

Heavy metals in seaweed for human consumption available in the Portuguese market

M. Sousa¹, A. Almeida², E. Pinto^{1,2}

¹Escola Superior de Saúde – Instituto Politécnico do Porto, Portugal; ²Faculdade de Farmácia da Universidade do Porto, Portugal

Seaweeds consumption has been increasing in European countries, including Portugal. Several studies have shown that some seaweeds species have the ability to accumulate contaminants, namely heavy metals. In particular, the presence of heavy metals in these food products can have a negative impact on the human health, and thus a systematic control of this type of food should be mandatory. In this study, five heavy metals (As, Cd, Tl, Hg, Pb) were analyzed in 16 samples of 9 species of seaweeds available in the Portuguese market for human consumption, namely Hijiki (*Hizikia fusiforme*), Arame (*Eisenia bicyclis*), Kombu (*Laminaria japonica*), Wakame (*Undaria pinnatifida*), Dulse (*Palmaria palmata*), seaweed spaghetti (*Himanthalia elongata*), seaweed lettuce (*Ulva rigida*) and Nori (*Porphyra umbilicalis*).

Heavy metals content was determined by ICP-MS (inductively coupled plasma–mass spectrometry) after microwave-assisted acid digestion.

The results showed As as the most abundant heavy metal (30.1–11.2 µg/g). By contrast, Tl was the lowest abundant, with contents below the method detection limit (0.003 µg/g) for almost all analyzed samples (10 out of 16). A high variability in the heavy metals levels was observed for the same species of different brands. For example, the As content in the seaweeds of the Wakame species ranged from 3.1 to 38.1 µg/g. The same was observed for Pb (contents ranging from 0.12 to 0.37 µg/g) and Cd (contents ranging from 0.24 to 0.43 µg/g) in the same species.

The present study stresses the need for a careful control of these products to ensure food safety.