EUNICID POLYCHAETES (ANNELIDA) FROM GREAT NICOBAR ISLAND, INDIA: II. ORDER: EUNICIDA

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INTRODUCTION

Polychaetes collected from Great Nicobar Island (6°45'-7°15' N lat. and 93°38'-93°55' E long) shows a distinct distribution based on the kind of substrate like coral reefs, mangroves, sandy substrate and sea grass beds. The substrate plays an important role in determining the species composition of various habitats (Sanders, 1958). The nereids of Great Nicobar Island has been previously described (Rajasekaran & Fernando, 2009). The present paper describes representatives of the seven families namely Eunicidae, Lumbrineridae, Arabellidae, Dorvilleidae, Oenonidae, Onuphidae and Hartmanniellidae. Eunicids occur in all benthic environments. In shallow temperate waters they are commonly encountered on rocky reefs, typical in such habitats as crevices and algal holdfasts. In the tropics they are especially common among dead corals. Many eunicids build robust parchment-like tubes which may have a complex branching shape, but other eunicid taxa, especially burrowers in soft sediments, do not construct permanent tubes. They are among the largest polychaetes and a number of species may exceed 1 m in length. As their large and complex jaws suggest, many species are carnivorous, although others apparently are omnivorous. Some species are sometimes referred to as “blood worms” for their well-developed parapodial branchiae that are often blood-red.

Great Nicobar Island has fairly rich polychaete fauna which shares with several other areas like the Gulf of Mannar, Lakshadweep, Andaman Islands and Gujarat coast which also have coral reefs (Kumaraswamy Achari, 1969; Soota, et al., 1980; Soota et al., 1981; Misra and Chakrabarty 1983 & 1991). The rich diversity of polychaete fauna of Great Nicobar Island may probably be due to the presence of a wide range of eco-niches and practically undisturbed geographic conditions with least pollution.

METHODS

Great Nicobar Island, the southern most Island of this archipelago, in fact the southern most land piece of India, is situated between 6°45'-7°15' N lat. and 93°38'-93°55' E long (Fig. 1). The island lies about 482 km south of Port Blair and 145 km north of the northern tip of Sumatra. The total geographical area approximates to 1044 sq. km.

The materials for the present study were collected from December 2000 the February 2004 from live corals, dead corals, beach rocks, seagrass beds and mangrove sediments of the intertidal region of 13 selected stations. The sediment samples collected were sieved through a 0.5mm sieve. Polychaetes associated with dead corals were collected by breaking them with a hammer and chisel. Before fixation, polychaetes were dropped into strong alcohol to have their pharynx everted, as it is helpful in identification of this group. They were fixed in 10% formalin diluted with seawater and later transferred to 70% ethanol. The proboscis jaws and other structures of the parapodia were examined under a microscope. The features of the polychaetes studied were drawn with a prism type Camera Lucida and the measurements were taken using a micro-occulometer.

SYSTEMATIC ACCOUNT

List of species

Family EUNICIDAE, Savigny, 1818
1. Eunice (Palolo) siciliensis (Grube, 1840)
2. Eunice antennata (Savigny, 1818)
3. Eunice indica Kinberg, 1865
Fig. 1: Map of Great Nicobar Island
4. *Eunice vittata* (Delle Chiaje, 1828)**
5. *Eunice savigny* Grube, 1878*
6. *Euniphysa tubifex* (Crossland, 1904)*
7. *Eunice coccinea* Grube, 1878*
8. *Eunice petersi* Fachald, 1992
9. *Eunice paupera* Grube, 1879
10. *Marphysa mossambica* (Peters, 1854)
11. *Marphysa macintoshi* Crossland, 1903*
12. *Marphysa corollina* (Kinberg, 1865)
13. *Lysidice collaris* Grube, 1870
14. *Lysidice ninetta* Aud. and M. Edwards, 1833
15. *Nematonereis hebes* (Grube 1840)*
16. *Lumbrineris tetraura* (Schmarda, 1861)
17. *Arabella iricolor iricolor* (Montagu, 1804)

* new record from Andaman & Nicobar Islands

** new record from Indian waters

1. *Eunice (Palolo) siciliensis* (Grube, 1840)


**Material**: 58 specimens collected from St. 1, 2, 4-8, 10-13 during December, 2000 to February, 2001.

**Habitat**: Boring into dead corals and beach rocks.

**Description**: Body 200-350 mm long with anterior region cylindrical and posterior region flattened. Prostomium is notched. Antennae are smooth. Anterior parapodia without branchiae. Branchiae are first present on segment 60 and usually simple filaments. Dorsal cirri are long, smooth, slender anteriorly and gradually diminish in size posteriorly. Simple capillary setae and compound falcigers. There are no pectinate and subacicular setae.

