

***Goniomya* from the Trichinopoly Group, Upper Cretaceous, Tamil Nadu**

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Abstract

The note records the presence of a new Pholadomyid lamellibranch belonging to *Goniomya* from the Upper Cretaceous rocks of Tamil Nadu. The form is assignable to the subgenus *Goniomya* and is described as a new species *Goniomya (Goniomya) stoliczkai*. Systematic description and the stratigraphic distribution of this new species is presented.

Introduction

The family Pholadomyidae had wide geographic and stratigraphic distribution during Mesozoic and Tertiary times, though it is represented at the present time by a single species *Pholadomya (Pholadomya) cardida* Sowerby, in the Atlantic ocean of Antellies. In fact *Pholadomya konincki* is a zonal index fossil in the Eocene rocks in British Islands. In India, Pholadomyidae was recorded by forms belonging to *Pholadomya* by Forbes (1846) from the Cretaceous rocks of Pondicherry. Later Stoliczka (1870-71) recorded three species of *Pholadomya* from the Cretaceous rocks of South India. *Pholadomya* is also known from the Jurassic rocks of Kutch, Western India, (Pascoe, 1959). No other genera belonging to Pholadomyidae has so far been recorded from the Cretaceous formations of South India. The note records for the first time occurrence of the Genus *Goniomya* which is represented by a new species.

Geology

The stratigraphy of the rock formations in the Tiruchirapalli district is as follows:

Tertiary	{ Cuddalore Sandstone (Mio-Pliocene) Niniyur Formation (Danian)
Upper Cretaceous (Middle Albian- Maestrichtian)	{ Ariyalur Group Trichinopoly Group Uttattur Group
Lower Cretaceous (Neocomian)	{ Uttattur & Terani Plant Beds (Upper Gondwana)
Archean	{ Charnockite, hornblende gneiss and pegmatites

The Trichinopoly Group which has yielded the genus *Goniomya* forms the middle division of the Cretaceous succession. It is divisible into two lithounits—the Lower Calcareous unit represented by shell limestones and brown shales with limestone concretions and bands and the Upper Arenaceous unit comprising calcareous sands, sandstones, sandy limestones and interbedded shales.

Biostratigraphically, the Trichinopoly Group is divisible into four distinct biostratigraphic zones (Ayyasami, 1979) on the basis of distribution of ammonites.

Trichinopoly Group	{ <i>Peroniceras dravidicum</i> Zone <i>Kossmaticeras theobaldianum</i> Zone <i>Lewesiceras vaju</i> Zone <i>Romaniceras (Yubariceras)</i> <i>ornatissimum</i> Zone
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A correspondence between biostratigraphic zones and lithostratigraphic units has been recognised in the Trichinopoly Group. The basal shell limestone from Garudamangalam ($11^{\circ}05' : 78^{\circ}55'$) to Kunnam ($11^{\circ}14' : 79^{\circ}01'$) corresponds to the *Romaniceras* (*Yubariceras*) *ornatissimum* Zone. The overlying shell limestone and shales yield no characteristic ammonites. The brown shales with limestone concretions of Saradamangalam ($11^{\circ}04' : 78^{\circ}51'$), Anaipadi ($11^{\circ}06' : 78^{\circ}56'$) and Andur ($11^{\circ}15' : 79^{\circ}51'$) constitute the *Lewesiceras vaju* Zone. The two distinct limestone bands with interbedded shale and characteristically containing *Rhynchonella* traceable from Kulakkalnattam ($11^{\circ}07' : 78^{\circ}57'$) to Kunnam is correlatable to the *Kossmaticeras theobaldianum* Zone. The calcareous sandstones and sandy limestones from Kannanur ($11^{\circ}04' : 78^{\circ}58'$) to Varagur ($11^{\circ}15' : 79^{\circ}02'$) define the *Peroniceras dravidicum* Zone.

The new species of *Goniomya* was collected from the sandy limestones of the Arenaceous unit falling in the *Peroniceras dravidicum* Zone.

Systematic Description

Superfamily: PHOLADOMYACEA Grey, 1847

Family: PHOLADOMYIDAE Grey, 1847

Genus: *Goniomya* Agassiz, 1841

Subgenus: *Goniomya* (*Goniomya*) Cox, 1969

The genus *Goniomya* is recognised by the presence of a number of steep oblique ribs inclined towards one another from the dorsal to the ventral margin in the shell. The absence of teeth, orthogyrate umbo and the posterior gape or other important morphological characters of *Goniomya*.

The shells belonging to the subgenus *Goniomya* (*Goniomya*) are characterized by steep oblique ribs meeting to form a series of 'V's opening towards the umbo.

Goniomya (*Goniomya*) *Stoliczkai* n. sp.

Material: 4 specimens, of which 3 are left valves.

Type specimens: Holotype SRPAL 8, Paratype: SRPAL 9. (Figs. 1 to 3).

Repository: The specimens are preserved in the Palaeontology Division, Geological Survey of India, Southern Region, Hyderabad.

Etymology: The specimen is named after Dr. Ferdinand Stoliczka, for his invaluable contributions to the invertebrate palaeontology of the Upper Cretaceous rocks of South India.

Diagnosis: Shell with orthogyrate subcentral umbo; ornamentation consists of a series of steep oblique ribs meeting along the median line in the form of 'V's; subcentrally located transverse ridge along the dorso-ventral axis, nearer the anterior.

