

TAXONOMIC STANDARDIZATION

Jack Q. Word and Danuta K. Charwat

Assessing the quantity of marine organisms in an area is one of the most necessary, time consuming, and costly aspects of an ecological monitoring program. Nearly 2,000 benthic samples and 500 trawl samples are taken by monitoring agencies annually in southern California alone. Although the trawl samples can usually be processed while at sea, each grab sample may take 10 to 20 man hours and cost \$100 to analyze in the laboratory. Regardless of the type of sample, the meaningfulness of the results of these biological surveys rests with the correctness of identification of the individual organisms and the consistency of identification with time and between survey areas and surveying agencies.

During this past year, we decided to initiate a taxonomic standardization program to promote a regional approach to the identification of marine organisms collected by local monitoring agencies. The first objectives of the program have been to identify the species of marine organisms taken from trawl and benthic sampling in all the areas surveyed by the Project and the monitoring agencies and to make the necessary corrections to the data presently available to the Project. As part of this effort, Project personnel have participated in most of the cruises conducted by the monitoring agencies since September 1971 (this work has been sponsored in part by a grant from the Environmental Protection Agency). James Allen, our fish taxonomist, has assisted and trained agency personnel in identifying fish species, and Jack Word works on the invertebrate catches. The results of this effort are varied. For example, four fish species commonly reported in surveys over the past two decades are either not known to exist in southern California or are extremely rare. Juvenile rockfish were seldom sorted and identified in these past surveys, although one species (the stripetail rockfish, *Sebastes saxicola*) has proven to be one of the most abundant fishes taken by otter trawl in the area. Trawl caught invertebrate samples were not processed consistently and, when sorted, were only superficially examined and identified. Our work has shown that some of these for example, the shrimp have depth distributions that are ecologically significant.

Using a computer coding system designed by Thomas Sarason of the Project, we have produced a complete list of invertebrate and fish species collected in southern California coastal waters, the agencies responsible for their identification, and their literature synonymies. The next step has been to arrange these species into systematic groups (e.g., polychaetes, ophiuroids, shrimp, etc.) and, in consultation with experts in the taxonomy of each group, determine the proper name for each species. The Project sponsors monthly meetings with biologists from the monitoring agencies. At these meetings, the nomenclature, literature sources, and correct methods of identification are reviewed. We then communicate the findings to a larger group of interested individuals and organizations through a monthly newsletter.

An equally important objective of the program is to establish guidelines for the uniform identification of marine organisms. We maintain at the Project an extensive library of systematic literature and a reference museum of correctly identified specimens for review

and comparison with those of other agencies. Bibliographies are compiled as each group is covered. We have prepared keys to the identification of the species of several taxonomic groups. With these keys, we are attempting to simplify as well as standardize their identification. By concentrating on clear illustrations (such as those in Figures 1 and 2), ecological characteristics (e.g., depth at which each species is found), and characteristics that are easily distinguishable in the field, we hope to minimize the time required for identification in the laboratory. So far we have produced a field and laboratory key to trawl caught southern California shrimp species (TM 211) as well as several provisional keys covering the irregular and regular sea urchins, crabs of the genus *Cancer* (adult and juvenile), sea stars of the genus *Astropecten*, and snails of the genus *Polinices*. In consultation with Dr. Kristian Fauchald, of the Allan Hancock Foundation, we have recently completed a revision to Hartman's Atlas of Polychaetes.

Most of the existing fish keys do not cover juveniles. Since juveniles are a major part of the trawl catches taken in southern California waters, we will include information on the size ranges and distinguishing features of juvenile forms in our keys. Keys to flatfishes and eelpouts are now being prepared, and a key to rockfishes will be produced in the next year.

Several major groups of invertebrates have been standardized, enabling the Project to begin the analysis of marine communities and the effects of wastewater discharges. For example, we are now able to determine the ecological distribution patterns of the southern California shrimp, using the data provided from all the areas surveyed by the monitoring agencies.

Although the program was originally intended to standardize the taxonomic procedures used by the southern California monitoring agencies, it has attracted the interest of organizations and individuals throughout California. Our mailing list includes the libraries of universities, state colleges, and natural history museums, and we have received enthusiastic reactions from experts in many fields of fish and invertebrate biology. As a result, we intend to produce a book of keys to the identification of southern California invertebrates.

We would especially like to acknowledge the involvement and effort of Dr. Kristian Fauchald and Don Cadien of Marine Biological Consultants, Inc., and the cooperation of the participants at our meetings.

FIGURES

Figure 1.

Illustration from one of a series of keys to southern California fishes and invertebrates published by the Project

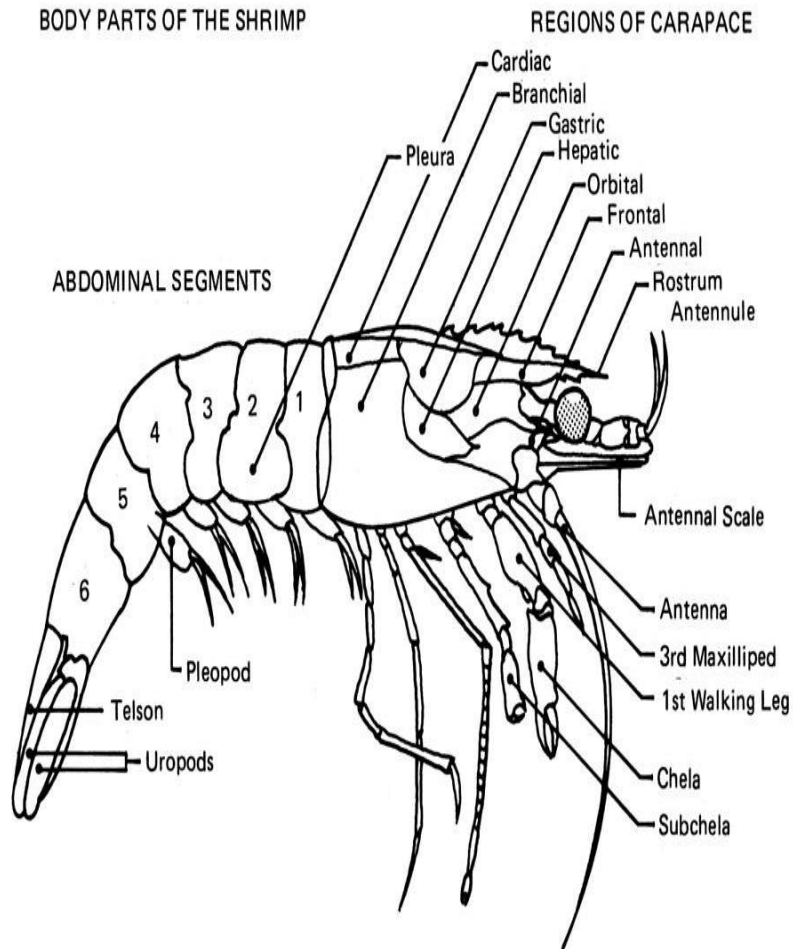


Figure 2.

Figure 2. mustration from the shrimp key (TM 211) pointing out features that distinguish one species of shrimp from others in the same family.