**Remarks**: Present materials agree well with the Day (1967) description.

**Distribution**: India: Andaman & Nicobar Islands, Gulf of Mannar, Lakshadweep and Gujarat.

**Elsewhere**: Tropical Indo-west Pacific and Atlantic Oceans, Mediterranean Sea.

2. *Eunice antennata* (Savigny, 1818)


**Material**: 32 specimens collected from St. 1, 2, 5, 7, 11 and 13 during December, 2000 to February, 2001.

**Habitat**: Boring into dead corals and beach rocks.

**Description**: Body 30 to 155 mm, the dorsal cirri and anal cirri are moniliform. Branchiae first start on setigerous segment 6, well developed between segments 10 and 25, where they have 6 or 7 filaments, decrease to 2 or 3 in median region; thereafter the number increases again in posterior segments. Acicular setae are first present in setigerous segment 19; they are yellow, tridentate and distally hooded. Other setae include slender capillary, bidentate compound falcigers with rounded hood, and pectinate setae with lateral.

**Remarks**: Present materials agree well with the earlier descriptions.

**Distribution**: India: Andaman, Gulf of Mannar, Andaman & Nicobar Islands, Pamban, Krusadai and Shingle Island, Tuticorin and Maharastra Coast.

**Elsewhere**: Red Sea, Persian Gulf, Indian Ocean, Philippine Island, Pacific Ocean, Indo-China, Ceylon (Sri Lanka).

3. *Eunice indica* Kinberg, 1865


**Material**: 21 specimens collected from St. 2, 3 and 11 during December, 2000 to February, 2001.

**Habitat**: Boring into dead corals.

**Description**: Body 20-24 mm long. A dark red spot is present on the median anterior border of each segment from the third. Prostomium in slightly notched in front. First branchiae single filament; all other branch pacinate; maximum 8 filaments. Branchiae are present from setigerous segment 3 to 23. Branchiae terminating well before posterior end, present on less than 55% of total number of setigers. Subacicular setae are yellow, distally tridentate, and occur as a transverse series of 4 in a parapodium. Compound setae distally bidentate and covered by a pointed hood.

**Remarks**: Present materials agree well with the original descriptions.

**Distribution**: India: Andaman & Nicobar Islands.
32

Fig. 2: Eunice vittata

Fig. 3: Eunice savigny


4. Eunice vittata (Delle Chiaje, 1828) (Fig. 2a-d)


Material: 14 specimens collected from St. 2, 4 and 5 during December, 2000 to February, 2001.

Habitat: Boring into dead corals.

Description: Body 30-35 mm long. Anterior segments with red bars which fade in alcohol. Antennae and cirri smooth, without annulations; the longest or median one extends back to sixth segment. A pair of circular eyes at the outer bases of the median antenna. Tentacular cirri are smooth, extend forward not quite to the front of the prostomium. Branchiae are first present from the third parapodia and continue back to segment 45; they have 10 to 18 filaments. Acicula yellow with blunt tips, slightly curved. Acicular setae yellow and tridentate with small apical tooth. Compound setae falcigerous, distally bifid and covered with a pointed hood.

Remarks: This is the first record of the species from Indian waters.

Distribution: Elsewhere: Australia.

5. Eunice savigny Grube, 1878 (Fig. 3a-f)


Material: 8 specimens collected from St. 2 and 8 during December, 2000 to February, 2001.

Habitat: Boring into dead corals and beach rocks.

Description: Body 55-60 mm long. Prostomium has a deep cleft at its anterior margin. Prostomial antennae are annulated. Eyes are large, purplish brown. Branchiae first present from parapodium 3, have 6 filaments on the tenth, 8 on the twentieth, 7 on the thirtieth, 3 on the fortieth and absent after parapodium 50. Compound falcigers have a secondary tooth and distally rounded. Acicula thick and pointed. Subacicular setae are translucent yellow, distally bidentate and hooded; the subdistal tooth is large and directed laterally.

