

***Scutum royii* - a New Species from Early Permian of West Bengal, India**

Abstract: A fossilized glossopterid female fructification collected from Kalipahari Colliery under the Raniganj Coalfield in the state of West Bengal, India has been described here as a new species of *Scutum* Plumstead, namely *Scutum royii* De which is axillary to leaf, shortly pedicellate, bivalved structure, one valve consisted of a seed-bearing ovate receptacle (1.2 x 0.9 cm) having cordate base, umbonate apex, dentate wing (up to 1.5 mm wide) and seed scars around 40 in number on receptacle arranged in horizontal rows, scars of one row alternated with scars of the next row. The sterile protective valve is obovate and empty, 8 x 4 mm.

Keywords: *Scutum royii*, Early Permian, India

Extensive palaeobotanical studies have been carried out in different collieries under the Raniganj Coalfield in the state of West Bengal, India such as West Jamuria Colliery¹, Sonapur-Bazari Colliery² etc. However, no palaeobotanical study was undertaken by any worker in

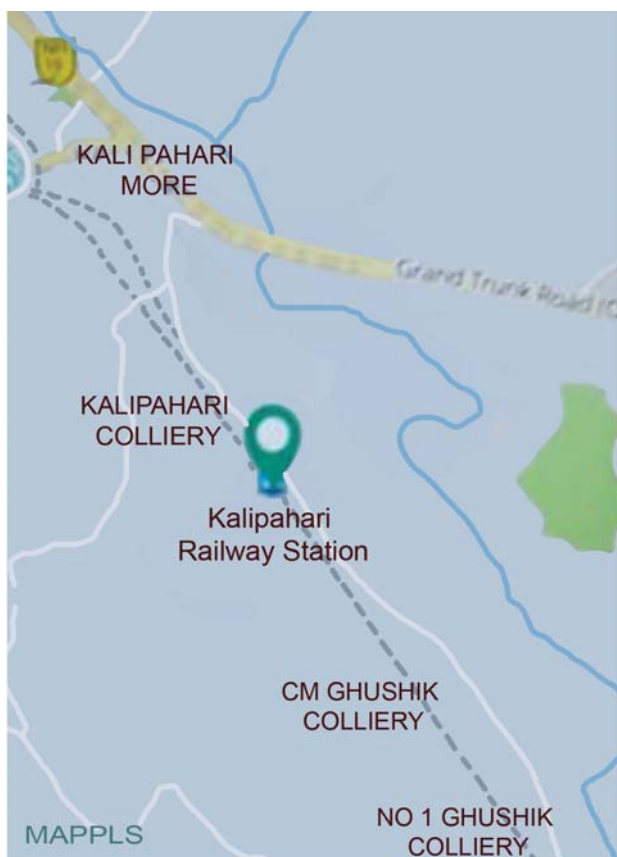
Kalipahari Colliery and I, therefore, carried out an investigation in this regard during 2020-2021. A large number of pteridophytic and gymnospermous fossils were collected and one of them was a glossopterid female fructification which has been identified as a new species of *Scutum* Plumstead and it has been described herein.

Material and Methods: The fossilized fructification collected from Kalipahari Colliery (23°39'55"N : 87°0'58"E) (Map1) was examined under low-power binocular and finer details of the sample were studied after soaking the material in xylol or kerosene oil. For identification of the specimen, its features have been compared with those of the authentic descriptions of glossopterid fructifications provided by different authors^{1,3-8}. The comparison has been presented in a table (Table 1). Different morphological features such as the shape of the receptacle, nature of its apex and base, number of seed scars present in the receptacle, features of wing, and features of pedicel have been taken into account for its identification. They are

Table 1: Comparison of *Scutum royii* sp.nov. with all known species of *Scutum*

Species	Fructification		L:W	Type of Wing	Width of Wing	Apex of receptacle	Base of receptacle	Size of pedicel scar	Diameter of seed	Stratigraphic age
	Shape	Size								
<i>Scutum leslii</i>	Circular, elliptical, ovate, obovate or lanceolate	1.3(2.5)3.8 1.1(2.2) 3.1 cm	<2:1	Margin entire or dentate, surface fluted and striated	Up to 9mm	Acute, acuminate or obtuse	Sharply constricted forming rounded or laterally truncated lobe	3.5(9.9) 36 x 1 (1.8)3.3 mm	(0.5-) 1(2) mm	Early Permian to Late Permian
<i>Scutum elongatum</i>	Elongately oval, broadest in the middle	2.0x1.0 -1.2 cm	2:1 -5:3	Margin entire, surface slightly fluted	2mm	Narrowly rounded	Rounded	Short, 2mm wide	2mm	Late Permian
<i>Scutum indicum</i>	Oval to round	1.5-2.3x 1.5 cm	1:1 -3:2	Margin entire, surface deeply fluted	4mm	Rounded	Rounded	4mm long	1mm	Late Permian
<i>Scutum sahnii</i>	Almost round to oval	2.0-3.4x 1.8-2.5 cm	10:9 -7:5	Margin cuneate, surface fluted	2mm	Wide, rounded	Narrowed downward	13x2 mm	—	Late Permian
<i>Scutum royii</i>	Ovate	1.2x0.9 cm	4:3	Margin dentate, surface repand	1.5 mm	Umbonate	Cordate	9.0x0.9 mm	<1mm	Early Permian

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Map-1. Showing Location of the Fossil Collected.

measured and photographed to record the morphological characters using a digital camera.

