Who's Working On Tropical Fish Seed Transport?

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The unavailability of high quality finfish and shellfish seed is a hindrance for many tropical aquaculturists. Naturally spawned or hatchery-produced seed are transported up to hundreds of kilometers by land, water or air to meet the increasing demand. Transport equipment varies from oxygen-saturated polyethylene bags to specialized boats or trucks. Basically, two systems are utilized – an open system, with an external apparatus supplying life support factors, and a closed system which is sealed and self-contained. The single most important factor is an adequate oxygen level. Other water quality parameters – temperature, salinity (for brackishwater seed), pH, hardness, concentrations of toxic metabolites, plus fish density and activity must be maintained within limits. Seedstock (and live fish) transport is well-documented in the developed countries but less so in the tropics.

Aquatic Sciences and Fisheries Abstracts (ASFA) from 1971 to 1989, and ICLARM library and professional staff collections were searched. Aquatic plants and items relating to general issues on transfer of species, quarantine and environmental impacts were not considered.

Some 72 articles spanning four decades from 1949 were found. Publication rate increased rapidly after the mid-1970s (Fig. 1). Less than one article per year was published prior to 1970, 1.2 articles per year during the 1970s, and 5.1 articles per year in the 1980s.

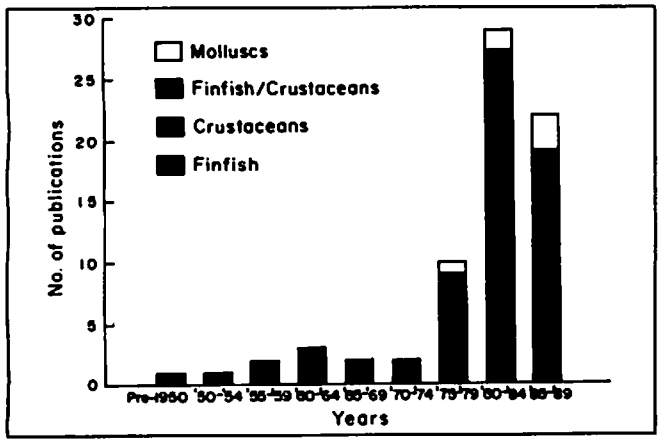

Fig. 1. Growth of the literature over time. Note there is a delay in the inclusion of materials in the databases used. N = 72.

There were more materials on finfish – milkfish, carp, mullet, rabbitfish, grouper, and seabass (together 68%) than on crustaceans – penaeids and freshwater prawn, (22%) or bivalves – mussel and giant clam (8%). The remainder (3%) covered both finfish and shellfish. Most of the finfish literature was on either milkfish or carp, while the majority of crustacean literature was on penaeids.

Journal articles were a slight majority (39%). Other publication vehicles were proceedings of symposia, conferences or workshops (31%); reports (14%); extension materials and manuals and special issues (altogether 17%). Nearly all were in English (93%). The remainder were in Spanish (3%), French (3%) and Thai (1%).

Recent Publications

Some recent publications include: *Important fish and shrimp fry in Philippine waters: identification, collection and handling* by T.U. Bagarinao et al., published in 1986 by the Aquaculture Department of the Southeast Asian Fisheries Development Center (SEAFDEC) as Aquaculture Extension Manual No. 10. It touches on the biology, fry grounds and seasons, collection, storage and transport of milkfish, seabass, siganid, and penaeid fry in the Philippines. V.G. Jhingran and R.S.V. Pullin's *A hatchery manual for the common, Chinese and Indian major carps* published jointly in 1988 by the Asian Development Bank and ICLARM, Manila, devotes a chapter on the transport of live fish seed and broodfish. *Improved fish transport in plastic bags* which appeared in the ICLARM Newsletter 8(4):8-9 (1985) and *Relationship between body weight and loading densities in fish transport using the plastic bag method* which appeared in Aquaculture and Fisheries Management 19(3):275-281 (1988) are both by R. Fröese. *Effect of desiccation of* Tridacna gigas *seed, pure oxygen improves survival during transport* by E.P. Solis and G.A. Heslinga appeared in Aquaculture 76:169-172 (1989). *Preliminary trials on transport of fry of* Hilsa ilisha *(Ham.)* by D.K. Das, D. Nath and P.R. Sen appeared in the Indian Journal of Fisheries 33(4): 481-482. Although nontropical, mention must be made here of *The transport of live fish: A review* by R. Berka published as the European Inland Fisheries Advisory Commission (EIFAC) Technical Paper 48 in 1986 by EIFAC, Food and Agriculture Organization, Rome.

Institutions and Contact Persons

SEAFDEC Aquaculture Department, P.O. Box 256 Iloilo City, Philippines (contact T.U. Bagarinao or the Brackishwater Aquaculture Information System [BRAIS]), has other publications on investigations on the collection, handling and transportation of penaeid and milkfish fry conducted at their facilities. A sizable portion of the publications came from the Indian subcontinent, many from the various stations of the Central Inland Fisheries Research Institute (CIFRI). For information on carp (as well as other finfish and shellfish) seed transport, contact A.G. Jhingran at CIFRI, Barrackpore, West Bengal 743-101, India. G.A. Heslinga with colleagues from two different research stations in the Philippines has worked out transport techniques for *Tridacna*. He may be contacted at the Micronesian Mariculture Demonstration Center, P.O. Box 359, Koror, Republic of Palau 96940.

ICLARM can provide more information on aquaculture seed transport. Write to Selective Fisheries Information Service, ICLARM, MC P.O. Box 1501, Makati, Metro Manila, Philippines, for details and costs involved.