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Artemisia: A Medicinally Important Genus

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Abstract

Artemisia contains more than 400 species, is the largest genus of the plant family Asteraceae. These plants play key roles in the lives of tribal peoples living in the Himalaya as well as modern society by providing highly rich medicinal properties. This review presents a summary of various volatile and non-volatile compounds of Artemisia species.

Keywords: Artemisia; Anti-malarial; Anti-cancer; Essential oils; Biological activity

Introduction

The word 'Artemisia' comes from the ancient Greek word: 'Artemis'=The Goddess (the Greek Queen Artemisia) and 'absinthium' = Unenjoyable or without sweetness comprises 400 species (~474) revered as 'Worm wood', 'Mug word', 'Sagebrush' or 'Tarragon' [1-2]. In the ancient time, the knowledge of herbal medicines were confined by a tribal community, practiced villagers, and priests but in the modern era, the popularity and faith in the bioactive containing herbal drugs have become widespread. Although, several synthetic drugs are available in market to treat various diseases and disorders but, they have side-effects. On the other hand, there is an increasing demand of the herbal medicines, scientist and pharmaceutical industries investigating phytochemical as they are safe, effective, cost effective, eco-friendly and free from deleterious effects without any side effects. Artemisia genus provides a promising cure for various diseases by containing antibacterial and antioxidant properties. Therefore, Artemisia genus prompted us to compile a review on the secondary metabolites and several phytochemical compounds characterized in its different species.

Pharmacological activity of Artimisia

Artemisia species are an excellent source of essential oils like pinene, thujyl alcohol, cadinene, phellandrene, thujone, etc. which are reported to possess various biological activities including, analgesic [3], and anti-convulsant [4], anti-arthritis [5], anti-cancer [6], anti-cholesterolemic, cholagogue, diuretic, febrifuge and vasodilator [7], anti-coccidal [8], anti-diabetic [9-11], anti-epileptic, anti-feedant [12], antifertility [9], anti-fungal [1], anti-viral, anti-helminthic [13], anti-herpes virus [14], anti-hyperlipidemic [15-16], anti-hypertensive [17-18], anti-spasmodic, antiinflammatory [19], anti-leishmanial [20-21], anti-malarial [22], anti-migraine [23], antinociceptive [24], anti-oxidant [6,25-27], anti-pyretic [28], anti-parasitic [29], anti-plasmodial [30], vermifuges, febrifuge, anti-biotic, urine stimulant, bile stimulant, anti-rheumatic [31], anti-tumor [32], Antiulcerogenic [33], anti-venom [34], deobstruents [35], disinfectant, choleretic, balsamic, depurative, digestive, emmenagogue, and anti-leukaemia and ant-sclerosis [36], emmenagogue, diuretic, abortive [37], hepatoprotective [25], immunomodulatory [38], insecticidal [39], neuroprotective [40], menopause, premenstrual syndrome, dysmenorrhea and attention deficit hyperactivity disorder [41], trypanocidal, trichomonacidal [42] and wormicidal [43].

Phytochemical compounds of Artimisia

Approx 839 compounds from A. abrotanum L., *A. absinthium L., A. afra, A. annua L., A. arborescens, A. capillaris Thunb., A. caruifolia, A. chamaemelifolia, A. cina, A. dracunculus L., A. herba-alba, A. indica Willd., A. japonica Thunb., A. vulgaris* have biochemically investigated [44-45] which contains terpenoids, flavonoids, coumarins, caffeoylquinic acids, sterols and acetylenes. Oxygenated terpenes and hydrocarbon and are chief compounds in Artemisia. These are mostly acyclic monoterpenes (citronellol, myrcenol, linalool, artemisia ketone, Artemisia alcohol etc.), monocyclic monoterpenes viz. p-menthanes (menthol α-terpinene, p-cymene, terpinen-4-ol, 1,8-Cineole piperitone etc.), bicyclic monoterpenes viz camphanes (borneol, camphor etc.) pinanes (α-pinene, myrtenol, myrtenal, 3-pinanol etc.), thujanes (α-thujene, sabinene, sabina ketone etc.), acyclic sesquiterpenes viz. farnesanes (farnesal, farnesol etc.), monocyclic sesquiterpenes viz. bisabolanes (α-bisabolol, cis-lanceol etc.), germacranes (germacrene A,

germacrene B, germacrene C, germacrene D etc.), elemanes (α-elemene, β- elemene, γ-elemene, δ-elemene etc.) humulanes (α-Humulene, Humulene epoxide I etc.), caryophyllanes (β-caryophyllene, γ-caryophyllene etc.), bicyclic sesquiterpenes viz. eudesmanes (α-selinene, β-eudesmol , kongol , artemisin etc.), cadinane (artemisinol, δ-Cadinene , γ-Cadinene etc.), muurolanes (γ-muurolene, δ-Muurolene etc.), amorphanes (4,7(11)-Amorphadien-12-al, 4-Amorphen,3,11-diol, Arteannuin A, Arteannuin B, Arteannuin C, Arteannuin D etc.), guaianes (α-guaiene, β-guaiene, γ-gurjunene etc.), aromadendranes (α-Aromadendrene, globulol etc.), tricyclic 151 sesquiterpenes viz. cedranes (cedrol, cedryl acetate etc.). These species also contain higher terpenoids viz. diterpenes (phytol, isophytol etc) and triterpenes (β-amyrin, α-amyrin, friedelin etc.). These species also contain higher terpenoids viz. diterpenes (phytol, isophytol etc) and triterpenes (β-amyrin, α-amyrin, friedelin etc.). The various class of compound reported here possess Limonene (64), is a monoterpene and has many medical and pharmaceutical applications [45] like anti-carcinogenic actions, in liver tumour models [46-47] and as topical medication for both dermal and sub-dermal injuries [48].

Conclusion

Increasing population and high demand of medicines causes unsustainable harvesting of various medicinal plants in the Himalayan region which in turn cause environmental degradation. Climate change also affecting the physiological properties of these medicinal plants. So it is necessary to encourage the preservation of traditional knowledge and cultivation through conventional and micro propagation protocols.

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