

DECCANANTHUS SAVITRII, A NEW PETRIFIED FLOWER FROM THE DECCAN INTERTRAPPEAN BEDS OF INDIA

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ABSTRACT

The paper deals with the description of a new monocotyledonous, dichlamydeous, petrified flower from the Mohgaonkalan beds of the Deccan Intertrappean series of India. The flower is hermaphrodite, hypogynous, with six perianth members in two whorls, six epiphyllous stamens and tricarpellary, syncarpous ovary. Provisionally it is placed under *Deccananthus savitrii* gen. et sp. nov. with affinities shown to Palmaceae.

INTRODUCTION

THIS paper reports a new petrified flower from the Deccan Intertrappean locality of Mohgaonkalan in the Chhindwara District of M.P., India. So far only three petrified flowers have been described from this locality. They are *Sahnianthus parijai* (Shukla 1944; Chitaley 1955) *Sahnipushpam shuklai* (Prakash and Jain 1963; Prakash 1956; Chitaley 1964; Verma 1956) and *Chitaleypushpam mohgaense* Paradkar (1971).

The present flower is different from all of them. The description is based on only one complete specimen. It was exposed in longitudinal section (Plate 1, Fig. 1). After studying it from many serial sections in l.s. the remaining piece was studied along the transverse plane.

DESCRIPTION

The flower is 4.2 mm long and 3.3 mm broad at its broadest part in the centre (Plate 1, Fig. 1). It shows a short, thick stalk, 945 μ long and 700 μ broad. The flower is narrow at the base and at the tip but broad in its middle portion. It is complete, gamopetalous, hermaphrodite and hypogynous (Text-Figs. 1, 2 & 3).

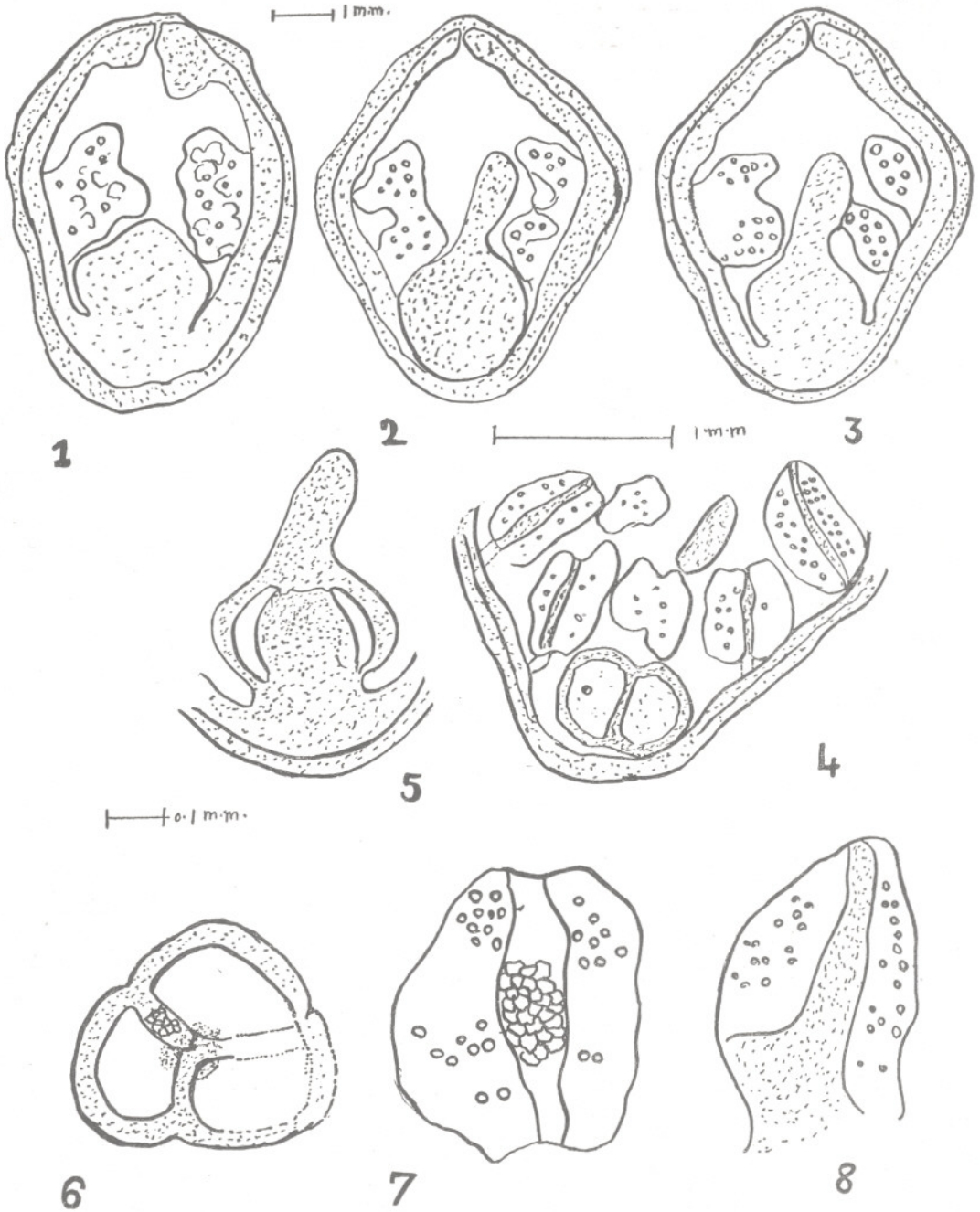
Perianth—The perianth is differentiated into two whorls, an outer and an inner (Plate 1, Fig. 1; Text-Figs. 1-3). The members of each whorl are fused with one another. The outer whorl is covering the

