Preliminary study on the preparation of fertilizer utilizing jellyfish

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Summary

We have examined the potential usefulness of jellyfish (dried sludge of Aurelia aurita and Stomolophus nomurai) as a fertilizer for vegetable fields. Inorganic components in the above jellyfish including Aurelia aurita (with and without aeration) were determined by absorptiometry, flame photometry, ICP emission spectroscopy, atomic absorption spectrometry, or ion chromatography. Concentrations of total nitrogen (980 mg/kg), total phosphorus (19000 mg/kg), magnesium (17000 mg/kg), and calcium (27000 mg/kg) in the dried sludge of Aurelia aurita were 2.3, 1360, 14, and 96 times higher than those in Aurelia aurita (without aeration, 420, 14, 1200, and 280 mg/kg), respectively. The dried sludge of Aurelia aurita seemed to have potential as a fertilizer but it contained high concentrations of iron (190000 mg/kg) and aluminum (2200 mg/kg) which might be undesirable for the growth of plant. On the other hand, concentration of total nitrogen (750 mg/kg) in Stomolophus nomurai was 1.8 times higher than that in Aurelia aurita (without aeration) although concentrations of total phosphorus (2.3 mg/kg) and calcium (75 mg/kg) were 1/6 and 1/4 of those in Aurelia aurita (without aeration). Stomolophus nomurai could be also expected to have potential as a fertilizer. Spinach was cultivated using the dried sludge of Aurelia aurita and Stomolophus nomurai etc. as a fertilizer. The dried sludge of Aurelia aurita seemed to accelerate the growth of spinach at earlier stage but rather decelerate the growth at later stage. Stomolophus nomurai was most effective for the growth of spinach. High concentrations of sodium chloride in jellyfish could be reduced by heating jellyfish suspension in a vacuum. Investigations are in progress to examine concentration conditions such as vacuum pressure and temperature.