National Systematics Laboratory Report for Calendar Year 1978

March 1979
Washington, D.C.

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service

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Juanita M. Kreps, Secretary
National Oceanic and Atmospheric Administration
Richard A. Frank, Administrator
National Marine Fisheries Service
Terry L. Leitzell, Assistant Administrator for Fisheries

INTRODUCTION

The primary function of the National Systematics Laboratory is to conduct original research on selected marine and freshwater organisms of economic or ecological significance, with emphasis on describing and explaining their structure, distinctiveness, classification, diversity, and evolution. All of these topics are embodied in the term "systematics." Understanding of how an organism may be characterized, easily recognized and classified, numbered with similar entities, and placed in accepted phylogenetic perspective is basic to many other areas of biological research. The overall objectives of the Laboratory in fulfilling its function are as follows.

1) Prepare taxonomic revisions that are sufficiently comprehensive to aid biologists in making identifications and serve as a basis for ecological studies. Along with this carry out anatomical studies that substantiate classifications.

2) Prepare regional systematic studies designed to integrate existing knowledge of biotas with the results of new research.

3) Serve as a source of specialized information for NOAA, other organizations, and individuals.

These ends are accomplished by the following Laboratory Program.

LABORATORY PROGRAM

Major research of the Laboratory is divided into four general areas, responsibility for work in each being that of a single scientist with technical and clerical assistance.

1) Epipelagic fishes - Bruce B. Collette

2) Benthic and deep pelagic fishes - Daniel M. Cohen

3) Penaeoid shrimps - Isabel C. Canet (Pérez Farfante)

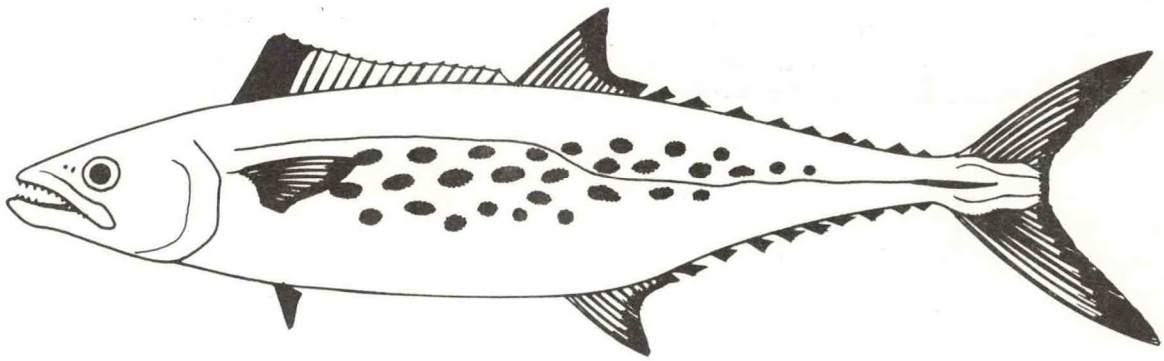
4) Crabs and other decapod crustaceans - Austin B. Williams

EPIPELAGIC FISHES

Research on epipelagic fishes is the chief concern of Dr. Bruce Collette. Particular emphasis is devoted to the study of the anatomy and systematics of scombroids, the group which includes the tunas, Spanish mackerels, and bonitos. Objectives are to define species, aid in the identification of adults and juveniles, contribute to the stability of nomenclature and provide a basis for studies on ecology and physiology. Also studied are the halfbeaks and needlefishes (Synentognathi), abundant fishes which are important forage items and which are of local commercial importance as food and bait. Monographs on these two families are being prepared for the series *Fishes of the Western North Atlantic*.

Work Completed During The Year

1) Spanish mackerels. Description of a new species from the Caribbean and Atlantic coasts of Central and South America was published in the *Fishery Bulletin* in conjunction with a Brazilian fishery biologist, L. A. Zavala Camin. This previously unnamed species replaces the Spanish mackerel *(Scomberomorus maculatus)* of the U.S. Atlantic and Gulf coasts, from Belize to southern Brazil. It differs in pelvic fin length and vertebral number, grows to a much larger size, and matures later than does *S. maculatus*. A draft of a manuscript describing a second new species from northern Australia and southern Papua New Guinea was completed and sent out for comments before submission for publication. A review of the 18 species of Spanish mackerels was presented at the Mackerel Colloquium held at the Gulf States Marine Fisheries Commission and a manuscript was subsequently accepted for publication in the proceedings of the colloquium.



