

The susceptibility and resistance of fry and fingerlings of *Oreochromis mossambicus* Peters to some pesticides commonly used in Sri Lanka

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Summary

The acute toxicity (48 hr LC₅₀) of seven herbicides, three acaricides and eight insecticides used in the control of agricultural pests in Sri Lanka to the fry and fingerlings of *Oreochromis mossambicus* Peters were investigated in freshwater at 28–29 °C under static laboratory conditions.

The fry were more susceptible to the pesticides tested than were the fingerlings. Most of the pesticides tested induced severe behavioural changes in the exposed fish. Exposure to some herbicides and insecticides resulted in lateral and upward bending of the body, while higher concentrations of some pesticides caused excessive mucous secretions, rupturing of eyes and production of haemorrhagic patches.

Of the pesticides tested on fry and fingerlings, Ronstar, Elsan and Endosulfan are the most toxic herbicide, acaricide and insecticide, respectively, while Basfapon, Rogor and Azodrin 60 are, respectively, the least toxic herbicide, acaricide and insecticide.

Introduction

Many types of pesticides have already been developed and marketed worldwide for horticultural and agricultural, as well as veterinary and medical purposes.

Depending partly on the nature of their chemical constituents, pesticides may disturb the balance in an aquatic ecosystem in a number of ways. They may destroy plankton, rooted vegetation and invertebrate species, however, the ultimate effect likely to become most evident is that on the fish populations. Pesticides could influence the growth rate, behaviour or the survival of the progeny; effect on the latter may be the most important in the long term. The recent work on the toxicity of various pesticides to fish has been extensively reviewed by MURTY (1986 a & b).

The inland fish production in Sri Lanka is around 30,000 tonnes. Inland fisheries as a significant commercial undertaking in Sri Lanka did not begin until the 1950s, when *Oreochromis mossambicus* was introduced. Today, almost 90 % of the current inland fish catch consists of *Oreochromis mossambicus*.

Because of the importance of tilapia species in commercial fisheries of tropical inland waters, a number of studies on the effects of various pesticides on different species of tilapia have been already carried out mostly on adult fish (PEILOU 1946; WEBBE & SHUTE 1959; BOYCE et al. 1966; SAILATHA et al. 1981; KABEER AHAMED SAHIB et al. 1983; SIVAPRASADA RAO et al. 1983; PASTEUR 1985; RADHIAH et al. 1986; GURURE 1987). However, the effects of a number of new pesticides commonly used for pest control remain to be tested specially on *O. mossambicus*, particularly on the most sensitive stages of this fish.

Résumé

Susceptibilité et résistance du frai et des alevins de Oreochromis mossambicus Peters envers quelques pesticides souvent utilisés à Sri Lanka

La toxicité imminente (48 h LC₅₀) de sept herbicides, trois acaricides et huit insecticides employés dans la lutte anti-parasitaire dans l'agriculture de Sri Lanka pour le frai et les alevins de *Oreochromis mossambicus* Peters a été étudiée en eau douce à 28–29 °C dans des conditions de laboratoire statique. Le frai étaient les alevins. La plupart des pesticides testés provoquaient de graves modifications du comportement chez les poissons. L'exposition à quelques herbicides et insecticides avait pour résultat une torsion du corps latérale et vers le haut alors que des concentrations plus fortes de quelques pesticides causaient des sécrétions muqueuses excessives, une hernie des yeux et la production de taches hémorragiques. Parmi les pesticides testés sur le frai et les alevins, Ronstar (herbicide), Elsan (acaricide) et