

Minireview on *Achillea millefolium* Linn

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Abstract Yarrow (*Achillea millefolium* L.) is an important medicinal plant with different pharmaceutical uses. *A. millefolium* has been used for centuries to treat various diseases including malaria, hepatitis and jaundice. *A. millefolium* is commonly prescribed to treat liver disorders. It is also used as an anti-inflammatory agent and is a hepatoprotective herb. *A. millefolium* is considered safe for supplemental use. It has antihepatotoxic effects also. It is prescribed as an astringent agent. It is prescribed in hemorrhoids, headache, bleeding disorders, bruises, cough, influenza, pneumonia, kidney stones, high blood pressure, menstrual disorders, fever, rheumatoid arthritis, gout, osteoarthritis, hemorrhagic disorders, chicken pox, cystitis, diabetes mellitus, indigestion, dyspepsia, eczema, psoriasis and boils.

Keywords *Achillea millefolium* · Efficacy · Literature review · Medicinal activity

Introduction

Achillea millefolium (English name: yarrow; Arabic names: *shavella*, *huzambil*; Urdu name: *biranjasef*; family Asteraceae) is a small, perennial, tufted herb up to 50 cm tall, with a slender cropping rootstock throwing numerous roots and stolons with a blunt, succulent scale at each

node. Leaves alternate, oblong-lanceolate, three pinnatisect, minutely divided into linear, dentate and mucronate more or less hairy segments. Flowers are numerous, small and white, with corymbose, ovoid, flat-topped heads at the ends of stems and branches. Fruits are shining, with no pappus. It is found in the Himalayas and Europe. *A. millefolium* is an important species, mainly known for its anti-inflammatory effects. It is prescribed to treat hepatitis B and C. It is effective in respiratory tract infections and gastrointestinal disorders. Its antibacterial activities have been reported. It is prescribed for abdominal pain, abdominal bloating and other gastrointestinal diseases. It acts as an astringent agent in diarrhea and dysentery. It is a digestive and antifatulent. It reduces fever via diaphoresis. It is prescribed in muscular pain. It is a blood purifier. It prevents excessive bleeding and helps to thicken the blood. It is prescribed in hypertension. This plant contains several components that have beneficial effects on human health. The pharmacological effects of *A. millefolium* are widespread. Yaesh et al. (2006) reported hepatoprotective, antispasmodic and calcium antagonist activities of the aqueous-methanol extract of *A. millefolium*. Dall'Acqua et al. (2011) reported vasoprotective activity of standardized *A. millefolium* extract. Montanari et al. (1998) reported an antispermatogenic effect of *A. millefolium* in mice. Pires et al. (2009) reported an antinociceptive peripheral effect of *A. millefolium* L. and *Artemisia vulgaris* L.—both plants known popularly by brand names of analgesic drugs. Tozyo et al. (1994) reported novel antitumor sesquiterpenoids in *A. millefolium*. Konyalioglu and Karamenderes (2005) reported protective effects of *A. millefolium* L. species native to Turkey against H₂O₂-induced oxidative damage in human erythrocytes and leucocytes.

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Chemical Constituents

It contains alkaloids, glucoside, choline, volatile oil, azulene, chamazulene, salicylic acid, sesquiterpenoids, dicaffeoylquinic acids (DCCAs), luteolin-7-*O*-beta-D-glucuronide, borneol, camphor, eucalyptol, beta-pinene, alpha-terpineol, diphenylpicrylhydrazyl radical, artemetin, dihydrodehydrodiconiferyl alcohol 9-*O*-beta-D-glucopyranoside and apigenin (Falconieri et al. 2011; Benedek et al. 2007).

Traditional Uses

Achillea millefolium is an astringent agent. It is prescribed for hemorrhoids and headache. It is useful in bleeding disorders. This drug is prescribed for bruises. Flowering plants have the most medicinal activity compared to other parts of plants. This has stimulant activity and is used as snuff. It is useful in cough and influenza. In the nineteenth century, it was said to have a larger number of indications than any other herb. An antiallergic compound has been isolated from flowers of this plant. It is used in hay fever. It is effective in respiratory tract infection, especially infusion is prescribed for respiratory tract ailments. This plant is effective in phlegmatic disorders such as cough and pneumonia. It increases bile production, which is helpful in the emulsification of fat. It is a diuretic and is prescribed in kidney disorders such as kidney stones. It is used in high blood pressure and is included in various herbal coded formulations that are usually used for the treatment of high blood pressure. It is prescribed in menstrual disorders. It helps in reducing fever. This plant is used to enhance the activity of other plants and as a blood purifier. It is anti-inflammatory and is prescribed in musculoskeletal disorders such as rheumatoid arthritis, gout and osteoarthritis. It helps in hemorrhagic disorders and prevents bleeding. It is used as an antiatherosclerotic agent and helps in lowering the blood cholesterol level. It is effective in fever such as chicken pox. It is prescribed in cystitis, diabetes mellitus and indigestion. It is effective in choleric dyspepsia. It is prescribed in eczema, psoriasis and boils (Usmanhani et al. 1997).

