

Bioactive Compounds & Medicinal Properties of *Valeriana jatamansi* Jones - a review

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Abstract: *Valeriana jatamansi* Jones commonly known as “Indian Valerian” is a perennial medicinal herb, gynodioecious in nature belonging to family Valerianaceae. Today the species is highly valued medicinal plant with many pharmacopeial monographs. It occurs at an altitude of 1200-3000 m asl. Rhizomes and roots of the herb yields essential oil. The therapeutic properties of Valerian are attributed to a group of compounds known as Valmane and Valepotriates. The Valepotriates are a group of monoterpenoids of irridoid type having epoxy group and beta-acetoxy isovaleric acid. Three novel sesquiterpenoids, valeriananoids of each, forty constituents of essential oils and eleven jatamanis including a new lignin isovaleroxylariciresinol have been extracted from this valuable herb. Underground parts are used in mental disorders, scanting hair, epilepsy, leprosy, as an insecticide and as potential anti-tumour agent. Present paper highlights the information based on available published literature so as to describe the active constituents and medicinal profile of this threatened species which will serve as a valuable platform for further research and conservation of this medicinally important species.

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1. Introduction

Valeriana jatamansi Jones syn. *V. wallichii* popularly known as Indian Valerian (Mushkibala in Hindi/Kashmiri, Suganthdhawal or Tagara in Sanskrit) is distributed in all temperate regions of the World except Australia (Jain,1968; Polunin and Stainton,1987). Several species of genus *Valeriana* have also been reported from Chile, Brazil, South Africa and Sub-tropical Asia and among these twelve species occur in India (Polunin and Stainton,1987; Rao *et al.*, 1997). *V. jatamansi* is a small herbaceous species of family Valerianaceae and is a perennial dwarf, hairy, rhizomatous herb forming a group of thick roots covered with fibers (Bagchi and Wooper, 2011). The herb mostly grows randomly in steep areas, moist, rocky, disturbed grassy slopes, on stones with coarse sandy loam soil. The herb occurs in an altitudinal gradient of 1200-3000 m asl.

Studies conducted on this species have revealed that the species falls in endangered category (Kaul and Handa, 2000) and is at the verge of becoming extinct (Nayar and Sastri, 1998) and due to its over-exploitation for its rhizomes having immense medicinal importance. Habitat degradation (Airi *et al.*, 2000; Nautiyal *et al.*, 2003) and other biotic interferences in its distribution ranges are the other reasons for depletion of this herb from its natural habitat (Chauhan and Nautiyal, 2005; Chauhan, 1999). The herbarium section of the Department of

Botany, University of Kashmir represents 5 species of the genus *Valeriana* from different localities of Kashmir valley including Shajnar, Dara, Harwan, Gulmarg, Yusmarg, Dacksun, Ferozpur, and Sonamarg (Naqashi and Dar,1982-86). Species is gynodioecious (Raina and Srivastava, 1992) and possess pubescent stem and radical leaves with several long petioled, cordate-ovate, cauline few or much smaller entire or pinnate with hairy fruits or nearly glabrous. Flowers are white tinged with pink. Root stock thick and horizontal, aromatic and modular (Hooker, 1881).

2. Active compounds and medicinal properties

V. jatamansi Jones an important medicinal wild herb is being exploited for its roots and rhizomes which contain valepotriates (Chopra, 1956; Sood 1992) highly effective against leprosy (Kour *et al.*1999) and curing Lewybody dementia (Bagchi and Wooper, 2011) . Commercially produced Valerian (Anonymous, 1976) is obtained from roots which have antibacterial and antiprozoal activity (Theis, 1966; Von and Rehman, 1969).The isolation of valepotriates and determination of its medicinal properties resulted in wide spread use of this compound as a sedative in West Germany under the trade name “valmane” which comprises of standardized mixture of valepotriates containing valtrate (15%), didrovaltrate (80%) and acevaltrate

(5%) (Fig. 1) (Anonymous, 1976; Theis, 1966; Von and Rehman, 1969). Although some clinical testing of these alkaloids were carried out earlier also, but the first report on its medicinal properties was published in 1969. The structure of three novel sesquiterpenoids, valeriananoids (Ming *et al.*, 1997), forty chemical (Dongsheng and Jixian, 1994) constituents of essential oils and eleven *jatamanins* including a new lignin, isovaleroxylariciresinol are extracted from *Valerian species* (Lin *et al.*, 2010; Dongsheng and Jixian, 1994).