The sera Spanish mackerel *(Scomberomorus brasiliensis)*, first recognized as an unnamed species by Laboratory research. Drawn by Keiko Hiratsuka Moore.

2) In response to a request from the Southeast Fisheries Center, a field guide to the tunas, billfishes, and other species taken by pelagic longline in the western Atlantic was prepared. This guide will facilitate identification of fishes taken during longline operations by foreign fishing vessels operating within the 200-mile zone. The guide is being revised for formal publication based on comments received from users of the draft.

3) A review of the marine Indo-West Pacific halfbeaks was completed in cooperation with N. V. Parin and Yu. N. Shcherbachev of the Institute of Oceanology, U.S.S.R. Academy of Sciences, and accepted for publication in the Soviet journal *Trudy Instituta Okeanologiya*. The review treats 8 of the 12 genera and 33 of the 73 known species of halfbeaks and is based on examination of more than 10,000 specimens. The primary economic significance of these fishes in the U.S. is as bait for billfishes; however, they are an important food resource in many other parts of the world.

4) A manuscript was completed and published describing five new species of Indo-West Pacific halfbeaks in cooperation with Dr. N. V. Parin.

5) Also published were sections on the families Batrachoididae, Belonidae, Coryphaenidae, Hemiramphidae, Lampridae, Pomatomidae, Rachycentridae, Scombridae, and Xiphiidae in the *FAO Species Identification Sheets for the Western Central Atlantic*.

In Progress

Progress was made on the long-term study of the anatomy and classification of the Spanish mackerels *(Scomberomorus)* and their near relatives. A stable nomenclature is particularly needed as these fishes constitute an important recreational and commercial fishery resource in the southeastern U.S. and other parts of the world. About 40 specimens were dissected during the year and counts and measurements were made on these plus an additional 30 specimens. A first analysis was made of geographic variation in the western Atlantic *S. maculatus* and the wide-spread Indo-West Pacific *S. commerson*.

BENTHIC FISHES

Research on benthic fishes is chiefly the responsibility of Dr. Daniel Cohen. The main topic of investigation is the classification and biology of fishes of the outer continental shelf and deeper water. Special emphasis is given to the gadiform or codfish group, many species of which are abundant in deep water and, along with ophidioid fishes, another group being studied, dominate the slope fish fauna. Monographs on both groups are being prepared for the series *Fishes of the Western North Atlantic*. Selected groups of deep-living pelagic fishes are also studied. As CALCOFI and MARMAP have shown, shallower dwelling early stages may be common constituents of the ichthyoplankton taken during egg and larvae surveys, and their identification depends upon the classification and nomenclature of adult fishes.

Work Completed During The Year

1) An analysis was completed and accepted for publication in the *Fishery Bulletin* of geographical variation in the 4-bearded rockling, a common gadid fish living around the rim of the North Atlantic Ocean. Larval stages of rocklings are locally abundant in the plankton, where they are often confused with the early stages of hake. Because there is an overall absence of concordance in the patterns of variation for many characters, 4-bearded rocklings are interpreted as a single polytypic species. Also included are range extensions to Mauritania, Greenland, and the Gulf of Mexico, with comments on the genera and nomenclature of rocklings.

2) A comprehensive worldwide revision of the catsharks, family Scyliorhinidae, was accepted for publication. This study of the largest shark family is the work of Stewart Springer, who retired several years ago, and represents work done while Mr. Springer was a member of this Laboratory.

3) Published were sections on the families Argentinidae, Brotulidae, Ophidiidae, Gadidae, and Moridae in the West Central Atlantic for the *FAO Species Identification Sheet* series.

4) Also published was a preliminary classification of the 84 genera of the order Ophidiiformes. Included are descriptions of two new genera and species, keys to, brief diagnoses and pictures of all genera, and a list of species. This order includes the brotulas, cusk eels (among which are abundant fishes of U.S. waters as well as the commercially fished congrio and klipfish of the Southern Hemisphere), the pearlfishes, and many other genera from the deepsea and tropical reef areas.

In Progress

Work continued on the preparation of a paper on the taxonomy of the blue hake genus *Antimora*, a locally abundant gadoid fish found on continental slopes throughout the world. Of the six named species, only two are recognized as valid, one restricted to the North Pacific, the other living elsewhere.

Progress was made on the study of a collection of ophidioid fishes taken by Soviet trawlers off the west coast of South Africa containing three undescribed species.

