Relationship between reservoir morphometry and the culture-based fisheries yield of giant freshwater prawn in selected reservoirs of Sri Lanka

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Culture-based fisheries of *Macrobrachium rosenbergii* the giant freshwater prawn (GFP) is being practiced in different reservoirs of Sri Lanka since year 2007, however, no attempts have been made to understand the relationships between varying yield and different limnological conditions in those reservoirs. Therefore, a five-year research project has been started to understand the variations in GFP yield in relation with changing stocking densities, and limnological conditions of the reservoirs. At this initial stage of the project, an attempt was made to correlate the annual total catch (sum of daily capture by the gill net fishers) of GFP with the morphometry of reservoirs being utilized. Reservoir morphometry in terms of shoreline length (m), area at full supply level (ha) and the extent of the littoral zone (m) were estimated in a total of 24 reservoirs located in Hambantota (11) and Monaragala (13) districts using GPS based mapping. Shoreline development index (D_L) and ratio between shoreline length and area (R_{LA}) were calculated using $D_L = L/2 \sqrt{(0.001 \pi A)}$ and $R_{LA} = L/A$, respectively. Catch data were collected for year 2019 as a sum of daily capture, from fisheries organizations associated with each reservoir. Stocking data were collected from the records of National Aquaculture Development Authority. Maximum and minimum calculated D_L ranged from 0.08 to 0.30 (mean 0.18 ± 0.01) whilst R_{LA} ranged from 0.02 to 0.14 $kmha^{-1}$ (mean 0.05 ± 0.01). Stocking density of GFP in those reservoirs ranged from 50000- 2003300 PLs. Maximum and minimum yield were 0.13 $kgha^{-1}$ and 4.3 $kgha^{-1}$ from March 2018-March 2019 which the mean $\pm$ SD value was recorded as 1.57 ± 0.22. Extent of the littoral zone varied from 15.77m to 24.10m (mean 19.26 ± 0.49). There was no significant correlation between the GFP yield and the littoral zone extent (r = - 0.033, p>0.05), D_L (r= -0.411; p>0.05) or R_{LA} (r= -0.231). Further data collection on catch per unit fishing effort is necessary to find meaningful relationships between the GFP production and the morphometry of reservoirs being utilized.

Keywords: reservoir morphometry*, Macrobrachium rosenbergii,* littoral extent, shoreline development index and culture-based fisheries

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