A NOTE ON THE PAVONINA FLABELLIFORMIS D'ORBIGNY (BENTHIC FORAMINIFERA) FROM THE ARABIAN SEA

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ABSTRACT

The detailed study of the inner shelf surface sediments off Karwar (India) revealed the occurrence of a benthic foraminiferal species Pavonina flabelliformis d'Orbigny. This is the first report of this species in the Arabian Sea. The ecological set up of Pavonina flabelliformis in modern sediments off Karwar suggests and updates the lower depth limit to 33 metre as against reported from deeper regions in previous studies. This will have significant bearing in palaeodepth studies of sedimentary strata having fossils of this species.

INTRODUCTION

As a part of the research programme on the recent foraminifera from the inner shelf off Karwar (central west coast of India), surface sediment samples were collected from the water depth ranging from 22 to 52 m, using Peterson grab sampler on board DSV Nand Rachit. While making a distribution analysis of the foraminifera in these samples (Nigam, 1993) the author came across few specimens of benthic foraminifera Pavonina flabelliformis d'Orbigny having well preserved and complete test. This species has not been reported so far from the Arabian Sea. The present short note reports this species first time from this region (Arabian Sea). Certain observations made on this species are given below.

SYSTEMATIC TAXONOMY

Order : FORAMINIFERA Eichwald, 1830
Sub order : ROTALIINA, Delage and Herouard, 1896
Super family : BULIMINACEA, Jones, 1875
Family : PAVONINIDAE Eimer and Fickert, 1899
Genus : PAVONINA d'Orbigny, 1826

Pavonina flabelliformis d'Orbigny

Figures 1 a-b


Pavonina flabelliformis forma typica BOLTOVSKOY, 1961, p. 292, pl. 5, fig. 31.

SHAPE : Test broadly palmate, flattened with reduced triserial stage of only earlier few chambers then biserial with rapidly broadening chambers and finally uniserial with very broad, low, semicircular and strongly curved, proximally at the margins.
CHAMBERS: 12 to 13 in number

COLOUR: White with grayish tint.

DIMENSIONS (IN MM): Length 0.70, width 0.8, thickness 0.07.

REMARKS AND PREVIOUS RECORDS: This species has been reported from Atlantic Ocean, Pacific Ocean and North America (Loeblich and Tappan, 1987). Barker (1960) reported this species from Pacific Ocean and Madagascar whereas, Boltovskoy (1961) illustrated a similar species as *Pavonina flabelliformis* d'Orbigny forma *typica*. This specimen differs from the illustration of Boltovskoy in having more broader test and high curvature of the margin. It also differs from *Pavonina flabelliformis* forma *atlantica* reported by him as the later has more narrow test.

Later, Srinivasan and Rajeshekhar (1980) recorded *P. flabelliformis* d'Orbigny from south coast cliff section of Outram Island, Ritchie's Archipelago (Andaman Sea) from Taipian stage of Nicobar series, belonging to late Pliocene age. Lithologically this section was soft brownish yellow calcareous silt mudstone and had very good preservation of foraminifera. However, it is interesting to note that the benthic foraminiferal assemblage suggested deposition of Taipian sediments in lower bathyal depth.

ECOLOGY

SUBSTRATUM: The sedimentological parameters of this area are summarized from earlier published reports (Hashimi *et al*., 1978; Nair *et al*., 1978). Sediments are generally olive grey in colour, clayey silt in nature with the mean size of particles 6-8. The amount of CaCO$_3$ is low (< 30%) in the inner shelf clayey silt off Karwar.

HYDROGRAPHY: The hydrographical data is obtained from Naik and Neelakantan (1989). The variations of these hydrographical parameters in and around the study area have been discussed below.

SALINITY: It shows a wide range of variations from 6.89 to 36.42%.

Fig. 1a One side view of *Pavonina flabelliformis* d'Orbigny (X 50)
Fig. 1b Another side view of *Pavonina flabelliformis* d'Orbigny (X 50)

TEMPERATURE: Oscillation in temperature at the surface waters were of the order of 4°C and ranging in general from 26.6 to 30.9°C.

DISSOLVED OXYGEN: The fluctuations in the concentration of dissolved oxygen in this area is between 4.23 and 5.01 ml/L.

pH: The overall hydrogen ion concentration (pH) varied from 7.72 to 8.41.

SUSPENDED LOAD: The variation in the average suspended load was found between 0.0419 gm/L and 3.2649 gm/L.

In view of the foregoing, the noteworthy points of the present study are:

1. It is first report of the occurrence of this species from Arabian Sea.
2. This species is reported from much shallower depth (at 33 metre) than earlier reported depth level from other regions.
3. From Indian region (both Bay of Bengal and Arabian Sea) so far this species is reported in fossil form (from Taipian stage) whereas, it is recorded here from the recent sediments.
4. The present ecological conditions suitable for the existence of this species at such shallower depth may also have its significance in paleodepth studies of sedimentary strata having fossilized *P. flabelliformis*. 
The material is housed in the micropaleontological repository of the National Institute of Oceanography numbered as GOD NIO Cat. No. K-120.

ACKNOWLEDGEMENT

I am thankful to Dr. B.N. Desai, Director and Shri R.R. Nair, Head (Geological Oceanography Division) and Deputy Director of the National Institute of Oceanography for their permission to publish the results. I sincerely thank Dr. Rajiv Nigam for reviewing the manuscript.

The financial assistance is provided by C.S.I.R. New Delhi vide their project 3(19) / YSA/90 (sanctioned to Dr. R. Nigam) and Senior Research Fellowship to me.

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