EXTRACTION AND CHARACTERIZATION OF BIXIN FROM THE ANNATTO SEEDS AND ITS POSSIBLE USE IN THE COLOUR ENHANCEMENT OF GOLDFISH

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This report describes two studies carried out on annatto seeds (*Bixa orellana*). Study one describes the isolation and characterization of bixin from annatto seeds collected from different geographical areas in Sri Lanka. Study two describes the effect of diets containing different amounts of bixin on colour enhancement of goldfish (*Carassius auratus*).

The annatto (*Bixa orellana*) seeds that contain bixin is commonly available in different geographical areas of Sri Lanka. The pods containing seeds are plentiful and the pigment can be easily extracted from the seeds to an organic solvent. In the present study, the pigment was confirmed as pure bixin, by its melting point, UV-vis and FTIR spectroscopy data. Our study found that the amount of pigment extracted was nearly 1.1% of the dry weight of the seed collected from Matale, Rathnapura, and Matara areas.

A further study was carried out to evaluate the effects of diets containing 0 mg, 50 mg, 100 mg, 200 mg, and 600 mg bixin extracted from annatto seeds and a diet containing synthetic carotenoid, astaxanthin (200 mg/kg) on skin pigmentation, growth, feed utilization and survival of a red variety of goldfish (*Carassius auratus)*. The average initial weight of fish was 8.7 ± 0.24 g, and the rearing period was 60 days. The degree of pigmentation in both skin and fins of goldfish increased significantly with increasing level of bixin in the diet ($P<0.05$). The diets

containing astaxanthin and 200 mg/kg bixin, both of which contained equivalent of 200 mg carotenoid per kilogram of diet, had similar effects on the total carotenoid deposition in the fins and the skin of fish. Bixin content of feed did not adversely affect on growth of fish when compared with the control group ($P<0.05$). A similar observation was also made on feed conversion ratio of the treated fish. Furthermore, no significant difference was observed in the survival of the fish in different treatments. The present results demonstrate that bixin extracted from annatto seeds which is an appo carotenoid can be successfully used in place of the expensive synthetic carotenoid, astxanthin in goldfish diet.