ON TWO NEW SPECIES OF *SAMAROPSIS* FROM THE SOUTH REWA GONDWANA BASIN, CENTRAL INDIA

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ABSTRACT

Two new species of winged fossil seeds are described from the Ganjra Nalla locality in the South Rewa Gondwana basin, Central India. One of the species, represented by a single specimen, has two broad lateral wings one on either side of a round body, which has a proximal ridge and a distal beak. This species is named *Samaropsis johillensis*.

There are three specimens of the other species which is characterized by an elliptical body, surrounded by two lateral wings, narrow at the proximal end giving it a cordate shape. The wings increase markedly towards the distal end where they are separated by a wide gap. This species is named *Samaropsis ganjrensis*.

INTRODUCTION

ALL the specimens described here were collected by the author from the Ganjra Nalla (23°21′ N). A thick band of carbonaceous shale is exposed in the nalla near its junction with the Johilla river, some 1½ miles south-west of the Birsinghpur railway station (23°22′: 81°4′), on the Katni-Bilaspur branch of Eastern Railway, which passes through the southern part of the Rewa State. The material consists of fine grained micaceous carbonaceous shale and sandstone deposited in alternate bands of various thickness. This deposit is situated just below the coal seam of the Johilla coalfield which is supposed to belong to the Barakar series (HUGHES, 1881, p. 126; FEISTMANTEL, 1881, p. 14).

In the earlier collections made from this very bed by T. W. H. Hughes and Hira Lal (SINOR, 1923) *Samaropsis* has been described by Feistmantel (1882), but it differs from the seeds described in this paper.

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Much of the carbonized portion of the impression of *Samaropsis johillensis* was destroyed. This made the task of photography and sketching very difficult. The impression along with a small portion of the rock material was, therefore, carefully detached from the main block, cleaned in xylol and photographed under xylol. A natural size photograph did not give very satisfactory result, but the enlargement brought out many of the details clearly.

DESCRIPTION

1. *Samaropsis johillensis* sp. nov.

Diagnosis — Body sub-oblate, elliptical with a short median ridge at its proximal end, and two conical beak-like projections at its distal end. Wings two, large, broad and spreading from the body and attached to it throughout its whole length, lateral and opposite, inclined at an angle of about 60° to the axis of the body, edges rounded. Vertical axis 1 cm., and total wing span 2·3 cm. approximately.

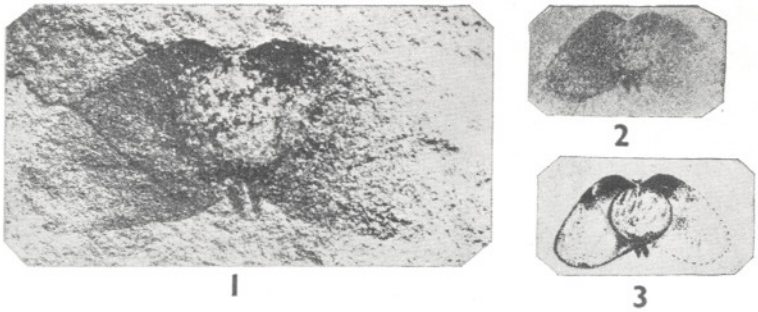
Locality — The junction of the Ganjra Nalla with the Johilla river, some 1½ miles south-west of the Birsinghpur railway station.

Horizon — Lower Gondwanas, below the Barakar coal seam.

Holotype — R.S. 1/3, collected in the year 1936 and kept at the Institute of Palaeobotany, Lucknow.

The carbonized impression on the dark grey shale shows a sub-oblate, elliptical body with a proximal ridge-like continuation, two distal beak-like projections and two broad wings. Just near one end of the ridge, which also separates the two wings, is present a broadly V-shaped patch of carbonized matter. This most probably marks the point of attachment of the seed with the stem, and hence this side has been referred to as the proximal side of the seed. The entire outline of one wing is clear, but that of the other is incompletely preserved (TEXT-FIGS. 2, 3).

The body of the seed is about 9 mm. along the transverse axis and 7 mm. along the median axis. A short spine-like proximal



TEXT-FIGS. 1-3 — 1, *Samaropsis johillensis* sp. nov., specimen R.S. 1/3 (enlarged). × 2½. 2, *S. johillensis*, specimen R.S. 1/3. × 1. 3, *S. johillensis* a camera lucida sketch, specimen R.S. 1/3. × 1.

prolongation of the body forms the ridge, about 1 mm. long and 0·5 mm. broad. At the distal end there are two beak-like projections which are conical in shape with their bases directed towards the body, and apices away from it. Each of these is about 1 mm. broad and 2 mm. long. There are no special marks noticeable on the body.

