International Journal of Herbal Medicine
Available online at www.florajournal.com

E-ISSN: 2321-2187
P-ISSN: 2394-0514
IJHM 2018; 6(3): xx-xx
Received: 18-03-2018
Accepted: 21-04-2018

Dr. Atiya Sayed
M.S (Ilmul Qabalat Wa Amraze Niswan), National Institute of Unani Medicine, Bangalore, Karnataka, India

Dr. Humaira Bano
MD (Ilmul Advia), National Institute of Unani Medicine, Bangalore, Karnataka, India

Correspondence
Dr. Atiya Sayed
M.S (Ilmul Qabalat Wa Amraze Niswan), National Institute of Unani Medicine, Bangalore, Karnataka, India

Brinjasif (*Achillea millefolium* Linn): An efficacious unani medicine

Atiya Sayed and Humaira Bano

Abstract
Plant based drugs have been in used against various diseases since time immemorial. In India the indigenous system of medicine namely Unani, Ayurveda & Siddha have been in existence for several centuries. This article bridges the gap between the traditional use of brinjasif (*Achillea millefolium* Linn) and the results of evidence based experiments. It is a flowering plant of the family Asteraceae and is widely used in Unani system of medicine as *muhallile warm* (anti-inflammatory) *musakine dard* (analgesic), *dafia'h huma* (antipyretic), *mudire boul* (diuretic), *mudire haiz* (emmenogogue), *qatil kirme shikam* (antihelmentic). Studies have shown that it possess anti-inflammatory, anti-oxidant, anti-microbial, analgesic, anti-spasmodic, hepatoprotective, gastro-protective activities.

Keywords: brinjasif, *achillea millefolium* linn, unani medicine

1. Introduction
The beneficial uses of medicinal plants in traditional system of medicine of many cultures are extensively documented. Plants have always been a good source of drugs and play a key role in human health care. About 80% of the world population relies on the use of traditional medicine, which is predominantly based on plant material [1]. India is one the most medico-culturally diverse country in the world where medicinal plant sector is part of a time – honoured tradition that is even respected today. Focus on plant research has increased all over the world and the results have validated the immense potential of medicinal plants used in various traditional systems [2]. The present review highlights the data on *Achillea millefolium* in Unani classical literature, its phytochemistry and research studies. Brinjasif (*Achillea millefolium* Linn), popularly known as "yarrow" belongs to the *Achillea*, the genus widespread all over the world. *Achillea* contains around 130 flowering and perennial species. These plants have hairy and aromatic leaves and flat clusters of small flowers on the top of the stem. The name *Achillea* is referred to the Achilles in the literary Trojan War of the Iliad who used yarrow to treat the soldier's wounds [3, 4]. Its species have been used by the people as traditional medicine over hundreds of years. Brinjasif (*Achillea millefolium* Linn) has been internally used as herbal teas for headaches, hepato-biliary disorders, gastrointestinal complaints, menstrual irregularities and as appetizer and externally as lotion or ointment against skin inflammation, wounds and abrasions [5, 6]. The medicinal properties of *Achillea millefolium* are worldwide recognized and the plant is included in the national pharmacopoeias of countries such as Germany, Czech Republic, France and Switzerland. In Brazil, *Achillea millefolium* is included in the list of the 16 medicinal plants of the "Verde Saude" (Green Health), a public health phytotherapy agency [7].

2. Methodology
For literature of brinjasif in unani medicine, all available classical text books of unani pharmacology were searched. Literature was also searched on google scholar/PubMed using keywords research studies on *Achillea millefolium*, yarrow, brinjasif. For data generation and analysis, experimental studies, clinical trials and reviews articles were taken into consideration.

2.1. Plant description
2.1.1. Botanical name: *Achillea millefolium* Linn [8, 9, 10, 11].

2.1.2. Synonyms: *Achillea lanulosa* Nutt [12, 13].

2.2.3. Vernaculars
- Unani Tibbi Name**:** *Artamasia, Artiyamasia* [14, 15].

- Hindi: *Gandmaar* [14], *Gandna* [16].
- Arabic: *Suila* [14, 15], *Fafor* [14].
- Persian: *Brinjasif* [9, 15] *Buimaderan* [8, 14].
- English: Yarrow, Milfoil [8, 9, 11, 17], Thousand leaf [17].
- Cutch and Himachal Pradesh: Brinjasif [8, 17].
- Kashmiri: Momadru, Chopandiga [8].