Remarks: This is the first record of the species from Andaman and Nicobar Island.

Distribution: India: Bombay.

Elsewhere: Philippines, Ceylon (Sri Lanka), Persian Gulf, South Africa.

6. Euniphysa tubifex Crossland, 1904 (Fig. 4a-g)


**Habitat**: Boring into dead corals and beach rocks.


**Remarks**: This is the first record of the species from Andaman & Nicobar Island.

**Distribution**: India: Gulf of Mannar and Krusadai Island.

Elsewhere: South Australia, Philippine Islands, Indian Ocean, Atlantic Ocean.

7. *Eunice coccinea* Grube, 1878

(Fig. 5 a-f)


**Material**: 8 specimens collected from St. 10, 11 and 12 during December, 2000 to February, 2001.

**Habitat**: Crevices of both rocks and dead corals.


**Remarks**: This is the first record of the species from Andaman & Nicobar Island.

**Distribution**: India: Lakshadweep.


8. *Eunice petersii* Fauchald, 1992

1854. *Eunice punctata* Peters, Uber die Gattung *Bdella* Savigny, (*Limnatus, Moquin-Tandon*) und die in


**Material**: 38 specimens collected from St. 1-8, 10-13 during December, 2000 to February, 2001.

**Habitat**: Boring into beach rocks and dead corals.

**Description**: Body 130-140 mm long for 181 segments, brown, dotted with tiny white punctations only over the anterior portion. Prostomial antennae smooth. Peristomial cirri about as long as the peristomial segment. Branchiae are first present from about segment 16, with 2-4 filaments; they are pectinately divided and attain a maximum of 8 filaments at setiger 30; the last 10 segments lack them. There are 2 acicula each of the first 28 to 30 parapodia, and only one in others. Acicular hooks are first present in segment 30; they are distally bidentate and subdistal tooth directed laterally. Other setae are of three kinds: slender capillary, pectinate, and bidentate compound falcigers in which the hood is distally rounded.

**Remarks**: Present material agree well with the earlier descriptions.

**Distribution**: India: Lakshadweep, Gulf of Mannar and Andaman & Nicobar Islands.

**Elsewhere**: Red Sea, Malay Archipelago, Philippines, New Caledonia.

10. *Marphysa mossambica* (Peters, 1854)


**Material**: 16 specimens collected from St. 1, 4 and 13 during December, 2001 to February, 2002.

**Habitat**: Boring in dead corals and rocks.

**Description**: Body 270-350 mm in length and flattened after the first few segments, Anterior margin of head deeply bilobed. Five smooth antennae, 1.5 times prostomial length. Anterior parapodial gill absent. Gills appear on the 25th-33rd foot according to size, reach a maximum of six to eight filaments and persist to the end of the body. Setae are all simple capillaries throughout, all with very narrow striated blades. No comb-setae. Acicula shading from yellow to black with straight blunt ends. Acicula setae pale, bidentate and only half the thickness of the acicula, not present in all feet.

**Remarks**: Present material agree well with the earlier descriptions.

**Distribution**: India: Andaman & Nicobar Islands, Pondichery, Kilakarai, Gulf of Mannar, Tuticorin and Gangetic delta.

**Elsewhere**: Widely distributed in Indo-Pacific region, Red Sea, East Africa, Singapore, Fiji and Australia.

11. *Marphysa macintoshi* Crossland, 1903

(Fig. 6 a-d)

1903. *Marphysa macintoshi* Crossland, Crossland, On the marine fauna of Zanzibar and British East Africa from collection made by Cyril Crossland in the years 1901
RAJASEKARAN et al.: Eunicid Polychaetes (Annelida) from Great Nicobar Island, India: II. Order: Eunicida

35

Material: 9 specimens collected from St. 4 and 11 during December, 2001 to February, 2002.

Habitat: Free living in sandy soil of lower littoral zone.

