

PRELIMINARY RESULTS OF ACOUSTIC TARGET STRENGTH MEASUREMENT OF BIGEYE (*THUNNUS OBESUS*) AND YELLOWFIN TUNA (*THUNNUS ALBACARES*).

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For the first time, in situ acoustic target strength of 4 yellowfin tuna (*Thunnus albacares*) and 2 bigeye tuna (*Thunnus obesus*) of 4 to 50 kg have been estimated. These fish were individually caught, identified and measured, then equipped with ultrasonic tags for telemetry experiments. During the tracking operation, simultaneous underwater acoustic data were recorded with a split beam echo-sounder. When the fish is under the transducer of the research vessel, a corresponding acoustic signal is reflected to the echo-sounder. Then, acoustic echoes can be compared with depths of the tagged fish to identify target strength of the fish, taking into account vertical movements of fish and possible effects on target strength measurements. Applications of those results in tuna studies are numerous. Acoustic is an excellent method to observe individuals or schools in their environment for tuna behavior studies. For abundance estimation of subsurface tuna stocks, acoustic has the advantage to be independent of catchability thus of CPUE. Knowledge of individual target strength of tuna is the previous condition of those kinds of studies.

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In aquaculture man has taken advantage of the large number of fish species and their biological diversity. Over about 25.000 species more than 100 are cultivated, and, for few of them, the production is high, about 7 and 0.7 millions tonnes/year for cyprinids and salmonids respectively. There are now many attempts to rear new species either to compensate for overexploitation of stocks (cod, tuna...) or for conservation purpose (endangered species such as sturgeons, ornamental fish). Finally the large number of cultivated fish reflects the diversity of fish caught by fisheries and offered to the market; the consumer is then expecting some diversity of species and products from aquaculture. Man is also taking advantage of the fish biological diversity in the case of polyculture as practiced in China. In intensively manured ponds, in inland waters, several fish species, especially cyprinids, exhibiting complementary feeding habits, are stocked and consume food at the different levels of the trophic web. The most commonly used species are the silver carp *Hypophthalmichthys molitrix* feeding on microalgae and microzooplankton, the grass carp *Ctenopharyngodon idela* on macrophytes, the bighead *Aristichthys nobilis* and the common carp *Cyprinus carpio* on zoobenthos and macrozooplankton. Other species are also introduced, taking advantage of other niches such as the black carp *Mylopharyngodon piceus* which eats molluscs. Similar systems are operating in India with the indian major carps. These system are deeply integrated with agriculture and represent an efficient way of recycling wastes (integrated fish farming). The productivity is high, in average more than 3t of fish/ha/year in China, which is much higher than in any other system of animal production consuming only primary production (grass). Presently polyculture yields 5 millions t/fish/year *i.e.* 50 % of the total production of fish culture in the world.

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