

***Habonucula*, a new Nuculid (Bivalvia) genus from Jurassic rocks of Kutch (Gujarat), W. India**

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Abstract

Habonucula n. gen. is proposed for Jurassic Nuculids which are characterised by feebly incurved, opisthogyrous, terminal umbones, and a complete absence of posterior area and umbonal ridges. *H. agrawali* n. gen. and n. sp. is described and designated as its type species.

Introduction:

Individuals of this form were collected from the Jhura Dome by Agrawal and referred by him (1956, p. 51) to *Nucula* (*Palaeonucula*) *cuneiformis* J. de C. Sowerby. A solitary left valve attached to a specimen of *Lima* (*Plagiostoma*) sp. nov., collected and described by Shukla (1959, unpublished Ph. D. thesis, Banaras Hindu University) from the Nara Dome in Kutch, unfortunately, escaped his notice and remained undescribed. Recently several specimens have been obtained from the Habo Hill, where they occur at a stratigraphic horizon equivalent to that of the previous ones. The individuals are found mostly as isolated single valves but the interior is never fully exposed.

Agrawal's specimens (four in all), otherwise excellently preserved, did not show the hinge characters. He was apparently guided by the shape of his specimens and inadvertently referred them to *cuneiformis* in view of a close proximity in outline with those of the figures of *N. (P.) cuneiformis* given by Cox (1940, p. 13, pl. 1, fig. 5 only). But this form, for want of posterior ridges and area, due to extreme pouting and some other important features, does not fit into any Nuculid genus known so far, and hence the new genus proposed.

Systematic Description:

Class: BIVALVIA Linné, 1758

Subclass: PALAEOTAXODONTA Korobkov, 1954

Order: NUCULOIDA Dall, 1889

Superfamily: NUCULACEA Gray, 1824

Family: NUCULIDAE Gray, 1824

Genus: *Habonucula* n. gen.

Type Species: *Habonucula agrawali* n. gen. and n. sp., Lower Callovian, Kutch (Gujarat) W. India.

Diagnosis: Shell equivalve, extremely inequilateral, trapezoidal in outline and moderately inflated, Umbones prominent, opisthogyrous, feebly incurved, terminal, placed at or beyond the posterior margin of the shell. Umbonal ridges and posterior area totally absent. Surface smooth or with irregular concentric threads. Inner ventral margin smooth.

Dentition consists of numerous small and straight teeth arranged in a long anterior row and a short posterior one.

Remarks: The only Jurassic genus with which it bears resemblance is *Palaeonucula** Quenstedt (Type-*Nucula hammeri* DeFrance) which has been discussed in

* Myra Keen (In Moore *et al.*, 1969, pt. N, p. N 231) has given a generic rank to *Palaeonucula* Quenstedt.

great detail by several authorities in the past. The diagnostic characters as given by its author (Quenstedt, 1930, p. 112) are:

‘Wirbel nicht oder nur mäßig stark opisthogyr. Bandgrube weit, kutz, nicht gekrümmt, rein dorsoventral oder doch nur schwach von hinten nach vorn oder von vorn oder von vorn nach hinten ziehend, nicht oder kaum löffelförmig in den Binnenraum der Schale vorspringend. Hinter der Bandgrube, zwischen Bandgrube und Hinterabschnitt der Zahnreihe, weder ein Bandgubenzahn noch ein ebenes Verbindungsstück der Schloßplatte. Vorderer Abschnitt der Zahnreihe gerade. Bauchrand der Klappe mäßig stark gekrümmt. Selten eine Area vorhanden, durch eine Kante abgegrenzt, auf die eine Furche nach hinten folgt. Schalenrand immer glatt. Devon bis Jura (bis jetzt?)’.

