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***Quadracythere tewarii* sp. nov. from Rajahmundry Inter-trappean Beds, India**

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Abstract

A new species of podocopid ostracode—*Quadracythere tewarii*—is described from the Early Eocene Inter-trappean beds of Rajahmundry area, Andhra Pradesh. The scanning electron study reveals the presence of numerous single pores of different shapes and sizes situated in the depressions produced by reticulating ornamental ridges on the lateral sides of the carapace. The associated microfauna indicates that *Q. tewarii* flourished in a near-shore, epineritic environment having open-sea connection.

Introduction

During the course of a micropaleontological study of the Inter-trappean beds of the Rajahmundry area, exposed near Pangadi ($17^{\circ}1' : 81^{\circ}39'02''$), in the West Godavari district of Andhra Pradesh, a new species of the ostracode genus *Quadracythere* was found. Although, a prolific assemblage of foraminifera was described from these beds a decade ago by the author (Bhalla, 1967), no detailed study of their ostracode assemblage has yet been made. However, a few casual reports of ostracodes are available (Sastri, *vide* Rao, 1953; Sastri, 1961; Bhalla, 1965; Bhalla, 1967). Ostracodes are good indicators of depositional environment and age of the enclosing sediments and, therefore, it was considered desirable to describe the present new find.

The Rajahmundry Inter-trappen beds have attracted a good deal of attention due to their unique stratigraphic position, in between the early flows of the Deccan Trap and this is further enhanced by the presence of prolific fossil assemblage, especially of marine nature. A study of these rocks, therefore, helps in solving a variety of problems connected with the age of the Deccan Traps.

Although there have been conflicting views regarding the precise age of the Rajahmundry Inter-trappean beds, a consensus has been reached in this country that they belong to Early Eocene. This would indicate *inter alia*, that the age of *Quadracythere tewarii* is also Early Eocene.

Quadracythere tewarii sp. nov. was found in samples L/5-1, L/5-3, L/5-4, and L/5-5 of the Inter-trappean beds exposed near Pangadi and is rare to frequent in occurrence (Bhalla, 1967). It occurs in Ecological Unit II which was considered to have been deposited in a near-shore, epineritic, open marine environment (Bhalla, *op. cit.*). It is, therefore, reasonable to infer that *Q. tewarii* flourished in these ecological conditions of Unit II which also contains foraminifera, ex., *Triloculina decipiens* Reuss, *Fissurina laevigata* Reuss, *Globulina inaequalis* Reuss, *Virgulina* cf. *V. dubia* Haque, *Rosalina sub-vilardeboana* (Schwager), etc., and some ostracodes.

The locality, sample numbers, etc., mentioned in the present paper are the same as given for the foraminiferal fauna by the author (Bhalla, 1967).

SYSTEMATIC DESCRIPTION

Subclass: OSTRACODA Latreille, 1806

Order: PODOCOPIDA Müller, 1894

Suborder: PODOCOPINA Sars, 1866

Superfamily: CYTHERACEA Baird, 1850

Family: TRACHYLEBERIDIDAE Sylvester-Bradley, 1949

Genus: *Quadracythere* Hornibrook, 1952

Quadracythere tewarii sp. nov.

(Pl. I, figs. 1-7)

