

# Short Communications

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## Evaluation of Toxicological Effects of Brown Seaweeds: Part I.

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Three varieties of brown seaweed, *Cystoseira barbata*, *Padina pavonia* and *Sargassum boveanum* are easily available at Karachi coast. The toxicological activities of all these weeds have been checked up and evaluated in albino mice.

Eight hundred and forty kilometers long Pakistan coastal area is highly enriched of almost all common varieties of brown, green and red seaweeds (Phaeophyceae, Chlorophyceae and Rhodophyceae families). The qualitative studies have revealed that a handsome amount of these go waste annually [1]. It has also been estimated that appreciable amount of protein [2], vitamins [3], polysaccharides [4] and algin [5] compound could easily be obtained from this source. Because of the high nutritional values, seaweeds were also practiced to be used for food [6-11] and feed [12-13] purposes. Today, in a number of countries, animals still stay browsing on seaweeds in winter as well as in summer [14-15]. Keeping in view all these facts we felt necessary to test the toxicity of brown seaweeds on animal models to assess its suitability for use in the preparation of food and feed.

The specimens of *Cystoseira barbata*, *Padina pavonia* and *Sargassum boveanum* were collected at random points from Karachi coast at Bulleji, Hawksbay, Ras Mauri and Paradise Point. These were washed thoroughly with fresh water to get rid of the unrequired marine salts, dried in sun and powdered. The data of chemical analysis for nutritional food values [16-17] is summarised in Table 1 (Each value was calculated as percentage on dry weight basis).

TABLE 1. FOOD VALUES OF BROWN SEAWEEDS.

S. No.	Weeds	Moisture (%)	Ash (%)	Protein (%)	Lipids (%)	Fibre (%)	Carbohy- drates (%)	Calorific values/ 100g
1.	<i>Cystoseira barbata</i>	7.5 ±0.01	29.0 ±0.02	8.5 ±0.04	3.2 ±0.02	10.5 ±0.01	41.3 ±0.01	233
2.	<i>Padina pavonia</i>	15.1 ±0.01	30.0 ±0.02	6.2 ±0.01	3.4 ±0.02	7.2 ±0.02	38.1 ±0.03	213
3.	<i>Sargassum boveanum</i>	9.2 ±0.03	32.2 ±0.02	8.7 ±0.02	8.3 ±0.01	8.3 ±0.01	33.3 ±0.01	249

(a) All values are mean of five readings expressed as percentage on dry weight basis. (b) Standard error of mean is expressed as ±.

For determining moisture and ash [17], one gram sample of each seaweed was kept in oven at 110°C for 6 hr. Cooled in desiccator to constant weight. Finally moisture was calculated.

The toxicity of *Cystoseira barbata*, *Padina pavonia* and *Sargassum boveanum* was determined by the administration of dried powder via oral route [18] in normal albino mice, weighing between 20-25 g. The test material (dried powder) was administered at a dose range of 125, 250 and 500 mg/kg body weight in mice (Table 2) for 21 days. *Cystoseira barbata* to group I, II and III; *Padina pavonia* to group IV, V and VI, and *Sargassum boveanum* to group VII, VIII and IX while group X was maintained as control and received the basal diet. Each group comprised of six animals of either sex which were observed for one month, there was no extra ordinary change in the physical condition.

TABLE 2. EVALUATION OF TOXICOLOGICAL EFFECTS OF BROWN SEAWEEDS.

Group* No.	Mean weight in g ± SD	Seaweed specimens (brown)	Oral dose in mg/kg	Toxic effect
I	24 ± 2	<i>Cystoseira barbata</i>	125	Nil
II	23 ± 3		250	Nil
III	23 ± 2		500	Nil
IV	22 ± 2	<i>Padina pavonia</i>	125	Nil
V	23 ± 2		250	Nil
VI	25 ± 2		500	Nil
VII	22 ± 3	<i>Sargassum boveanum</i>	125	Nil
VIII	23 ± 3		250	Nil
IX	21 ± 3		500	Nil
X	23 ± 2	Control	Basal diet.	Nil

\*Each group consisted of 6 animals and received seaweed specimens (brown). X group was kept as control and received only basal diet.

The animals were kept under observation for one month. After this period the animals showed no toxic effects, also there were no physical abnormalities observed and then autopsied to see any gross changes in various organs; heart, lungs, liver, stomach, spleen, G.I.T, kidneys, ovaries and testes.

Since the *Cystoseira barbata*, *Padina pavonia* and *Sargassum boveanum* given by oral route to the albino mice were found to be non-toxic, it is therefore concluded that these varieties of brown seaweeds could safely be used in the preparations of food and feed.

**Key words:** Toxicity, Brown seaweeds, Albino mice.

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