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lipids and fatty acid Analysis content`s in Pharaoh Cuttlefish *Sepia pharaonis* (Ehrenberg 1831) in the marine waters of the northwestern Arabian Gulf

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Abstract

The current study demonstrated variations in total fat content and fatty acid composition in different body parts of the *Sepia pharaonis*, including both the head and mantle, from three selected specimens weighing 700 ± 50g, 1566.7 ± 410.9g, and 2441.7 ± 401.9g. Fatty acid analysis showed significant differences among weight groups (P ≤ 0.05) between the groups based on weight for most of the fatty acids studied. Oleic acid was the most abundant fatty acid in the head and mantle tissues. Fatty acid analysis showed significant differences among weight groups (P ≤ 0.05) eicosapentaenoic acid (EPA), linoleic acid, linolenic acid, palmitic acid, and stearic acid showed a significant increasing trend with growth, where the largest group exhibited higher values compared to the smallest group, the intermediate group presented intermediate values, statistically indistinguishable from both the lower and higher weight groups. In contrast, docosahexaenoic acid (DHA) remained relatively stable in the head with no significant differences, whereas it showed significant variation in the mantle. the higher fatty acid concentrations in the head may be due to the different nature and

functions of the tissues compared to the mantle. The mantle contains lower lipid accumulation possibly because it is mostly muscular compared to the head. Overall, the results suggest a positive relationship between body weight and lipid accumulation and clear differences in fatty acid profiles between tissues. These results emphasise the effect of growth and tissue type on the biochemical composition of *S. pharaonis*, with possible implications for its nutritional value and exploitation.

Keywords: Fatty acids, Total fat, *Sepia pharaonis,* Weight groups, EPA, DHA, Marine organisms.