2.2.4. Morphology
It is an erect, slightly aromatic, pubescent, perennial herb with stoloniferous roots, 15-90 cm in height, leaves are 3-pinnatisect, radial leaves stalked, upper sessile. Flowers in corymbose clusters with white or pale pink in colour [8, 17]. The aerial parts of the herb possess agreeable aromatic odour and bitterish, astringent and pungent taste [17].

2.2.5. Habitat
In India it is commonly distributed in Himalayas from Kashmir to Kumaun at altitude of 1,050-3, 600m [8, 9, 17]. Also seen growing in Bombay and Belgaum areas [17].

2.2.5. Part Used: Flowering tops [18].

2.2. Phytochemical constituents
Volatile oil: The main constituents of the volatile oil are:
Azulene, chamazulene, prochamazulene, α-pinene, β-pinene, eucalyptol, α-thujone, terpinene, limonene, borneol, terpineol, bornyl acetate, caryophyllene, tricyclene, camphene, sabinene, 1-8-cineole, camphor [19].
Other constituents: flavonoids, lignans, amino acid derivatives, fatty acids, alkamides [3], sesquisterpene lactones, caffeic acid, polyacetylenes, tannins, sterols [2].

Fig 1: *Achillea millefolium* plant

Fig 2: Flowering tops

3. BRINJASIF (Achillea Millefolium) In Classical Unani literature

3.1. Mizaj (Temperament)
Hot1°& Dry2° [14, 21]
Cold & Moist [22]

3.2. Af'al (pharmacological actions)
Muhallile warm (anti-inflammatory), musakkine dard (analgesic), *dafae humma* (antipyretic) [11, 21, 22], *musaffie khoon* (blood purifier) [21], *mudire boul* (diuretic), *mudire haiz* (emmenogogue) [14, 15, 21], *Mufattit sange gurda wa masana* (urotriptic), *qatil kirme shikam, (*antihelmenthic), *Mujaffife qurooh* (cicatrizant) [14, 21].

3.3. Istamal (theraputic Uses)
Awrame ahsha (visceral inflammation), *warme rehm*(pelvic inflammatory disease), *salabate rehm*(uterine tumors), *ehtabase boul* (urinary retention), *ehtabase haiz* (ammenorrhoea), *sange gurda wa masana*(nephrolithiasis), *usre viladat*(difficult labour), *ikhraj masheema*(for expulsion of placenta), *humma*(fevers), [14, 15, 21] *darde sar*(headache), *sadar* (dizziness), *dawar*(vertigo), *qurooh*(ulcers), *kirme shikam* (helminthic infestation) [14, 21].

3.4. Miqdar khuraq (dose of administration)
As Powder: 2-7*masha* (2-7gm)
In decoction: 7-17 *masha* (7-17gm) [14, 21].

3.5. Muzir (harmful): In kidney disease [14, 21].

3.6. Musleh (corrective): Anisoon (*Pimpinella anisum*), khashkhash (*Papaver somniferum* seeds) [14, 21].

3.7. Badal (substitute): Afsanteen (*Artemesia absinthium*) and Babona (*Anthemis nobilis*) [14, 21].

4. Pharmacological Studies

4.1. Antioxidant Activity
Candan F *et al* [23] reported that essential oil of *Achillea millefolium* exhibited antioxidant activity, in *in vitro* study, due to synergize effect of its main components i.e. eucalyptol, camphor, borneol, β-pinene and α-terpineol.
Parejo *et al* [24] reported that distilled plant material exhibit antioxidant and radical scavenging activities due to higher phenolic content than the non-distilled material.

4.2. Antimicrobial Activity
Ferda Candan *et al* [23] in *in vitro* study on essential oil of *Achillea millefolium* reported that it exhibited moderate activity against *Streptococcus pneumoniae, Clostridium perfringens* and *Candida albicans*, and weak activity against *Mycobacterium smegmatis, Acinetobacter lwoffii* and *Candida krusei* because of the presence of eucalyptol (1,8-cineole), borneol and camphor, a well-known antimicrobial agents.
Stojanovic *et al* [25] in *in vitro* study on lipophilic extract of aerial parts of *Achillea millefolium* for its antimicrobial activity against five bacteria (*Staphylococcus aureus, Escherichia coli, Klebsiella pneumoniae, Pseudomonas aeruginosa and Salmonella enteritidis*) and two fungi (*Aspergillus niger* and *Candida albicans*) reported that the extract possessed a broad spectrum of antimicrobial activity against all tested strains.

