STACHYOTAXUS SAMPATHKUMARANI SP. NOV. FROM ONTHEA IN THE RAJMAHAL HILLS, BIHAR

A. R. RAO
Department of Botany, University of Lucknow

ABSTRACT

An impression collected from Onthea in the Rajmahal Hills in Bihar (Jurassic), India, is described and interpreted as a species of *Stachyotaxus*. The impression shows the sterile part bearing *Elatocladus conferta* type of leaves and the strobilar part bearing oppositely arranged megasporophylls, bearing in the angles of their inward bend two obliquely placed seeds, like those of *Stachyotaxus elegans*. Incidentally this is the first report of *Stachyotaxus* from India and the specimen is placed under a new name *S. sampathkumarani*.

WHILE examining a collection of plant impressions collected from the Rajmahal Hills in 1946 attention was drawn in a preliminary note to the existence of two new interesting types in that flora. One of them identified as a species of *Stachyotaxus* and reported as such (RAO, A. R., 1950) forms the subject matter of this short paper.

DESCRIPTION

The type specimen (ON 14) consists of a fertile impression on a hard grey rock so characteristic of the locality Onthea in the Rajmahal Hills. On account of the irregular fracture of the rock under the hammer the specimen has been rather unsatisfactorily exposed (FIG. 1) and has been injured in the middle. Still the shoot and the strobilus lie in a way suggesting a clear connection between the two (FIG. 2), supported by certain marks on a small chip of the rock (ON. 29) which forms a counter part of the type specimen. The entire specimen measures 5 cm. long and 1 cm. broad. The slightly decurrent leaves have prominent midribs and entire margins and generally conform to the type known as *Elatocladus conferta*. They have narrow twisted bases, spiral phyllotaxis, and measure 5 mm. long by 1 mm. broad. The epidermical features could not be made out. The axis of the shoot extends into a strobilus 2 cm. long by 0-7 cm. broad (Fig. 2). The sporophylls which seem to be oppositely arranged are nearly 8 mm. long and arise almost at right angles from the axis. They are worn out at places and there is a suggestion of parallel venation on them. Each sporophyll is flat, then bent at right angles in the middle (FIGS. 3 & 4) forming a kind of socket or depression in the angle of which are lodged, side by side, two obliquely inverted seeds. Neither the exact shape of the seed nor its attachment to the sporophyll could be clearly made out. The seeds measure 4 mm. long by 1-5 mm. broad. They are not fully preserved but the compressed seed coat and its fibrous texture are seen.

Specimen O.N. 12, when split into two, showed a number of sterile shoots of *Stachyotaxus*.

A specimen similar to the one found on O.N. 14, but with a little bigger but shorter strobilus has been figured by Dr. S. C. D. Sah (THESIS, 1956, Pt. 25 Fig. 6) also from Onthea. One of the seeds of that strobilus has been pressed side ways and shows the fibrous seed coat clearly. The basal twist of the leaf and the midrib in each leaf can be seen although Sah states otherwise.

DISCUSSION

Nathorst (1908) instituted the genus *Stachyotaxus* for some dimorphic shoots from the Rhaetic of Scania. The spike-like megastrobili of these are nearly 6 cm. long and bear spoon-shaped sporophylls arising almost at right angles from a stout axis. Each sporophyll has a short stalk and an expanded triangular scale bearing two ovate seeds each being enclosed in a cupule (SEWARD, 1919). Each sporophyll forms an upturned acuminate apex. The specimen described in this paper shows all the above features (except the cupule and the dimor-
phic foliage) associated with *Stachyotaxus*,
and its reference to this genus is well war-

tanted. In spite of their bearing two seeds
Nathorst compares these strobili with those
of *Dacrydium*. Miss Gibbs (1912) also

optines that *Stachyotaxus* belongs to the
Podocarpaceae. Seward (loc. cit.) pointed
out the resemblance between the fertile
fossil shoot of *Stachyotaxus* and *Podocarpus
spicata*. Nathorst (1908) described two
species of *Stachyotaxus*-St. *elegans* and
St. *septentrionalis* from Sweden. My speci-
men resembles the latter to some extent,
Rao (1950). Halle (1913, p. 83) pointed out
the resemblance between some shoots of
Elatocladus from Grahamland and *Stachyo-
taxus*.

