

Therapeutic Effects of Valerian (*Valeriana officinalis* L.)

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Abstract: Valerian is a plant that is endemic to mild parts of the America, Europe and Asia. It is used as an opiate, especially in the cure of restlessness, and almost all herbal sleep aids contain valerian. Valerian contains many compounds who act synergistically. Preparations containing valerenic acid may be regulated. This species is spreading in spontaneous flora, in humid and cloudy areas (woods, wet meadows), especially in hilly and mountainous areas. It was taken and broad in culture and in the present the raw material of valerian comes, mostly, from cultures. Valerian essential oil is known for its calmative and anxiolytic activity, whereas valepotriates are known to apply a regulative effect on the autonomous nervous system. This medicinal plant used to help various health problems including insomnia, anxiety, heart problems and more others; has been used pharmaceutically for at least of 2000 years in the cures of brain disorders and also as treatment of varied nervous disorders, antispasmodic, anthelmintic, diuretic, diaphoretic, emmenagogue and hysteria. The present review presents the biological evidence of this plant which is very helpful in combating sleep problems and has no negative effects on long term. Although, the valerian tea is known to not have negative impacts, overdosing may lead to intestinal issues.

Keywords: anxiety, essential oil, insomnia, rhizome, sleep, stress, *Valeriana officinalis*.

Introduction

Insomnia affects the adult population, almost one-third, and subsidizes to increase rates of absenteeism, social disabilities and health care use (Bent et al., 2006). The extracts from the underground parts (rhizome and roots) of valerian are widely used to induce sleep and improving its quality. The present review article

aims to briefly present the therapeutic effects for human's health of valerian (*Valeriana officinalis*).

Bent et al. (2006) have reviewed some randomized, placebo-controlled trials of valerian for improving sleep quality. The investigated studies, in number of 16, were performed on a total of 1093 patients; the research team observed that the most studies had some significant methodologic problems in the valerian preparation and doses, but also in the varied length of treatment. In 6 studies, a binary result of sleep quality was reported and was remarked a significant benefit, statistically ensured, of using valerian for sleep problems. The results of the study suggest that the sleep quality can be improved by valerian without having side effects (Bent et al., 2006). In table 1 are presented the inventoried studies by Bent and his team.

Taxonomy and description

Valeriana officinalis L. is a species form *Plantae* kingdom (Vegetal, plants), subkingdom *Viridiplantae* - which include green plants - infrakingdom *Streptophita* (land plants), division *Tracheophyta* represented by spermatophytes, seed plants or phanérogames, *Magnoliopsida* class - plants with flowers - *Dispcales* order, *Valerianaceae* family and *Valeriana* genus (Integrated Taxonomic Information System, 2011).



Figure 1. *Valeriana officinalis* - plant morphology
(Source: <https://www.spicegarden.eu>)

Table 1

Sleep quality improvement after different doses of valerian
(Adapted after Ben et al., 2006)

First Author, Year	No. of Participants	Participant Population	Mean Age	Dose	Subjective Sleep Quality Measure	Sleep Quality Result	Sleep Quality Improvement
Jacobs, 200521	270	Adults with anxiety or insomnia recruited from Internet advertisements	41	600 mg qhs extract	Dichotomous (sleep improved or not)	89% of valerian group improved 86% of placebo group improved	No
Jansen, 197726	150	Geriatric inpatients with sleep disturbance	79	100 mg tid extract	Dichotomous (very good, good, a little better vs no improvement, worse)	85% of valerian group improved 51% of placebo group improved	Yes
Leathwood, 198225	128	52% good sleepers, 48% poor sleepers; health status not reported	NR	400 mg qhs dried root	Dichotomous (slept better or not)	43% of valerian group slept better 25% of placebo group slept better	Yes
Vorbach, 199624	121	Non-organic insomnia requiring medication	47	600 mg qhs dried root	Dichotomous (good sleep or not)	66% of valerian group had a good sleep 26% of placebo group had a good sleep	Yes
Cerny, 199923	98	Healthy volunteers	34	360 mg qhs + 80 mg lemon balm extract	Visual analog scale	33% of valerian/lemon balm group improved 9.4% of placebo group improved	Yes
Kuhlmann, 199922	91	Healthy subjects	41	600 mg qhs extract	Visual analog scale	7.4% increase in valerian group 4.5% decrease in placebo group	No
Kamm-Kohl, 198420	80	Elderly patients with a nervous impairment of behavior	NR	90 mg tid	Dichotomous (sleep improved or not)	74% of valerian group improved 33% of placebo group improved	Yes
Delsignore, 199227	40	Patients with minor anxiety symptoms and emotional tension disturbances	51	100 mg tid	Dichotomous (insomnia improved or not)	81% of valerian group with insomnia improved 50% of placebo group with insomnia improved Complete data not reported	NR

