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Pharmacognostic Study, Traditional Medicinal Uses, And Pharmacological Activities of *Crepidium Amplectens*

Vijay Nigam*, Saurabh Dubey, Shivam Chaurasia, and Kanchan Agarwal

Daksh Institute of Pharmaceutical Science (DIPS), Chhatarpur, Madhya Pradesh, India

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***Corresponding author:** Vijay Nigam, Daksh Institute of Pharmaceutical Science (DIPS), Chhatarpur, Madhya Pradesh, India, Email id: vijaynigam79@yahoo.com

Abstract

Crepidium amplectens is one of nature's most extravagant flowering plants i.e. It is grown primarily at a height of more than 1500fts in India and different parts of the world. It has been used in many parts of the world in traditional healing systems as well as in the treatment of a number of diseases since ancient times. It belongs to the largest family of plant kingdom i.e., Orchidaceae. Yet no studies have been done regarding its medicinal properties and traditional uses. Here brief research is carried out on its phytochemical profile and pharmacology to rule out its medicinal properties. Microscopy of leaf shows starch grains, stone cells, fibers, vessels are important anatomical characteristics of organized drugs. Plant shows aphrodisiac, haemostatic, anti-diarrheal, styptic, anti dysenteric, febrifuge, cooling and tonic. It faces the extreme danger of extinction due to over-exploitation and habitat loss.

Keywords: Medicinal Herbs; Styptic; Aphrodisiac; Haemostatic; Anti-Diarrheal; Anti Dysenteric; Febrifuge

Introduction

Ayurveda is eternal and its tradition is everlasting. It continues to flow from ancient times. The history of Ayurvedic literature being associated with Brahma and other *devtas* is very ancient, dignified and enormous. *Dhanvantri* the lord described that *Ayurveda* is the science of life. It is a mirror of life (beneficial, non-beneficial, happy and unhappy factors of life). The main purpose of Ayurveda is to protect the health of a healthy person and to mitigate the disorders of a patient. The recognition of Charaka, *Susuruta* and other Samhitas, in their own way, continues from ancient times. The principles of health protection described in Ayurveda, tools for disease free life, good conduct and noble behavior and other issues described lucidly are important in all their perspectives. The rhizomes are elongated (thus, the plants are well-spaced, e.g., *C. distans* (Schltr.) Szlach.) or abbreviated (plants clustered, e.g., *C. resupinatum* (G. Forst.) Szlach.) and are sometimes branched. Pseudobulbs are erect, elongate, fusiform, few are noded, usually completely covered by leaf bases and basal scales, and arise from the basal nodes of the previous pseudobulb, or from the tip of the rhizome. The leaves are usually 3–6 in number (rarely 2; rarely up to 10), spirally arranged, and clustered at the apical part of the shoot. The leaf-sheath and petiole are well-developed. The leaf-blade is always plicate and membranous; and often at least slightly oblique, ovate to lanceolate, or elliptic to oblong. The leaves of the plant are more or less attenuate, acute at the apex, basally cordate, rounded, or more rarely cuneate; and 1, 3, 5, or 7-veined. The flowers are small to medium-sized (mostly ca. 0.5 cm, occasionally up to 2.3 cm in diameter—e.g., *C. megalanthum* (Schltr.) Szlach.) [1-20].

Materials and Methods

Literature research is conducted using different available literature on the drug, such as classical text of *Ayurveda* and other compendium. Botanical & medicinal Data is also collected from various books, magazines, journals, periodicals and papers published in the e-journal etc. The review was conducted with an interactive strategy of combining the keywords *Astavarga, Ayurveda, Jivaniya, Bramahniya, Nighantu, Samhita* etc.

Study area

Considering the availability of the plant, the study is conducted in different areas of Uttarakhand, especially Dehradone. Mussoorie, popularly known as the "Queen of Hills" is a charming hill station situated at an altitude of 2003 mts (+6500 FT) above sea-level in the Garhwal hills of Uttarakhand.

Identification

The samples of plant materials were identified with the help of standard local flora. Preliminary identification was done by examining fresh plants procured by the local villagers. The corresponding raw materials were collected, and the morphological characters were compared with the fresh plants and vernacular names.

Geographical distribution

Species of *Crepidium* are found in tropical countries including China, the Indian subcontinent All around the world it is found in Pakistan, Bhutan, and Tibet between 1500-3100 mts elevation. In India found in Central and Eastern Himalaya from Uttarakhand to Assam and Sikkim up to an altitude of 3300 mts in alpine grassland, grassy hill sides, damp gullies and stony slopes.

Specific Habitat

Himachal Pradesh- Shimla, Glen fall, Baluganj, Elysium Hill, on the way to Rani Forest, on the way from Khajiyar to Chamba, Chail, Hattu peak and Narkanda. Uttarakhand-Dehradun-Camelback Road, on Mussoorie bypass road, above Barlowgunj in Chakrata, Jaunsar Tehri (Magra); Pauri-Pode khal; Chamoli-Nagnath, Ukhimath, Gopeshwar; Pithoragarh-Sarju Valley, Bernath, Thalkedar; Nainital-Bhawali, Ramgarh; Almora-Between Ranikhet and Chaubatiya (Figure 1).