Result: *Scutum royii* De sp. nov.

Diagnosis – Fructification axillary to leaf, bivalved, pedicellate, pedicel up to 9mm long, receptacle ovate, 1.2x0.9 cm bearing about 40 seed scars, seed scars arranged in horizontal rows and scars of one row alternated with scars of another row, its base cordate, apex umbonate, winged, wing narrow, repand as well as dentate, sterile valve protective, obovate and empty.

Holotype – Specimen No. K20, Palaeobotany and Palynology Section, Department of Botany, University of Burdwan, West Bengal, India (BURD).

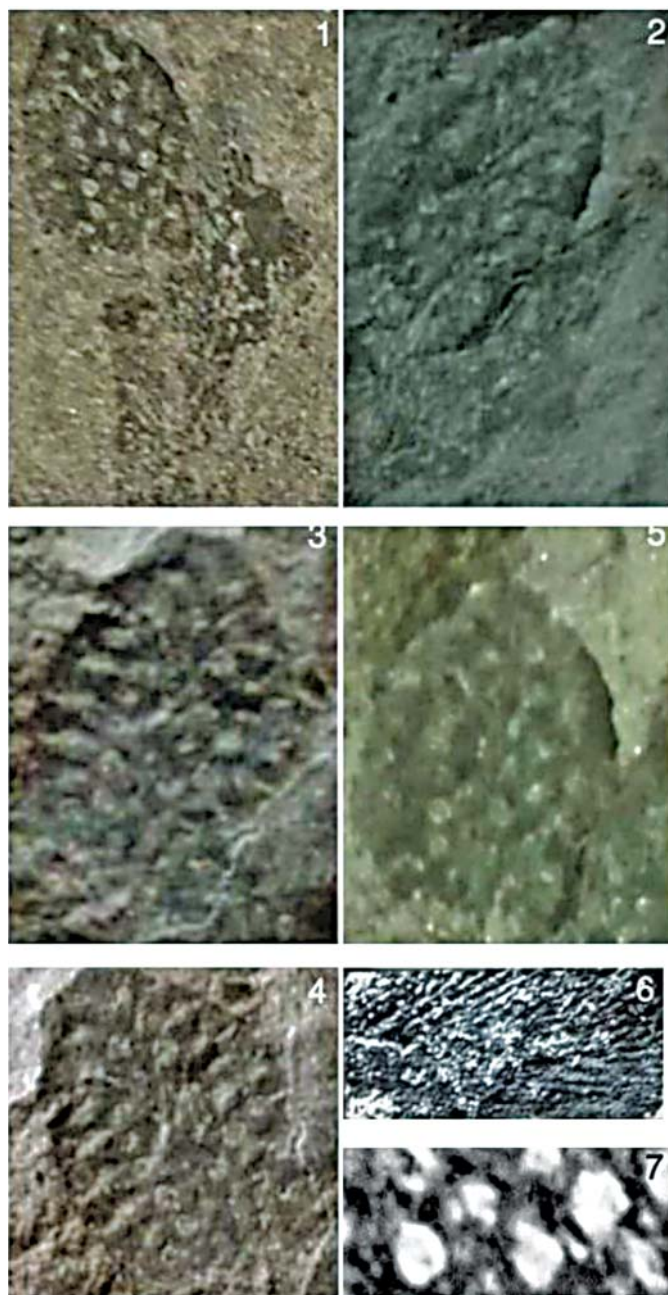
Type Locality – Kalipahari Colliery (Early Permian), Paschim Bardhaman District, West Bengal, India

Horizon – Barakar Formation, Raniganj Coalfield.

Repository – Palaeobotany and Palynology Laboratory, Department of Botany, University of Burdwan, West Bengal, India.

Etymology – The species is instituted after the name of the eminent Palaeobotanist of India Dr. S.K. Roy (Ex-Professor, Department of Botany, University of Burdwan).

Description – The specimen is a compression fossil. A branch of 4mm diam. bearing leaf has been found (Fig.1). The fructification is axillary to leaf which has been found attached by a 9mm long stalk (pedicel) to the upper side of the petiole just at the base of the leaf of *Glossopteris* sp. (Fig.1).



Figures. *Scutum royii* sp. nov: 1, Pedicellate fructification; 2, Sterile valve below receptacle; 3-4, Receptacle with wing and seed scars; 5, Receptacle with dentate wing (on right side); 6, Midvein of leaf with secondary veins; 7, Seed scars (enlarged) arranged in alternate rows.

