

A REPORT OF THE ZOOPLANKTON OF THE PAGO PAGO HARBOR AREA

This analysis is based on three groups of samples. A series of six horizontal surface samples were taken on April 9, 1974, between 14:00 and 19:00 hours. Two types of open conical nets were used: one, a meter in diameter had a net mesh of 230 microns; the other, one-third of a meter in diameter, had a net mesh of 60 microns. A sample was taken with each net at each of three areas: at the head of Pago Pago Harbor, toward the mouth of the harbor, and outside of the harbor over the Ta'ema Bank. Two horizontal surface samples were taken April 18, 1974, between 14:00 and 17:00, in the upper Pago Pago Harbor area with a simple open conical net one-third of a meter in diameter; the net mesh was 60 microns. One sample was taken in an area of discolored water and one outside. In addition, a surface sample of the discolored water was also collected. A series of several horizontal surface samples were taken with an open conical net one-fourth of a meter in diameter with 60 micron mesh. This last series did not have specified collection data and was used for on taxonomic purposes only.

There are several problems associated with the analysis. The data had to be treated non-quantitatively due to technical difficulties. The samples were confined to the surface layer; there were no horizontal tows at depth nor vertical or oblique tows to delineate or suggest changes in community structure with depth. All samples were collected during a relatively

short period of time and thus no temporal changes could be identified. Finally all samples were collected during the day; diurnal changes were not studied.

Two major surface communities were found in the area. The first, a simple one, was confined to the upper harbor. Four species made up well over 90% of the individuals collected: a sergestid shrimp, Lucifer sp.; an arrow worm Sagitta sp., most probably S. enflata; a calanoid copepod Acartia sp., a cyclopoid copepod Oithona sp. Very little net phytoplankton was found with these animals although occasionally some filamentous blue-green algae were present. The sample of the discolored water contained small naked dinoflagellates. Charles Seeley has identified the flagellates of the discolored water of Pago Pago Harbor as Glenodinium sp. and Mesodinium rubrum. Zooplankton of this discolored water was almost exclusively nauplii, copepodids, and some adults of Acartia sp. and Oithona sp. The latter species was too small to be represented in the samples collected with the 230 micron net but was the dominant species in the 60 micron net. The larval stages and quite possibly the adults of these two small copepods must have been feeding on the dense concentrations of the nanoplankton. The filamentous blue-green algae were not abundant enough and too long to be easily utilizable. Organic detritus, although not found, should not be excluded as a possible source of nutrition for these zooplankters

of this enclosed body of water. In samples taken outside the discolored water the above two copepod species, adults and larvae, predominated. Sagitta sp, although not numerically abundant was noticeable because of its large size. A few observations on the contents of the posterior ends of the guts showed that Sagitta sp. had been feeding on the larger stages of the copepods; most sagitta guts were empty. Various stages, protozoa, subadult and adult, of Lucifer sp. were also found in the samples taken outside of the discolored water. Their trophic position has not been identified.

The second community is called here the 'ocean' community. It is similar in some respects to the neritic community of the continental shelf areas in that it has meroplanktonic and a few planktonbenthos elements. But since it can not be differentiated from an oceanic community further offshore, it cannot truly be considered neritic. In addition the holoplanktonic members of the community are more similar to members of the epipelagic oceanic community than a truly neritic community.

Of the adult holoplanktonic animals of this ocean community the genera Farranula and Corycaeus, cyclopoid copepods of the family Corycaeidae, were most abundant. Undinula sp., probably the cosmopolitan U. vulgaris, was common. Other calanoids, Paracalanus and

Clausocalanus were rare but would be expected in greater abundance in the waters away from the surface. Arrow worms of the genus Sagitta and Pterosagitta were present as was the pelagic amphipod Hyperia. Larvae of the holoplanktonic animals were very abundant as would be expected in surface daytime samples. Most common were Undinula copepodids and the calyptopis stages of euphausiids, the adults of which were probably in much deeper water. Meroplankton were represented largely by brachyuran zoea, caridean larval stages, barnacle nauplii, and benthic tunicate larvae. Around the mouth of the harbor there was a general mixing of components of both the harbor and ocean communities. However meroplanktonic forms were much more numerous, probably due to the larger ratio of benthos area to water volume.

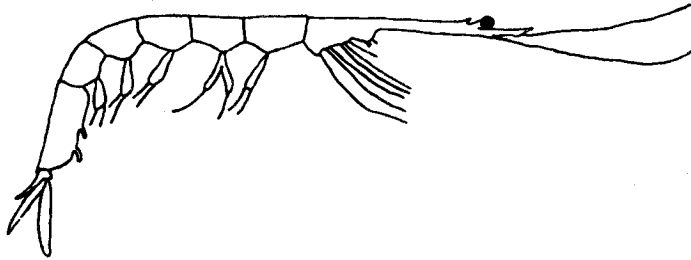
As should be noted from the opening discussion, this report is not meant to give a complete picture of the zooplankton ecology of the area but only a simple beginning. More work needs to be done on temporal and vertically spatial faunal changes especially. It should also be noted that the horizontally spatial positions of the two communities defined here will depend on the hydrographic circulation characteristics of the area, a fact always to be kept in mind when studying zooplanktonic communities.

