

6. SPECIES DOMINANCE AND SUCCESSION.

In tropical estuaries, salinity is the key factor that controls the distribution and abundance of various zooplankton species. During the monsoon, because of heavy discharge of fresh water, the salinity is reduced to near fresh water conditions in the estuarine systems. Almost all the zooplankton organisms are wiped out with the exception of a few low saline species. Repopulation of these waters start during the postmonsoon period. Their intrusion and propagation towards the interiors of the estuaries depend largely on the salinity incursion. The successional pattern of various species could be deduced from the numerical abundance.

Compared to the low saline season the zooplankton numbers increase many fold during the favourable saline period. The estuarine species are r selected (Highly unpredictable or seasonal environments favour opportunistic species with high rate of increase - r selected - while the more constant environments do not - K selected, Mac Aruther, 1972). The

succession shows that although many species appear in the sequence a few species among them tend to dominate numerically. The percentage of dominance may vary, but often a few species together constitute the major portion of the population.

Comparisons of species rich communities (like the open ocean) to species poor communities (like estuaries) have led to the generalisation that there are fewer numerically dominant species in the former (Mac Arthur, 1969). While there is an increasing gradient in species diversity from estuaries to open ocean, studies reveal that more often a few species tend to occur in greater abundance in the stable environments also (Haridas et al., 1980; Madhupratap et al., 1981; Nair et al., 1981). Birch (1981) analysing the marine benthic communities also came to the conclusion that Mac Arthur's theory need not always hold true.

In the estuaries Copepoda almost always showed the highest numerical dominance. Although 51 species belonging to this group were recorded only a few generally dominated the assemblage. Other groups/species predominated only rarely.

In the Cochin backwaters, Paracalanus crassirostris was the dominant species at the mouth area during the early postmonsoon period (November). This species was replaced by Paracalanus aculeatus during the late postmonsoon and early premonsoon months. Acartia centrura dominated all other species, all through the rest of the premonsoon period (Fig. 30 A). Other high saline species which are common in these waters like Acrocalanus similis, Acartia bilobata, A. spinicauda, A. pacifica, Pseudodiaptomus serricaudatus, P. ionesi and species of the family Centropagidae though occurred in considerable numbers are dwarfed by A. centrura. During the peak monsoon month (July) Pseudodiaptomus annandalei which preferred stratified waters is the dominant species. Acartia plumosa, a medium saline species was common during late monsoon. This species with Acartiella keralensis predominated in the middle reaches during the peak salinity regime. Though other high saline species of Acartiidae penetrated into these areas during this period they did not dominate. During the monsoon period A. gravelyi is the dominant species in the interior of the estuary.

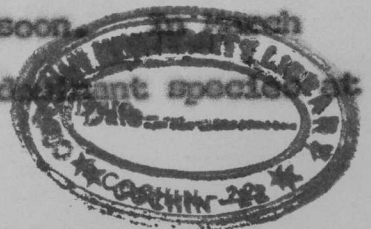
Acartia centrura showed absolute dominance during most of the months of the year at Neendakara estuary. During the peak premonsoon period (April-May) Lucifer

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hanseni and Sagitta bedoti predominated (Fig. 30 A). At Kallai also A. centrura was the dominant species during the pre- and post- monsoon. But during low saline period, zoea larvae, Acartiella keralensis and A. gravelyi replaced the high saline species. Almost similar situation existed at Korapuzha estuary also (Fig. 30 B).

Similar to Cochin backwaters, various high saline species occurred in higher abundance during the pre-monsoon and postmonsoon months in these estuaries also. But Acartia centrura almost always outnumbered these species. The low saline species, Acartiella gravelyi was absent in Neendakara estuary, and species like A. keralensis and Acartia plumosa occurred in low numbers. This was because, very low saline condition did not exist at the mouth area of this estuary. Even at the peak of the monsoon salinity was 6.7‰ and 14.4‰, at the surface and bottom respectively.

In the estuaries of Mahe and Beypore dominance of copepods was not as high as in other estuaries (Fig. 30 B). Acartia centrura dominated only during peak premonsoon at Mahe while at Beypore it dominated during early premonsoon and postmonsoon. In each Pseudodiaptomus annandalei was the dominant species at



Mahe and Oithona nana at Beypore. Brachyuran zoea and caridean larvae were dominant during early pre-monsoon and monsoon season and the amphipod Corophium triaenonyx was abundant in postmonsoon at Mahe. Eutima commensalis, a hydromedusae and the sergestid Lucifer hansenii were the dominant species during the peak saline months at Beypore. Zoea, larvae of carideans and the cladoceran Evadne tergestina stemmed into dominance in some months during monsoon. The ctenophore Flurobrachia globosa dominated in late postmonsoon.

Acartiella graveleyi was the dominant species during the early premonsoon at the Thettappilly and Veli lakes (Fig. 30 C). At Thettappilly it was replaced by medium saline species like Acartia plumosa and Acartiella keralensis during late premonsoon. Only some caridean larvae were present during the early monsoon period. Very low saline diaptomids like Heliodiaptomus cinctus and Alloidiaptomus mirabilis were dominating copepods during late monsoon and postmonsoon months. But in the Veli lake high saline species like Acartia centrura, A. spinicauda and Pseudodiaptomus aurivilli dominated during the premonsoon months. Though low saline copepods were present

during the postmonsoon months, caridean larvae dominated.

Zooplankton populations in the estuaries are rich during the saline period. Most of the common species that occurred during this period were able to tolerate a considerable range of salinity variations and dominance is probably achieved at optimum salinity and when other environmental factors are also conducive.

Salinity recovery is faster at the mouth area of the estuaries during postmonsoon season and is slow towards the middle and upper reaches. Broadly, the successional pattern showed three seres, the low saline forms dominated the entire estuary (but in low numbers) during monsoon and the head region during postmonsoon. The high saline forms dominated the mouth area during postmonsoon and the middle reaches during premonsoon. The medium saline species were abundant in middle reaches during early premonsoon and at the upper reaches during later premonsoon. The medium saline species replaces the low saline forms towards the head as salinity recovers and later high saline species also invade this area in late premonsoon when salinity increases further.

In general Acartia centrura was the dominant species and this along with a few other species like Acrocalanus similis, Paracalanus crassirostris, Acartia bilobata, A. spinicauda and Pseudodiaptomus serricaudatus formed bulk of the population during saline period. Although the carnivorous groups like hydromedusae and ctenophora were not numerically dominant, the ecological dominance of these groups cannot be overlooked.

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