Pharmacological Activity

Choleric Activity

Benedek et al. (2005) reported the choleric effects of *A. millefolium* in isolated perfused rat liver. A study was conducted to investigate the efficacy of a fraction enriched in DCCAs and luteolin-7-*O*-beta-D-glucuronide for its choleric potential. This study compared *A. millefolium*

with cynarin (1,3-DCCA), which is derived from *Cynara scolymus* and is the main compound of this plant. Solid-phase extract was used for preparation of DCCAs and luteolin. These components were prepared from a 20 % methanolic extract of *A. millefolium*. These experiments showed a dose-dependent increase in bile flow using an *A. millefolium* fraction. The choleric effect of *A. millefolium* fraction was two- to threefold more compared to cynarin. When DCCAs and luteolin were given simultaneously, there was significant bile flow compared to the single compound cynarin. This study showed that *A. millefolium* has choleric potential.

Antimalarial Activity

Lehane and Saliba (2008) reported that common dietary flavonoids inhibit the growth of the intraerythrocytic malarial parasite. A study was conducted to investigate the efficacy of flavonoid against malarial parasites. For this purpose, chloroquine-sensitive and chloroquine-resistant (7G8) strains were used. Eleven flavonoids were investigated, and eight exhibited activity against the 3D7 strain. The 7G8 strain was affected by all flavonoids. Luteolin was most effective at preventing the parasite growth.

Antioxidant and Antimicrobial Activity

Candan et al. (2003) studied the antioxidant and antimicrobial activities of the essential oil and methanol extracts of *A. millefolium*. This was an in vitro study. On phytochemical analysis, 36 compounds were identified, 90.8 % of total oil. Principal components that make up 60.7 % of oil are borneol, camphor, eucalyptol, beta-pinene and alpha-terpineol. Diphenylpicrylhydrazyl radicals were reduced by oil. A hydroxyl radical scavenging effect in the Fe³⁺-EDTA-H₂O₂ deoxyribose system was exhibited by oil. Nonenzymatic lipid peroxidation of rat liver homogenate was inhibited using oil. Antioxidant activity was exhibited by the polar phase of the extract. Antimicrobial activity of oil was found against *Candida albicans* and *Streptococcus pneumoniae*. This study showed that the plant has antioxidant and antimicrobial activities.

Antimicrobial Activity

Stojanović et al. (2005) reported the in vitro antimicrobial activity of extracts of *A. millefolium* L.

Antihypertensive Activity

De Souza et al. (2011) reported the hypotensive mechanism of the extracts and artemetin isolated from *A. millefolium* L. in anesthetized rats. Hydroethanol extracts and their

fractions such as ethyl acetate, dichloromethane and butanolicand were investigated for their hypotensive activity. Hydroethanolic and dichloromethane exhibited hypotensive activity in normotensive rats. Ethyl acetate and butanolic extract activity was not significant. On phytochemical analysis, artemetin was isolated and administered orally and intravenously in rats. Artemetin exhibited dose-dependent activity. Furthermore, its mechanism of action was investigated. It was found that artemetin has angiotensin-converting enzyme activity.

Estrogenic Activity

Innocenti et al. (2007) reported the in vitro estrogenic activity of *A. millefolium* L. Pure compounds were isolated and characterized from *A. millefolium*. Aerial parts of this plant were used in crude form. A methanol/water fraction exhibited estrogenic activity in vitro. Some compounds such as dihydrodehydrodiconiferyl alcohol 9-*O*-beta-D-glucopyranoside, apigenin and luteolin were isolated from this plant. This study indicated that active constituents in plants could be candidate estrogenic agents.

Conclusion

Various medicinal activities have been recorded in the current era of evidence-based medicine. *A. millefolium* has a bright future as a therapeutic agent. The current effort has been made to review the pharmacological activities of this plant. *A. millefolium* is very important for large-scale marketing. It is also clear that much must be discovered, in terms of both active ingredients and biological effects. Furthermore, the information documented here is intended as a reference tool to the scientist in the field of pharmacology.

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