The fructification is a bivalved structure (Fig.2), one valve consists of a seed-bearing fertile 1.2 x 0.9 cm receptacle (Fig.1). The fertile surface of the receptacle faced towards the adaxial surface of the subtending leaf. The receptacle (L:W = 4:3) bearing seed scars is ovate having a wing of regular width except at pedicel insertion where it is contracted to form rounded lobe on either side being up to 1.5 mm wide which is repand (Figs.3&4) and where perfect is dentate (only a few teeth have been preserved) (Fig. 5). Receptacle covered with about 40 circular seed scars (Figs. 1, 3 and 4) which are less than 1mm in diameter arranged in horizontal rows and scars of one row alternated with scars of another row (Figs. 5 and 7). Some of the raised seed scars appeared to be hollow which represented cavities left by decayed seeds (Figs. 3 and 4).

The sterile protective valve obovate and empty, 8x4 mm (Fig. 2).

The leaf bearing the fructification was up to 7mm wide having midvein and secondary veins emerging from midrib anastomosed to form narrow elongated meshes (Fig. 6).

In Table 1 features of various species of *Scutum* Plumstead have been compared with those of the specimen collected from Kalipahari Colliery which shows that this specimen varies greatly in many features from all of them.

Discussion: The study and analysis of supportive data of different literature⁸⁻¹² suggested that fructification genera *Hirsutum*, *Jambadostrobus*, *Plumsteadia*, *Plumsteadistrobus* and *Venustrobus* represent a single type glossopterid fructification and these genera should be merged into a single genus *Scutum* Plumstead (typified by *S. leslii* = *S. leslium*). Following Tewari⁸ the fructification collected from Kalipahari Colliery has been treated as *Scutum*.

From her extensive revisional work Prevec⁵ merged all nine species of *Scutum* recognized by Plumstead¹³⁻¹⁵ and one species recognized by Anderson and Anderson¹⁶ into a single species *S. leslii*. Besides, three more species of *Scutum*, namely *S. elongatum*, *S. indicum* and *S. sahnii* have been described by Surange and Chandra⁶. The fructification collected by the author from Kalipahari Colliery differs in several features (Table 1) from all these known species of *Scutum*. It is, therefore, treated as a new species namely *Scutum royii* De, *sp. nov.*

Scutum royii De, *sp. nov.*

Order: Glossopteridales *sensu* Pant, 1982

Family: Dictyopteridaceae Surange and Chandra, 1975 ex Rigby, 1978 emend. Maheshwari, 1990

Genus: *Scutum* Plumstead, 1952 emend.

Surange and Chandra⁶ interpreted the wing of *Scutum elongatum* and *Scutum indicum* to have been formed by a marginal row of overlapping flattened seeds. According to Anderson and Anderson¹⁶ wing is a 'fused outer ring of modified ovules'. In *Scutum royii* the wing has also been formed in the similar way (Figs. 3 and 4).

In *S. royii* some of the raised structures situated on the receptacle appeared to be hollow (Figs. 3 and 4) as was observed by Banerjee¹⁷ and Plumstead¹³ which represented cavities left by decayed seeds.

Conclusion

This investigation added a new species, *Scutum royii* De, to the list of the genus *Scutum* described so far from India. The present study revealed that *Scutum* has a broad geological distribution in India from Early Permian to Late Permian. The diameter of seed scars, apex, base, length to width ratios (L: W) of the receptacle meet the diagnostic delimitations of its species. The width of the wing varies among different species of *Scutum*. This character, therefore, should not be emphasized in the delimitation of genera. However, the possibility of species circumscription cannot be ruled out. □

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Received: 18 December, 2023

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DEMISE

DEMISE OF DR. SISIR K. MAJUMDAR



Dr. Sisir K. Majumdar, a Life Member (since 2000) and former Council Member of the ISNA for the period March, 2004 – February, 2021, left for his heavenly abode on the 22nd July, 2024 in England. The Indian Science News Association (ISNA) deeply mourns his sad demise and offers deepest condolences to the members of his bereaved family.

Born on the 4th January, 1937 in Dacca (now Dhaka, Bangladesh), Sisir K. Majumdar was educated at Jagannath College, Dhaka, graduated from the Presidency College, Calcutta and became a medical graduate from the Calcutta Medical College. A good orator and debater at the Presidency College, he acted as the President of the Medical College Students' Union for a number of years. While a Council Member at ISNA, Dr. Majumdar

contributed a number of articles in *Science and Culture*, the mouthpiece of ISNA. After a few years of service in Govt. Hospitals, he left Govt. job and joined May and Baker in Calcutta. Later he left for England and settled there. However, he did not give up his Indian nationality. He worked there in the National Health Service of England, from which he retired in due course.

Dr. Sisir K. Majumdar is survived by his wife Swapna and daughter Anamika. May his departed soul rest in peace. □

*Manas Chakrabarty
Amit Krishna De
Honorary Secretaries
Indian Science News Association*