Farag, 2003 ¹⁸	25	Healthy volunteers with sleep-onset insomnia	37	320 mg + other herbs qhs	St Mary's Hospital Sleep Questionnaire	Data not shown	NR
Coxeter, 2003 ¹⁷	21	Adults with chronic insomnia; combined n-of-1 trials	54	225 mg qhs extract	Proportion of treatment success	0.49 proportion of success with valerian over placebo	No
Diaper, 2004 ¹⁹	16	Healthy adults with a mild sleep complaint	56	300 or 600 mg qhs extract	Visual analog scale, posttreatment score (0-100)	Valerian 300 mg = 48.1 Valerian 600 mg = 51.5 Placebo = 47.9	No
Donath, 2000 ¹²	16	Healthy subjects with insomnia	49	600 mg qhs extract	Visual analog scale	10% increase in valerian group 15% increase in placebo group	No
Schulz, 1994 ¹³	14	Healthy elderly women with insomnia	62	405 mg tid extract	Visual analog scale	No difference between groups Data not shown	No
Balderer, 1985 ¹⁴	10	Healthy subjects	33	450 mg or 900 mg qhs dried root	Visual analog scale	No difference between groups Data not shown	No
Leathwood, 1985 ¹⁵	8	Healthy subjects with insomnia	45	450 or 900 mg qhs dried root	9-point scale (9 is best score)	Valerian 450 mg score = 5.8 Valerian 900 mg score = 5.2 Placebo score = 5.0	No
Francis, 2002	5	Children with intellectual deficits and sleep disturbances	11	20 mg/kg dried root qhs	Visual analog scale (by parents)	Baseline score = 5.3 Valerian score = 7.5 Placebo score = 6.7	No

Valerian is a perennial species with a varied morphology. It has a strong rhizome with secondary roots. In its first year develops a basal leaf rosette with pinnate leaves. From the second year, the plant forms the flowering stem, which grows between 80-120 cm, and ramification at the top. The pinnate leaves form between 9 - 21 finely serrated leaflets, or a single pinnate. Leaves are pale green on the upper surface and darker underneath, they are attached, on the stem, in pairs to either side. The stems are ended in umbels bearing many branches and tiny white and pale pink flowers. When the plant is fresh doesn't smell. The typical smell of valerian can be felt by finely issued by the roots, when is fresh, and is increase only when the plant was been dried (Plant-Encyclopaedia).

Origins and Traditions

The medicinal use of *Valeriana officinalis* has a long history, dating from the era of Hippocrates and Dioscorides, the Greek physicians, who recommended it as sleep aid. The Roman emperor's Marcus Aurelius physician, Galen, also prescribed it for sleep disorders as insomnia. The ancient classical authors recommend this plant as a diuretic and menstrual flow simulator.

Among its utilities, in 16th century was also used as treatment of trembling, nervousness, headaches and heart palpitations (Engels, 2008). It was used in World War II to calm the soldier's anxiety and nervousness due to the bombs that were occurring and also to relieve the stress caused by air raids. In ritual practices, as ceremonies, it was used as a tool for spells (www.spell8.com).

