Who's Working on Aquaculture in Mangroves?

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Mangrove areas around the world have been a traditional site for aquaculture on account of their regular water supply and proximity to seed source.

This article characterizes the literature on this subject. We used the Aquatic Sciences and Fisheries Abstracts (ASFA) covering the period 1971-1988, the ICLARM library and professional staff collections. The papers selected for this article explicitly mention use of the mangroves for aquaculture.

The majority (93%) of the 160 publications we found were written in English. Other languages used were Spanish, French, Indonesian and Thai. Conference proceedings papers made up 51% of the total. There were four reviews, two theses, and a textbook.

Two thirds of all publications were put out by Asia-based authors. One-tenth originated in Latin America and the Caribbean. A few papers also came from Africa, Australia and North America (Fig. 1).

The literature surveyed was classified into several broad groups. Fig. 2 shows the growth in time of the literature in these groups.

Although the first paper on this subject was published in 1953, the literature grew little until the 1970s (Fig. 2). Papers on aquaculture development in mangrove areas increased 17 times over the previous decade. This could be attributed to the National Symposium/Workshop on Mangrove Research and Development and the International Workshop on Mangrove and Estuarine Area Development for the Indo-Pacific Region, both held in Manila, Philippines, in 1977.

Resource management papers first appeared in the early 1970s. A recent, important publication in this area is "Mangrove Mapping in Ecuador: The Impact of Shrimp Pond Construction" by a group headed by A. Terchunian of the College of Marine Studies, Center for Remote Sensing, Newark, Delaware, 19716, USA (1986).

Readers interested in mangrove pond engineering may look up the "Report of consultation/seminar on coastal fishpond engineering, 4-12 August 1982, Surabaya, Indonesia", available from the ASEAN/UNDP/FAO Regional Small Scale Fisheries Development Project Preparatory Assistance, Third Floor Arcadia Building, 860 Quezon Avenue, Quezon City, Philippines, and "Construction of Brackish-water Fishponds in the Niger Delta" (1985) (in: The Mangrove Ecosystem of the Niger Delta: Proceedings of a Workshop edited by B.H.R. Wilcox and C.P. Powell, which should be available from the National Institute of Oceanography and Marine Research, Port Harcourt, Nigeria.

Two bibliographies may be useful: 1) "The Bibliography on Mangrove Research 1600-1975" compiled by B. Rollet and published by the United Nations Educational, Scientific and Cultural Organization (UNESCO), 7 Place de Fontenoy, 75700 Paris, France; 2) "Bibliography on Mangrove soils: Annotated Bibliography no. SH-1800 covering the published literature for 1957 to 1974. Thionic Fluvisols" published by the Commonwealth Agricultural Bureaux: Farnham Royal, Slough, England.

H.R. Rabanal of the ASEAN/UNDP/FAO Regional Small Scale Fisheries Development Project Preparatory Assistance, (address mentioned above), T. Singh of the Fisheries Development Authority, Malaysia (LKIM), P.O. Box 12630, 50784, Kuala Lumpur, Malaysia, and Ali Punoromo, Director, Research Institute for Coastal Aquaculture, Jln. K.S. Tuban P.O. Box 30 Palmerah, Jakarta, Indonesia are three resource persons.

One compilation, Proceedings of the Workshop on Conversion of Mangrove Areas to Aquaculture, 24-26 April, 1986, Iloilo, Philippines provides an overview of the current thrusts in research.

Here are two centers of information one may contact: Project Coordinator, REMIN-REMIC Project, Ministry of Natural Resources, The Regional Mangrove Information Center for Asia and the Pacific, 8th Floor, Triumph Building, 1610 Quezon Avenue, Quezon City, Philippines, which has an extensive collection of mangrove-related publications and is updating the Rollet bibliography mentioned above. Mr. R.S. Jara is presently in charge. The second is the Brackishwater Aquaculture Information System, c/o SEAFDEC Library, Tigbauan, Iloilo, Philippines. ●

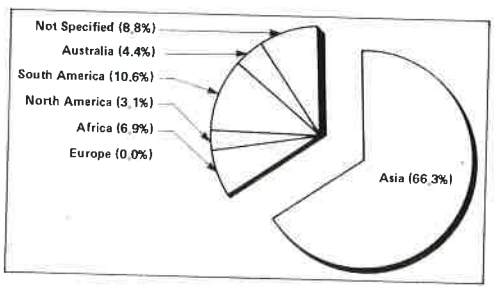

Fig. 1. Regional distribution of publications.