inner one all over, suggesting a bud condition of the flower. The tips of the inner whorl are coiled inside forming two thick knob like structures (Plate 1, Fig. 1), where it is 250 to 350 μ thick, and the rest of the portion is 135 to 150 μ . Cells of this whorl are parenchymatous, thin walled, intermingled with a few thick walled cells (Plate 1, Fig. 2). Members of the outer whorl are 4-5 layered and 120 to 130 μ thick. Cells of the inner whorl have brown contents. The lobes of the inner whorl of the perianth at the tip of the flower differ in size, one being smaller than the other (Text-Fig. 1). The bigger one is $480 \times 576 \mu$ and the smaller is $300 \times 380 \mu$.

Androecium—Stamens are six, epiphyllous, placed at different levels on the perianth lobes (Plate 1, Fig. 1; Text-Fig. 4). Three are at the lower level and three are on the higher level. Filaments are all of equal length, being 90 μ long each. The anthers are two lobed, with the connective (Plate 1, Fig. 5) running throughout the length (Text-Fig. 8). The attachment of the filament to the anther is dorsifixed. The anthers on the higher level are 750 to 800 μ long and 450 to 500 μ broad and those on the lower level are 600 to 625 μ long and 400 μ broad. Each anther is 4 locular. The cells of the anther wall and the connective are made of simple parenchymatous cells (Text-Fig. 7).

The two pollen sacs of each lobe are filled with mature pollen grains, thus showing the development of anthers earlier than the ovary which is in young condition. The pollen grains are seen in both polar and equatorial view (Plate 1, Fig. 3). Each pollen grain (Erdtman, 1966) is $20 \times 15 \mu$ to $18 \times 15 \mu$, peroblate, trichotomosulcate, the subculi stand in relation to the pole in much the same way as the sides of an equilateral triangle to the centre of the triangle. Grains are psilate, with sexine slightly thicker than nexine.

Gynoecium—It is tricarpellary, syncarpous, trilocular (Text-Fig. 6) with an axile placentation (Text-figs. 5 & 6) (Plate 1,



TEXT-FIGS. 1-8 — 1, 2 & 3. Selected serial longitudinal sections of flower. 4. L. S. of flower showing anthers. 5. L. S. gynaecium. 6. T.S. ovary showing trilobular condition. 7. Anther showing cells of the connective and pollen grains. 8. Anther showing connective.

Fig. 6). The ovary is almost sessile, 1.5 mm. broad and 1.18 mm. long (Plate 1, Fig. 4) and its wall is 4 to 5 layered. Style is short, 560 μ long and 382 μ broad. Stigma is 350 μ long and 3.50 μ broad thus not much differentiated from the style. Ovules are not seen. However, remains of axile placentation are noticed.

DISCUSSION

From the above description of the flower it is clear that the petrified flower with the trilobular ovary and probably 6 lobes of the perianth looks like a monocotyledonous flower. Number of stamens is also six arranged in two whorls, placed at two levels on the inner whorl of the perianth. The structure of the pollen grains though not typically monocotyledonous as monosulcate or monocolpate, but such trisulcate structure as seen in the present flower is also noticed in the pollen grains of some of the palmaceae. Comparisons of this flower to the living ones bring it close to the family palmaceae.

Resemblances are found in the nature of perianth, condition of ovary, number of stamens and the structure of pollen grains. However, since the present study is based only on one specimen of the flower and that too in young condition, not showing distinct ovules, the present flower is named provisionally as *Deccananthus savitrii* gen. et sp. nov. The generic name is after the region of India from where it is being described and the specific name is after Mrs. Savitri Sahni, the first Director of Birbal Sahni Institute of Palaeobotany, Lucknow, and wife of Late Prof. Birbal Sahni.

We have compared this flower with the known petrified flowers from the Deccan Intertrappean beds of India. *Sahnianthus parijai* (Shukla, 1944, & Chitale 1955) is different in having only one whorl of perianth, and more stamens and carpels. Also the pollen grains are different. *Sahnipushpam shuklai* and *Chitaleypushpam mohgaense* also differ from our flower in having one whorl of perianth and pentacarpellary gynoeceium. In the former flower, loculi are more. Thus, it is evident that the *Deccananthus savitrii* is different from all the known flowers from the Deccan Intertrappean beds of India.

