INDOCARDIUM, A NEW SUBGENUS FROM THE CRETACEOUS OF INDIA

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While examining our recent collection of cardiids from the Bagh Beds of Narmada Valley, it was found that by their hinge characters, the nature of the spines on their radial ribs and presence of intercalaries they belong to the genus *Granocardium* Gabb, but could not be placed in any of its recognised subgenera. A new subgenus *Indocardium* is. therefore, proposed here to accommodate them.

SYSTEMATIC DESCRIPTIONS

Family : CARDIIDAE Lamarck, 1809

Sub-Family : CARDIINAE Lamarck, 1809

Genus : *Granocardium* Gabb, 1869

Sub-genus : *Indocardium* nov.

Type species : *Indocardium blanfordi* nov.

Derivation of name : The subgenus is named after India, country of origin. The species is named after W. T. Blanford, the pioneer worker on geology of Narmada Valley.

Diagnosis : Shell small to medium, sub-quadrate to cordate; radial ribs strong, sharp, with spines growing on crests; intercalary ribs restricted to posterior declivity; margin internally crenulate, more or less digitate along posterior declivity; hinge straight to slightly bent, short.

Remarks : Hinge characters and the radial ornament with intercalary ribs place this material under Gabb's genus *Granocardium* (Keen, 1969, p. N 585). Of its subgenera, *Granocardium sensu stricto* (Keen, *loc. cit.* fig. E84.11) has intercalaries in all the interspaces; *Criocardium* (Keen, *loc. cit.* fig. E84.1) has intercalaries in all its interspaces and besides that they are spinose; further, its hinge is relatively long; *Ethmocardium* (Keen, 1969, *loc. cit.* fig. E84.6) has intercostal spaces pitted internally. Thus the present subgenus can be distinguished from all these subgenera of *Granocardium*.

Age : Upper Albian to Campanian.

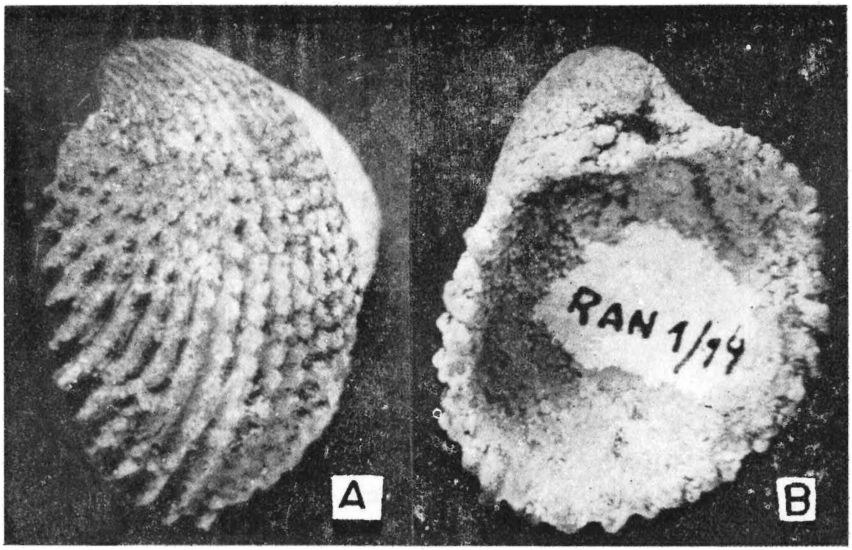

Fig. 1-A. *Granocardium* (*Inocardium*) *blanfordi* sp. nov. R.V. showing intercalary ribs of the posterior declivity-external view, Cotype Specimen No. Ran 2/74. x 2; B. Internal view of Cotype specimen No. Ran. 1/74. x 2.

Indocardium blanfordi sp. nov.

Figs. 1a-b, and 2.