4.2. Anti inflammatory Activity
Anti-inflammatory effect was reported in *in vitro* study on methanolic lyophilized extract of powdered aerial parts and fractions enriched in flavonoids and dicaffeoylquinic acids of

Achillea millefolium L [24].

Burk *et al.* [26] in *in vitro* study concluded that anti-inflammatory effect of aqueous extract of *Achillea millefolium* L may be due to synergistic action of plant compounds that act as free radical scavengers and effect the activation of inflammation-related enzymes and production of inflammatory mediators.

4.3. Analgesic Activity

Pires JM *et al* [27] in *in vivo* studies reported significant analgesic effect of extracts of *Achillea millefolium* L probably due to presence of flavonoid glycoside, rutin and caffeic acid.

Noureddini M. *et al* [28] in *in vivo* study on aqueous extract (AE) of *Achillea millefolium* L. reported maximum antinociceptive effect at a dose of 160 mg/kg AE. Its activity may be result of its central and peripheral action.

4.4. Vulnerary

Hemmat *et al*, [29] in his *in vivo* study reported 100% wound healing, achieved after 14 days of treatment with 5% yarrow extract cream and was more pronounced as compared to 1% phenytoin as a standard healing agent. Active ingredients of yarrow such as achilliein, apigenin, amino and fatty acids may contribute to the healing effects of yarrow extract. Presence of hydrolysable tannins in yarrow extract may cause coagulation of surface proteins and prevention of wound infection and assist the wound for faster healing.

4.5. Gastroprotective Activity

Cristiane HB *et al.* [30] *in vivo* studied antiulcerogenic activity of the crude aqueous extract of *A. millefolium* L. and reported that it protect the gastric mucosa against the direct necrosing action of ethanol and stress-induced lesions by reducing the volume and the acidity of secreted gastric juice, suggesting that in the gastric protective action of the extract, there must be a blockage of the mainly receptors presented in the parietal cell (M3, H2 – histamine receptor and CCKb – gastrin receptor) as well as their second messengers.

Potrich FB *et al.* [31] in *in vivo* study reported that hydroalcoholic extract of *A. millefolium* L. reduced chronic gastric ulcers and promoted significant regeneration of the gastric mucosa probably because of its antioxidant properties.

4.6. Antispasmodic Activity

Moradi MT *et al.* [32] in *in vitro* study reported relaxatory effect of *A. millefolium* on smooth muscles of ileum in rat and suggested that the effect can be due to the blockade of voltage dependent calcium channels.

Mehdi B *et al.* [33] in *in vitro* study demonstrated that hydroalcoholic extract of *A. millefolium* inhibited electrical induced contractions of guinea pig ileum. The effect was dose dependant and probably due to its interaction with acetylcholine activity.

4.7. Oestrogenic Activity

G. Innocenti *et al.* [34] in *in vitro* study reported that crude extract and isolated compounds of the aerial parts of *A. millefolium* induced a positive estrogenic effect. The crude extract was more active than the fractions, suggesting a synergic effect. Apigenin and luteolin, the most important estrogenic compounds among tested compounds. Both receptors, α and β estrogen (ERα, ERβ) receptors were activated by apigenin. Luteolin seems to have a very slight effect on β and does not seem to activate β at all.

4.8. Anti fertility Activity

Nasrin T *et al.* [35] studied the effects of *A. millefolium* L. extract on spermatogenesis in adult male wistar rats. At the dose of 800 mg/kg, intra peritoneal injection, thickened seminiferous tubules on basal membrane, decrease in cell accumulation in seminiferous tubule, severe disarrangement, degenerative cells and severe decrease in sperm count were seen. At the dose of 800 mg/kg/day, orally, basal membrane was thickened and the disarrangement in cells was demonstrated.

4.9. Anti diabetic activity

Yalda *et al. in vivo* [36] studied effect of *Achillea millefolium L.* on interleukin-1β (IL-1β) and inducible nitric oxide synthase (iNOS) gene expression of pancreatic tissue in diabetic rats and reported higher insulin level associated with lower glucose level and higher body weight compared to control diabetic group. It seems that beneficial effect of *Achillea millefolium* L. on diabetes is due to amelioration of IL-1β and iNOS gene over expression and its antioxidant activity which can have a β-cell protective effect.

