

**'Reactive' extraction of arsenosugars from brown alga Wakame
(*Undaria pinnatifida*)**

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Marine algae form an important food basis for the above all Asian population. Beyond that they are also from economic interest e.g. for the production of gelling and thickeners for food industry and for medical applications. Thus the alginate contained in the brown alga Wakame (*Undaria pinnatifida*) in particularly high concentration plays an important role. This is the reason, which makes analysis of arsenic species essential but more difficult.

The total arsenic determination in algae can supply, however, no information about their toxic status, so that quantification and an identification of the arseno-organicals must take place additionally to the inorganic arsenic species. Usually, shaking the alga sample with water or water/methanol solutions leads to the almost complete extraction of the original arsenic species, which can be analyzed then by means of suitable coupling techniques such as HPLC-ICPMS and/or HPLC-ESIMS. An exception is the alga Wakame, with which only approx. 30% of the total arsenic are extractable. A cause of these low and strongly varying extraction efficiencies could be the covalent bonding or adsorption of the arsenic species to the gel-like alginate matrices, which consist of polysaccharides with 1,4-glycosidic-connected α -L-Guluronic acid and β -D-mannuronic acid units.

In the present work we can demonstrate, how the solubility of the alginate was increased by suitable alkaline extracting agents with the result that the extraction efficiency can be improved substantially. By means of anion exchange chromatography coupled with ICPMS and ESIMS as parallel detectors some of the arising arsenic species could be identified. The pH-dependent extraction connected with the identification of the arsenosugars setting free thereby was used, in order to characterize their bonding to the alga structure. The quantitative results were verified with standard reference materials.