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NUTRITIONAL ANALYSIS OF SRI LANKAN FISH SPECIES IN FAMILY LEIOGNATHIDAE WITH RESPECT TO HUMAN HEALTH

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ABSTRACT

Fish play a significant role in human nutrition and health as they provide a good balance of proteins, lipids, vitamins and minerals and Omega -3 fatty acids with relatively low caloric value than other muscle foods. Among the large number of species of fish, Family Leiognathidae has been prescribed specially for curing patients and lactating mothers traditionally. The present study was focused to investigate the nutritional and chemical importance of Leiognathids in order to see whether any scientific basis for the traditional belief. Fish is cooked in different ways to improve its hygienic and to enhance its flavor and taste before consumption. Therefore, impact of different cooking methods on the nutritional value of the fish was also investigated. Contents of Moisture, Protein, Total fat, Macro and Micro minerals, Non Nutritive Toxic Metals, Histamine and Fatty acid profiles of Leiognathids were investigated.

Thirteen species of Leiognathids; *Gazza minuta, Gazza achlamys, Leiognathus dussumieri, Leiognathus splendence, Leiognathus brevirostris, Leiognathus bindus, Leiognathus faciatus, Leiognathus equulus, Leiognathus lineolatus, Leiognathus leuciscus, Leiognathus daura ,Secutor ruconius and Secutor insidiator* were identified along the west coast of Sri Lanka out of 17 described species of the region. However, throughout the study period two species; *Gazza minuta* and *Leiognathus dussumieri* were recorded abundantly.

In this study standard analytical methods (AOAC) were followed in all analysis. Moisture contents of fish varied significantly (71.05 ± 0.94 % - 77 ± 1.04 %) among the species and the highest content was recorded in *Leiognathus faciatus.*

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However, the muscle tissues of all the species were rich in protein and it varied from 17.33 ± 0.62 % to 27.98 ± 0.66 % whereas, a significantly higher values were observed in *Gazza minuta* and *Leiognathus brevirostris.* Total fat contents also varied significantly from 4.9 ± 0.366 % to 17.00 ± 2.86 % and the highest percentage was observed in *Leiognathus brevirostris.* Most of species in family Leiognathidae belonged to medium fat (5% -10%) and fatty fish groups (>10%). There was a linear inverse relationship between moisture content and total fat content in all the species studied.

Percentages of total saturated fatty acids and unsaturated fatty acids in each species significantly varied and polyunsaturated fatty acid (PUFA) was the dominant fatty acid group in all the species. Saturated fatty acids (SFA) in all species varied from 14% to 64% of the total fat content. The dominant saturated fatty acids in family Leiognathidae were Meristic acid, Palmitic acid and Stearic acid. Present study has shown that Monounsaturated fatty acids (MUFA) ranged from 5% to 19.3%, in all species studied. Among the PUFA, eicosapentaenoic acid (EPA), Docosapntaenoic acid (DPA), Docosahexaenoic acid (DHA) and Heneicosapentaenoic acid (HPA) dominated in all the species. PUFA/ SFA ratio varied m from 0.5 to 5.13 and Ω-3/Ω-6 ratio varied from 1.86 to 9.22.

Both macro and micro elements were detected in all species studied, K (121 ± 3.21 - 965 ± 8.57 mg/100g) was the most abundant macro element and Zn and Fe were the abundant micro elements. Levels of Pb, Cd, Hg and histamine (<40mg/100g) were also in safe ranges. Although, the percentages of total fat and protein contents increased after deep frying, portion of heart friendly

polyunsaturated fatty acids; EPA and DHA were lost. Considering high percentage of palatable protein contents, high percentage of heart friendly poly unsaturated fatty acids, high ratio of PUFA/SFA and Ω3/ Ω6, high contents of Calcium and other minerals and very low levels histamine, Leiognathids can be considered as a suitable source of nutrients for wellbeing of both curing patients and lactating mothers. Furthermore, results of the present study clearly indicated that the best cooking methods for Leiognathids were steaming and boiling when considered the nutritional value of the prepared food material. Since these species are rich in health friendly nutrients, the traditional belief that these fish species are friendly for curing and sick people appears to be valid.