ASPECTS OF THE REPRODUCTIVE BIOLOGY OF *Puntius sarana*, *Sarotherodon mossambicus* AND *Tilapia melanopleura* IN PARAKRAMA SAMUDRA, SRI LANKA.

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BY

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ABSTRACT

1. Aspects of the reproductive biology of *Sarotherodon mossambicus* and *Tilapia melanopleura*, two exotic species and *Puntius sarana*, an indigenous species were investigated in the Parakrama Samudra, a man-made lake in Sri Lanka.

2. The overall sex ratio of *S.mossambicus* and *T.melanopleura* was 1.85 females and 1.1 females respectively for every male. The overall sex ratio of *P.sarana* was 1.5 females for every male. Seasonal changes in the sex ratio were studied and the probable causes are discussed.

3. Variation in sex ratio with the increasing size of the fish was investigated and it was found that in *S.mossambicus* and *T.melanopleura* percentage of females decrease with increasing size. All fish over 32.0 cm in length of *S.mossambicus* and 29.0 cm in length of *T.melanopleura*, were males. But in *P.sarana* precentage of females present were increasing with increasing size. All fish over 34.0 cm in length were females.

4. Minimum size at maturity of *S.mossambicus* was found to be 27.5 cm and 17.0 cm for males and

females respectively. In T.melanopleura males mature at a length of 22.5 cm, while females reach maturity at a much smaller size, at 17.0 cm. Males of P.sarana mature at a length of 20.5 cm.

5. It was observed that the testes of S.mossambicus and T.melanopleura are extremely small in size and probable causes are discussed.

6. Seasonal changes in the macroscopic appearance of gonads and the maturity coefficient of all three species were studied. All three species were found to spawn throughout the year. Both S.mossambicus and T.melanopleura had several peaks. T.melanopleura has two main spawning seasons, occuring in November and March, which coincide with the peak rainy season and the intermonsoon period respectively. P.sarana has a well defined peak spawning season from August to October with maximum spawning activity occuring in September - October period, being correlated with peak rainy season.

7. The egg diameter distributions and histological studies indicated the presence of reserve oocytes and two groups of yolked oocytes in T.melanopleura and P.sarana, and eggs are shed more than once per season. The egg diameter distribution of S.mossam-

bicus indicates a simultaneous maturing of all ova destined to be spawned within a season and only one group of yolked oocytes and reserve oocytes were present.

8. Fecundity was determined for 55 individuals of T.melanopleura, 80 individuals of S.mossambicus and 51 individuals of P.sarana. Fecundity of S.mossambicus was found to vary between 380 to 1200 for fish ranging in length from 18.1 cm and 27.2 cm and in weight from 180 g to 391 g. Fecundity of T.melanopleura was found to vary between 760 to 6160 for fish ranging from 18.8 to 25.8 cm and 126 to 380 g. in length and weight respectively. Fecundity of P.sarana varied between 16,000 and 290,000 for fish ranging in length from 23.8 cm to 38.0 cm and in weight from 180 g to 792 g.

9. Fecundity (F) of all three species was found to be statistically significantly correlated to body length, weight and gonad weight. These relationships were,

For S.mossambicus

$F = 92.42\ GW + 377.1$ (to gonad weight in g)

$F = 2.39\ W + 291.84$ (to body weight in g)

$F = 63.23\ L + 628.37$ (to body length in cm)

For T.melanopleura

F = 223.4 GW + 870.6 (to gonad weight in g)

F = 10.23 W + 551.1 (to body weight in g)

F = 307.9 L - 4057.1 (to body length in cm)

For P.saranaa

F = 3812 GW + 270.38 (to gonad weight in g)

F = 153.9 W + 6425 (to body weight in g)

F = 5465.9 L - 95269 (to body length in cm)

10. Spawning potential of P.sarana for the year of study was calculated. Depending on the availablility of catch statistics of T.melanopleura seperately from that of S.mossambicus, spawning potential was calculated for the former for 3 months and its impact on fishery is discussed.