Description: The shell is of moderate size with prominent orthogyrate umbo. The position of the beak is subcentral or rather distantly placed from the anterior margin (at about 2.5 cm in paratype). The anterior margin is well rounded while the posterior is broad and almost straight with rounded corners. The commissure slopes gently from the anterior side to posterior. The ornamentation consisting of a series of strong oblique ribs, inclined towards each other, meeting along a median line from umbo to the ventral margin. The angle thus formed is about 60° . There are about 20 to 26 ribs opening out towards umbo on the anterior side. Near the posterior margin the ribs are considerably less prominent and rather faint. There is a broad but clear ridge subcentrally located along the dorso-ventral axis, but nearer to the anterior side. The ridge extends from the ventral margin to approximately half the height. The ribs cross the ridge without interruption. Posterior gape is present while the anterior one is not clear. Hinge region reveals the absence of teeth.

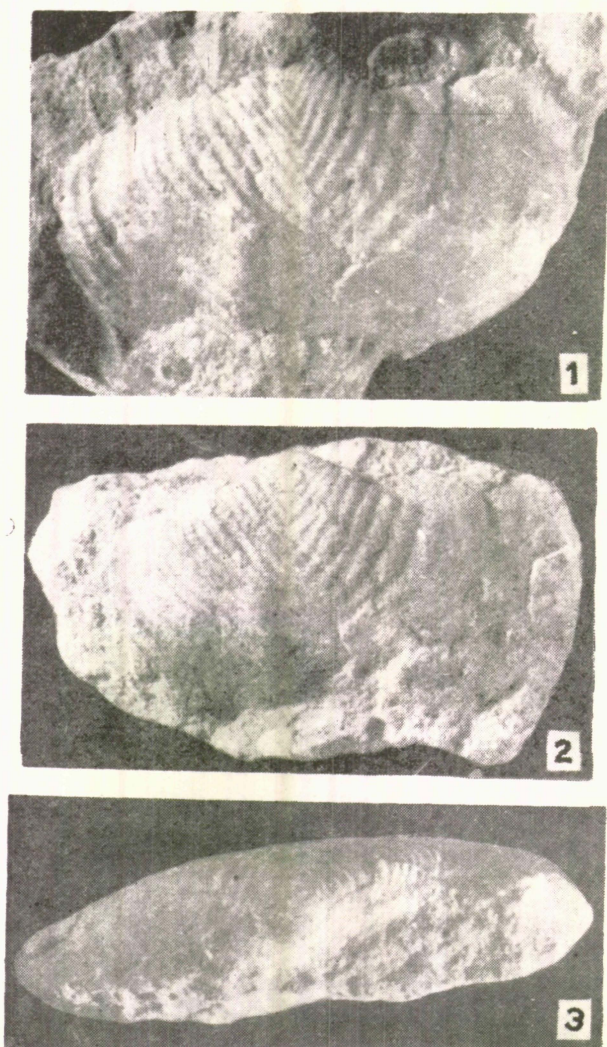


Figure 1. Lateral view of the Holotype No. SRPAL 8.
 Figures 2 & 3. Lateral and dorsal view of paratype
 No. SRPAL 9.

	Measurement	
	<i>Holotype</i>	<i>Para type</i>
Length (L)	6.80 mm	6.25 mm
Height (H)	4.20 mm	3.80 mm
Thickness	1.65 mm	1.25 mm
H/L	0.61	0.61
Angle 'V' (of the ribs at the line of intersection at 1.5 cm from the umbo)	about 60°	about 60°

Locality: All the four specimens were collected from the sandy limestone which is included in the *Peroniceras dravidicum* Zone at about a kilometer west of Gudalur village (11°08' : 79°00'), Tamil Nadu.

Discussion: The ornamentation consisting of ribs meeting to form 'V's is diagnostic of the genus *Goniomya*. The Indian form is not comparable to species of *Goniomya* (*Goniomya*) described so far.

H. Woods (1909), in the monographic work on the Cretaceous lamellibranchia of England records the presence of two species belonging to the genus *Goniomya*, of which *Goniomya archiaci* (Pictet and Renevier) belongs to the subgenus *Deltamya* Burmeister. The species *Goniomya mailleana* (D'orbigny) from the Cenomanian of England, has the characters of the subgenus *Goniomya*, but differs from the South Indian form in a more anteriorly located pointed umbo, narrowly rounded anterior margin and the transverse ridge extending from the beak to the postero-ventral margin. The height/length ratio of the English form (measurements were taken from the figure) is 0.44 compared to 0.61 of the South Indian form.

The Cretaceous Bagh beds of the Narmada Valley yielded only the genus *Pholadomya*. Among the Cretaceous sediments exposed along the Himalayan belt and Assam plateau there is no record of the genus *Goniomya* (Pascoe, 1959).

In the Treatise on invertebrate Palaeontology (N) Mollusca, page 832, the genus *Goniomya* is described to have cosmopolitan distribution in the sediments ranging in age from Lower Lias to Upper Cretaceous (Turonian). However, the South Indian form has been collected from rocks belonging to a younger horizon i.e., Coniacian. The presence of the species *Goniomya* (*Goniomya*) *stoliczkai* n.sp. associated with the ammonites of Indo-Pacific affinity, further elucidates the cosmopolitan distribution of this genus during the Cretaceous.

Horizon and Age: The *Goniomya* (*Goniomya*) *stoliczkai* sp. nov. is found in association with the ammonoids *Kossmaticeras theobaldianum* Stoliczka, *Kossmaticeras bhavani* Stoliczka, '*Placenticeras*' *tamulicum* Blanford, *Pachydesmoceras pachydiscoides* Matsumoto, *Scaphites brahminicus* Stoliczka. *Inoceramus* of the Group *Inoceramus lamarcki* and *Inoceramus naumanni*, *Pinna* sp., *Trigonarca* aff. *T. trichinopolitensis* and *Tellina* sp., are the associated bivalves. The ammonite assemblage indicates Coniacian age for the sandy limestone horizon of the Trichinopoly Group.

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