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POLYCHAETES OF PORTO NOVO WATERS

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ABSTRACT

The Vellar Estuary and nearshore waters of Parangipettai were surveyed for the polychaete fauna during 1973-78. Polychaetes were collected from the plankton, sediments from intertidal region and subtidal region, bivalve and gastropod shells and other hard substrates like stones, cement boulders, wooden piers, boat hulls, oyster beds, floating logs and seaweeds. One hundred and twenty-three species in 94 genera under 44 families have been identified. Their distribution in the neritic waters and in the Vellar Estuary has been studied in relation to salinity and nature of substrate. Depending on their distribution and salinity preference, they are classified into four groups such as (1) Species which are purely marine, (2) Species which are marine, but enter into the marine and gradient zones of the estuary in high saline conditions, (3) species which are estuarine, but rarely found in the nearshore waters and in areas of high saline waters and (4) Species which are purely estuarine.

INTRODUCTION

THE COASTAL zone of Porto Novo (Parangipettai) is rich in polychaete fauna. Polychaete fauna of Indian waters has been recorded by numerous workers, but with little ecological details. The Polychaete fauna of Porto Novo waters was studied considerably (Balasubrahmanyan, 1960, 1964; Srikrishnadhas *et al.*, 1981, Chandran *et al.*, 1982; Rajathy, 1985), but a comprehensive knowledge about them is lacking. Hence an attempt has been made to study the polychaetes, with special reference to their habitat, distribution and density in Porto Novo waters.

MATERIAL AND METHODS

Vellar Estuary and nearshore waters of Porto Novo were surveyed for polychaetes during 1973-'78. Polychaetes were collected from the plankton, sediments from intertidal and subtidal region, among fouling organisms, on bivalve and gastropod shells and other hard substrates like stones, cement boulders, wooden structures, boat hulls, oyster beds, floating logs and seaweeds. Qualitative samples were periodically collected from the bottom trawl catches between 40 to 80 m line in the neritic waters of Porto Novo, 20 m line, Vellar Estuary, Killai Backwaters and Pichavaram mangrove. In the Vellar Estuary, samples were taken regularly from the four zones namely marine zone, gradient zone, tidal zone and freshwater zone. Quantitative studies were possible only to the pelagic, intertidal and sub-tidal forms. Quantitative study for the pelagic forms were done from April 1974 to March 1976 and the intertidal and subtidal forms from April 1975 to March 1976. Some of the forms were collected only as larvae from plankton from the field. The larvae settled in the laboratory rearing tanks and they were identified after sexual maturityl Standard methods were used for the quantitative study of pelagic, intertidal and subtida. polychaetes and for the estimation of salinity (Thangaraj *et al.*, 1979: Srikrishnadhas *et al.*, 1981; Chandran *et al.*, 1982).

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Results and Discussion

During 1973-'78, 123 species have been collected and identified. All the identified species are coming under 94 genera falling in 44 families. Of these 55 species are errentia and 68 species are sedentavia. The regional and seasonal changes of salinity in the study area have been reported elsewhere (Srikrishnadhas, 1977; Thangaraj *et al.*, 1979).

Salinity and nature of substrate are the two main factors which govern the distribution of polychaetes in Porto Novo waters. The species which prefer high salinity are found only in the sea and in the estuary they are distributed in areas which experience high salinities. Ramamoorthi (1954) has classified the Vellar Estuary and marked the area near the mouth as marine zone since it showed high salinity most of the time. The salinity records in the present study period also reveal the same fact and it has been reflected on the distribution of both the pelagic and benthic polychaetes. Krishnamoorthi (1963) and Srikrishnadhas *et al.* (1981) have shown that salinity is one of the important factors which determine the distribution of polychaetes. In addition to that the nature of substratum and the availability of hard substrate for the attachment for the sedentary polychaetes limits the distribution of benthic polychaetes. Table 1 shows the nature of substrate preferred by each species. In the quantitative sampling of the pelagic, intertidal and subtidal regions, only a limited number of species are encountered for which the maximum record has been given (Table 1). It is inferred that other species in these sampling areas are very rare, but they have occurred once or more times in the qualitative samples.