Description

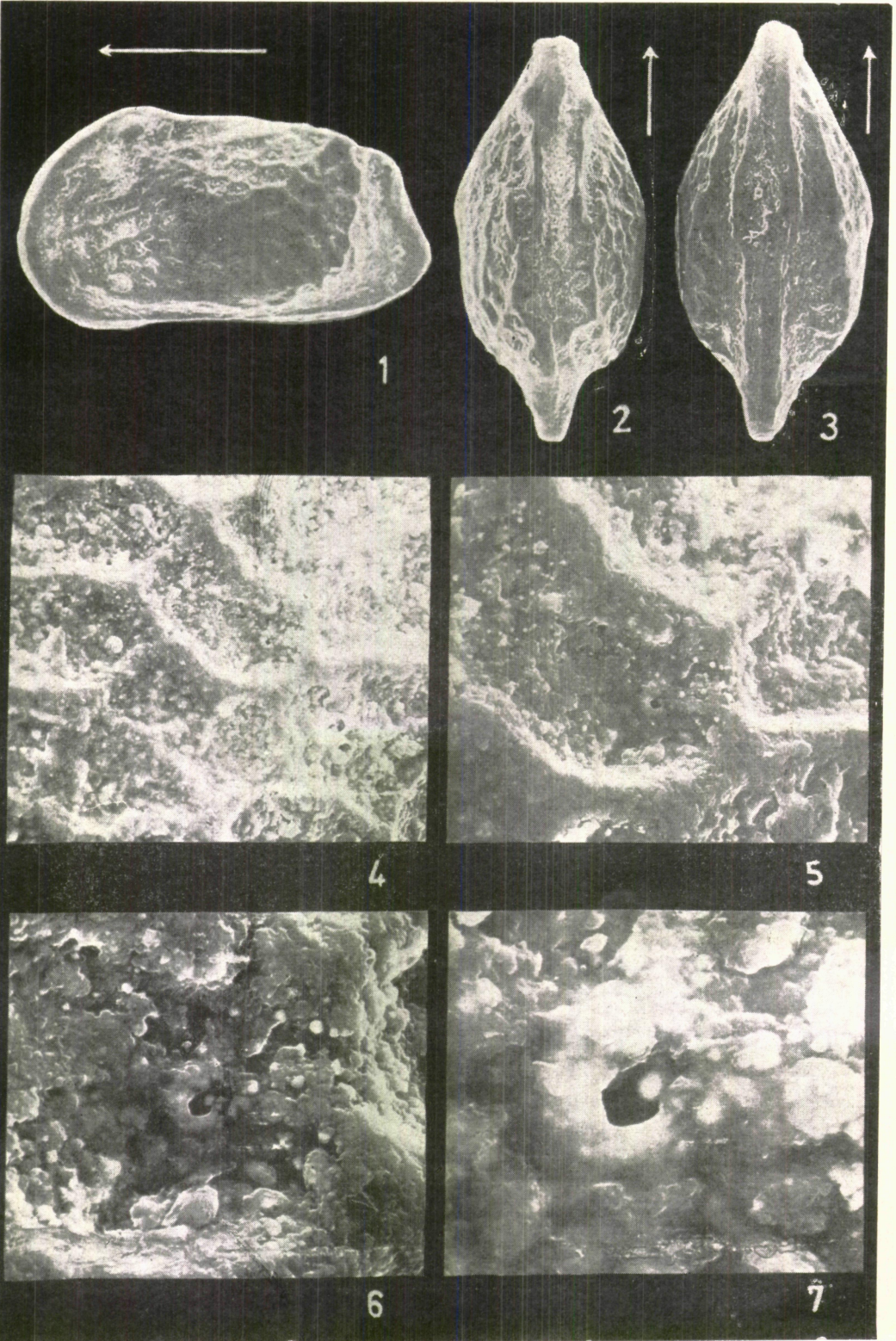
Carapace large, thick, subquadrate in lateral view, maximum height at anterior cardinal angle, less than 1/4 of the length from anterior end; anterior outline broadly rounded, smooth, bordered by a prominent, moderately broad, anteromarginal rim originating close to eye tubercle, running all along anterior margin, following antero-ventral outline and merging with ventral margin, a shallow groove runs on inner side of this rim along its entire length; dorsal margin almost straight, sub-parallel to ventral margin, slightly depressed behind anterior cardinal angle, bordered by a weak dorsomarginal rib, extending from near eye tubercle and merging with posterior vertical ridge in posterodorsal region; ventral margin slightly sinuate in middle otherwise straight; a straight, longitudinal, ridge making an angle with ventral