Description: Body 200-220 mm long, slender, rounded or somewhat flattened. Palps partially fused and the anterior margin of the head is not obviously bilobed. Antennae smooth, about as long as the prostomium. Eyes not defined. Mandibles normal. Anterior parapodial gill absent. Gills appear on 20th-50th foot according to size, reach a maximum of six filaments and gradually decrease towards the end of the body. Acicula bluntly pointed and brown with pale tips. A single brown unidentate acicula seta. Notosetae are winged capillaries and comb setae; neurosetae are compound spiniger with knife-shaped blades.

Remarks: Agrees well with the earlier description (Day, 1967). This is the first record of the species from Andaman and Nicobar Island.

Distribution: India: Krusadai Island, Pulicate Lake, Gopalpur (Orissa) and Lakshadweep.

Elsewhere: Philippines, Australia, Singapore, Red Sea, East Africa.

12. Marphysa corallina (Kinberg, 1865)


Material: 12 specimens collected from St. 4 and 11 during December, 2000 to February, 2001.

Habitat: Boring in both beach rocks and dead corals.

Description: Body 200-220 mm long, the anterior part rounded and the posterior part flattened. Prostomium bilobed. Antennae smooth, about 1.5 times as long as prostomium. Gills star from 20th-50th foot according to size, reach a maximum of six filaments and continue to the posterior end with a reduced number of filaments. Comb setae with 20-25 teeth. Neurosetae compound falciger. Acicula dark with pale blunt tips, acicular setae pale and bidentate with small guards.

Remarks: Present material agree well with the Day (1967) descriptions.


Elsewhere: Indian and Atlantic Oceans, Mediterranean and Red Sea, Australia, New Caledonia.

13. Lysidice collaris Grube, 1870


Material: 32 specimens collected from St. 1, 2, 5, 7, 8, 11 and 13 during December, 2000 to February, 2001.

Habitat: Boring in dead corals.

Description: Prostomium is distinctly bilobed in front and has two reniform eyes located near the outer base of the paired antennae. The 3 prostomial antennae are slender. Second dental plate with three heavy teeth. In anterior segments the dorsal cirri are slenderer than ventral ones. In posterior segments the dorsal cirri become shorter. Setae include capillary setae, bidentate
composite falcigers, comb setae and bidentate subacicular hooks are first present at setiger 21 and continue posteriorly.

Remarks: Present materials agree well with the Day (1967) descriptions.

Distribution: India: Andaman & Nicobar Islands, Kilakarai, Pamban, Gujarat coast and Gulf of Mannar.


14. Lysidice ninetta Audouin & Milne Edwards, 1833


Material: 23 specimens collected from St. 5, 8, 10 and 11 during December, 2001 to February, 2002.

Habitat: Boring in dead corals.

Description: Body 75-100 mm long, reddish with white spots and white bar on setiger 2 and 5. Prostomial antennae short, three in number, peristomial appendages and gills absent. Parapodia each with a bluntly conical dorsal cirrus, rounded ventral cirrus and a broad setigerous lobe. Setae include capillaries, pectinate setae, composite falcigers and bidentate acicular hooks. Acicula black with blunt tips. Bidentate subacicular hooks from setiger 22-25 onwards.

Remarks: Present materials agree well with the Day (1967) descriptions.


15. Nematonereis hebes Verrill, 1900


Material: 9 specimens collected from St. 2, 5 and 12 during December, 2001 to February, 2002.

Habitat: Boring in dead corals and seagrass soft sediments.

Description: The body is filiform and about 50 mm long; orange anteriorly and greenish posteriorly. The prostomium is depressed oval and has a single short antenna (Fig. 7.a). A pair of semicircular eyes located on the postlateral part of the prostomium, behind the antennal base. There are no tentacular cirri. Parapodia have digitiform dorsal cirri and short, conical ventral cirri; branchiae are lacking (Fig. 7.b). Superior setae include winged capillary (Fig. 7.c) and broad comb setae. Inferior setae bidentate hooded falcigers (Fig. 7.e). Subacicular hooks usually occur singly in a fascicle; they are black, distally bidentate and hooded (Fig. 7.d), and first present in segment 20 and continue to the end.

Remarks: This is the first record of the species from Andaman & Nicobar Islands.

Distribution: India: Gulf of Mannar, Pamban, Krusadai Island and Cheval Paar.

