# Biological and Chemical Properties Contributing to the Potential of the Cyanobacteruim, *Nostoc commune* Vaucher, as a Food Source in the Philippines

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Among the estimated 125 species of heterocystous cyanobacteria noted in the Philippines, only one species, *Nostoc commune* Vaucher (BGA) is used as a local food. Its popularity as a vegetable dish is mostly confined among the natives in northern Luzon, where the BGA is abundantly occurring and the people are accustomed to eating algae as food ingredients. The food property that is well liked about this BGA is its gelatinous and gummy texture. This property is attributed to a dietary fiber, oxalate-oxalic acid soluble substance (OOSS), found in the mucilaginous sheath. OOSS could be as much as 37% of the total DM in the discoid, dried form (DDF) of the macrocolony, while the amount in the fresh spherical form was 34%, which was not statistically different from the DDF. The sugars in the OOSS were identified as D-glucuronic acid and D-galacturonic acid based on TLC. Although, its total carbohydrate content was as much as 57.4% of total DM, that could be responsible to the semi-sweet taste of the BGA. Crude protein and crude fat (of field samples) could be as much as 41% and 4%, respectively. There were three protein bands identified in the desiccated discoid types, such as 29, 36, 39 kDa, which may be stress polypeptides that were synthesized in response to desiccation. It has all the essential amino acids except tryptophan. Included in the six free amino acids is taurine, with moderate amount of 1.26mg/100g protein, that is essential in human growth, especially in the development of brains and eyes. Of the two forms of BGA used as food, i.e., the fresh, spherical form, and the discoid, disc, dried form, the Filipinos prefer the latter due to its long shelf life. Fortunately, in the dried form, there was no ß-N-methylamino-L-alanine (BMAA) detected in the preliminary screening test done. BMAA is a neurotoxin that is proposed to contribute to the ALS/Parkinsonism-dementia complex. *N. commune* was noted to be abundant in rice paddies and hilly places, especially in northern Luzon. The factors that seemed to promote such condition were the shallowness of the floodwater, warm water temperatures (30-40°C), abundant light (up to 80,000 lux), alkaline pH (pH 8.0-9.0), orthophosphate value (~1.79), $NH_4$-$N^+$ content of ~0.86 ppm and a good supply of bicarbonates. However, this BGA is sensitive to pollution. Of the 14 soil properties examined in ten different rice paddies, it seemed that the BGA is sensitive to copper at ~10 ppm in the soil. Growth *in vitro* was enhanced with 1.5% $CO_2$-enriched air with 195% increase in fresh weight over the non-$CO_2$-enriched air. However, its biomass could reached as much as 200 kg DM per hectare when intercropped with rice for one cropping season. The alga can fix $N_2$ in an amount equivalent to 56 kg N/ha over 90 d.

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