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The stable isotope ratios of $^{13}\text{C}/^{12}\text{C}$ and $^{15}\text{N}/^{14}\text{N}$ and the weight ratio of total carbon to total nitrogen (C:N) are important indicators in the field of environmental monitoring. As a part of the assessment of nutrient enrichment in Negombo lagoon ecosystem, stable isotope technique is used to study the stable isotope ratios of mangroves and adjacent water. Although this technique is an advanced tool to identify the fingerprints of environmental pollutant sources, totally new to the research field in Sri Lanka.

The fresh mangrove leaves (young, matured and old) of *Rhizophora apiculata* and *Rhizophora mucronata* species, totally 35 samples and 10 surface water samples were collected from 12 sampling points randomly selected from the bank of Negombo lagoon. The leaves were rinsed with distilled water, oven dried at 40 °C for 48 hours and powdered. The water samples were filtered into glass fiber filters to collect suspended particulate materials in the water and filter papers were oven dried at 40 °C for 24 hours. Samples were analyzed by combustion on a Eurovector elemental analyzer coupled to an Isoprime mass spectrometer in GNS science, New Zealand.

There were some effects of %Nitrogen (%N) on the old leaves where the %N is quite low (range 0.3% to 1.7% with a mean value of 0.6%), but generally young and matured leaves had similar trend in % N (range 1.1% to 2.9% with a mean value of 1.8% and range 0.7% to 2.9% with a mean value of 1.5% respectively). The behavior of isotopic Nitrogen-15 ratio ($\delta^{15}\text{N}$) in those three types of mangrove leaves was significantly different compared with behavior of %N in leaves. The range of $\delta^{15}\text{N}$ in young and matured leaves was from 2.3‰ to 12.3‰ with a mean value of 5.4‰ and this ratio in old leaves had a range from 5.1‰ to 8.0‰ with higher average of 6.52‰. The average % Carbon values (%C) of all the three types of mangrove leaves were in the range of 42% to 43%. The isotopic Carbon-13 ratio ($\delta^{13}\text{C}$) of young, matured and old leaves was within the common range for C3 plants, with values ranging from -25.4 to -32.7‰ and average of -29.5‰.

The total Carbon to total Nitrogen ratio (C: N, atom) had increased in older leaves (range 36.2 to 163.3 with mean value of 120.8), and significantly decreased in matured and young leaves (average values of 41.9 and 34.5 respectively). The average $\delta^{13}\text{C}$ value of the lagoon water was -24.6‰ and average $\delta^{15}\text{N}$ value of the water was 6.7‰.

The carbon and nitrogen isotopic compositions obtained in this study are comparable with previously published results in the other coastal regions of the world. As an initiative research study on the stable isotope analysis in Sri Lanka, the results and findings, generated in this study can be considered as the baseline data for future studies based on the lagoon ecosystem.

Key words: stable isotopes, isotopic ratio, mangroves, ecosystem

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