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Thecosomatous Pteropods from the Mozambique Channel

On cruise no. 8 of the R./V. « Anton Bruun », during the International Indian Ocean Expedition, series of tows were made to collect planktonic and bathypelagic organisms for physiological and biochemical studies. The research was carried out by Dr. J.M. Teal of the Woods Hole Oceanographic Institution (WHOI, 1965; Della Croce, 1964-65).

Most of the tows were carried out at night, in surface waters, at depths where heavy traces of scattering were recorded by the PGR, or at day-time and at different depths.

The net, exceeding 4 meters in length, had hexagonal meshes approximately 5 mm long and 2 mm wide, and a square opening of 2,25 m². In order to avoid damage to the organisms as much as possible, the collector was a very large one (about 30 cm in diameter).

As the experiments were carried out mostly on Euphausiids and planktonic shrimps, the other specimens (with the exception of Coelenterata which were particularly difficult to handle) were preserved for general observations on taxonomy and geographical distribution, and for classifying them as possible source of scattering. Euphausiids and Siphonophores are already known to be definite components of the scattering layers (Moore, 1950; Barham, 1963).

Because of the mesh size of the net, the collection of animals of the different groups were generally not very abundant. The collections

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Collection de Référence

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were made between Durban (South Africa) and Nosy Bé island (Madagascar), at the following geographical positions:

Station	Starting position	Date	Starting time	Tow	Sonic depth
398 D	25° 46' S - 34° 29' E	30- 9-'64	0415	Surface	400
398 A	22° 46' S - 35° 50' E	1-10-'64	0415	Surface	—
399 D	21° 18' S - 36° 19' E	2-10-'64	0415	Surface	1500
400 B	21° 41' S - 35° 39' E	3-10-'64	0415	Surface	—
401 A	19° 58' S - 36° 33' E	4-10-'64	0415	Surface	—
404 A	19° 34' S - 40° 19' E	10-10-'64	0415	Surface	—
405 A	18° 26' S - 40° 19' E	11-10-'64	0415	Surface	2520
406 C	18° 27' S - 41° 20' E	12-10-'64	1455	(*)	2150
407 B	17° 34' S - 42° 43' E	13-10-'64	1530	500 mwo	1950
407 H	17° 22' S - 43° 10' E	14-10-'64	1330	600 mwo	710
408 E	16° 11' S - 43° 29' E	16-10-'64	0415	Surface	1600
409 D	16° 12' S - 43° 41' E	18-10-'63	0415	Surface	600
409 N	15° 29' S - 44° 42' E	20-10-'64	0415	Surface	1600
410 B	14° 33' S - 45° 47' E	21-10-'64	0410	Surface	2000

(*) Six tows respectively with 10, 50, 100, 150, 200 and 300 meters of wire out (= mwo). Sonic depth in meters.

According to Chen and Bé (1964), since 1888, about thirty five papers dealing with the distribution of Pteropods in the world oceans have been published. The studies devoted to these holoplanktonic organisms are relatively scarce, and most of them are based upon collections of oceanographic expeditions.

The local surveys in the Indian Ocean concerned only the waters off Nosy Bé, North western Madagascar (Frontier, 1963; 1966), to which we refer also in consideration of the fact that sampling in the Nosy Bé area was partially carried out approximately at the same season and day-time of ours.

The following species occurred in our samples.

EUTHECOSOMATOUS PTEROPODS

Euclio cuspidata (Bosc)

1 specimen. Length: 22 mm? (extremities broken). Station: 410 B. Shell covered by a colony of hydroids.

Eurythermic species previously recorded in the Indian Ocean as far as 40° Lat. S (Tesch, 1948), but not yet off Nosy Bé.

