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GLOBIRHYNCHIA SPECIES FROM JAISALMER, RAJASTHAN

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ABSTRACT

The paper incorporates the first systematic work on Rhynchonellid brachiopods from the Bathonian beds of Jaisalmer, Rajasthan. This lithological succession, exposed in the area, consists of alternate hard limestone and marl beds. Out of invertebrate assemblage of genera and species present in the above succession, only the two new species of genus *Globirhynchia* are being described here. On the basis of the brachiopod assemblage, suggestions have also been made for modifying the stratigraphic picture of the marine Mesozoics of Rajasthan.

INTRODUCTION

Studies on marine mesozoic succession has been made by Blanford (1877), Oldham (1886), Allison (1939), Taylor (1953-1954), Swaminath (1956), Subramaniam (1965) and Singh and Krishna (1966-1967). The geological succession proposed by Singh and Krishna (1966-1967) is given in the Table 1.

The noteworthy contributions to the Mesozoic palaeontology are by Sahni (1958) on brachiopods and echinoids, Lubimova *et al.* (1960) on ostracods, Subotina *et al.* (1960) on foraminifera, Srivastava (1965) on pollens and spores and Singh and Krishna (1966-1967) on invertebrates with special reference to ammonoids.

Though references are in the earlier literature reporting a rich brachiopod assemblage in the Jurassic succession of Jaisalmer area, but except enlisting some genera and the erection of the new genus *Jaisalmeria* by Sahni & Bhatnagar (1958), not much is encountered on brachiopods in these publications.

In order to make a detailed study of this rich brachiopod fauna, the authors made systematic stratigraphic collections from the Sections exposed near Jaisalmer city, Nala cutting near Kuldhar village (4-5 kms SW of Jaisalmer), Amarsagar (about 1 km West of Jaisalmer), Rupsi (about 6 kms NW of Jaisalmer), and Bhadasar (about 15 kms NW of Jaisalmer).

In the present paper two species of Genus *Globirhynchia* Buckman, 1918 are being described and recorded for the first time from Jaisalmer region. The other associated brachiopod genera having more than one species are *Trichorhynchia*. Buckman, 1918 ; *Flabellirhynchia* Buckman, 1918 ; *Tetrarhynchia* Buckman, 1918 ; *Bihendulirhynchia* Muir-Wood, 1935 ; *Kutchirhynchia* Buckman, 1918.

It has also been observed in the field that rhynchonellids in this area have appeared at the base of Jaisalmer Formation and continue till the Upper Callovian, while terebratulids appear for the first time in the Upper Callovian, horizon of Jaisalmer Formation and continue up to Bhadasar Formation of Tithonian age. Further, Sahni (1958) assigned Lower Tithonian age to the *Jailsalmeria* bearing horizon of Bhadasar, but the associated ammonoid fauna studied in this laboratory is of Upper Tithonian, therefore, it is suggested that the age of genus Jaisalmeria be changed to Upper Tithonian.

A brachiopod form possessing both the Rhynchonellid and Terebratulid characters has been found in

Table 1. Stratigraphic Succession

Age	Rock Units	Lithology
UPPER CALLOVIAN	RUPSI STAGE	Calcareous sandstone and clays with hard limestone bands
LOWER TO MIDDLE CALLOVIAN	KULDHAR STAGE	Calcareous sandstones, sandy limestone, clays and marls with intermittant hard limestone bands
BATHONIAN	JAISALMER STAGE	Arenaceous ferruginous limestone with sandy beds
TRIASSIC	LATHI SERIES	Coarse sandstone and shales

(after Singh and Jaikrishna 1969)

this collection. The detailed study of this form is in progress and there is every possibility that this form may throw considerable light on the phylogenetic relationship of the two groups—Rhynchonellids and Terebratulids.

The horizon from which the genus *Globirhynchia* has been collected is given in the litholog (Fig. 1).