Plans were made for participation in a cooperative study of the biology of a deep-sea thermal vent area northeast of the Galapagos Islands. Thousands of photographs were studied in order to learn more of the fishes living near the vents.

Specimens of the gadiform genera *Physiculus* and *Lotella* from Japan were studied, and a preliminary manuscript clarifying the taxonomy of several species was prepared.

Work was done on a manuscript describing from photographs, occurrence of the common eel *Anguilla* from deep water in the Bahamas.

Preliminary work was done on a paper describing the geographical distribution of ophidioid fishes living at depths greater than 2000 m, to be presented during 1979 at the Pacific Science Congress.

Available material of the scaly toadfishes of the genus Batrachoididae was examined. Analysis of geographic variation in morphometric characters of two, widely distributed species was completed. A manuscript revising the genus and describing two new species from the tropical eastern Pacific is being written.

PENAEOID SHRIMPS

The research of Dr. Isabel C. Canet (Pérez Farfante) is directed chiefly toward studying the morphology, systematics, distribution, and certain aspects of reproduction of penaeoid shrimps, which constitute one of our most valuable fisheries resources. Research results aid in identification, classification, in describing distribution patterns, and in adding to knowledge of reproductive biology.

Work Completed During The Year

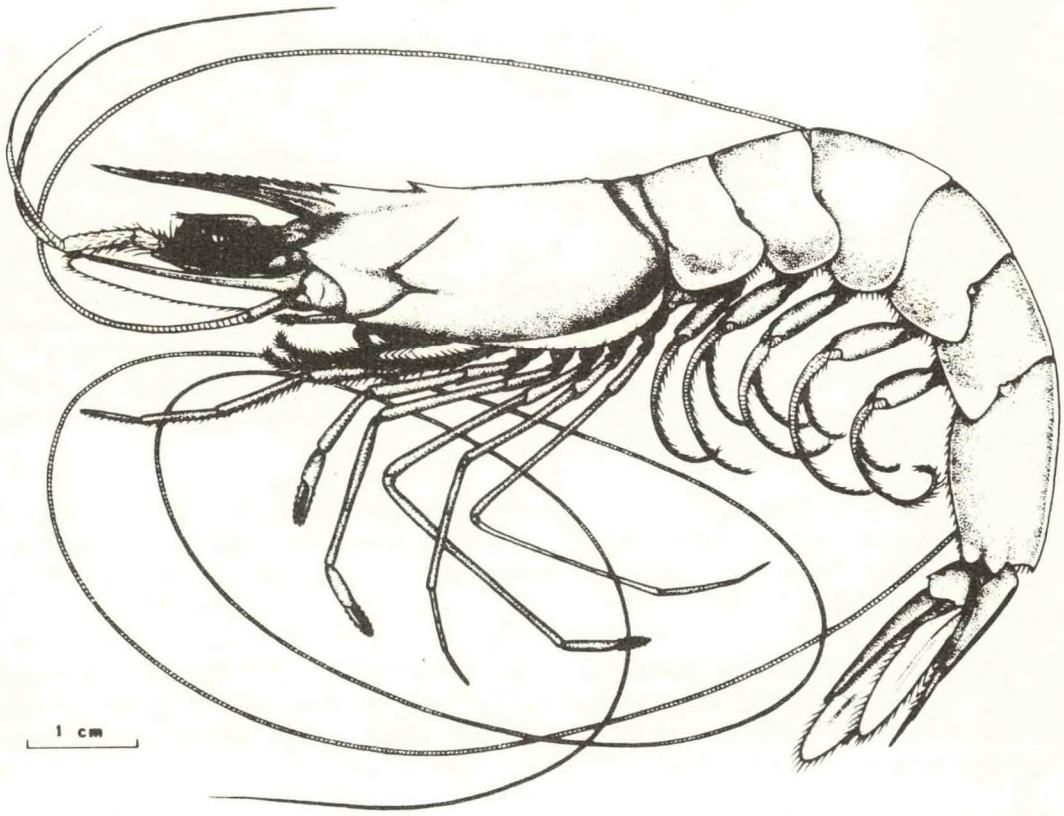
1) Three specimens of the genus *Penaeopsis* having male and female external characteristics were described from the waters of the Philippines. They are the first individuals possessing both a petasma and a thelycum that have been recorded in the literature. The possible origins of the anomalies are discussed following an account on the genitalia of the specimens in an article published in the *Fishery Bulletin*.