The diverse type of environments in Porto Novo coastal zone exhibit an interesting pattern of distribution of polychaetes depending on their salinity preference. Based on their distribution, they can be classified into four groups.

1. *Species which are purely (truly) marine* : They will never enter into the estuary. Such type of species are *Gattyana deludens, Sthenolepis japonica, Sthenelais boa, Bhawania goodei, Lepidonotus tenuisetosus, Pisionidens indica, Chloca parva, C. flava, Eteone ornata, Phyllodoce madeirensis, P. tenussima, Paralacydonia weberi, Ancistrosyllis groenlandica, Hesione intertexta, Syllis gracillis, Nephtys* sp., *Diopatra* sp., *Onuphis eremita, onuphis* sp., *Eunice australis, E. indica, Prionospio saldanha, Laonice cirrata, Magelona cincta, Spiochaetopterus costarum, Notomastus giganteus, Axiotella obockensis, Maldane sarei, Owenia fusiformis, Sabellaria spinulosa alcocki, S. intoshi, Amphictus gunnari, Terebellides stomi, Pista typha, Sabella* sp., *Pomatoceros triqueter, Pomatoleios kransii, Hydroides homoceros, H. heteroceros, H. albiceps, Spiobranchus tetraceros, spiobranchus* sp. and *Spirorbis foraminosus.*

2. *Species which are marine, but enter into the marine and gradient zones :* of the estuary when the salinity was high. Such type of species are *Amphinoma rostrata, Pelagobia longicirrata, Eulalia sanguinea, Alciopina parasitica, Phalacrophorus pictus, Tomopterus helgolandica, Travisiopsis lobifera, Autolytus* sp., *Pseudonereis* sp., *Perinereis* sp., *Micronereis* sp., *Glycera alba, Eunice tubifex, Polydora ciliata, P. hoplura, Prionospio pinnata, P. malmgreni, Scolelepis squamata, Magelona papilliocornis, Disoma orissae, Cirratulus cirratus, Stilarioides* sp., *Brada villosa, Armandia lanceolata, Sternaspis scutata, Euchlymene annandalei, Auchenoplax* sp., *Pectinaria crassa, Desychone cingulata* and *chone* sp.

3. *Species which are estuarine, but rarely found in the near shore waters and in areas of high values of salinities* : Such type of species are *Ancistrosyllis constricta, Hololepidella maculata, Gyptis* sp., *Tylonereis fauveli, Nephtys polybranchia, Glycinde oligodon, Lumbriconereis latreilli, L. polydesma, L. impatiens, L.*

TABLE 1. *Habitat, niche and maximum density of polychaetes of Porto Novo waters*

(S : Sea, E : Estuary, B : Backwaters and M : Mangrove)

Species	Habitat	Niche	Maximum density
Gattyana deludens	Inside gastropod shells with hermit crabs	S	—
Lepidonotus tenuisetosus	Crevices on molluscan shells & boats hull	S	—
Hololepidella maculata	Subtidal mud	E	16/m²
Sthenolepis japonica	Subtidal mud	S	16/m²
Sthenelais boa	Subtidal mud	S	—
Pisionidens indica	Intertidal sand	S	—
Pisione sp.	Collected as larvae	—	—
Bhawania goodei	Crevices of gastropod shells	S	—
Amphinome rostrata	Crevices of logs & seaweeds	S, E	—
Chloca parva	Subtidal mud	S	—
C. flava	Subtidal mud	S	—
Pelagobia longicerrata	Pelagic	S, E	120/m²
Eteone ornata	Subtidal mud	S	—
Eulalia sanguinea	Among *Balanus* & Oysters	S, E, B	—
Phyllodoce malmgreni	Intertidal & subtidal mud	E	—
P. tenuissima	Subtidal mud	S	—
P. madeirensis	Subtidal mud	S	—
Paralacydonia weberi	Subtidal mud	S	—
Alciopina parasitica	Pelagic	S, E	30/m²
Phalacrophorus pictus	Pelagic	S, E	10/m²
Tomopterus helgolandica	Pelagic	S, E	30/m²
Travisiopsis lobifera	Pelagic	S, E	30 m²
Ancistrosyllis constricta	Intertidal & Subtidal mud	E, B, M	384/m²
Ancistrosyllis groenlandica	Subtidal mud	S	—
Hesione intertexta	on floating logs	S	—
Gyptis sp.	Subtidal mud	S, E, B	96/m²
Exogone verugera	Subtidal sand/mud	S	—
Syllis gracilis	Crevices on molluscan shells & among *Balanus*	S	—
Autolytus sp.	Pelagic as polybotricus & saccrocirrus stages.	S, E	—
Ceratoneneis costae	Intertidal & subtidal mud	E, B, M	192/m²
Dendroneneis aestuarina	Subtidal mud	E, B	—
Tylonereis fauveli	Intertidal & subtidal muddy sand.	E	92/m²
Micronereis sp.	Crevices on wood	B	—
Pseudonereis sp.	Crevices on wood	B	—
Perinereis cultrifera	Among oyster & *Balanus* wooden piers & cement boulderes	E, B	—
Nephtys polybranchia	Subtidal mud & muddy sand	E, B	—
Nephtys sp.	Subtidal mud & muddy sand	E, B	704/m²
Glycera alba	Intertidal and subtidal sand and muddy sand	S, E	96/m²
Goniada sp.	Subtidal mud	S, E	—