Harris (1926, 1935) working on the Rhaetic
Greenland flora has pointed out that the
above two species of *Stachyotaxus*, as noticed
there, are distinct from each other in just a
few points. He has drawn attention to the
existence of specimens or parts of specimens
of St. *elegans* approaching St. *septentrionalis*.
He has however pointed out that the latter
species is distinguished by its smaller cone,
smaller seeds and smaller leaves, not more
than one mm. broad. In 1950 I pointed
out that my specimen resembles St. *septen-
trionalis*. But subsequent closer examina-
tion reveals that there is a resemblance
also with some of the specimens figured as
St. *elegans* by Nathorst (loc. cit.). The stro-
bulus in my specimen resembles that of St.
*elegans* rather than that of St. *septentrionalis*.
A comparison can be made between
Nathorst’s Fig. 9 (Table 2) and Figs. 2 & 3
in this paper, showing the abrupt bend of the
seed-bearing scale. But the comparison
stops here as the cuticular features are
known in the above two species and not in
my specimen. Harris is also of the opinion
that *Stachyotaxus* does not fit into any of the
known families of conifers although he
admits that the individual megasporophyll
can be compared with that of *Dacrydium*.
He suggests that *Stachyotaxus* should be
kept apart as a separate genus by itself.
He has added to our knowledge of the cuticle
of the microsporophylls, seed structure and
pollen features of this genus. The ovule
shows a nucellus which is free to the base,
a rather primitive feature not seen in any of
the living conifers. Florin (1940) is of the
opinion that both *Elatocladus conferta*, (com-
parable to *Eupodocarpus* of *Podocarpus*) and
*Stachyotaxus* belong to the Podocarpaceae.

My specimen resembles to some extent
*Beaniopsis rajmahalensis* Ganju (1947), part
of a strobilus, also described from the
Rajmahal Hills. Each sporophyll bears two
seeds whose micropylar part is slightly
elongated. The longer axes of the two
seeds diverge from each other but their
principal planes are in continuation with
each other. This is the main point of
difference between my specimen and *B.
rajmahalensis*. In fact there is some resem-
blance between the sporophyll marked with
an arrow in Fig. 3 and parts of Ganju’s
photo 10. At the same time this may be
due to just an accident in preservation. The
foliage of *B. rajmahalensis* is not known.
It may be that it is after all a *Stachyotaxus*,
then genus with which it shows a close compa-
rison as Ganju himself admits.

From the foregoing discussion it will be
seen that my specimen can be referred
only to *Stachyotaxus* and that this is the
first species of the genus to be reported
from India, and differs from other known
types.

In view of the above facts the specimen
described in this paper has been placed
under a new specific name *Stachyotaxus
sampathkumarani* in memory of my old
teacher.

**DIAGNOSIS**

*Stachyotaxus* Nathorst

*S. sampathkumarani* sp. nov.

Conifer shoot bearing terminal megas-
stromulus with loosely and possibly oppositely
disposed megasporophylls. Each megal-
sporophyll attached at right angles to axis,
almost sessile, slightly decurrent, elongated,
flat, and the apical part upturned abruptly
forming at the angle a depression in which
are lodged two pyramid-shaped seeds with
fibrous integument and a sharp pointed
micropyle. Leaves bifacial, uninnerved with
basal twist and conforming in general to the
type *Elatocladus conferta*. Fist., found abun-
dantly in Onthea and other localities in the
Rajmahal Hills.

**Locality—** Onthea.

**Age—** Middle Jurassic.

I wish to express my grateful thanks to
Dr. M. N. Bose who has helped me in various
ways.
REFERENCES


EXPLANATION OF PLATE 1

1. Photograph of the entire impression showing the strobilus (str) slightly removed from the shoot × 1.

2. Upper part of the above magnified to show the possible connection between the shoot and the strobilus × 1.5.

3. A part of the strobilus showing four sporophylls, arranged in two opposite rows. The distal upturned part of the sporophyll (sp) and the seed (s) placed in the angle can be made out × 4.

4. Further magnified view of the part seen in photo 3 showing the above mentioned features as well as the seemingly fibrous nature of the seed coat, the slightly decurrent base of the sporophylls and the cut end of the strobilar axis × 7.