D-15: Changes in morphometric characters and chemical composition during development in *Anguila bicolor bicolor* McClelland and *Anguilla nebulosa nebulosa* McClelland

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Anguilla bicolor bicolor McClelland and *Anguilla nebulosa* McClelland are reported from inland waters of Sri Lanka, but not much information has been reported on their biology and chemical composition. These Anguilid eels are also considered as an untapped, high quality protein source available in the inland waters of Sri Lanka. Eels are a delicacy in Scandinavian and Far-east countries. The objective of the present study is to investigate the possibilities of starting an eel fishery in Sri Lanka.

Eels at silver eel, yellow eel and elver stages were captured using unbaited fyke nets from 5 reservoirs (*viz.* Mahagala wewa, Phahalaandara wewa, Ranmudu wewa, Badagiriya wewa and Kudabadagiriya wewa) and Malala lagoon connected to the Malala river in the Hambantota district and from Garanduwa lagoon and Thalaramba canal in Matara district. Glass eels were only captured at the mouth of the Thalaramba canal close to the sea using scoop-nets and a trap specially constructed for this purpose. Eels at all stages were subjected to measurement of total length, pre-dorsal length pre-anal length, eye diameter, head length, somatic weight, gonadal weight and liver weight. These measurements were used to determine the ano-dorsal distance, length-weight relationship, gonado-somatic-index (GSI) and hepato-somatic-index (HSI). Histological studies were done on gonads and liver. Muscle and liver samples were analysed for water, protein and lipid. Analyses for protein were carried out after acid digestion using the Kjeltec analyser and for lipid after extraction in chloroform : ethanol (2:1) mixture by using the Soxtec. These parameters were used to compare 2 eel species.

Weight, eye diameter, head length and mouth width increased with increasing body length for both species although the patterns were slightly different. Mean ano-dorsal distance (± SD) of *A.bicolor* and *A. nebulosa* were 1.43 ± 1.12 and 12.06 ± 1.04 respectively and they maintained the same distance throughout development. GSI significantly increased with body length in both species whereas HSI showed an increase only in A. nebulosa and no correlation was seen in *A.biclor*. Water and protein contents in muscle were significantly higher in *A.nebulosa* than in *A.bicolor* and in both species they decreased significantly with development. Mean protein level in muscle of *A. bicolor* and *A. nebulosa* were 16.61% and 17.18% respectively. Lipid in muscle increased significantly with length in both species with significantly higher lipid content in muscles of *A.bicolor* than in *A.nebulosa*. Water and lipid content in liver showed no correlation with total length in both species. Percentage lipid in muscle decreased with water in muscles of both species and showed a high correlation. Protein in liver of only *A.bicolor* showed an increase with total length. Water content in liver was higher and protein and lipid were lower in *A. nebulosa* when compared to levels in *A. bicolor*. Mature gonads were not found in eels studied.

Ano-dorsal distance could be used as a criterion to distinguish the 2 species. Differences in HSI. and in chemical composition of liver of *A. bicolor* and *A. nebulosa* could be due to genetic differences between one 2 species and also became only *A.nebulosa* silver eels were captured. Both species of eels do not reach maturity in riverine habitats and lagoons. They are comparable to European eel, *Anguilla anguilla* due to the high levels of protein present in their muscle and also they are potential sources for protein for Sri Lankans. Water content in muscle could be used to determine the fat content in muscle.

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