The wings are attached to the body along its whole length, starting from the ridge at its proximal end and extending up to, and covering almost, half the length of the beaks. As only one wing is complete in the impression, measurements of that wing alone are given here. The single wing-span, that is the distance between the median axis of the seed and the distal margin of the wing, is about 11·5 mm. Thus considering the other wing equal to the one which is complete, the total wing-span comes to about 23 mm., while the total median vertical length of the seed is 10·0 mm. approximately. Wing-spread (TEXT-FIG. 4), the longest distance between the distal end of a wing and the body, is about 8 mm. The wings are inclined towards the distal end at an angle of about 60°. Wing-breadth is 10·0 mm. The complete wing shows numerous faint striations extending outwards from the edge of the seed in a gentle curve towards the outer margin of the wing (TEXT-FIG. 1).

2. *Samaropsis ganjrensis* sp. nov.

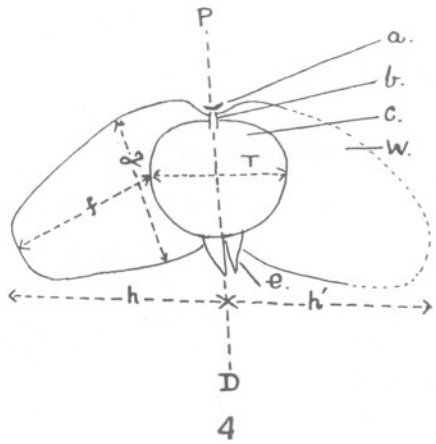
Diagnosis — Seeds subprolate, elliptical with two wings attached all round the body, except at the distal end. Free ends of the wings rounded, equal or unequal. Wings broader at the distal than at the proximal end Median axis 1·2 cm. and transverse axis 1·0 cm. approximately.

Locality — The junction of the Ganjra Nalla with the Johilla river, some 1½ miles south-west of the Birsinghpur railway station.

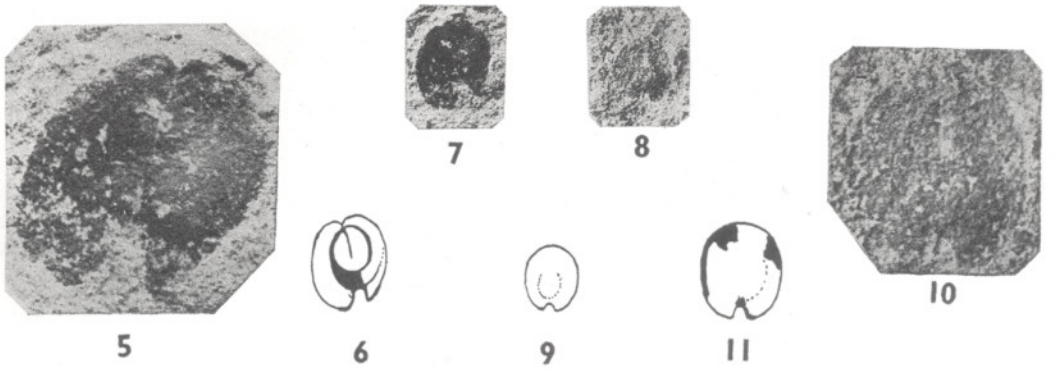
Horizon — Lower Gondwanas, below the Barakar coal seam.

Holotype — R.S. 1/29 (specimen 1), collected in 1944, and two paratypes R.S. 1/37 (specimen 2) collected in 1946, and R.S. 1/3 (specimen 3), collected in 1936 respectively by the author, and kept at the Birbal Sahni Institute of Palaeobotany, Lucknow.

Three specimens of this species have been discovered in the collections. One of these shows the structure very clearly (specimen 1 — TEXT-FIGS. 5-7), the other two are much worn out and show only



TEXT-FIG. 4 — *Samaropsis johillensis* sp. nov. An outline diagram of the seed to explain the terminology used in the description. P, proximal end; D, distal end; PD, median vertical axis; a, mark of attachment; b, ridge; c, body; w, wing; e, beak; f, wing spread; g, wing breadth; h h′, total wing span, T, transverse axis of the body. × 2½.