The herb is widely used in making perfumed powder and cardiac preparations. It is regarded as an aphrodisiac, antispasmodic, tranquilizer, antiseptic, expectorant, febrifuge, nerve tonic, ophthalmic, sedative supportive and tonic useful in hysteria, cholera, snakebite, scorpion sting, asthma and neurosis (Wagner *et al.*, 1980; Grusla, *et al.*, 1986; Gupta, *et al.*, 1996; Nahrstedt., 1984; Diapher and Hindwarch, 2004). Cytotoxicity of valeoptriates have been reported for potential anti-tumour properties which reduces the size of tumor after 24 hours application (Diapher and Hindwarch, 2004). Dried rhizomes are also employed in hair oil (Kirtikar and Basu, 1975; Kumar, 2003; Prakash and Mahrotra, 1994). Roots are acrid and bitter which are used as carminative, laxative, and hypnotic. These are also used for curing blood diseases, burning sensation, cholera, skin disease, throat troubles and ulcers (Pande *et al.*, 1994). Further roots increase the lustre of eyes, promote growth and blackness of hair and are also useful in the treatment of cough, chest pain and kidney troubles.

On the basis of collection of ethnic information the tribes of Tehri- Garhwal Uttarakhand regard *Valeriana* as a sacred plant and are used in the preparation of *urtan* (a cosmetic) in marriage and religious ceremonies and also as an insect repellent (Pande *et al.*, 1994). Ethno-botanical studies conducted on Gaddi tribes of Bharmour area in Himachal Pradesh has reported the use of its leaves and roots for performing *havan* (Religious ceremonies) and is locally known as *Nak Nahani* (Uniyal and Issar, 1967).

3. Conservation status

About 350 species of the genus *Valeriana* and family Valerianaceae have been over exploited due to their use in curing of wide range of diseases nationally and internationally (Gupta, 2010; Wyatt, 1981). The ever increasing demand has enforced indiscriminate collection of rhizomes by various agencies, researchers and locals causing drastic threat to its existing wild population.

The population assessment of *Valeriana* species has revealed that on an average there is a decrease of about 30 - 40 plants per 100 m² and is increasing with passage of time. Species of genus *Valeriana* are totally wiped out from some previously recorded localities (Wyatt, 1981; Verma *et al.*, 2004), comparatively at lower altitudes while their distribution in the inaccessible terrain has dissected and shrunken. Profound impact indicates that species is exploited for its rhizome, which is the source of active principle - valeportrites for which plant is sought after and has been depleting from its natural habitats at a fast pace, hence, it is of immediate concern that different conservation measures and strategies be adopted so as to stop its further depletion from its natural habitats.

4. Conclusion

Valeriana jatamansi Jones is a natural tetraploid species distributed from Afghanistan to Southwest China and Burma. Underground parts contain epoxy-iridoid esters called Valepotriates which are found in variable amounts having bioactive compounds which confer anxiolytic properties. It is cultivated in some community forest on commercial basis, but on the private land it is planted as demonstration plots not on a commercial basis. Harvesting is done during September - November. The whole plant is dug out and only rhizomes are collected. For commercial cultivation 2500 Kg (Manondar, 1976) of dry rhizome can be collected from one hectare of land. First good harvest can be done after two years of plantation. Drug obtained from rhizomes is used in perfumed powder and cardiac preparations.