Schenck (1934), who considers *Palaeonucula* to be a subgenus of *Nuculopsis* Girty, has figured (pl. 4, figs. 1. 1a & 1b) a toptype of *N. hammeri* from the Upper Lias of Gundershofen, Alsace, which shows a sufficiently wide and deeply impressed posterior area bounded by definite umbonal ridges. Cox (1940, p. 10) finds close relationship between *N. hammeri* and the Kutch forms such as *Nucula* (*Palaeonucula*) *cuneiformis* J. de C. Sowerby, *N. (P.) kaoraënsis* Cox and *N. (P.) blanfordi* Cox. He has consequently assigned all of them to *Palaeonucula* which has been regarded by him as a subgenus of *Nucula* Lamarck in view of the absence of any clear line of demarcation between them. Since Quenstedt's diagnosis of *Palaeonucula* ‘is not even applicable to its genotype’, Cox (*op. cit.*, p. 11-12) emended its characters but none of the species mentioned above shows any tendency of absence of the posterior area and the umbonal ridges. Besides, their posterior end is always flat.

The present genus, as stated before, has neither the posterior area nor umbonal ridges and consequently the posterior end instead of being flat with a slight median concavity, is convex and the shell surface slopes uniformly right up to the posterior margin. Absence of the posterior area may be due to extreme pouting of the marginal region which in turn may have been instrumental in obliterating the entity of both the posterior area and corresponding umbonal ridges by bringing up the convexity of the region in uniformity with that of the main body of the shell. In addition, the umbones are only feebly incurved and the teeth of both the series are straight.

*Habonucula agrawali** n. gen. and n. sp.

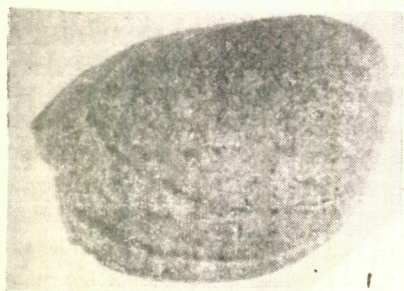
Pl. 1, figs. 1-12

Nucula (*Palaeonucula*) *cuneiformis* J. de C. Sowerby: Agrawal, 1956, p. 51 (non J. de C. Sowerby).

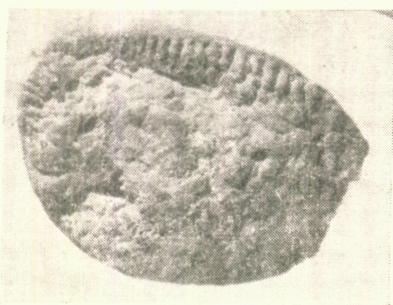
* The species has been dedicated to Prof. Dr. S. K. Agrawal.

EXPLANATION OF FIGURES

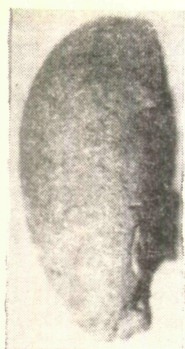
- Figures 1-3: *Habonucula agrawali* n. gen and n. sp. Holotype (No H/ $\frac{28}{6}$ /6), a left valve. Fig. 1 - Side view; Fig. 2 - Posterior view; Fig. 3 - Internal view showing teeth. About $\times 2.5$. Bed no. 15 (Lower Callovian), S of Fulae (Habo Hill), Kutch.
- Figures 4-6: Same species. Paratype (No. H/ $\frac{47}{1}$ /1), a bivalved specimen. Fig. 4 - Side view of the left valve; Fig. 5 - Posterior view; Fig. 6 - Dorsal view. About $\times 3.0$. Same horizon, N of Boladi (Habo Hill), Kutch.
- Figures 7-9: Same species. Paratype (No. H/ $\frac{47}{1}$ /23), a bivalved specimen. Fig. 7 - Side view of the right valve; Fig. 8 - Posterior view; Fig. 9 - Dorsal view. About $\times 2.8$. Same occurrence as above.
- Figures 10-12: Same species. Paratype (No. H/ $\frac{28}{1}$ /27), a bivalved specimen. Fig. 10 - Side view of the left valve; Fig. 11 - Posterior view; Fig. 12 - Dorsal view. About $\times 3.5$. Same horizon, S of Fulae (Habo Hill), Kutch.