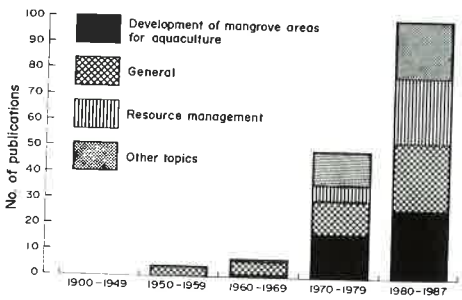

Fig. 2. Proportions of papers on different research areas and their growth from 1900 to 1987.

Who's Working on Tilapia and Carp Diseases?

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This article characterizes the literature on diseases of tilapia and carp and indicates how those interested can have access to this literature and contact experts.

The Aquatic Sciences and Fisheries Abstracts (ASFA) covering the period 1971-1988, ICLARM library and professional staff collections were used to characterize the literature and prominent authors.

The overwhelming majority of the 536 items found were written in English. A total of sixteen other languages, mostly German, French, and Chinese were used.

Journal articles and papers presented in various conferences and symposia constituted the bulk of the material (91%).

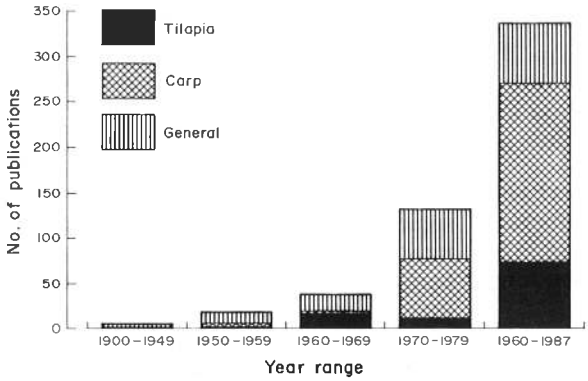

Fig. 1. Proportion of papers on tilapia, carp and other fishes for each decade, beginning 1900.

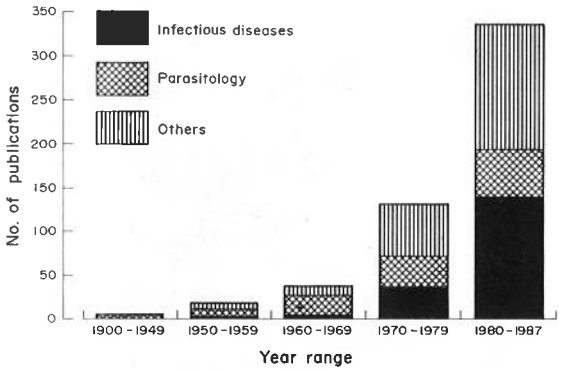

Fig. 2. Proportion of papers on infectious diseases and on parasitology for each decade, beginning 1900.

General texts (6%), reviews (1.5%), three theses, and a bibliography made up the rest.

Publications on the diseases of tilapia and carp began early in this century, with the article by C.M. Wenyon in 1908 entitled "Report of a travelling pathologist and protozoologist".

Papers particularly on tilapia or carp diseases made up nearly three-fourths of the publications surveyed (71%). More papers have been published on carp (51%) than on tilapia (20%), but the number of tilapia papers is increasing at twice the rate of carp papers (Fig. 1).

