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Yellowfin Seabream, A Target Species for Monitoring of Coastal Pollutants

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Fish Species for Eco-Toxicological Studies

For several reasons, fish species have attracted considerable interest in studies assessing biological and biochemical responses to contaminants. Despite their limitations, such as a relatively high mobility, fish are generally considered to be the most feasible organisms for pollution monitoring in aquatic systems. Fishes are by far the most diverse class of vertebrates; the 28,000 species identified to date are greater than the combined numbers for the other classes [1].

This taxonomic diversity is reflected in a diversity of body forms, lifestyles, and physiologies, which also reflect the great diversity of aquatic systems that fish inhabits, from freshwater to hypersaline waters, with temperatures ranging from below freezing to >45°C, pressures ranging from 1 to 1000 Atm, and other variability's in solar radiation, oxygen concentrations, ionic and organic matter compositions, turbulence, bottom environments, and so forth. This diversity has driven the use of fishes for scientific inquiries into the influences of environmental variables on the evolution and adaptations of organisms [2].

The study of mechanisms of toxicity in fish involves two distinct rationales, with fish serving both as targets and as models. Clearly, fish are targets for environmental contaminants; some fish populations are highly exposed to chemicals, especially in urban, industrial, or coastal sites (e.g. Yellowfin seabream) [3]. These fish are studied because of concern for population-level effects or as sentinels for the health of the environment. In addition, they may be subjects of research to investigate the mechanisms involved in physiological adaptation to chemical exposure [4].

Fish also are widely used as animal models in toxicological research, with the ultimate goal of extrapolating the results to inform questions concerning the potential human health effects of chemical exposure. Thus, research in fish toxicology involves a two-way extrapolation, with human results being used to establish mechanisms of relevance to fish as targets, and fish being used as models to address specific mechanistic questions with application to human health.

Several criteria should be used in selecting fish species for ecotoxicological testing [2]:

- Widely available fish species with adequate background information.
- Fish species with a known history of diverse sensitivities and behavioral strategies.
- Indigenous, representative fish species of the receiving system being studied should be considered first. If definable and possible, a keystone fish species should be used. Keystone species are those that influence a community because they play a significant role in the community, not because of their numerical dominance.
- Species must be amenable to culturing and maintenance in the laboratory.
- Test species can be collected from wild populations, cultured in the laboratory or purchased from a commercial supplier.

Yellowfin Seabream, Suitable Marine Fish Species

Yellowfin Seabream (*A. latus*) known as Grey Bream, Japanese Silver Bream, Yellow Sea Bream, Yellow Seabream, Yellow-Finned Black Porgy). It is belongs to Phylum: Chordata (chordates), Subphylum: Vertebrata (vertebrates) Infraphylum: Gnathostomata (jawed vertebrates), Superclass: Osteichthyes (bony fishes), Class: Actinopterygii (ray-finned fishes), Order: Perciformes (perch-like fishes), Suborder: Percoidei, Family: Sparidae, Genus: Acanthopagrus and Species: Acanthopagrus latus [5] (Figure 1) with max size 50.0 cm TL (male/unsexed); and max weight: 1500 g. It lives in demersal environment of freshwater, brackish and marine water within 34°N - 20°S, 48°E - 154°E (including Indo-West Pacific: Persian Gulf and along the coast of India to the Philippines, north to Japan, south to Australia). It Occurs in shallow coastal waters and enters river mouths and estuaries. Often feeds in tidal flats, mainly on echinoderms, worms, crustaceans and mollusks [6].

A. latus is a protandrous hermaphroditic sparid (Porgies) [3]. Yellowfin seabream, the natural inhabitant of the creeks studied, are found in the shallow water of the intertidal zone that experiences dual fluctuations in both temperature and salinity. This fish is under threat because of their continuous exposure to toxic chemical-rich industrial effluents that are discharged into the creeks.
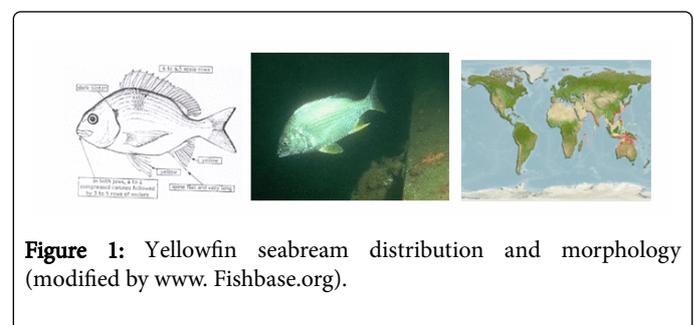

Figure 1: Yellowfin seabream distribution and morphology (modified by www. Fishbase.org).

Yellowfin sea bream is considered to be one of the most commercially important marine fish in Iran, due to its consumer preference and is newly successful cultured in the coastal area of Iran, especially in Khuzestan province. These economically important fish are under threat because of their continuous exposure to toxic

chemical-rich industrial effluents that are discharged into the Persian Gulf and their enclosed creeks. wild stocks of sea bream have declined substantially in recent years [3], owing to overexploitation, pollution and illegal fishing practices, there is an urgent need to revive them through processes of conservation, management, and mariculture, knowledge of the mainly common pollution effect on vital organ of this fish, is a basic prerequisite for successful management, and also for correct interpretation of ecological investigations [7], so yellowfin sea bream, bottom-dwelling fish that bring them in intimate contact with sediment during parts or all of their life, is suitable candidate for toxicology testing.

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