TEXT-FIGS. 5-11 — 5, *Samaropsis ganjrensis* sp. nov. (enlarged) specimen R.S. 1/29 (seed specimen 1). × 3. 6, *S. ganjrensis* sp. nov. specimen R.S. 1/29. An outline sketch of Fig. 7. × 1. 7, *S. ganjrensis* sp. nov. specimen R.S. 1/29. × 1. 8, *S. ganjrensis* sp. nov. specimen R.S. 1/37 (seed specimen 2). × 1. 9, *S. ganjrensis* sp. nov. specimen R.S. 1/37. An outline sketch of Fig. 8. × 1. 10, *S. ganjrensis* sp. nov. specimen R.S. 1/37. Enlarged. × 3¼. 11, *S. ganjrensis* sp. nov. specimen R.S. 1/3. Camera lucida sketch (seed specimen 3). × 1.

the general outline (TEXT-FIGS. 8-11). Only two of the three specimens have been photographed (TEXT-FIGS. 7, 8).

The seed (specimen 1) is 1·2 cm. long and 1 cm. broad. It is slightly narrowed down at the proximal end which is cordate; from here a narrow longitudinal line extends towards the distal end, dividing the body into unequal halves. The body has an elliptical outline with a dark outer layer (? a sclerotesta) which seems to be markedly thickened towards the distal end (TEXT-FIG. 5). Only one of the two wings is completely preserved (left-hand side of the seed in TEXT-FIG. 5); at the proximal end the two wings are narrow and meet in the median line so as to form a cordate outline. Towards the distal end each wing increases markedly in width, and has a broadly rounded margin; at this end the two wings are separated by a broad gap. The other two specimens resemble specimen one in general outline and shape, that is the general construction of the body and the wings is the same.

DISCUSSION

Samaropsis is a large genus with a wide geological range. Specimens which furnish no anatomical data, and show clear samara-type wings have been included under this generic name (SEWARD, 1917, p. 333). They are supposed to be the seeds of Cordaitean plants and are included in the Cardiocarpales.

Several species of *Samaropsis* are described from the Lower Gondwanas of India. The occurrence of *Samaropsis* in the Ganjra Nalla locality in the South Rewa Gondwana basin was reported by Feistmantel (1882) from a collection made by T. W. H. Hughes during his survey of South Rewa coalfields (HUGHES, 1880; SINOR, 1923).

Samaropsis johillensis sp. nov. described in this paper differs in shape and size from all the seeds recorded so far from the Palaeozoic strata.

Its body is much broader along the transverse axis than along the vertical. This character is met with only in the *Samaropsis* species described by Feistmantel (1882, PL. XI, FIG. 7); but in this specimen the body is much smaller in size and the wings expand almost equally all round the body. They do not show such a remarkable development in transverse extent as is seen in our species. Feistmantel's specimen has neither the beaks nor a proximal ridge.

Another seed to which this seed can be conveniently compared is *Samaropsis pincombei* (WALKOM, 1928) from the Upper Coal Measures of the New Castle district, Australia. *S. pincombei*, though slightly bigger than the Indian species *S. johillensis*, shows some striking points of resemblance. It has a proximal ridge, two distal beak-like projections and two large lateral wings with striations similar to those of *S. johillensis*. However, it differs in the general shape of the body and in the inclination of the wings. The beak in *S. pincombei* is blunt and diverging, while that in *S. johillensis* is conical, converging and pointed.

No other seed except *S. pincombei* Walkom and *S. pitcairniae* (ZEILLER, 1900), shows so much lateral growth of the wings as is found in *S. johillensis* sp. nov. But *S. pitcairniae* differs from our species in other characters.

Samaropsis ganjrensis sp. nov. is also quite different from all the other Indian species. It shows a certain degree of similarity with *S. ovalis* figured by Walkom (1935). This is also comparable partly with *S. emarginata* and partly with *S. barcellosa* (WHITE, 1908). The distal rounded lobes of the wings are much like those of *S. emarginata*, but it resembles *S. barcellosa* in the general shape and size of the body and the wings. As the seeds of this species cannot be compared in full to any of the seeds, it is safer to assign them to a distinct species. This species is named *Samaropsis ganjrensis* after the locality from where the seeds have been collected.

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