In the United States, this species is used as dietary supplement in some forms, like alcoholic tinctures, infusions or teas, dried and shredded roots extract in capsules or tablets. Most of the times, valerian is combined with other herbs traditionally known to promote sleep such as hops (*Humulus lupulus*), passion flower (*Passiflora incarnata*), and lemon balm (*Melissa officinalis*) from different botanical families (Engels, 2008).

Behind its medicinal properties, there are also superstitions related to this plants properties as: storm protection by hanging sachets with ground valerian root which will protect your home against wind, lightning and floods during the storm, eases the communications (few blossom in a vase ease tensions during difficult conversation), and support self-acceptance just by plant it in your

garden or carry a piece of root with you.

Chemical Composition

The whole plant contains volatile oil, but the underground parts are richer. The volatile oil content of the fresh roots is 0.05-0.22%, and in the dried 0.2-2.43% depending on the species, variety and growing conditions. The valerian volatile oil contains esters of borneol, in a higher proportion (9.54%) of fenugreek bornyl isovalerianate (which imprints the specific smell of the valerian rhizoma), as well as bornyl formate, acetate and butyrate; as well as pinene, camphene, dipentene, citrene, etc. Among the other compounds of the raw material are: valepotriate (0.1%), the acid isovaleric, valerenic acid (with antispasmodic action, similar to papaverine), other organic acids (formic, acetic, butyric, malic), alkaloids, regimens, alcohols, antibiotics, tannin, enzymes, mineral salts, etc. (Muntean et al., 2016).

Therapeutic Effects of Valerian

Pre-menstrual syndrome it's a common disorder with a wide variety of symptoms like irritability, depression, fatigue, food cravings, mood changes and sensitivity on breasts level (Jacobs et al., 2007). According to Moghadam et al. (2016), the extracts of valerian roots could reduce some severe symptoms of pre-menstrual syndrome.

Feng et al. (2022) shows how Valerian Extract Capsules (VEC) are made from the underground parts of the plant and the rhizome of *V. officinalis*, a potent Chinese patented medicine used to treat stomach pain and bloating caused by gastrointestinal disorders such as chronic gastritis and functional dyspepsia.

Gromball et al. (2014) noticed that children from primary school suffering from hyperactivity and concentration difficulties, but without ADHS criteria, has responded well to the 7 weeks treatment with a treatment based on valerian root with lemon balm; a reduction of problems at school and at home, but also a reduction of symptoms was observed. This combination between valerian root and lemon balm can represent a viable option for impulsive children with concentration difficulties (Gromball et al., 2014).

Biological action of Valerian oil

Active compounds of valerian (volatile oil, acids, alkaloids, etc.) from the underground parts (rhizome and secondary roots) have a sedative effect on the nervous and cardiac system. The therapeutic action is conditioned by a complex of active principles. It is known as a strong sedative of the whole nervous system (Cho and Shimizu, 2015).

It's used as nervous sedative, cardiac tranquilizer, hypotensive, insomnia, cardiac neuroses and more. It enters in the composition of some sedatives and others products, as well as teas: calming, gastric, sedative and calming against cardiac disorders. Using valerian without interruption leads to habituation, again the disbursement of certain doses has negative effects on the digestive tract; it causes headaches and nausea (Muntean et al., 2016).

At the brain level increases the amount of a chemical substance called gamma aminobutyric acid (GABA). This acid helps regulate nerve cells and calms anxiety (Gropper, 2020).

Conclusions

Valeriana officinalis L. has an enormous importance in alternative medicine, mostly in treatments of insomnia and has showed its benefits since the second century A.D. when people first discovered valerian properties and the non-harmful way it can treat various health problems. Furthermore, the way the roots of this plant helps increasing a substance that regulates a certain nervous cell which eventually calms the nervousness is an important step in treating people that suffer from anxiety, and also because it doesn't provoke addiction like other drugs.

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