Material: 12 specimens, Cotypes No. Ran 1/74 and Ran 2/74

Dimensions: Height/Length ratio — 1.1
Thickness/Length ratio — 0.6

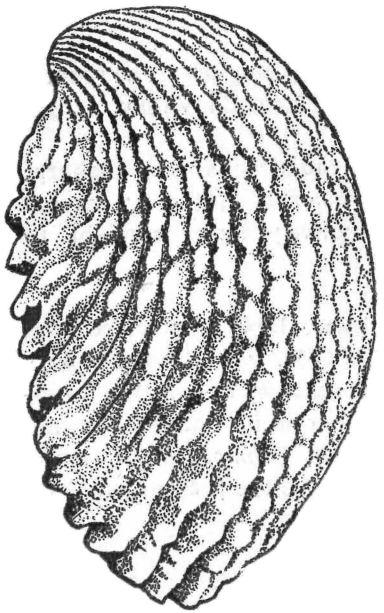

Fig. 2 Drawing of the Cotype No. Ran. 2/74, x 2 (approx.)

Description : The shell is sub-quadrate, medium sized with its maximum length situated a little below half the height, and maximum tumidity between 1/3 and 2/5 ths of the height above the centre. Surface carries 30 to 34 radial ribs with spines growing on their sharp crests; spines are laterally compressed and pointed on the 10-12 ribs of the posterior declivity, and more or less blunt to nodose on rest of the ribs. Ribs of the posterior declivity are slightly but distinctly more close set than those on the rest of the shell surface, and constitute the digitate posterior margin. A smooth thread like intercalary occurs on the anterior flanks of the ribs of the posterior declivity. The valve margin is internally crenulate, but distinctly digitate along the posterior declivity. A feeble radial depression passes just behind the posterior adductor muscle mark; it is not visibly reflected in any way on the external surface, though it apparently corresponds in location to the demarcation of the posterior declivity from the rest of the shell surface.

Remarks: Coming from the same horizon as that of the present species, *Cardium phataensis* Chiploukar & Badve (1973, p. 94, pl. 3, fig. 28) is obviously a different species with much fewer (14-16) radial ribs. Though not well preserved, by its shortly bent hinge, its spines growing on the crests of radial ribs, posterior margin somewhat digitate and presence of intercalary ribs in the posterior declivity (rather ill preserved) this species belongs to the new subgenus diagnosed here.

Cardium (*Trachycardium*) *incomptum* Sowerby from the Trichinopoly group (Stoliczka 1870, p. 216, pl. XI, figs. 3-7; Forbes 1846, p. 145, pl. 15, fig. 15) can not belong to *Trachycardium* as now defined (Keen, 1969, p. N 586_m, fig. E86.5) because of its spines growing on the crests of the radial ribs (they are on the flanks of the ribs in *Trachycardium*) and has to be transferred to our new subgenus *Indocardium*.

By the margin of its posterior declivity less clearly digitate, intercalary ribs situated on the floor of the interspaces and the interspaces tending to be broader than the radial ribs towards the shell margin Sowerby's *incomptum* is separable from the new species described here.

Incidentally it may be mentioned here that like Stoliczka (*loc. cit.*) we also do not agree with Zittel that Sowerby's *Cardium* (*Trachycardium*) *incomptum* is the same as *Cardium ottoi* Geinitz (Zittel 1864, p. 144, pl. 6, fig. 4a-d) from the Cretaceous of Gossau of Germany.

It may also be remarked here that of the other South Indian species of *Cardium* viz. *C.* (*Trachy.*) *exulans* Stol. and *C.* (*Trachy.*) *productum* Sow. placed by Stoliczka (1870, pp. 216-217) under *Trachycardium*, because of the spines growing on the crests of their ribs have to be removed from *Trachycardium*, as now diagnosed (Keen 1969), but to decide where else to place them, better preserved material would be desirable.

Some specimens from the Turonian of Madagascar (Antanitiloky) are reported by Collignon (1934, p. 23, pl. 3 figs. 11-12) as belonging to *Cardium* (*Trachycardium*)

incomptum Sowerby (through oversight attributed to Forbes); but there is no mention of the intercalary ribs in his description nor any indication of them is available in his illustrations. Therefore, taking them as they are described and illustrated by Collignon, they can not be identified with Sowerby's *incomptum.*

It may further be pointed out here that Collignon's specimens show spines borne on the crests of the radial ribs; therefore, like the above mentioned species from South India, this species from Madagascar also has to be removed from *Trachycardium* (subfamily Trachycardiinae) and placed under the subfamily Cardiinae.

Occurrence: *Astarte* Bed near the top of the Nimar Sandstone around Ranapur, Gala and Kanakapra in Jhabua District, M. P.

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