Khalid *et al.* [37] in *in vivo* study evaluated hypoglycaemic and hypolipidemic effect of extract of *Achillea millefolium* in alloxan induced diabetic rats and reported that the extracts at dose levels of 250 and 500 $mg \cdot kg^{-1}$ body weight showed significant ($P \leq 0.05$) decrease in blood glucose level, TGL, VLDL, cholesterol, SGOT, SGPT, and ALP in diabetic rats. The extracts due to its antioxidant property prevented the *β*-cells of pancreas from the cytotoxic effects of Alloxan monohydrate.

4.10. Hepatoprotective Effect

Ruqaya M *et al.* [38] *in vivo* studied hepatoprotective effect of methanolic extract of *Achillea millefolium* on carbon tetrachloride induced hepatotoxicity in rats and reported significant decrease in liver enzymes and regeneration of hepatic cells probably due to presence of flavonoids in it.

Yaeesh S *et al.* [39] in *in vivo* study reported that pre treatment of mice with crude extract of *Achillea millefolium* significantly prevented the toxin induced rise in plasma AST and ALT and the effect was further verified by histopathology of the liver, which showed improved architecture, absence of parenchymal congestion and apoptotic cells, compared with toxin group animals.

4.11. Neuroprotective Effect

Vazirirnejad R *et al.* [40] in *in vivo* study demonstrated that treatment with aqueous extract of *Achillea millefolium* attenuate disease severity, inflammatory response and demyelinating lesions in experimental autoimmune encephalomyletitis because of its anti-inflammatory and antioxidant properties.

4.12: Anxiolytic Effect

Baretta IP *et al.* [41] in *in vivo* study demonstrated that oral administration of hydroalcoholic extract of *Achillea millefolium* L in mice exerted anxiolytic like effects and did not present tolerance after short-tem, repeated doses.

5. Conclusion

A. millefolium is a herb of enormous therapeutic effects and has been used for various ailments especially visceral inflammation, wound healing, analgesia. Some of its traditional usages have been scientifically validated. A number of compounds have been isolated from the plant

especially phenolics, flavonoids, sesquiterpenes, tannins, camphor, eucalyptol, terpinene which are responsible for its pharmacological activities. Further, clinical research appears worthwhile to explore the therapeutic potential of this drug.