2) Also published was the section on the shrimp families Solenoceridae, Penaeidae and Sicyoniidae (Penaeoidea), and Hippolytidae and Palaemonidae (Caridea) in the *FAO Species Identifications Sheets for the Western Central Atlantic (Fishing Area 31)*.

3) A manuscript was prepared describing a new species of *Penaeopsis* found in the Indian Ocean from the Bay of Bengal to off Mozambique and Madagascar at depths between about 185 and 675 m. It has been accepted for publication in the *Proceedings of the Biological Society of Washington*.

4) A paper on range extensions of *Penaeopsis serrata*, written in cooperation with Dr. B. G. Ivanov of VNIRO, Moscow, was accepted for publication in the *Proceedings of the Biological Society of Washington*.

5) A world-wide revision of the penaeid shrimp genus *Penaeopsis* was completed. The study of extensive collections made during the cruises of 26 research vessels revealed that the genus *Penaeopsis* includes six species, five of them occurring in the Indo-West Pacific (two of which were found to be new to science), and one on both sides of the Atlantic. Some of these shrimps are fished commercially, others have been found to be abundant enough to sustain a fishery. In this monograph, a key for separation of the species is given, and a diagnosis, detailed descriptions, discussion of intraspecific variations, and geographic and bathymetric ranges for each are presented together with full references, locality records, and numerous illustrations. Various charts are also included.



A very abundant shrimp known by fishermen as megalops (*Penaeopsis serrata*) is caught on the upper continental slopes on both sides of the Atlantic. Drawn by Maria M. Farfante.

In Progress

Species of the genus *Solenocera* found in the commercial catches off Northern Territory, Australia, are under investigation. The presence of a species of *Solenocera* was reported only once before from Australian waters, off Queensland. The material, collected from commercial vessels or during the course of research sampling of shrimps, represents both an extension of the range of the species involved and an addition to the list of commercial shrimps for that country.

A revision of the "rock shrimps," genus *Sicyonia*, in the American Pacific was begun. These shrimps, which constitute a large percentage of most trawl catches and have a considerable commercial potential, have barely been investigated. The objectives of the present research are to aid in species identification, to understand geographic variation in meristic and morphometric characters, and to determine geographic and bathymetric ranges. So far, 12 species have been identified; one of them is new to science.

Morphological variations in the amphi-Atlantic shrimp *Parapenaeus longirostris* are being examined to determine geographic variation of morphometric and meristic characters in this widely distributed, economically important species. It is fished commercially in the eastern Atlantic and the Mediterranean, particularly off the coasts of Spain, France and Italy where it constitutes the most important shrimp resource. In American waters, however, like many other species that occur on the continental slope, its economic potential has not been fully assessed.

CRABS AND OTHER DECAPOD CRUSTACEANS

Research on crabs of the world and decapod crustaceans of the temperate western North Atlantic region is the responsibility of Dr. Austin Williams. Studies have been done or are in progress on anatomy, taxonomy, phylogeny, distribution, species diversity, community structure, and other aspects of the biology of these crustaceans. Interest is centered on crabs and shrimps associated with estuaries and nearshore circulation systems. The information produced is of particular value to NOAA and to scientists who are attempting to characterize the U.S. east coast estuarine and near shore biotas for management directed toward harvest of food, shipping, coastal urban and industrial development, and conservation.

Work Completed During The Year

1) Generic placement of a xanthid crab living on offshore reefs of the southwestern North Atlantic was reconsidered in light of a suite of characters developed from comparisons with a number of similar genera. This crab is one of the many warm water species whose distribution extends from the central western Atlantic and West Indian regions northward along the southeastern United States. Scanning electron microscopy was of particular benefit in making the necessary comparisons for publication.

2) Reassessment of northern geographic limits for decapod crustaceans in the Carolinian Province was accomplished in collaboration with G. H. Herbst of the University of Wisconsin, and B. B. Boothe, Jr., formerly with the South Carolina Wildlife Marine Resources Department, MARMAP Program. Trawl samples taken in 1977 from the Cape Hatteras-Cape Lookout, North Carolina area, together with other collections from the Carolinas during the past 15 years, have added about 70 species to the known decapod crustacean fauna of the region. Significant northward extensions of range for selected species are given in this paper accepted for publication. Recomputation of northern range limits given by Williams in 1965 confirms that Cape Lookout marks a zone of greater zoogeographic change than does Cape Hatteras.

