal region Endosperm absent embryo ill preserved salaried cell is seen.

Cruciferospermum arabii gen.nov :

Seed is elongated, no endospermic, measuring 350u in length and 100u breadth. Seed with lateral wing each 170um in length and 84um in breadth. The wing is divisible into two parts the inner part consists of compactly arranged 6-7 layer of vertically elongated cells about 40ux20u in size and outer part rounded to polygonal shaped paranchymatous cells,75u in size. The Seed's unitegmic with micropylar and chalazal end. The seed coat is two layered 30um thick consisting thick-walled parenchymatous cells. Embryo ill preserved.

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