USE OF *AZOLLA* SPP. (FILICOPHYTA: AZOLLACEAE) AS THE MAJOR SOURCE OF FEED IN THE POND CULTURE OF MACROPHYTOPHAGOUS FISH SPECIES.

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1.0 SUMMARY

A major problem for developing aquaculture in Sri Lanka is the high cost of fish feed. *Azolla* which is currently being tried as a green manure in rice farming is used as a fish feed in other Asian countries such as China, Thailand and Philippines. The suitability of *Azolla* as a fish feed in Sri Lanka was investigated in this project.

Seven fish species suitable for aquaculture were screened for their acceptance of *Azolla* as a feed. *Ctenopharyngodon idella, Oreochromis niloticus, Trichogaster pectoralis, O. mossambicus, Etroplus suratensis, Labeo rohita and Cirrihinus mrigala* showed positive growth rates on *Azolla* in that order.

Feeding experiments using the two species of *Azolla* available in Sri Lanka, namely, *A. imbricata* and *A. pinnata,* showed that better growth of fish is achieved when fed on the former species.

The growth of *A. imbricata* was tested on locally available bio-fertilisers such as cow dung, goat manure and chicken manure. The growth was found to be highest in cow dung.

The effect of *Azolla* floating mat on water temperature, pH and dissolved oxygen concentration (dO_2) in fish tanks up to a depth of one meter was investigated. The dO_2 and pH were found to be low when *Azolla* mat was present, but they were quite within the tolerable ranges of fish species tested. The temperature did not show a consistent difference between tanks with and without *Azolla.*

Fish species tested, except *Ctenopharyngodon idella,* showed higher growth rates on *Azolla* than on the other aquatic weeds such as *Elodea canadensis, Nitella flagellifera,* and *Spirodella polyriza.* However, *Ctenopharyngodon idella* showed the highest growth rate on *N. flagellifera.* The growth rates of fish species tested, except that of *Ctenopharyngodon*

idella, were significantly (at 5% level) less than that on a dry formulated feed (which contained 31.8% crude protein).

Ctenopharyngodon idella and *O. niloticus* were tested for growth rates at three stocking densities, 10,000, 25,000 and 40,000 ha^{-1}, and it was found that the lowest density was the best for growth. The growth of fish was found to be much better in larger tanks than in smaller tanks.

Proximate analysis of *A. imbricata* showed that it contained 19.4% crude protein, 5.4% lipid and 22.7% crude fibre.

The present study shows that *Azolla,* which could easily and cheaply be grown, and can be used as a cheap source of feed for the grass carp (*Ctenopharyngodon idella*) and the Tilapia species, *O. niloticus mossambicus* and *O. niloticus* in pond culture in Sri Lanka.