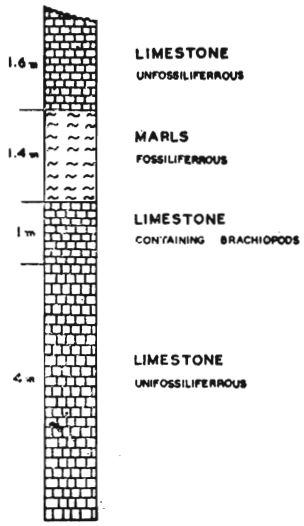

Fig. 1. Generalised Lithological Succession Near Amarsagar

SYSTEMATIC DESCRIPTION

Family Rhynchonellidae GRAY, 1848
Sub-family Cyclothyridinae MAKRIDIN, 1955
Genus Globirhynchia, BUCKMAN, 1918

Globirhynchia amarsagarensis sp. nov.
(Pl. I—1-4)

Material : Twenty well preserved specimens besides a number of broken and distorted specimens.

Description : Globose, medium sized. Length ranges from 1.90 cms to 2.15 cms and width from 1.80 cms to 2.05 cms with anterior border plicated. Brachial valve more convex than the pedicle valve. Height of the shell maximum in the middle, surface ornamented with about 17 sharp costae ; width of the costae more in the anterior part reducing gradually towards the posterior part. The more convex dorsal valve slopes steeply on the lateral sides ; the broad fold in the centre comprises 6-7 costae. Fold more prominent on the posterior side of the shell. Ventral valve depressed more at the anterior portion forming sulcus and raised an either side into lateral lobes, 4 characteristic costae in the sulcus.

Hinge line curved, valve margins blunt. Lateral commissure at first simple takes a straight course but soon changes to zig-zag form as it follows alternating costae terminations. Beak narrow, suberect, hypothyrdid, pointed and slightly incurved. Beak ridges characteristic.

Ventral valve with diverging dental plates, thicker near the umbo, gradually becoming thinner at the outer side. Dorsal septum long, extends for one third of the valve length. Hinge plates connected by dorsal median septum.

Measurement (Table 2)

Comparison and remarks : The new species described in this paper possess characteristic ornamentation. It differs from *Globirhynchia subobsoleta*, Davidson in having a prominent sulcus and a long dorsal septem. Though it resembles morphologically wih *Stolomorhynchia* Buckman but it differs in having the clear muscle scars and the dental plates. In comparison to *Ptyctorhynchia* Buckman the present species differs in possessing the characteristic plications and trilobation at the anterior margin.

Table 2. Measurements (in centimeters)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Lv	1.96	2.00	2.07	1.95	2.05	2.04	1.90	2.00	2.05	2.00	2.10	1.95	1.98	2.15	2.10	1.86	1.88	2.10	2.15	2.10
Ld	1.67	1.70	1.69	1.65	1.70	1.67	1.60	1.64	1.75	1.75	1.75	1.68	1.75	1.65	1.70	1.60	1.60	1.60	1.75	1.72
l	1.88	1.93	1.87	1.82	1.85	1.83	1.80	1.80	1.80	1.98	2.00	1.92	1.92	2.08	2.00	1.82	1.84	2.00	2.07	2.05
E	1.18	1.10	1.13	1.11	1.12	1.14	1.05	1.15	1.05	1.10	1.05	1.05	1.08	1.05	1.15	1.08	1.05	1.15	1.15	1.08
Ed	.80	.82	.85	.80	.76	.82	.80	.90	.80	.80	.82	.80	.80	.80	.87	.85	.80	.80	.90	.84
Ev	.38	.28	.28	.21	.36	.22	.25	.25	.25	.30	.23	.25	.28	.25	.28	.23	.25	.25	.25	.24

Lv =Length of the ventral valve.
Ld =Length of the dorsal valve
l =Width of the shell
E =Total thickness of the shell.
Ed =Thickness of the dorsal valve.
Ev =Thickness of the ventral valve.

Type horizon : Bathonian.

Type locality : Amarasagar. Distance 1 km from Jaisalmer on Amarsagar-Rupsi Road.

Repository: Author's collection—Holotype No. $JA_2/R1.1$.

Etymology : The species is named after the locality from where the collection was made.

Globirhynchia jaisalmerensis sp. nov.

(Pl. II—1-4)

Material : Ten well preserved specimens.

Description : Globose, small sized. Length and breadth about equal in size with plicated anterior border. Brachial valve more convex than the pedicle valve. Thickness of the shell maximum near the hinge line, surface ornamented with about 14 smooth costae. Coastae more thicker at the anterior side, gradually becoming less and less thick towards the posterior side. The more convex brachial valve slopes gradually on the lateral sides with no dedian fold. Ventral valve slightly depressed at the anterior side.