3) A review of the decapod crustaceans from the northeastern U.S. in the collections of the Northeast Fishery Center was published in collaboration with Dr. R. L. Wigley (dated December 1977 but appeared in winter 1978). Distributional and environmental summaries are presented in an annotated checklist, supplemented by charts, graphs and tables for 131 species of shrimps, lobsters, and crabs fround between the Gulf of Maine and near the mouth of Chesapeake Bay. Data are mainly from samples collected by NMFS *R/V Delaware I, Delaware II, Albatross III,* and *Albatross IV* during the past 25 years, with a few samples from other vessels and incidental shore collecting.

4) Published was the section on True Crabs (Brachyura) in the West Central Atlantic for the *FAO Species Identification Sheet* series.

In Progress

Preparation of a comprehensive illustrated review, including identification keys, of the temperate water decapod fauna of the U.S. east coast is nearing completion. This work has resulted in supplementary studies which are appearing before the main work.

A systematic review of mud shrimps, genus *Upogebia,* in the eastern Pacific continues. A number of previously unrecognized species have been distinguished.

A systematic review of mud crabs of the genus *Panopeus* was begun when Dr. J. B. Sullivan, Duke University Marine Laboratory, pointed out that hidden within the commonly recognized *P. herbstii* is an apparently unrecognized species. This complex species has been broken into a number of "forms" by previous authors.

A systematic revision of the genus *Latreillia,* a primitive group of crabs with world wide distribution, is near completion. Differences between eastern and western Atlantic populations are pointed out, a new species is described from the central Pacific, poorly known Indo-West Pacific species are placed in synonymy, and distributional problems are discussed.

Description of a very peculiar new crab from shallow water near the West Indian island of Tobago is near completion.

LABORATORY PUBLICATIONS

COHEN, D. M.
Families Argentinidae, Brotulidae, Gadidae, Moridae, and Ophidiidae, In: W. Fischer (ed.), *FAO Species Identification Sheets for Fishery Purposes, Western Central Atlantic (Fishing Area 31)*, vols. I-VIII (unpaginated). FAO, Rome.

Review of: Francis Day (1829-1889) and his collections of Indian fishes, by P. J. P. Whitehead and P. K. Talwar. 1976. Bull. British Mus. (Nat. Hist.), Hist. ser., vol. 5, no. 1, 189 p. *Copeia*, 1978, p. 377.

COHEN, D. M., and NIELSEN, J. G.
Guide to the identification of genera of the fish order Ophidiiformes with a tentative classification of the order. *NOAA Technical Report NMFS Circular* 417, 72 p.

COLLETTE, B. B.
Families Batrachoididae, Belonidae, Coryphaenidae, Hemiramphidae, Lampridae, Pomatomidae, Rachycentridae, Scombridae, and Xiphiidae. In: W. Fischer (ed.), *FAO Species Identification Sheets for Fishery Purposes, Western Central Atlantic (Fishing Area 31)*, vols. I-VIII (unpaginated). FAO, Rome.

COLLETTE, B. B., and PARIN, N. V.
Five new species of halfbeaks (Hemiramphidae) from the Indo-West Pacific. *Proceedings of the Biological Society of Washington*, vol. 91, no. 3, pp. 731-747.

COLLETTE, B. B., RUSSO, J. L., and ZAVALA CAMIN, L. A.
Scomberomorus brasiliensis, a new species of Spanish mackerel from the western Atlantic. *Fishery Bulletin*, U.S., vol. 76, no. 1, pp. 273-280.

PÉREZ FARFANTE, I.
Intersex anomalies in shrimp of the genus *Penaeopsis* Crustacea: Penaeidae). *Fishery Bulletin*, U.S., vol. 73, pp. 687-691.

Decapoda, Penaeoidea and Caridea (Shrimps and Prawns), In: W. Fischer (ed.), *FAO Species Identification Sheets for Fishery Purposes, Western Central Atlantic (Fishing Area 31)*, vol. VI (unpaginated). FAO, Rome.

WILLIAMS, A. B.
Transfer to *Pseudomedaeus* of the xanthid crab *Micropanope distinctus* (Rathbun). *Proceedings of the Biological Society of Washington*, vol. 91, no. 2 pp. 546-557.

True crabs In: W. Fischer (ed.), *FAO Species Identification Sheets for Fishery Purposes, Western Central Atlantic (Fishing Area 31)*, vol. VI (unpaginated). FAO, Rome.