Elsewhere: Australia, Malay Archipelago, Indo-China, Indian Ocean, Suez Canal, Mediterranean Sea.

16. Lumbrineris tetraura (Schmarda, 1861)


*Material*: 9 specimens collected from St. 4, 6 and 11 during December 2002 to February 2003.

*Habitat*: Littoral soft sediments.

*Description*: Prostomium pale, short, blunt, depressed conical. Parapodia are obvious throughout, even from the first, where they have a broad, postsetal lobe and spreading setal fascicles. Simple winged capillary, hooded hooks are present from the first segment and 3 acicula. Fifth parapodium is provided with 7 to 10 hooks in addition to superior and inferior limbate setae. The presetal lobe is a short, compressed pad. The postsetal lobe is a broad, oblique, acicular lobe, directed outward; this form is maintained through about 20 segments; after that it is elongate and more slender, erect. The parapodial base becomes elongate in a similar way further back, but directed laterally. Setae and acicula are clear yellow. The simple hooks in anterior segments shorter, stouter hooks occur between parapodia 25 and 40. Limbate setae are absent after segment 61. Posterior parapodia are provided with only simple, hooded hooks, with many small teeth distally.

*Remarks*: Present materials agree well with the Day (1967) descriptions.


17. *Arabella iricolor* (Montagu, 1804)


*Habitat*: Boring in dead corals.

*Description*: Body color grey iridescent. Body is long, cylindrical and measures 60 mm for 100 segments. Prostomium bluntly conical with 4 eyes in a transverse row along its posterior margin, there are no appendages. First 1-2 segments achaetous, dorsal cirri rudimentary, ventral cirri absent. Parapodia bilobed with unequal lobes. Setae are only simple limbate and geniculate, with serrations at the base of the wing.

*Remarks*: Agrees well with the description of Day (1967).

**DISCUSSION**

In the present study 17 species were collected from the Great Nicobar Island, of which 6 species are new records to entire Andaman & Nicobar Islands of which one species is a new record to Indian waters. Earlier studies on polychaetes of Andaman and Nicobar Islands, (except for the Great Nicobar Island) has been compiled by Soota et al. (1980). Of the 161 species listed by him only 26 species from order Eunicida due to the fact that several different ecosystems had been sampled. Eunicida collected from Great Nicobar Island shows a distinct distribution based on the kind of substrate like coral reefs, mangroves, sandy substrate and sea grass beds. The substrates play an important role in determining the species composition of various habitats (Sanders, 1958).

One of the main problem in studying the infauna of coral reefs is taking the Eunicida out of the coral colony without damaging them which will render it difficult for identification. Eunicida are really the most important boring animals in coral rocks (Ebbs, 1966). Coral destruction by polychaetes has been observed by Hutching (1986) from Great Barrier reef of Australia. In the present study, 15 species of polychaetes were collected from coral habitats. The most important coral degrading polychaete belongs to the family is Eunicidae (Hartman, 1954). Boring is effected chiefly by the abrasion action of hard pharyngeal structures, such as those possessed by nereids and eunicids (Ebbs, 1966). Although there is little published information on the polychaete fauna of coral reef present work has indicated that it supports a rich and diverse fauna of polychaetes. The importance of the boring activity of polychaetes was recognized by Hutching (1986) who regards them as the “prime and most effective agents” in the destruction of corals. This view is also being supported by Vittor and Johnson (1997).

Observations based on substratum preference by Eunicida revealed that dead corals harbored the largest number of Eunicida. This is probably because corals
are hard, stable substrates that are elevated from the sea bottom avoiding the loose sandy silty particles entering inside the tubes. Corals also provide a good protection from predators. At the time of settlement, the larvae are very much susceptible to predation and to being dislodged by water currents. Algae that are present on the dead coral also provide protection against water current and predators to the pelagic larvae of Eunicida at the time of settlement and initial penetration into coral. As these Algae are found only on the surface of dead coral, Eunicida give more preference to dead coral rather than live coral. Hutchings (1981) also observed most Eunicida in dead corals from Great Barrier Reef.

SUMMARY

The present paper deals with 17 species of polychaetes of the Order, Eunicida. Six species are recorded for the first time from entire Andaman & Nicobar Islands of which one species is a new record to Indian waters.

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