TABLE 1 (*Contd.*)

Species	Habitat	Niche	Maximum dessity
Glycinde oligodon	Subtidal mud	S, E	288/m²
Diopatra neapolitana	Intertidal and subtidal mud & muddy sand	E, B	2480/m²
Diopatra sp.	Subtidal mud	S	88/m²
Onuphis eremita	Intertidal sand	S	—
Onuphis sp.	Subtidal mud	S	80/m²
Morphysa gravelyi	Intertidal and subtidal mud	E, B, M	—
Eunice tubifex	Crevices on corals, gastropod shells & among seaweeds	S, E	—
E. australis	Crevices on gastropod shells & among *Balanus*	S	—
E. indica	Subtidal mud	S	—
Lumbriconereis latereilli	Intertidal and subtidal sand	E	—
L. polydesma	Intertidal and subtidal muddy sand	S, E	—
L. simplex	Subtidal mud	E	64/m²
L. impatients	Intertidal & subtidal mud	E	—
L. pseudobifilaris	Subtidal mud	E	—
Dorvillea neglecta	on mulluscan shells with *Balanus*	E, B	—
D. incertus	Subtidal mud	S, E	96/m²
Pseudopolydora kempi	Intertidal and subtidal mud	E	48/m²
Pseudopolydora sp.	collected as larvae	—	—
Polydora ciliata	Boring into gastropod shells	S, E	—
Polydora sp.	Intertidal & subtidal mud	E	112/m²
Malacoceros indicus	Intertidal & subtidal mud	E	48/m²
Spio filicornis	collected as larvae	—	—
Laonice cirrata	Subtidal	S	64/m²
Scolelepis squamata	Intertidal & subtidal sand	S, E	48/m²
Spiophanes sp.	collected as larvae	—	—
Nerinides sp.	Subtidal mud	E	—
Prionospio pinnata	Subtidal mud	S, E	448/m²
P. cirrobranchiata	Subtidal mud	E, B, M	64/m²
P. saldanha	Subtidal mud	S	608/m²
P. malmgreni	Subtidal mud	S, E	288/m²
P. polybranchiata	Subtidal mud	E, B, M	650/m
Megalona papillicornis	Subtidal mud	S, E	112/m²
M. cincta	Subtidal mud	S	176/m²
Disoma orissae	Subtidal mud	S	—
Scoloplos marsupialis	Intertidal & subtidal muddy sand	E	160/m²
Poecilochaetus serpens	Subtidal mud	S, E, B	32/m²
Chaetopterus variopedatus	collected as larvae	—	—
Mesochaetopterus sp.	collected as larvae	—	—
Spiochaetopterus costarum	Subtidal mud	S	161/m²
Chaetozone setosa	Subtidal mud	S	—
Cirratulus cirratus	Crevices on corals, shells & stones	S	—
Stilarioides sp.	Subtidal mud	S, E	32/m²

TAB 1 (*Contd.*)