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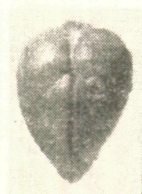
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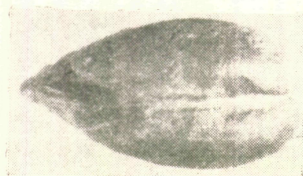


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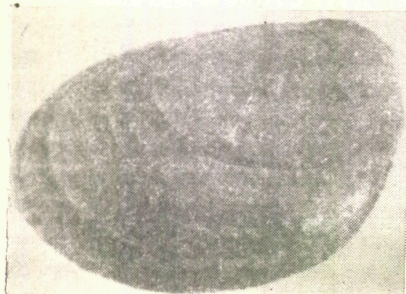
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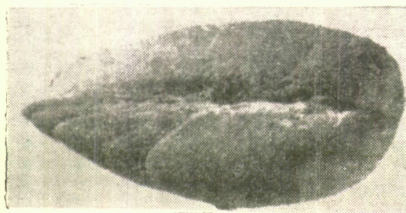
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Description: Shell trapezoidal, strongly inequilateral, equivalve and moderately inflated; length to height ratio varies from 5:3 to 4:3. Umbones pointed, opisthogyrous, only slightly incurved, terminal and placed at or beyond the posterior margin of the shell; the corresponding profile is obtusely rounded and umbonal ridges are absent. Antero-dorsal margin feebly arched, its profile almost straight and gently inclined with respect to the horizontal. Anterior margin moderately rounded, meeting the antero-dorsal and gently convex ventral ones in obtuse curves. Posterior margin short and gently arched, meeting the ventral one in a broad, smooth curve; its profile is nearly straight. Posterior end evenly convex; posterior and anterior areas absent. Surface of the shell either smooth or ornamented with fine, concentric threads, more closely spaced near the ventral margin; the interspaces are occasionally accentuated.

Hinge structure consists of a long anterior and a short posterior row of small, straight and parallel teeth, which decrease in size regularly towards the umbo. The anterior row is gently arched and subhorizontal, and consists of about 28 teeth. The posterior row, consisting of about six comparatively large but slender teeth, diverges obliquely from the anterior one at an angle of about 80°-90°.

Dimension :

	Holotype (H/ $\frac{28}{6}$ /6-LV)	Paratype (H/ $\frac{47}{1}$ /1-BV)	Paratype (H/ $\frac{28}{1}$ /23-BV)
Length	18.8 mm	13.2 mm	19.2 mm
Height	12.6 mm (67.0%)	9.7 mm (73.5%)	13.4 mm (69.8%)
Inflation	5.5 mm (29.3%)	7.6 mm (58.3%)	7.4 mm (38.5%)

Material: About a dozen specimens. One of them (No. H/ $\frac{23}{1}$ /16) is associated with *Pseudolimea duplicata* (J. de C. Sowerby) on a slab. These are in addition to the five specimens mentioned above.

Repository: Department of Geology, Banaras Hindu University.

Horizon and Localities: Dhrang Member of the Habo Formation (Kanjilal, 1974, unpublished Ph.D. thesis, Banaras Hindu University): Bed No. 15 (Lower Callovian) N of Boladi, S of Kotai, Fulae and Dhrang; Bed No. 13 (Lower Callovian)-S of Dhrang.

These beds have also yielded the Macrocephalitids (*Macrocephalites* s.s., *M. (Kamptokephalites)*, *Indocephalites*, etc.) belonging to the Lower Callovian assemblage of Kutch.

Remarks: The authors are not aware of any other Jurassic genus or species showing characteristic features of the present species.

Guided by the shape and size of the Jhura specimens (Nos. BA/S/7 & 10, BA/G₁/5 and OR/5), identical to fig. 5 of Cox (1940, pl. 1), Agrawal (*loc cit.*) referred them to *N. (P.) cuneiformis* J. de C. Sowerby. But, for want of posterior ridges and area due to extreme pouting of marginal region, it would be appropriate to assign them to the present new genus. Besides in view of their perfect resemblance with the typical specimens of its type species, they are considered to be conspecific with it. The Nara Dome specimens (Shukla, referred above) too is inseparable from the present ones.

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Technische Universität Berlin, for providing the photostat copy of the papers (portions relevant to *Palaeonucula* only) by W. Quenstedt (1930) and H. G. Schenck (1934). Financial assistance for field work and study of the present collection from the University Grants Commission and Council of Scientific and Industrial Research is thankfully acknowledged.

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