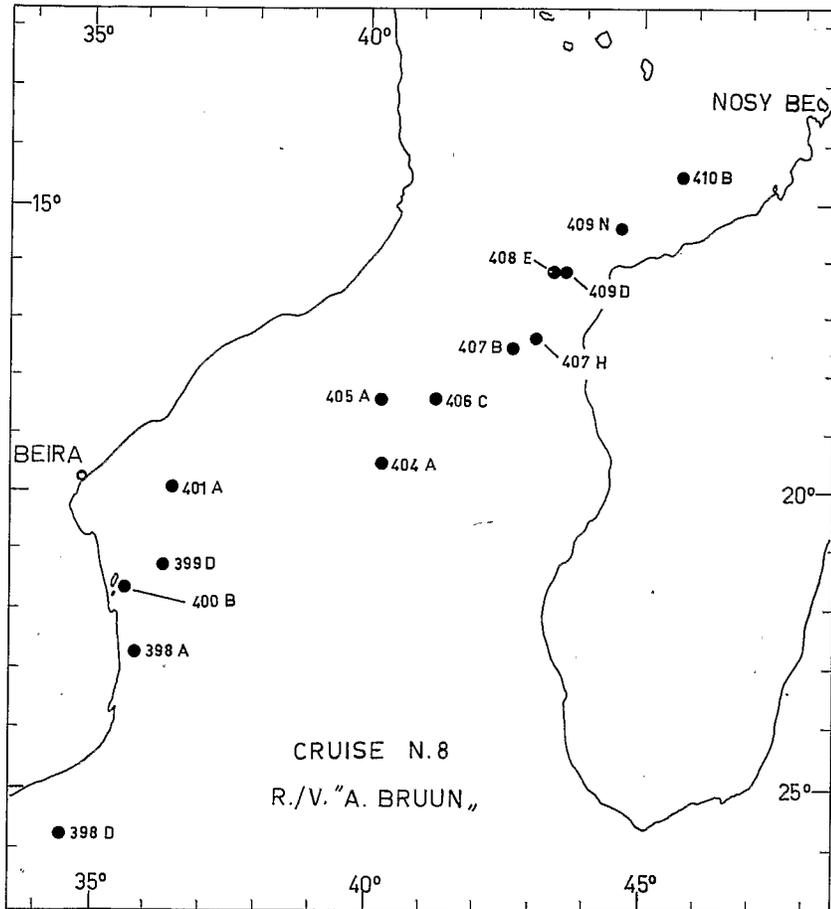
Euclio pyramidata (Linné)

Euclio pyramidata pyramidata L. (= *angusta* Boas)

3 specimens. Length: 8,2-8,5 mm. Stations: 404 A, 405 A, 409 D.

Euclio pyramidata lanceolata (Lesueur) (= *lata* Boas)

7 specimens. Length: 9,5-13,5 mm. Stations: 399 D, 400 B, 401 A, 406 C.



Geographical positions of the sampling stations.

The species is very eurythermic and almost ubiquitous (absent in polar waters only), the subspecies *pyramidata* being characteristic mainly of colder waters, and the subspecies *lanceolata* of the warmer

ones. In our collection, subspecies *lanceolata* was more frequent and found near the african coast and in the center of the channel. *E. p. pyramidata* was caught in the center of the channel only; it occurred more frequently than *lanceolata* in surface waters off Nosy Bé.

Diacria trispinosa (Lesueur)

10 specimens. Length (including the young part of the shell): 9,9-10,2 mm. Stations: 404 A, 405 A, 406 C, 409 D, 410 B.

Recorded across the Mozambique Channel. This species occurred very rarely off Nosy Bé: only 3 specimens, among which 2 juveniles, were found in a three years survey 30 miles around the island. There *Diacria quadridentata* substituted *D. trispinosa* which seems a characteristic species of true pelagic waters. *D. trispinosa* is a very eurythermic and almost ubiquitous species, which is only absent in polar and subpolar waters.

Cavolinia globulosa (Rang)

14 specimens. Length: 5,0-5,8 mm. Stations: 399 D, 400 B, 401 A, 406 C, 410 B.

Scattered across the Mozambique Channel. The species occurred in the Nosy Bé area, but scarcely and only at stations 30 miles offshore. *C. globulosa* is characteristic of the tropical waters of the Indo-Pacific.

Cavolinia gibbosa (Rang)

5 specimens. Length: 9,0-9,5 mm. Stations: 405 A, 409 D, 409 N.

The species is almost limited to the Indo-Pacific where it occurs as far as 40° Lat. S. *C. gibbosa* appears to be characteristic of the pelagic waters; it was never collected off Nosy Bé.

Cavolinia inflexa (Rang)

Cavolinia inflexa lata Boas

2 specimens. Length: 7,2 mm. Distance between the lateral edges: 4,4 mm; that is 77% of the length (in agreement with Tesh for the Indian Ocean specimens). Stations: 399 D, 410 B.