WILLIAMS, A. B., and WIGLEY, R. L.
Distribution of decapod crustacea off northeastern United States based on specimens at the Northeast Fisheries Center, Woods Hole, Massachusetts. *NOAA Technical Report NMFS Circular* 407, 44 p.

IN PRESS

COHEN, D. M., and RUSSO, J. L.
Variation in the fourbeard rockling, *Enchelyopus cimbrius*, a North Atlantic gadid fish, with comments on the genera of rocklings. *Fishery Bulletin.*

COLLETTE, B. B.
Adaptations and systematics of the mackerels and tunas. In: *The physiology of tunas*, G. Sharp and A. Dizon, eds., Academic Press, N. Y.

Specimen banking of maring organisms. In: International Workshop on Monitoring Environmental Materials and Specimen Banking.

COLLETTE, B. B., and RUSSO, J. L.
Introduction to the Spanish mackerels, genus *Scomberomorus*. In: *Proceedings of the mackerel colloquium*, E. Nakamura, ed., Gulf Coast Research Lab.

HERBST, G. H., WILLIAMS, A. B., and BOOTHE, JR., B. B.
Reassessment of northern geographic limits for decapod crustacean species in the Carolinian Province, USA; some major range extensions itemized. *Proceedings of the Biological Society of Washington.*

PÉREZ FARFANTE, I.
Penaeopsis jerryi, a new species of shrimp (Crustacea: Penaeidae) from the Indo-West Pacific. *Proceedings of the Biological Society of Washington.*

PEREZ FARFANTE, I., and IVANOV, B. G.
Range extensions of *Penaeopsis serrata* (Crustacea: Penaeidae) to off New Jersey and Rio Grande do Sul. *Proceedings of the Biological Society of Washington.*

WILLIAMS, A. B., and DUKE, T. W.
Crabs (Arthropoda: Crustacea: Decapoda: Brachyura). In: C. W. Hart and S. M. Fuller, eds., *Pollution ecology of estuarine invertebrates.* Academic Press.

INFORMATION AND SERVICES

Technical Information

Specialized technical information was provided to: NMFS Market News, New Orleans on common names of fishes, and Terminal Island on common names for imported shrimps, scampi, and other lobsters; NMFS International Fisheries on lobsters in Turkey, Brazil and other countries and on Chilean crabs; NMFS Office of Marine Mammals and Endangered Species on the snail darter. Also to: FDA regarding common names of imported fishes and Chilean barnacles; State Department concerning Antarctic animals; Congressman Leggett on definitions of species and subspecies; Atlantic States Marine Fisheries Commission about tilefishes; S. Carolina Marine Resources Commission on taxonomy; Virginia Institute of Marine Science on fiddler crabs in Chesapeake Bay; Time-Life and Louisiana State Press about fish cookbooks; Frozen Food Specialties, N.J. on Indo-W. Pacific portunid crabs; National Geographic about crabs; New England Fish Co., Seattle on king crabs; city seafood market, Wash., D.C. about *Macrobrachium*. In addition: Colombia Central Bank about shrimp rearing; the Fishery Section of the Central Bank of Nicaragua; the Instituto Nacional de los Recursos Naturales Renovables, Colombia; and the Eco-Zist Co. of Teheran on shrimp culture.

Identifications

Halfbeaks were identified for the Bishop Museum and the University of New England in Australia. A series of fishes from El Salvador were identified for the University of Massachusetts. Gadoid and/or ophidioid fishes were identified for the Smithsonian Institution; Harbor Branch Foundation; Lamont-Dougherty Geological Observatory; Museum National d'Histoire Natural, Paris; Institute of Oceanographic Sciences, U.K.; and State Museum, Namibia.

A very extensive collection of penaeoid shrimps (about 23,000 specimens belonging to 12 genera and 37 species) were identified from collections at the following institutions: Scripps Institution of Oceanography; British Museum (Natural History); California Academy of Sciences; Allan Hancock Foundation; American Museum of Natural History; Peabody Museum of Natural History, Yale; Instituto Nacional de Pesca, Mexico; University of Panama. Numerous specimens of solenocerid shrimp from northern Australia were identified for the Forestry, Fisheries and Land Conservation Branch, Northern Territory, Australia. Shrimps were also identified for investigators at: NMFS Woods Hole; University of N. Carolina; University of Texas; Texas A&M University; and S. Carolina Marine Resources Commission.

