

## Effect of habitat requirements on fish diversity and distribution in Rawan Oya, a perennial wet zone stream in the central hills of Sri Lanka

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At present, many freshwater fish species including all the endemics are threatened due to large-scale habitat alteration caused by various anthropogenic activities. Investigations on the effect of habitat requirements of freshwater fishes in relation to species diversity and distribution is therefore an urgent necessity to develop a suitable conservation framework for fish habitat rehabilitation. The present study, carried out at monthly intervals over a six month period, aims at determining the species composition, abundance and habitat conditions of fish in upstream to downstream reaches consisting of riffles, runs and pools in Rawan Oya, a 13.5 km long left bank tributary of the Mahaweli. Fish were captured from six sampling reaches each consisting of two sites using a scoop net, drag net, hand net and cast net. The fish were identified, counted and released. Physico-chemical parameters of water such as the flow rate, temperature, pH, conductivity, DO, and BOD<sub>5</sub> were determined monthly at pre-selected sampling sites located in the upper, mid and lower region of the stream.

A total of 21 fish species belonging to 11 families were recorded, of which 14 are of ornamental value, 5 are endemic and 3 are exotic. A progressive increase in species diversity and fish abundance occurs from headwaters to downstream. Only 3 bottom dwelling species, *Garra ceylonensis*, *G. phillipsi* and *Schistura notostigma* tolerate fast flowing riffles (mean water flow > 100 cm s<sup>-1</sup>) and run-riffle areas with bed rock, boulders, cobble and gravel substrates in the uppermost region. *Danio malabaricus* and *Tor khudree* also survive in fast flowing waters with

similar substrates but at lower altitude. In contrast, about 16 fish species colonize the downstream run and pool channels with a comparatively lower water velocity (mean water flow  $26.7 \text{ cm s}^{-1}$ ) and a substrate comprising mostly of sand, silt, clay and detritus. One-way ANOVA coupled with Duncan's Multiple Range test showed significant ( $p < 0.05$ ) variation between upstream and downstream water velocity, temperature, pH, conductivity, DO, and BOD<sub>5</sub>. Shannon-Weiner diversity index was significantly higher in pools. These results indicate that pools are the preferred habitat of fish and habitat requirements such as altitude, substrate type together with the velocity, temperature, pH, conductivity, DO and BOD<sub>5</sub> of the water appear to play a major role in determining the diversity and distribution of fishes in this stream.