Figure 1: Various parts of Crepidium amplectens.

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Taxonomic Features

The stem is underground, spreading, fibrous roots downwards, ribbed. Leaves-Usually 2-4, sessile or petiolate, 6.5-11.5 cm long, ovate-lanceolate, often discolored, green, acute with prominent veins, leaves in whorls on the nodes directly raised upwards, angular, attenuate, stem covered with basal leaves forming a tubular structure. Flowers-scape-7.6 -21 cm long, flower small shortly stalked in terminal raceme, about 10 mm in diameter, yellowish green with purple centre. Bracts- spreading shorter than the ovary. Sepals-oblong, dorsal 1-4 nerved, lateral 3-5 nerved, 2 laterals rather shorter than the dorsal, margins recurved. Petals-linear, slender, longer than sepals, margin recurved, lip-6, shield like, slightly convex, tip rounded, notched or bilabiate, adnate to the base, the column sides of the lip produced upwards into large auricles, auricle of the lip very variable, acute, or obtuse, straight, and slightly overlapping. Staminal Column- Very short with short spreading arms. Anthers- Sub terminal, pollinia-4. Fruits-6 chambered capsule. Seeds- minute, powdery, ovoid, pseudobulbs 3-9 cm long and 1-3 cm in diameter, conical, fleshy, smooth, shining, in pairs, new one look like garlic cloves, greenish white, covered with membranous sheath, slightly mucilaginous, remain alive over longer period. Flowering: July-August. Fruiting: September-October [21-37].

Phytochemical Profile

Pseudobulbs contain alkaloid, glycoside, flavonoids and β-sitosterol. Also contains piperitone, O-Methylbatatasin-1, 8-cineole, citroenellal, eugenol, glucose, rhamnose, coline, limonene, p-cymene and ceryl alcohol (Table 1).

Table 1: Phytochemical compounds that were isolated from Orchids.

Class	Phytochemical	Source	Reference
Alkaloids	Cephalandole	*Cephalanceropsis gracilis*	Wu et al., 2006[a]
	Cremastrine	*Cremastra appendiculata*	Ikeda et al., 2005
	Dendrobine	*Dendrobium nobile*	Kudo et al., 1983
	Shihunidine	*Dendrobium lodigesii*	Li et al., 1991
Bibenzyl derivatives	Alkyl ferulates	*Dendrobium moniliforme*	Lo et al., 2004
	Gigantol	*Cymbidium goeringii Epidendrum rigidum Scaphyglottis livida*	Won et al., 2006; Hernandez - Romero et al., 2005; Deciga-Campos, et al. [35]
	Cumulatin, Densiflorol A	*Bulbophyllum kwangtungense*	Wu et al., 2006[b]
	Pholidotol A & B	*Pholidota chinensis*	Wang et al., 2006[a]
	Aloifol	*Nidema boothii*	Hernandez-Romero et al., 2004
Flavonoids	Derivative of Quercetin	*Anoectochilus roxburghii*	He et al., 2006
	Quercetin	*Dendrobium tosaense*	Lo et al., 2004
	Chrysin	*Cypripedium macranthos*	Shimura et al., 2007
	Homoisoflavanone	*Cremastra appendiculata*	Fan et al., 2001
Phenanthrenes	Coeloginanthridin	*Coelogyne cristata*	Majumder et al., 2001
	Moscatin	*Dendrobium loddigesii*	Chen et al., 1994
	Fimbriol A	*Maxillaria densa*	Deciga-Campos et al. [34]
Terpenoids	Dendroside A	*Dendrobium nobile*	Zhao et al., 2001
	Dendromoniliside A & B	*Dendrobium moniliforme*	Zhao et al., 2003

Pharmacological Activities

a) Pseudo bulbs are Sweet, aphrodisiac, haemostatic, antidiarrhoeal, styptic, antidysentric, febrifuge, cooling and tonic. It is useful in sterility, vitiated conditions of Pitta and Vata, semen related weakness, internal and external hemorrhages, dysentery, fever, emaciation, burning sensation and general debility.

b) *Jivaniya* (Vitality promoter)- This medicinal plant is vitality promoter, maintaining the balance between three doshas i.e., Vata, Pitta and Kapha. It enhances the energy, body strength, skin glow and other properties of the body.

c) *Bramhaniya* (Body mass promoter)- This medicinal plant is body mass promoter. It is described within the *Bramhaniya varga*.

d) *Ayushya* (Longevity)- This medicinal plant mitigate the disorder of the body and specifically alleviates *Tridosaja* disorder in the body to increase longevity and slow down the process of ageing.

e) Antioxidant activity: Pseudo bulb extract of *Crepidium amplectens* shows antioxidant activity.