EXPLANATION OF PLATE I

All figures scanning electron micrographs

Figures 1-7. *Quadracythere tewarii* sp. nov., Holotype

1. Side view ($\times 103$).
2. Dorsal view ($\times 103$).
3. Ventral view ($\times 103$).
4. Showing details of ornamentation ($\times 452$).
5. Showing haphazard distribution of numerous normal pores in depressions produced by ornamental reticulating meshwork ($\times 894$).
6. Enlargement of the central portion of figure 5, showing different shapes and sizes of pores ($\times 1810$).
7. Abnormal, single, pore with angular outline ($\times 4114$).



margin runs on ventral side merging smoothly with the ventral ridge in postero-ventral region; posterior end drawn-out slightly below mid-height into a narrowly rounded caudal process, concave dorsally and convex ventrally, smooth, merging gradually with dorsal as well as ventral margins; a prominent ridge extends vertically downwards from just in front of posterior cardinal angle making a faint convex curve and coalescing with ventral ridge in posteroventral region; carapace posterior to this ridge strongly compressed.

Eye tubercle distinct, situated at anterior cardinal angle with slight excavation on all sides; subcentral tubercle developed in anteromedian region, somewhat protruding.

Carapace surface ornated with coarse reticulations; about six ridges radiate from subcentral swelling towards anteromarginal ridge, crossed by three to four ridges parallel to anterior margin; reticulations posterior to subcentral tubercle rather haphazardly distributed.

In dorsal view, carapace subcuneiform, moderately inflated; maximum width at submedian swelling from where lateral sides slope rapidly towards anterior end; posteriorly, lateral sides gently sloping, making steep curve at posterior vertical ridge, then tightly compressed up to posterior extremity; anterior end truncated due to marginal prominent ridge; LV overlaps RV near eye tubercle.

Stereoscan micrographs reveal the presence of only one type of pores confined to mild depressions produced by reticulating ornamental ridges on the lateral surface of the carapace and scattered haphazardly therein (Pl. I, figs. 4, 5). All are normal, single, pores without lip and vary in size and shape which may be irregularly circled to nearly angular in outline (Pl. I, figs. 6, 7). In the present study, the nomenclature of pores as proposed by Puri (1974) has been followed.

The internal characters of the carapace could not be studied as open valves were not found and efforts to open the carapace did not succeed. Sexual dimorphism was not apparant in this new species.

Dimensions (in mm)

	<i>length</i>	<i>height</i>	<i>width</i>
Holotype (Pl. I, figs. 1-7)	0.62	0.33	0.29
Other specimens	0.68 to 0.58	0.35 to 0.30	0.30 to 0.28

Remarks

Quadracythere tewarii sp. nov. is related to *Quadracythere avadheshi* (Singh and Misra) (= *Cythereis avadheshi* Singh and Misra), originally described by Singh and Misra (1968) from the Eocene of Rajasthan, India, but differs in having more elongate carapace, smooth posterior margin, and a posterior vertical ridge. From *Quadracythere avadheshi mudhensis* Khosla, also described from the Eocene of Rajasthan (Khosla, 1972), *Q. tewarii* differs in having more elongate and inflated carapace, posterior vertical ridge, and smoothly rounded posterior end. The anterior cardinal angle of the present species is not protruding and the ventral longitudinal ridge is not as prominent as in *Q. avadheshi mudhensis*. It also differs from the Rajasthani subspecies in general outline in dorsal view with maximum width lying anterior to middle.

Type horizon: Inter-trappean beds, sample L/5-3, hard limestone. Also in samples L/5-1, L/5-4, and L/5-5.

Type locality: Quarry section, one mile southeast of Duddukuru village and less

than a furlong from milestone 350 on Kavvur-Eluru road, West Godavari district, Andhra Pradesh, India.

Geologic age: Lower Eocene.

Repository of type material: Holotype, No. 19546, a complete carapace, deposited in the Paleontological Collections of the Geological Survey of India, Calcutta.

Etymology: This new species is named in honour of Professor B. S. Tewari, Panjab University, Chandigarh, in recognition of his pioneering work and notable contributions to the micropaleontology and stratigraphy of India.

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