Crabs were identified for investigators at: the University of Florida; St. Andrews Biological Station, New Brunswick; University of North Carolina; San Francisco State University; Smithsonian Oceanographic Sorting Center; Gulf Coast Research Laboratory, Miss.; Virginia Institute of Marine Science; Florida Department of Natural Resources; North Carolina State University; South Carolina Marine Resources Commission, MARMAP Program, (also shrimps).

Curatorial Assistance

Substantial help was furnished to the Smithsonian Institution by handling much material of groups being studied by Laboratory scientists. Assistance in studying the national collections and using the library was provided to numerous scientists, both visiting and by mail.

Maintenance was provided for the Smithsonian collections of scombrid, synentognath, gadiform, ophidiiform and argentinoid fishes. The scombrid material in the fish collection was rearranged and 200 scombroid skeletons were integrated into the skeletal collections. Assistance in borrowing or studying fishes in the fish collection was provided to scientists from the Northeast and Southeast Fishery Centers, University of Massachusetts, University of Miami, California Department of Fish and Game, British Museum (Natural History), Virginia Institute of Marine Science, Clemson University, the University of Ghent, Belgium.

A plan taking cognizance of newly recognized families and genera was provided to the National Museum of Natural History for the reorganization of the penaeoid shrimp collection. Added to the latter were extensive materials from American waters (Brazil, Costa Rica, Panama, Guatemala and the Gulf of California), and the Indo-West Pacific (Mozambique, Pakistan, Timor Sea, and Australia). Crabs and shrimps from North and South Carolina, Georgia, Florida, Texas and Panama were added to the Museum collections.

Manuscripts

Reviews were provided for: NMFS Fishery Bulletin, Circulars, and Special Scientific Reports, Copeia, Occasional Papers of the University of Kansas, the American Midland Naturalist, Smithsonian Contributions to Zoology, Annals of the South African Museum, Publications of the University of Karachi, Fisheries Research Board of Canada, Bulletin of Marine Science, Science, American Geophysical Union, Estuaries, Proceedings of the Biological Society of Washington, Marine Biology, and for colleagues in NMFS, Smithsonian, Oregon State University, Virginia Institute of Marine Science, University of Tokyo, University of Massachusetts, South Carolina Department of Marine Resources, University of Delaware, College of Marine Studies, University of Texas, University of California, and a free-lance author.

Research Proposals

Reviews were provided for Sea Grant, Smithsonian, the National Science Foundation, the American Philosophical Society, and the National Geographic Society.

Collaborators and Visitors

Visitors to the Laboratory included T. Leitzell, J. Wise, G. Moser, D. Flescher, A. Alvariño, A. Merrill, and Richard Langton, all of NMFS; R. White, National Academy of Sciences; E. Anderson, Virginia Institute of Marine Science; R. Shipp, University of South Alabama; T. Berra, Ohio State University; M. Bradbury, San Francisco State University; D. Bourne, Marine Advisors, Inc.; D. Nolf, University of Ghent, Belgium; W. Warner, author, Washington, D. C.; A. Davidson, author, London; L. Ejsymont, Plankton Sorting Center, Gdansk, Poland; D. deSylva, University of Miami; P. Major, U.S. Coast Guard; M. Boeseman, Rijksmuseum van Natuurlijke, Leiden; J. Leis, Marine Ecological Consultants, Solerno Beach, Cal.; L. Taylor, Waikiki Aquarium; J. Lundberg, Duke University; A. Butler, Huntsman Marine Laboratory; two marine biologists from the People's Republic of China; M. Torres, Colombia Central Bank; D. V. Lightner, University of Arizona, S. Ortega, Central Bank of Nicaragua; J. Clamp, North Carolina State Museum; M. Christophersen, Duke Marine Laboratory and University of Sao Paulo, Brazil; G. Herbst, University of Wisconsin; A. B. McCrary, University of North Carolina; R. Heard, G. Goeke and D. L. Adkison, Dauphin Island Sea Lab., Ala.; D. Nations, Northern Arizona State Univ.; K. Shaw, Texas Instruments, Dallas, Texas; L. Abele, Florida State University; R. C. Brusca, and B. Wallerstein, University of Southern California, Allan Hancock Foundation. Dr. N. V. Parin of the P. P. Shirshov Institute of Oceanology in Moscow spent six weeks based in the Laboratory working on a joint review of the Indo-West Pacific marine halfbeaks.

