

Abstract

The purposes of this research was to study the nutritional value of Spirogyra spp., cultivation, and modification of the algae into snacks or sweets in order to develop and widen their utilization.

Nutritional study of Spirogyra spp. revealed the composition in gram per 100 grams of dry weight as follows protein 18.65, fat 5.21, carbohydrate 56.31, fiber 7.66, ash 11.78. Eighteen amino acids content was found to be rather low similar to those in some kind of vegetables. Mineral content as milligram per 100 grams dry weight were iron 33.85, manganese 35.80, magnesium 241.10, potassium 1.19, sodium 1.56, calcium 26.88 and phosphorous 125.76. Vitamin content as milligram per 100 grams dry weight were provitamin A 0.25 (4,180 IU), vitamin B₁ 0.04, vitamin B₂ 0.55, niacine 3.65, vitamin B₆ 0.84. No vitamin C was detected. Moisture was 8.05% and energy 3.12 kilocalories per gram dry weight.

Heavy metals content of the algae analysed as milligram per kilogram fresh weight were cadmium 0.0085, cromium 0.1510, copper 0.3950, lead 0.0662, zinc 1.7280 and mercury 0.0158.

Physical and Chemical studies of the water resources where Spirogyra spp. were able grow indicated the average pH to be 7.22, temperature 24.4 °C, dissolved oxygen 8.56. The nutrients found in milligram per litre were nitrate-nitrogen 0.40, ammonia-nitrogen 0.078, orthophosphate 0.044 and total phosphate 0.200 but no nitrite-nitrogen.

Field cultivation of Spirogyra spp. was not possible in all conditions. Laboratory cultivation, on the other hand, could be maintained but there was neither cell nor filamentous multiplication.

Identification of the algae revealed 6 species i.e. Spirogyra ahmedabadensis Kamat, 1962; S. ellipsospora Transeau; S. lodziensis Kadlubowska, 1972; S. minor (Schmidle) Transeau, 1944; S. submaxima Transeau and S. verrucosa (Rao) Kreiger.

Study on the feasibility of modification of the algae into snacks or sweets showed that they could be made into snacks i.e. algal cracker. They could be mixed with 6 other snacks and sweets i.e. algal-health cracker, algal bread, algal cake, crispy algal egg-noodle, algal cooky and crispy algal "krong-krang". Fresh algae were found to give better products than the dry algae. However, the taste and odour of all products were acceptable.

It was concluded that the algae could be consumed safely and gave nutritional value comparable to that of the vegetables especially the fibers contain higher value than other algae and certain vegetables. Although the field cultivation was not possible, the algae could be found naturally in great number during the rainy season. Modification or mixing of the algae with certain food was possible with rather high acceptability.