Frank Ferrari

April 21, 1974

SOME COMMON PLANKTON FROM PAGO PAGO HARBOR AND OFFSHORE FROM TUTUILA ISLAND

7X



Lucifer sp. a planktonic sergestid shrimp

7X



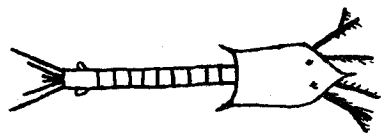
Creseis sp. a shelled (thecosomate) pteropod

7X



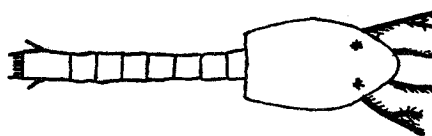
Sagitta sp. probably S. enflata a common nearshore arrow worm

75X



Lucifer sp. protozoa stage

75X



euphausiid shrimp calyptopis stage for comparison with Lucifer protozoa

30X

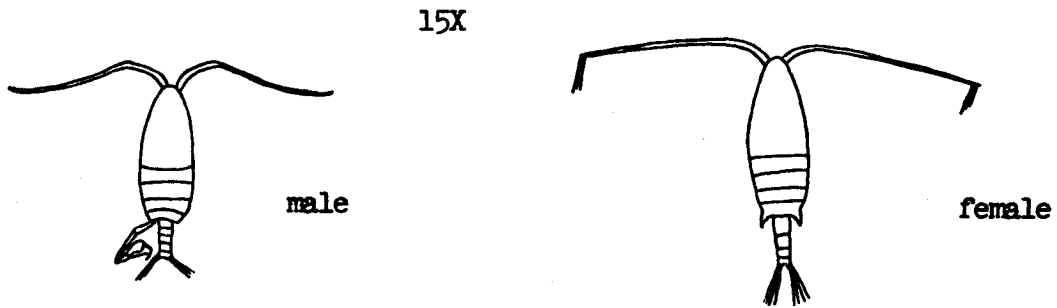


Oikopleura sp. a planktonic appendicularian (tunicate)

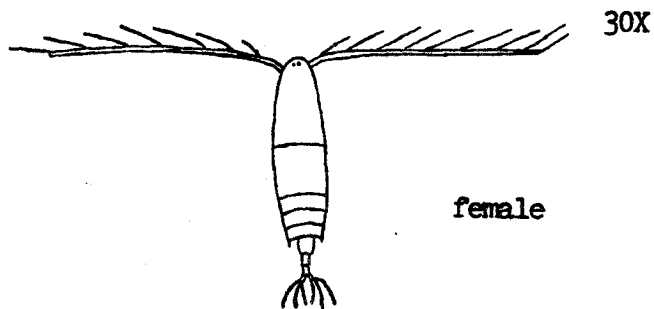
30X



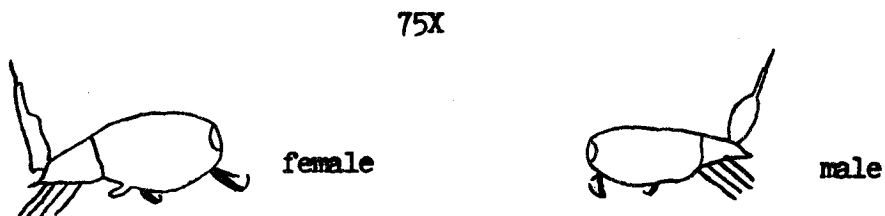
brachyuran zoea (crab larvae)



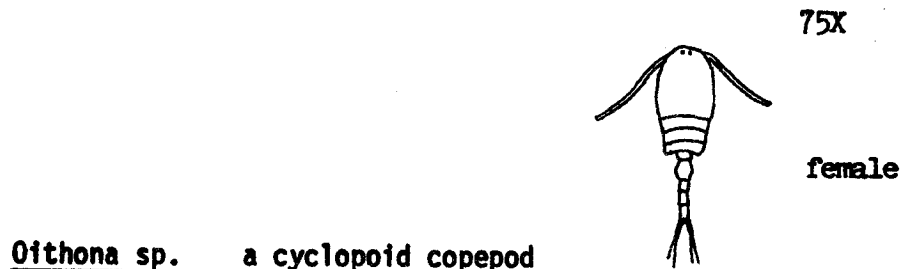
Undinula sp. probably the cosmopolitan species U. vulgaris a copepod



Acartia sp. a calanoid copepod



Farranula sp. a cyclopoid copepod of the family Corycaeidae



Oithona sp. a cyclopoid copepod