Parasitology

By the first quarter of this century, research was already underway on the parasitology of tilapiine fishes in Africa. For instance, H.A. Baylis was working on parasitic nematodes and R.P. Dollfus was working on parasitic copepods. Researchers based in Africa put out most of the parasitology literature until the late 1960s. European-based researchers took over in the 1980s. Among the prominent authors are I. Paperna, now of the H. Steinitz Marine Biological Laboratory, Hebrew University, P.O. Box 469, Eliat 88103, Israel, on tilapia parasitology in Africa; and K. Molnar, a parasitologist at the Hungarian Academy of Science, Veterinary Medicine Research Institute, 1581, Budapest, P.O. Box 18, Hungary, on carps and other fishes. The growth of literature on this subject was greatest in the 1960s, but started to wane in the 1970s. Parasitological publications made up 24% of the total.

Infectious Diseases

More than a third (34%) of the papers surveyed dealt with infectious diseases. The leading institution, at least for third-world disease problems, is the Institute of Aquaculture, University of Stirling, Stirling, Scotland. D. Kumar of the Laboratory of Icthyopathology and Fish Health Protection, Kausalyagang, Bhubaneswar-751002, India has several papers on carp infectious diseases and their control. J. Olah, a pathologist at the Fisheries Research Institute, H-5541, Szarvas, Hungary has written and edited publications on carp diseases.

Papers on disease control, 9% of the literature surveyed, began to be published by the 1960s and increased by a factor of three during 1969-1979 and again during 1980-1987.

Results of investigations on environmental diseases such as gas bubble disease (7% of the literature) began to be published in the 1950s. There was a rapid increase through the 1970s.

Ten per cent of papers were on other afflictions such as genetic diseases, abnormalities, nutritional deficiencies, carcinomas, as well as papers on histology and immunology. Of these, immunological studies manifested the largest increase. The remaining 16% of the papers were of a general nature, not particular to one disease. Fig. 2 shows the numbers over time.

Publications from Europe have shown a rapid (logarithmic) growth since the 1960s, while those from Asia and most other regions have shown lesser (linear) increases. Africa has shown a decline since the start of the 1970s.

Here are some publications the reader might begin with. The Journal of Fish Diseases; senior editor, Prof. R.J. Roberts, is the Director of the Institute of Aquaculture, University of Stirling, Scotland. The Hatchery Manual for the Common, Chinese and Indian Major Carps, by V.G. Jhingran and R.S.V. Pullin (2nd edition 1988, published by ICLARM), devotes an up-to-date chapter on carp diseases. Parasites and Diseases of Fish Cultured in the Tropics by Z. Kabata published by Taylor and Francis, 4 John St. London, UK provides an excellent overview of fish maladies. Fish Quarantine and Fish Diseases in South and Southeast Asia: 1986 Update (Asian Fisheries Society Special Publication No. 1 c/o ICLARM) presents the most recent research results in that region. Fish, Pathogens, and Environment in European Polyculture, Symp. Biol. Hung. vol. 23, 1984, edited by J. Olah provides a window into European research in this field. The proceedings of the Second International Symposium on Tilapia in Aquaculture 16-20 March 1987, in preparation at ICLARM, will contain a worldwide cross-section of recent research.

Here are some organizations which may lead to further contacts: The Asian Fisheries Society (c/o ICLARM) has a Fish Health Study Group; Mr. Jose Natividad of the BFAR/IDRC Fish Health Project, Bureau of Fisheries and Aquatic Resources, 880 Quezon Avenue, Quezon City, Metro Manila 3008, Philippines; The American Fisheries Society, 5410 Grosvenor Lane, Suite 110, Bethesda, MD 20014, USA, also has a Fish Health Section. Another is the European Association of Fish Pathologists, State Fish Epidemics Control Service, Eintrachweg 17, D-3000, Hanover 1, Federal Republic of Germany.

The Selective Fisheries Information Service (SFIS) based at ICLARM can provide information on tilapia and carp diseases. Write to Selective Fisheries Information Service, ICLARM, MC P.O. Box 1501, Makati, Metro Manila, Philippines, for details and costs involved. ●