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A comparative study on fatty acid composition of two zooplanktivorous freshwater fish species in Bolgoda Lake

In Sri Lankan reservoirs, some fish species such as *Ehirava fluviatilis* and *Hemirhamphus marginatus (the correct scientific name of the hemirhamphid species is doubtful. This species is considered as H. marginatus according to characteristics described in Monto, 1955).* have colonized in freshwater and brackish water habitats from marine habitats. In marine habitats, zooplanktivorous fish species are able to obtain PUFA from their food, so that evolutionarily these species are lacking enzymes to convert short carbon chain fatty acids to PUFA. The fish species that have colonized freshwater from marine habitats also possess this ability. Therefore it can be hypothesized that the fish species that have secondarily colonized in freshwater habitats, have to rely on food items containing PUFA because they may not posses the necessary enzymes to synthesize PUFA from short carbon chain fatty acid precursors. In this study fatty acid profiles of flesh and stomach contents of two zooplanktivorous fish species collected from Bolgoda Lake (*E. fluviatilis* and *H. marginatus*) were analyzed to investigate whether there is a similarity between fatty acid profiles of their flesh and stomach contents.

Lipids were extracted separately from muscles and stomach contents of the fish according to the Bligh and Dyer method. The free fatty acids were then analyzed by reversed phase HPLC (best separation was obtained using 20% water in acetonitrile). To identify the fatty acids, fluorescence derivatives were prepared using 4-bromomethyl-7-methoxycoumarine (Br-Mmc) compound. In the identification of 4-methyl-7-methoxycoumarin fatty acid esters, it showed an excitation maximum at 362 nm and emission λmax at 398 nm.

When the individual chromatograms of gut content and flesh of same fish species were overlapped, it is evident that *E. fluviatilis* depends mostly on foodstuff for their PUFA requirements Spearman's rank correlation analysis indicate that the fatty acid profile of flesh is significantly relates to that of stomach contents ($r_s = 0.985$ – $p<0.001$). On the other hand in *H. marginatus*, PUFA content in food and muscles do not occur in same magnitudes ($r_s = 0.505$ – $p>0.05$). This indicates that *E. fluviatilis* obtains PUFA from their food where as *H. marginatus* may have to synthesize some of the PUFA form short carbon chain precursors.