

SOME TOXICOLOGICAL AND BIOLOGICAL STUDIES
ON THE FRY AND FINGERLINGS OF
Sarotherodon mossambicus (Peters).

A THESIS PRESENTED FOR THE DEGREE OF
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ABSTRACT

Part 1

Seven weedicides, three acaricides and eight insecticides commonly and currently used in agricultural practice in Sri Lanka were tested to determine their toxicity to the fry and fingerlings of Sarotherodon mossambicus. The results of the acute toxicity tests suggest that of the pesticides tested Ronstar, Elsan and Endosulfan are the most toxic weedicide, acaricide and insecticide respectively.

The experimental results indicate that in the order of decreasing toxicity to the fry the pesticides tested could be listed as follows :-

(a) Weedicide :

Ronstar > Propanex > Lorox > Stam F-34 >
Gramoxone > Agroxone > Basfapon.

(b) Acaricide :

Elsan > Dicofol > Rogor-40.

(c) Insecticide :

Endosulfan > Aldrex 25 > Ambush >
Gammalin 20 > Endrex 20 > Super Sumithion >
Actellic 50 > Azodrin 60.

In the case of fingerlings, the rank order of decreasing toxicity of pesticides to them is as follows :-

(a) Weedicide :

Ronstar > Lorox > Propanex > Stam F-34 >

Gramoxone > Agroxone > Basfapon.

(b) Acaricide :

Elsan > Dicofol > Rogor-40.

(c) Insecticide :

Endosulfan > Aldrex 25 > Ambush >

Gammalin 20 > Endrex 20 > Actellic 50 >

Super Sumithion > Azodrin 60.

Endosulfan appears to be highly toxic to both stages of the fish. The 48-hour LC_{50} value for the fry was 0.00067 p.p.m. and that for the fingerlings was 0.0065 p.p.m. This pesticide has comparatively the most toxic effect on S. mossambicus.

The results of these bioassay tests also suggest that among the pesticides tested Basfapon, Rogor-40 and Azodrin 60 are respectively the least toxic weedicide, acaricide and insecticide.

The toxicity of Basfapon appears to be very low. Its 48-hour LC_{50} values for the fry and fingerlings were 1122.02 and 1595.88 p.p.m. respectively. In comparison with the other pesticides, Basfapon seems to have the least toxic effect on S. mossambicus.

The fry and fingerlings exposed to these pesticides exhibited spinal bending even at dilute concentrations. A variety of symptoms were displayed by the fry and fingerlings in these solutions. These included excessive mucous secretion around the eyes (e.g. in Actellic 50 and Ronstar) and haemorrhage in the snout, eye and opercular regions (e.g. in Lorox and Stam F-34).

Part 2

Achatina fulica is a common terrestrial gastropod mollusc which is now an important pest in Sri Lanka. Experiments were carried out to test the possibility of using the flesh of this pest as food for the culture of Sarotherodon mossambicus.

The chemical analysis of A. fulica showed that the flesh of the muscles of its foot consists of 49.6% protein, 33.3% carbohydrates and 10.7% lipid.

Fingerlings measuring ~~3-4~~ cm. in total length and 0.2-0.4gm. in weight were used in the experiments which were carried out over a period of 12 weeks. The results showed that higher growth rates (average 0.07 gm/day) were exhibited by fingerlings which were fed with A. fulica flesh as supplementary food than those fed with chicken feed (average 0.03 gm/day). The growth rates were found to be least in those fingerlings which were not fed with any accessory food material (average 0.02 gm/day).

The feasibility experiments conducted showed that the flesh of A. fulica could be profitably utilized in the culture of S. mossambicus.