DIAGNOSIS OF THE GENUS

Deccananthus Chitale and Kate

Flower complete, with two perianth whorls, regular, hermaphrodite, ebracteate. *Androeceium* of 6 stamens, epiphyllous, in two whorls; pollen grains trichotomosulcate. *Gynoeceium* tricarpellary, syncarpus, trilobular with axile placentation.

DIAGNOSIS OF THE SPECIES

Deccananthus Savitrii Chitale and Kate

Flower with short pedicel. *Perianth* members 6, the two whorls close against each other; outer whorl 120 to 130 μ thick, inner whorl 135 to 150 μ and at places 250 to 350 μ thick; members of inner whorl curved inside at the tip of flower forming a knob measuring 300 \times 380 μ . *Stamens* 6, attached to perianth at two levels; anthers 4 locular, dorsifixed, each 750 to 800 μ long and 450 μ broad, anthers on lower level are smaller than those on higher level; filament length 90 μ long; connective running through the anther; pollen grains 20 \times 15 μ , sexine slightly thicker than nexine, psilate, peroblate, trichotomosulcate; *Gynoeceium* tricarpellary, syncarpus, trilobular; ovary large, round, 1.5 mm. broad and 1.18 mm. long; style 580 μ long and 380 μ broad; stigma solid, simple, 350 μ long and 350 μ broad, not much differentiated from style.

Holotype — Department of Botany, Institute of Science, Nagpur. Moh/KU-2.

Locality — Mohgaonkalan.

Horizon — Deccan Intertrappean series of India.

Age — ? Uppermost Cretaceous.

ACKNOWLEDGEMENT

We acknowledge with gratitude the suggestions made by Mrs. S. A. Paradkar for the identity of this flower. We are grateful to the Government of Maharashtra for awarding National Loan Scholarship to the Junior author. We also thank the Director, Institute of Science, Nagpur, for the laboratory facilities.

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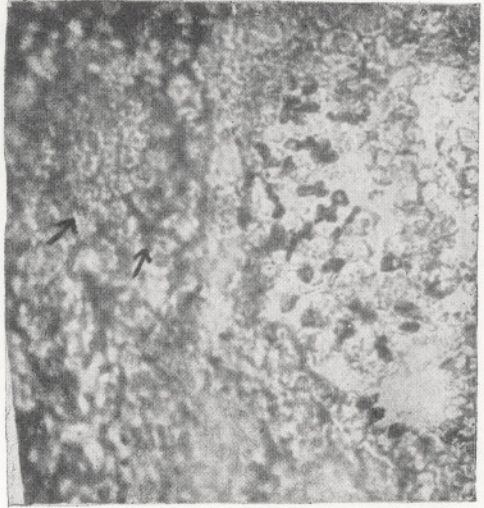
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EXPLANATION OF PLATE I — FIGS. 1-6

1. Part of the flower as exposed on the rock $\times 20$.
2. Cells of perianth (arrows) $\times 130$.
3. Pollen grains enlarged $\times 600$.
4. L.S. flower showing gynoeceium and anthers $\times 50$.
5. Anther with connective and pollen grains $\times 75$.
6. T.S. ovary showing trilobular condition $\times 70$.



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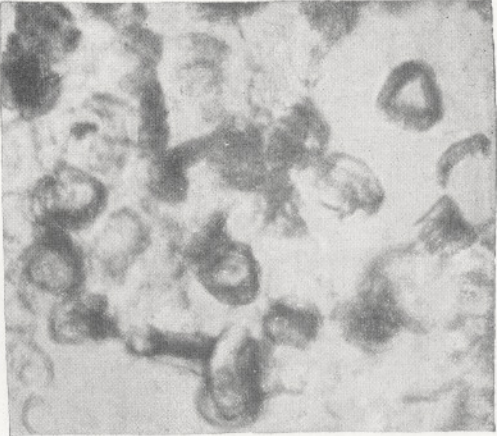


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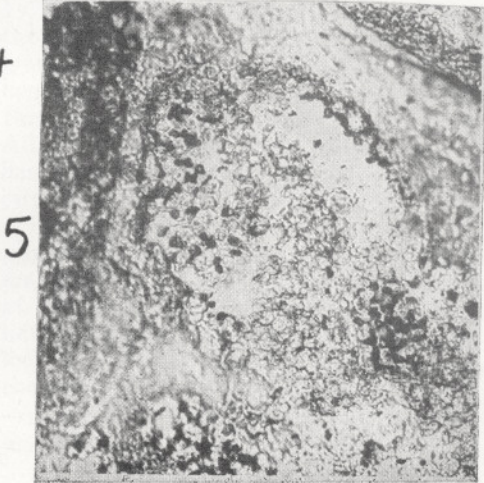
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