PROFESSIONAL MEETINGS

American Society of Ichthyologists and Herpetologists. Annual meeting in Tempe, Arizona, attended by Cohen and Collette.

American Association for the Advancement of Science. Annual meeting in Washington, D. C., attended by Cohen and Collette.

Society of Systematic Zoologists. Annual meeting in Richmond, Va., attended by Collette and Williams.

Gulf States Marine Fisheries Commission. Annual meeting in Brownsville, Texas, attended by Collette where he presented the introductory paper at the Mackerel Colloquium, "Review of the Spanish Mackerels (genus *Scomberomorus*)," co-authored with Russo.

Impact of Federal Wildlife Regulations on the Systematics/Ecology Community. Meeting sponsored by the Association of Systematics Collections and held at the National Academy of Sciences in Washington, attended by Collette and Cohen.

Symposium on the Composition and Evolution of Crustacean Faunas in Cold and Temperate Waters of the World Oceans. Duke University Marine Laboratory, Beaufort, N. C., attended by Williams (co-convenor) and Canet.

WORKSHOP MEETINGS

Estuarine Research Federation Governor's Board and Atlantic Estuarine Research Society. Meeting in Atlantic Beach, N. C., attended by Williams.

ACADEMIC

Dr. Cohen served on a doctoral committee at the Virginia Institue of Marine Science.

Dr. Collette served on a doctoral committee at the Virginia Institute of Marine Science.

Dr. Williams served on a master's committee at the University of North Carolina, Chapel Hill.

Dr. Collette taught an undergraduate ichthyology course during the spring term at The George Washington University in Washington, D. C. and a graduate ichthyology course during the summer at Northeastern University.

Dr. Cohen taught the fish section of a course on Vertebrates of the Gulf of Maine at the Cobscook Bay Laboratory of Suffolk University.

Lectures or seminars were presented: on the phylogeny of gadiform fishes and on populations of benthic fishes observed from a submersible, at the Smithsonian Institution and at several universities and institutes in Japan and the People's Republic of China by Dr. Cohen; on the morphology and dehiscence of the spermatophores of American white shrimps, genus *Penaeus*, at the Marine Station of the Environmental Research Laboratory, University of Arizona and University of Sonora by Dr. Canet; on Spanish mackerels at the Virginia Institute of Marine Science and on the results of the Tektite Program at the Field Museum of Natural History in Chicago by Dr. Collette; on research in invertebrate zoology at the National Museum of Natural History at the University of North Carolina by Dr. Williams.

OTHER ACTIVITIES

Smithsonian Institution. Cohen and Collette were Research Associates of the Department of Vertebrate Zoology and Canet and Williams of the Department of Invertebrate Zoology. Williams served as a member of the Oceanographic Sorting Center Arthropod Advisory Committee and as a member of the Special Event Alert Network Advisory Committee.

Museum of Comparative Zoology, Harvard. Collette continued to serve as a Research Associate in the Department of Ichthyology.

American Society of Ichthyologists and Herpetologists. Collette continued to serve as Secretary of the Society and on the Environmental Quality and Ichthyological Collections committees. Cohen served on the Board of Governors and was appointed to the Long Range Planning and Finance Committee.

Fishes of The Western North Atlantic. Collette and Cohen continued to serve on the Board of Editors.

U.S.-U.S.S.R. Cooperation in Studies of The World Ocean During 1975-1980. Cohen helped to plan a workshop on the "Systematics of Fishes In Cold and Temperate Waters of the World Ocean". Williams was co-convenor of a workshop, "Symposium on the Composition and Evolution of Crustaceans in the Cold and Temperate Waters of the World Ocean", Duke University Marine Laboratory, October 20-22, and Editor of the proceedings.

Estuarine Research Federation. Williams served as Chairman of the Publications Committee.

Biological Society of Washington. Cohen and Collette served on the Council.

STAFF

Daniel M. Cohen	Ichthyologist and Laboratory Director
Bruce B. Collette	Ichthyologist
Isabel C. Canet	Carcinologist
Austin B. Williams	Carcinologist
George E. Clipper	Scientific Assistant
Joseph L. Russo	Scientific Assistant (from 11/07/77 until 09/01/78)
Billy B. Boothe	Scientific Assistant (from 04/24/78 until 10/23/78)
María M. Farfante	Scientific Illustrator and Scientific Assistant
Keiko H. Moore	Scientific Illustrator and Scientific Assistant
Arleen S. McClain	Administrative Assistant and Secretary
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