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ACULTURE PRODUCTION POTENTIAL OF *OPHICEPHALUS STRIATUS* BLOCH IN A PEATY SWAMP OF SRI LANKA

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The snakehead, *Ophicephalus striatus* was grown two ponds dug in the Muthurajawela swamp, a low peaty swamp in Sri Lanka to evaluate their luction potential at 2 stocking densities. The ls which were 172 m^2 and 160 m^2 in surface area 1 m in depth, were initially fertilized with -dung and were stocked with forage fish species *tius vittatus* at a density of 20 individuals/ m^2. the forage fish population was established, erlings of *O. striatus* measuring 11.0 cm to cm in total length were stocked at the ities of 3750 and 5750 individuals/ha. During culture period of 9 months, the gross primary uctivity of the ponds were maintained above 1.1 /day^{-1} by fertilizing with cow-dung at every 4 s interval. The recovery rates of *O. striatus* he end of the culture period were 52% and 58% ectively for the stocking densities of 5750 and individuals/ha and the respective yields were mated to be 553.6 kg/ha/year^{-1} and 579.9 a/year^{-1}.

oduction

The snakehead, *Ophicephalus striatus* Bloch is ured in many south east Asian countries as it hes a high market price compared to other hwater species (Muir and Roberts, 1982). Since flesh is firm, palatable and practically less, it is one of the most popular freshwater fishes in Sri Lanka (Kilambi, 1986).

Because of its carnivorous habit, it is used in polyculture to control the population size fish species such as Tilapia (Cruz and ncia, 1980).

O. striatus is capable of tolerating extreme ronmental conditions such as low pH (Varma,). It is present in large numbers in the rajawela swamp, a low lying peaty swamp in the coast of Sri Lanka, which covers an area of d 3000 ha (Fig. 1). This swamp is characterized acidic and low primary productivity (Costa and iahetty 1987).

Due to high abundance of *O. striatus* in this , this study was carried out to investigate on feasibility of aquaculture of this species in H and less productive swamp conditions.

Earlier studies have shown that the food rsion efficiency of *O. striatus* is higher in H swamp conditions than in neutral pH normal tions (Wijeyaratne, 1989). The yield of this es from aquaculture in dug-out ponds in the at a stocking density of 9000 individuals ha^{-1} een estimated to be 543 kg ha^{-1} for a period of nths (Wijeyaratne, 1990).

The present study was carried out from June to February 1990 to determine the optimum ing density of *O. striatus* in dug out ponds in uthurajawela swamp and to study the ecological iency of conversion of primary productivity *O. striatus* production in order to determine quaculture production potential of this species w pH swamp conditions.

Materials and Methods

Fingerlings of the snakehead, *O. striatus* ranging in total length from 11.0 cm to 14.5 cm were stocked in two dug out ponds in the Muthurajawela swamp at densities of 3750 and 5750 individuals ha^{-1}. The ponds were 172 m^2 and 160 m^2 in surface area and were 1.0 m in depth. Six weeks before stocking the ponds were fertilized with cow-dung added at a rate of 0.5 kg m^{-2} as suggested by Samarakoon and van Zon (1991). After fertilizing, ponds were inoculated with algae rich green water from a highly eutrophic freshwater lake as suggested by Costa and Keembiahetty, 1987). Two weeks after fertilizing, the ponds were stocked with *Puntius vittatus* collected from the swamp to be used as forage fish for *O. striatus*. The stocking density of *P. vittatus* were 20 individuals m^{-2}. At the time of stocking of *O. striatus* fingerlings, *P. vittatus* populations were well established in the two ponds.

During the growing period of *O. striatus* fertilizing of the ponds with cow-dung and inoculation with algae rich green water were carried out at every 4 week interval.

Primary productivity and plankton respiration of the pond water were measured weekly by the light and dark bottle technique and the pH value was measured using a portable pH meter (Model: Hach 17200). The dissolved oxygen content of water was measured every other day between 09.00 hours and 11.00 hours using a oxygen meter (model: Hach 16040-00). The water temperature at the surface was recorded using a glass thermometer.

After the growing period of 9 months, cultured fish were caught using cast nets and seines. The total length and weight of the individuals caught were recorded.

In the calculation of ecological efficiency of conversion of primary productivity into *O. striatus* productivity, 10 g of wet weight of fish were considered to be equivalent to 1 gC (Rodhe, 1958).

Results

Variation patterns of gross and net primary productivities, pH, dissolved oxygen content and temperature of the two ponds during the study period are shown in Fig. 2. Since both ponds are in close proximity, the variation pattern of these parameters were more or less similar in both ponds. The net primary productivity (NPP) was observed to range between 0.24 gC m^{-2} day^{-1} and 1.35 gC m^{-2} day^{-1} while the gross primary productivity (GPP) varied from 1.10 gC m^{-2} day^{-1} to 1.79 gC m^{-2} day^{-1}. The pH of the ponds ranged from 4.5 to 6.5 during the study period. The dissolved oxygen content of the pond water ranged from 2.8 mg l^{-1} to 5.8 mg l^{-1}. The temperature of the surface water varied from 27°C to 30°C during the study period.

Results of the culture programme and the values for ecological efficiencies are summarized in Table 1.

Discussion

Muthurajawela swamp is considered to be a suitable habitat for aquaculture by some developers and few research has been already done on this aspect (Costa and Keembiahetty 1987, Wijeyaratne 1990). However, due to its acid sulphate soils, some researchers have regarded that pond aquaculture should not be an option for serious consideration in the development of this presently underutilized swamp (Samarakoon and van Zon, 1991).

The values recorded for GPP and NPP during this study were found to be smaller than those recorded