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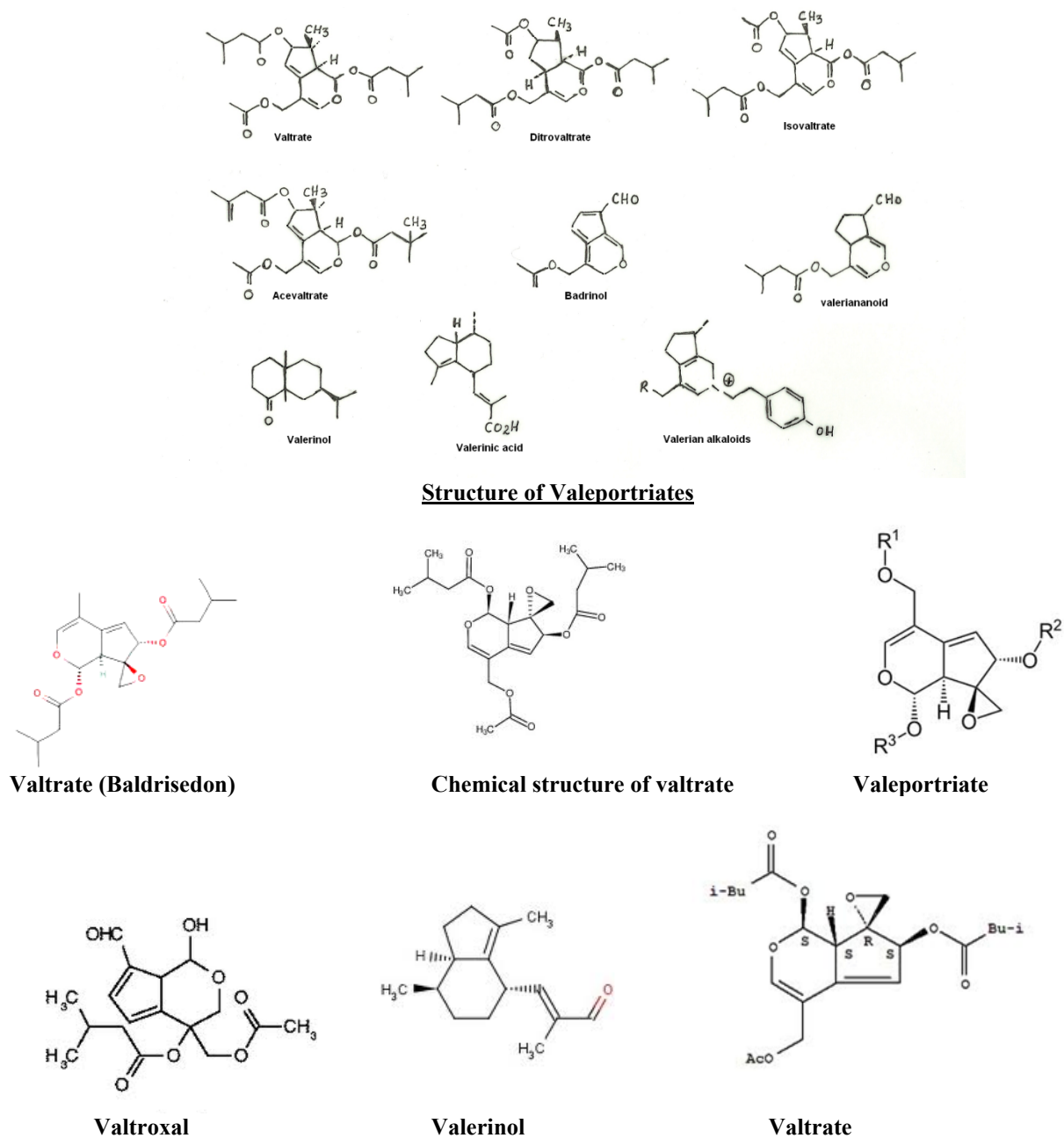


Fig. 1: Molecular and Chemical structures of different chemical constituents obtained from *Valeriana jatamansi*

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