

Little known uses of common aquatic plant, *Hydrilla verticillata* (Linn. f.) Royle

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Abstract

Plants have been associated with health, nutrition and overall care of mankind since time immemorial. *Hydrilla verticillata* (Linn.f.) Royle is credited with numerous biological activities. The plant is the rich source of variable nutrients and chemical constituents like saponins, vitamins, minerals, antioxidants, amino acids, detoxifying agents, etc. Hydrilla is especially valuable to true vegetarians. Besides its other uses, therapeutically this plant may be used to provide complete nutrition, to improve digestion and gastrointestinal function, circulation, neurological health, blood sugar control, to strengthen immunity and increase endurance. The paper highlights various medicinal uses of the plant and different nutrients and chemical constituents present in it.

Keywords : *Hydrilla verticillata*, Aquatic plant, Medicinal uses, Nutrients, Antioxidants, Detoxifying agents.

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usually 7.6 m long with spreading thick mats on the water surface. Leaves are about 1.5 cm long, in whorl of 3-8 together, oblong-linear, apiculate, sharply serrate-dentate, sessile, whitish, and smooth beneath and rough green on upper surface. Flowers are tiny, red, pink or white in small umbels arranged in axillary and terminal panicles, 10-25 mm in length, floating on the surface just above the water. Roots are turion and tuberlike, 4-15 mm long, off-white to near black in colour.

It can survive in a few centimeters of water or in depths of up to 6m. It is ecologically sound and it grows 2.5 cm in one day in fresh water.

Hydrilla is considered as noxious weed. The plant possesses numerous mechanisms of vegetative reproduction that enable it to spread very rapidly. Management and control of this weed have been achieved by the systemic treatment with the herbicides, biological control and potential use of it as green manure in agricultural field⁵⁻⁸.

Uses

Nutritive value

Hydrilla plant is a low fat source of protein and studies at the University of

Introduction

The universal role of plant to treat diseases is exemplified by their employment in all the major systems of medicine irrespective of the underlying philosophical premise, as for example, Ayurveda, Western medicine, Unani and those of orient medicines. Hence, the plant kingdom has got wide attention as a potential source of new drugs. As a result, strategies for the fractionation of plant extracts based on biological activity rather than on a particular class of compound have been developed. Many of life saving drugs in present day of allopathic system are obtained from plant origin only.

Numerous data on the uses of plants including medicinal use have been systematically gathered by Gadgil and

Vartak (1981)¹. Therapeutic potential of herbal drugs ranges from parts of plants, through simple extracts to isolated active constituents. In the present paper, we have attempted to compile the medicinal values of *Hydrilla verticillata* (Linn.f.) Royle plant, which belongs to family *Hydrocharitaceae* (tape grass family) and is well-known as *Chingudia dala* in the Mayurbhanj district of Orissa. It is found throughout India, Sri Lanka, Malaysia, China and United States up to altitude of 610 m in water, including lake, ponds, rivers, streams and marshes.

Morphology and Ecology²⁻⁴

H. verticillata is a slender, submerged, perennial aquatic herb. Stem is much branched rooting at nodes,

Southern Florida indicate that it contains hundreds of enzymes, many of which are unique to this aquatic “nutrient powerhouse”. It also contains chlorophyll^{4,9}, whose health benefits are



Stem of *Hydrilla verticillata*



Hydrilla verticillata Plant



Flowering buds of *Hydrilla verticillata*

being studied with renewed interest in recent years (chlorophyll has been used since ancient times as an antiseptic and healing remedy). Hydrilla is especially valuable to true vegetarians. Vitamin B-12, iron and calcium are commonly supplied by animal foods (e.g. milk, cheese, meats) in an omnivorous diet. Among the nutrients these three are responsible for maintaining mental health (cognition, attention span, neuronal life), for delivery of oxygen to cells and for the maintenance of strong bones and resilient connective tissues. Adequate amounts of vitamin B-12, iron and calcium are difficult to obtain in vegetarian diets. Scientists are surprised to find that hydrilla contains more calcium than any other whole food source on earth¹⁰. Milk and egg production is increased by 20% and 14%, respectively, if dairy cows and chickens eat hydrilla. Its high values of calcium, vit. B-12, polysaccharides, amino acids, micro and macro nutrients make it a food of great value to everyone

especially to vegans and other classes of vegetarians^{11, 12}. It also contains the β -carotene, which deliver even more antioxidant, free radical scavenging, anti-ageing, anti-pollution properties.

Hydrilla plant is processed by harvesting sterilization with purified water and ozone treatment, then is dried at low temperatures. Almost all its parts like stems, leaves, flowers, turions and tubers are employed for food and medicinal purposes and can be used in the form of powder, tablets. Hydrilla can be mixed into beverages, sauces and salad-dressings; it can be sprinkled on salads and cooked into vegetable dishes of all sorts. ‘Vibrant Health’ makes hydrilla available in 200 g powder, wide mouth jars and in 1000 mg (1g), 60 tablets. As a food supplement, one tablespoon of powder or one to four tablets daily are recommended for use by a health professional. It is also available with chlorella in ‘Green Vibrance’, a well-known and respected green superfood, where a consumer will benefit 10.5 g of hydrilla in one month’s use of it (30 doses)^{15, 17, 18}.

Medicinal uses

Two biologically important and structurally novel natural products, otteliones A and B, obtained from this plant exhibit potent antitumor activity¹³. It also has antibacterial properties¹⁴. Therapeutically hydrilla plant may be used for the following purposes¹⁵: digestion and gastrointestinal function, improves blood circulation, helps in detoxification, good for neurological health¹⁶ and cardiovascular function. It increases endurance, help in blood sugar control,

strengthens immunity to protect the body from invaders and slows ageing.

Chemical Constituents^{13, 19-24}

This plant is of supreme nutrient density and bland taste. It contains variable nutrients and chemical constituents, for example saponin; salt of calcium and magnesium; β -carotene with abundant trans mineral; polysaccharides; amino acids; micro and macronutrients; antioxidants and detoxifying agents. It is the rich source of vitamins, viz. B-1, B-2, B-3, B-5, B-6, B-12, etc. It also contains minerals, such as potassium, phosphorous, iron, zinc, manganese, copper, cobalt, molybdenum, otteliones A and B. The various nutrients present in it are mentioned in Table 1.

Conclusion

The ancient Indian system of medicine needs verification on modern scientific basis. An attempt to blend ancient and modern science as well as their art could be fruitful and such attempts must be carried out on sound scientific basis. As *H. verticillata* has been used in many physiological adverse conditions and proved to possess good therapeutic agent, it needs to be studied in details. The review of literature and authors' observations clearly earmark potentialities of this plant as a good source of vitamins, minerals, nutrients, antioxidants and detoxifying agent.

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Table 1 : The various nutrients present in the *Hydrilla verticillata* plant^{11, 13, 14, 16}

Nutrients/Minerals	Amount (mg/10.5 g)
Vitamin B-1	26.2
Vitamin B-2	0.08
Vitamin B-3	5.2
Vitamin B-5	11.4
Vitamin B-6	35.9
Vitamin B-12	1.1
Calcium	1460
Magnesium	76.1
Potassium	245
Phosphorus	29.7
Iron	35.8
Zinc	6.3
Manganese	24.5
Copper	0.2
Cobalt	0.4
Molybdenum	15 μ g/10.5g
β -Carotene	19600 IU/10.5g

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