Species	Habitat	Niche	Maximum density
Brada villosa	Subtidal mud	S	—
Armandia lanciolata	Intertidal & subtidal sand & muddy sand	S, E	—
Cossura delta	Subtidal mud	S, E, B, M	448/m²
Sternaspis scutata	Subtidal mud	S, E	48/m²
Heteromastus similis	Intertidal and subtidal mud	S, E, B, M	256/m²
Notomastus giganteus	Subtidal mud	S	176/m²
Capitella sp.	Subtidal mud	E, B	—
Branchiocapitella singularis	Subtidal mud	E, B	—
Euclymene annandalei	Intertidal and subtidal sandy mud	S, E	336/m²
Axiothella obockensis	Subtidal mud	S, E	—
Maldane sarsi	Subtidal mud	S	—
Owenia fusiformis	Subtidal mud	S	—
Sabellaria spinulosa alcocki	on molluscan shells & coral rocks	S	—
S. cementarium	on stones & cement boulders	E	—
S. intoshi	on gastropod shells	S	—
Sabellaria sp.	collected as larvae	—	—
Pectinaria crassa	Subtidal	S, E	32/m²
Pectinaria sp.	collected as larvae	—	—
Samytha sp.	subtidal mud	E	—
Melinna sp.	Intertidal mud	E	—
Auchenoplax sp.	Subtidal mud	S	—
Amphicteis gunnari	Subtidal mud	S	320/m²
Terebellides storem	Subtidal mud	S	80/m²
Loimia medusa	collected as larvae		—
Lanice socialis	collected as larvae		—
Pista typha	Subtidal mud	S	64/m²
Polymnia sp.	Subtidal mud	E	—
Sabella sp.	Subtidal	S	—
Dasychone cingulata	fouling among *Balanus*	S, E	—
Laonome indica	Intertidal & subtidal mud	S, E, B, M	32/m²
Chone sp.	Subtidal mud	S, E	—
Serpula vermicularis	Fouling—on all hard objects	E, B, M	—
Mercierella enigmatica	Fouling—on all hard objects	E, B, M	—
Pomatolelos kraussii	on floating logs	S	—
Pomatoceras caeruleus	on stones, cement boulders & shells	E	—
Pomatoceras triqueter	on shells	S	—
Hydroides albiceps	on shells	S	—
H. homoceros	on shells, other hard objects & floating logs.	S	—
H. heteroceros	on gastropod shells & coral rocks	S	—
Spirobranchus tetraceres	on gastropod shells	S	—
Spirobranchus sp.	on gastropod shells	S	—
Spirorbis foraminosus	on floating logs & sea weeds	S	—

pseudobifilaris, Dorvillea incertus, Malacoceros indicus, Nerinides sp., *Scoloplos marsupialis, Poecilochaetus serpens, Heteromastus similis, Cossura delta, polymnia* sp., *Laonome indica* and *Pomatoceros caeruleus.*

4. *Species which are purely (truly) estuarine* : They are distributed throughout the estuary, backwaters and mangrove environments without showing any preference to higher salinity, and are never found in the neritic waters. Such type of species are *Phyllodoce malngneni, Ceratonereis costae, Perinereis cultrifera, Dendronereis aestuarina, Diopatra neapolitana, Marphysa gravelyi, Lumbriconereis simplex, Dorvillea neclectus, Pseudopolydora kempi, Polydora* sp., *Prionospio cirrobranchiata, Prionaopio polybranchiata, Capitella capitata, Branchiocapittlla singularis, Samytha* sp., *Melinna* sp., *Sabellaria cementarium, serpula vermicularis* and *Mercierella enigmatica.*

Some of the common species in the estuary coming under the third group were found in large numbers in the nearshore waters during the monsoon season. This shows a temporary shifting of the populations into the sea from the estuary to overcome the monsoonal effects. The population of polychaetes in the estuary, backwaters and mangrove environments were thin during the monsoon months owing to the very low salinity caused by the monsoon floods and the population began to build up in the postmonsoon by the fresh settlement of larvae. The thick population was observed in summer and premonsoon months and most of the species showed their maximum density during September or October, before the next monsoon sets in. This phenomenon is very well exhibited in the estuary and the degree of changes depend on the intensity of the monsoon.

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