Curved hinge line with valve margins blunt. Lateracommissure at first simple but are transformed into zigzag course as it follows costae terminations. Beak narrow, pointed, projecting, suberect and hypothyridid. Beak ridges not very characteristic.

Ventral valve with diverging dental plates, thicker near the umbo, gradually reduced at the outer side. Dorsal septem not very long extends for about half of the valve length, Dorsal median septum connects the hinge plates.

Measurement (Table 3)

Comparison and Remarks : *Globirhynchia jaisalmerensis* sp. nov. differs from *Globirhynchia amarsagarensis* sp. nov. by the absence of sulcus and fold, smooth costae and ventral valve having a slight depression at the anterior side.

Type horizon : Bathonian.

Type locality : Amarsagar. Distance 1 km from Jaisalmer on Amarsagar—Rupsi Road.

Repository : Author's collection—Holotype No. $JA_2/R_2.1$.

Etymology : The species is named after the city of Jaisalmer in Rajasthan.

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Table 3. Measurements in centimeters

	1	2	3	4	5	6	7	8	9	10
Lv	1.15	1.25	1.18	1.48	1.50	1.58	1.55	1.52	1.35	1.33
Ld	1.00	1.10	1.00	1.25	1.40	1.40	1.42	1.40	1.22	1.20
L	1.15	1.25	1.10	1.25	1.45	1.45	1.50	1.41	1.15	1.22
E	.60	.65	.60	.70	.70	.75	.70	.75	.70	.72
Ed	.35	.35	.38	.45	.42	.50	.43	.51	.45	.48
Ev	.25	.30	.22	.25	.28	.25	.27	.26	.25	.24

Lv =Length of the ventral valve.
Ld =Length of the dorsal valve.
l =Width of the shell
E =Total thickness of the shell
Ed =Thickness of the dorsal valve.
Ev =Thickness of the ventral valve.

EXPLANATION OF PLATES

PLATE I

Globirhynchia amarsagarensis sp. nov.

1-4. Four views of holotype, No. JA1/R1.1.
1. Ventral view × 3 (approx.)
2. Dorsal view × 3 (approx.)
3. Anterier view × 3 (approx.)
4. Lateral view × 3 (approx.)

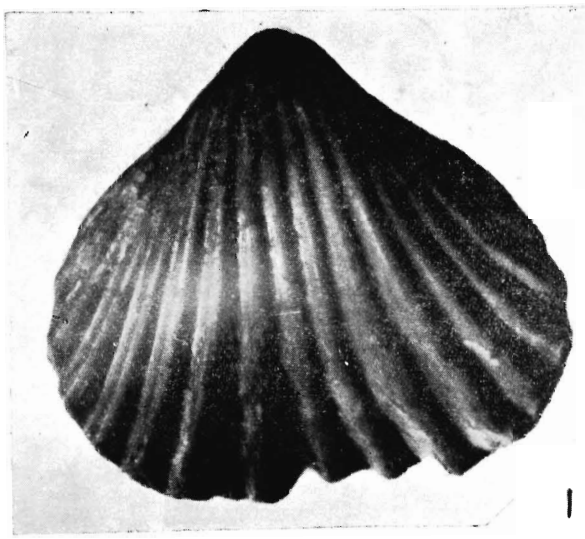
PLATE II

Globirhynchia jaisalmerensis sp. nov.

1-4. Four views of holotype, No. JA1/R 2.1.
1. Ventral view × 5 (approx.)
2. Dorsal view × 5 (approx.)
3. Anterier view × 5 (approx.)
4. Lateral view × 5 (approx.)