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f) Antifungal and Antibacterial Activity-Extract of *Crepidium amplectens*shows antifungal and antibacterial activites.

g) The ethanol extract of its pseudo bulb exhibits analgesic and anti-inflammatory activity in experimental animals.

Classical Medicinal Uses

a) Intake of *Mahamayur Ghrita* processed with *Jivaka* and other herbs is useful in *Rasaraktadi dhatugat vikara, shrotadi indriya* vikara (sensory organ disorders), *svarabhransa* (Aphesia), asthma, cough, facial paralysis, vaginal disorders, blood disorders and semen related problems.

b) Intake of powder prepared from *Jivaka*, and other herbs mixed with an appropriate quantity of honey and crystal sugar is useful in cough and cardiac diseases.

c) *Vacadi* Taila processed with *Jivaka*, and other herbs used as *anuvasana vasti*; is beneficial for *Gulma*, distention, Vata associated disorders and urinary incontinence.

d) Intake of *Jivaniya Ghrita* processed with *Jivaka* is useful for the whole body vitiated with gout and *Vata* associated disorders.

e) Citrakadi Taila processed with *Jivaka*, and other herbs is useful in Vata associated disorders, sciatica, limping, kyphosis, gout, and urinary disorders.

f) *Mahapadma Taila* processed with *Jivaka*, and other herbs is useful in gout and fever.

g) *Jivaniya Ghrita* processed with *Jivaka* and other herbs, used properly, can be effective in treating gout and other chronic *Vata* associated disorders.

h) *Asthapana vasti* processed with *Jivaka* and other medicinal herbs is useful in treating *Gulma*, metrorrhagia, anaemia, malaria.

i) Intake of *Ghrita* processed with *Devadaru*, Kakoli, Jivaka and other medicinal herbs given in proper dose is useful in child emaciation.

j) *Himavana Agada* prepared with the powder of *Pancavalkala, Jivaka* and other herbs mixed with honey to make a paste and external application of this paste on snake bite alleviates the toxicity. It also alleviates other symptoms like edema, erysipelas, boils, fever and burning sensation.

Traditional Medicinal Uses

a) Decoction prepared from its pseudo bulb is useful in general debility.

b) Intake of powder prepared from its pseudo bulb is useful in seminal weakness.

c) Intake of its pseudobulb powder promotes lactation.

Discussion

Crepidium amplectens (Jeevak) plant found in Central and Eastern Himalaya from Uttarakhand to Assam, Sikkim and other neighboring states is of significant importance due to its multipurpose efficacy in the management of different disorders and maintenance of proper health. *Crepidium amplectens* is one among 292 species of genus *Crepidium* and family Orchidaceae. It can provide various miraculous remedies for several severe disorders. The environmental protection and conservation of *Crepidium amplectens* requires immediate attention. A detailed and serious survey of its natural habitat is also required to ensure its availability. Another research study is required to find out its ecological behavior in the natural environment - so as to increase its density. Research work must be initiated in this direction which is possible through tissue culture and modern agricultural practices.

Conclusion

Table 2: Biological Activity of Bioactive compounds in Orchids.

Biological Activity	Reference
Antimicrobial	shiura et al.,2007
Anti inflamation	Wang et al., 2006b
Anti oxidant	He et al.,2006
Anti cancer Activity	Wu et al.,2006
Anti pyretic	Chen and chen ,1935
Anti mutagenic	Miyazawa et al., 1999
Anti convulsive	He et al.,2006
Anti helmentic	Rhee et al.,1982
Anti hepatoxic	Wu et al.,2007
Wound healing	Nayak et al.,2011
Anti platelet	Ding et al. [37]
Anti diabetic	Wu et al.,2004
Immunomodulatory activity	Ye et al., 2002
Pain reliving	Deciga -Campos et al., [34]
Anti virus	Deciga -Campos et al., [35]
Herbicidel agent	Hermandez et al.,2005

The information collected regarding *Crepidium amplectens* needs a thorough phytochemical investigation including alkaloid extraction and isolation with some clinical trials, biological evaluation on experimental animal models, toxicity studies etc. People are cultivating *Crepidium amplectens* (Jeevak) for their economic upliftment and thereby protecting the species from danger of extinction. But there is an urgent need in addition to protection and conservation to create mass awareness among the local people regarding the promotion of its therapeutic efficacy. The paper highlights information to conserve *Crepidium amplectens* for sustainable medicinal uses for the future generation. Since Ayurveda and ethnobotany continue to play a major role in

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medical therapy, it is of utmost importance to conserve these resources for the welfare of mankind. This species has been listed as "Endangered" for the globe, however, based on its low density, frequency, and abundance in natural pockets in Himachal Pradesh, Jammu & Kashmir, and Uttarakhand, it deserves to be categorized as "Critically Endangered" for the globe; the natural habitats of these species throughout the Himalayas need to be identified and officially protected for conservation (Table 2).

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