Of the two subspecies *longa* and *lata*, the latter is the commonest in the Indian Ocean and western Pacific. In the Nosy Bé area the species occurred at stations as far away from the shore as over the edge of the continental shelf.

Cavolinia longirostris (Lesueur)*Cavolinia longirostris longirostris* (Lesueur)

2 specimens. Length: 7,2-7,6 mm. Station: 401 A.

This species is very abundant in the warm waters of the world oceans. In the Nosy Bé waters *C. l. longirostris* is the inshore form which is replaced offshore by *C. l. angulata*, the commonest form of the pelagic waters of the Indopacific region (Tesch, 1948). The two forms were frequently represented in the surface samples. The two specimens were collected near the african coast.

Cuvierina columnella (Rang)*Cuvierina columnella columnella* (Rang)

1 specimen. Length: 11,2 mm. Station: 406 C.

It is a common tropical species. In the Indo-Pacific the subspecies *urceolaris* Mörch is most common, whilst the subspecies *columnella* is rare. In the Nosy Bé area *C. c. urceolaris* was rather frequent at the stations offshore. In the three years survey only one specimen of *C. c. columnella* has been found.

PSEUDOTHECOSOMATOUS PTEROPODS

Cymbulia sp.

2 specimens without pseudoconcha. Stations: 406 C, 409 N.
Cosmopolitan genus.

HETEROPODS

Atlanta gaudichaudi Souleyet

3 specimens. Diameter: 5,1-7,2 mm. Stations: 400 B, 406 C.

Cosmopolitan species, predominant everywhere in the Indo-Pacific. The collected specimens were of great size.

Pterosoma planum Lesson

2 specimens. Length: 10,0-14,5 mm. Station: 400 B.

This species is characteristic of the Indo-Pacific. It has been found only twice in the offshore samples of the Nosy Bé area, and likely limited to the pelagic waters.

Cardiopoda richardi Vayssière

1 specimen. Length: 18,5 mm. Station: 407 H.

Scattered in all tropical waters. In the Nosy Bé area only the nearly related species *C. placenta* has been found.

Pterotrachaea hippocampus Philippi

3 specimens. Length: 16,0-35,0 mm. Stations: 404 A, 406 C. Cosmopolitan species.

Pterotrachaea coronata Forskål

4 specimens. Length: 25,0-50,0 mm. Stations: 401 A, 406 C, 409 D.

Cosmopolitan species not previously found in the Nosy Bé area.

Firoloida demaresti Lesueur

1 male specimen. Length: 16,0 mm. Station: 409 N. Cosmopolitan and very common species.

We may note that several species occurring in our samples were not found in the three years survey which was limited to an area not farther away than 30 miles from shore, and that only at stations farther off very few specimens of some of these species were collected: *Euclio cuspidata*, *Diacria trispinosa*, *Cavolinia gibbosa*, *Pterosoma planum*, *Cardiopoda richardi*, *Pterotrachaea coronata*.

On the other hand all these species are well represented in the survey concerning the pelagic area of the South western part of the Indian Ocean (Tesch, 1948; 1949). We may likely conclude that these species belong to the pelagic environment, and that they do not tolerate any mixing with the neritic waters. The pelagic character of our collection would be also confirmed by the scarcity of the *Atlantidae* which, in warm waters, are numerous only inshore and isolated offshore.

Our specimens were of large size, while medium size specimens and small Pteropods as *Limacina* spp. and *Diacria quadridentata* were lacking. It is interesting to note, however, that small specimens of Stomatopods and Amphipods have frequently been found in the samples.

Pteropods of pelagic areas have a mesoplankton habitat, and most of them being collected at dawn in surface waters show that they rise normally from deeper layers at night.

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RIASSUNTO

Gli AA. riportano alcune osservazioni sulla distribuzione dei Pteropodi Tecosomi e degli Eteropodi raccolti prevalentemente di notte, ed in acque superficiali caratterizzate da «scattering» registrato dal PGR. Le raccolte furono effettuate nel corso della crociera n. 8 del R./V. «A. Bruun» in occasione della Spedizione Internazionale nell'Oceano Indiano.

SUMMARY

The AA. report some observations on the distribution of the Thecosomatous Pteropods and Heteropods collected mainly at night in surface waters, where scattering was recorded by the PGR. The samples were collected on cruise n. 8 of the R./V. «A. Bruun» during the International Indian Ocean Expedition.

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