PLATE III

Serial Transverse Sections of *Globirhynchia amarsagarensis* sp. nov.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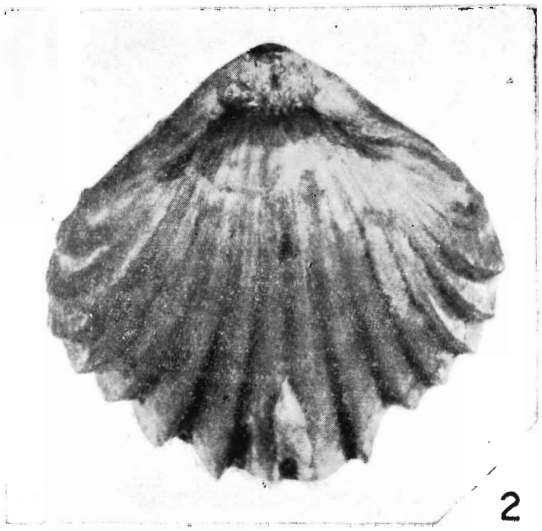
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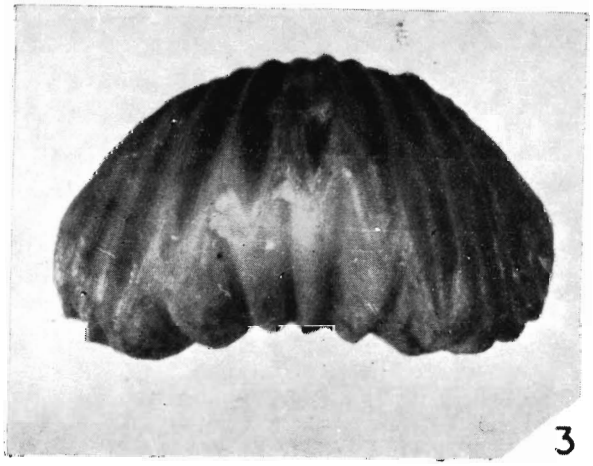
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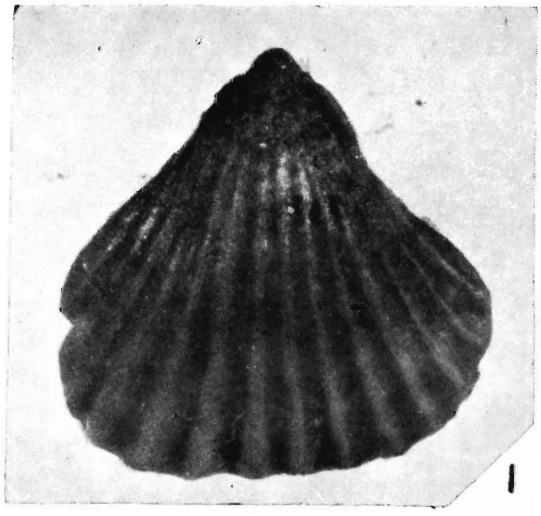
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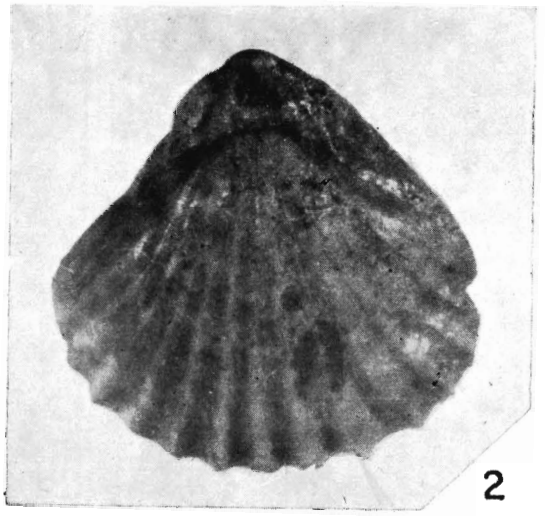
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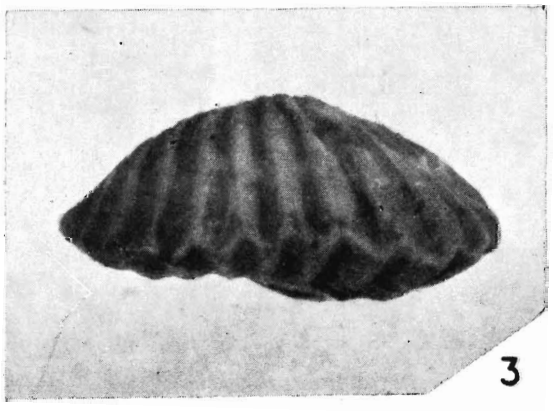
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4

2·1

1·62

2

1·58

1·8

1·56

1·69

1·52