6. References

1. WHO. WHO Guidelines on Safety Monitoring of Herbal Medicines in Pharmacovigilance Systems. Geneva, Switzerland: World Health Organization, 2004.
2. Dahanukar SA, Kulkarni AR, Rege NN. Pharmacology of medicinal plants and natural products. Indian j pharmacol. 2000; 32:366-370.
3. Saeidnia S, Gohari AR, Mokhber DN, Kiuchi F. A review on phytochemistry and medicinal properties of genus *Achillea*. DARU. 2011; 19(3):173-86.
4. Mitich LW. Intriguing World of Weeds: Yarrow – the herb of Achilles, Weed Technology. 1990; 4:451-453.
5. Nadim MM, Malik AA, Ahmad J, Bakshi SK. The essential oil of *Achillea millefolium* L. World J Agric Sci. 2011; 7(5):561-65.
6. Zargari A. Medicinal Plants. Tehran University Publication, Tehran, 1996; 3:106-117.
7. Bradley PR(ed). British Herbal Compendium British Herbal Medicine Association, Bournemouth, U.K. 1992: 1:190-191.
8. Kritikar KR, Basu BD. Indian medicinal plants. 2nd ed. Oriental Press, Uttaranchal, India. 2003; III:1376-78.
9. Khare CP. Indian medicinal plants. Springer India (P) Ltd, New Delhi, India, 2007, 10-11.
10. Evans WC. Trease and Evan pharmacognocy. 15th ed. Reed Elsevier India (P) Ltd, New Delhi, India, 2005, 472.
11. Chopra RN, Nayar SL, Chopra IC. Glossary of Indian medicinal plants. NISCIR, New Delhi, India, 2002, 3-4.
12. Prajapati ND, Kumar U. Agro's dictionary of medicinal plants. Agrobios, India, 2005, 5.
13. Rastogi RP, Mehrotra BN. Compendium of Indian medicinal plants. CDRI, New Delhi, India, 2002; II:7-8.
14. Khan HMA. Muheet-e-Azam. CCRUM, New Delhi, India, 2012, 645-47.
15. Ibn Baitar. Al Jameul Mufredat wa al Advia wa al Aghzia. CCRUM, New Delhi, India. 1999; III:97-102.
16. Hakeem MAH. Bustanul Mufradat. Idarae Kitab-us-Shifa, New Delhi, India, 2002, 73-74.
17. Anonymous. The Wealth of India. CSIR, New Delhi, 2003; I:54-55.
18. Anonymous. The Unani Pharmacopoeia of India. CCRUM, New Delhi, India, 2010: II(2):3-4.
19. Shawl AS, Srivastva SK, Tripathi S, Raina VK. Essential oil composition of *Achillea millefolium* L. growing in Kashmir. India. Flavour and Fragrance Journal. 2002; 17(3):165-68.
20. Lakshmi T, Geetha RV, Anitha R, Aravind KS. Yarrow (*Achillea millefolium* Linn) a herbal medicinal plant with broad therapeutic use-A Review. International Journal of Pharmaceutical Sciences Review and Research. 2011; 9(2):136-41.
21. Ghani N, Khazainul Advia, Idarae Kitab-us-Shifa. New Delhi, India, 2010, 361-62.
22. Ibn Sina, Al Qanoon Fil Tib. (Urdu trans. by Kantoori GH). Idarae Kitab-us-Shifa, New Delhi, India, 2007, 291.
23. Candan F, Unlu M, Bektas T, Deferera D, Polissiou M, Sokmen A *et al*. Antioxidant and antimicrobial activity of the essential oil and methanol extract of *Achillea millefolium* Subsp. *millefolium* Afan. (Asteraceae). Journal of Ethnopharmacology. 2003; 87:215-20.
24. Biro-Sandor Z. Assessment report of *Achillea millefolium* L. herb. European Medicines Agency, 2011, 1-23.
25. Stojanovic G, Radulovic N *et al*. *In vitro* antimicrobial activity of extracts of four *Achillea* species. J Ethnopharm. 2005; 101:185-190.
26. Burk DR, Cichacz ZA, Daskalova SM. Aqueous extract of *Achillea millefolium* L. (Asteraceae) inflorescences suppresses lipopolysaccharide-induced inflammatory response in RAW 264.7 Murine Macrophages. Journal of Medicinal Plants Research. 2010; 4(3):225-34.
27. Pires JM, Mendes FR, Negri G, Duarte-Almendi JM, Carlini EA. Antinociceptive peripheral effect of *Achillea millefolium* L. and *Artemisia vulgare* L. both known popularly by brand names of analgesic drugs. Phytother Res. 2009; 23(2):212-19.
28. Noureddini M, Rata V. Analgesic effect of aqueous extract of *Achillea millefolium* on Rat's formalin test. Pharmacologyonline. 2008; 3:659-64.
29. Hemmati AA, Arzi A, Amin M. Effect of *Achillea millefolium* extract in wound healing of rabbit. Journal of natural remedies. 2002; 2:164-167.
30. Cristiana HB, Cristina SF *et al.* Action of crude aqueous extract of leaves of *Achillea millefolium* L. (compositae) on gastrointestinal tract. Rev Bras Farmacogn. 2002; 12:31-33.
31. Potrich FB, Allemande A *et al.* Antiulcerogenic activity of hydroalchohalic extract of *Achillea millefolium* L.: involvement of the antioxidant system. J Ethnopharmacol. 2010; 130(1):85-89.
32. Moradi MT, Mohmoud RF *et al*. Antispasmodic effect of yarrow (*Achillea millefolium* L) extract in the isolated ileum of rat. Afr J Tradit Complement Altern Med. 2013; 10(6):499-503.
33. Mehdi B, Mitra EA *et al*. Antimotility effect of hydroalcoholic extract of yarrow (*Achillea millefolium*) on the guinea pig ileum. Pakistan journal of biological sciences. 2007; 10(20):3673-3677.
34. Innocent G, Vegeto E *et al*. *In vitro* estrogenic activity of *Achillea millefolium* L. Phytomedicine. 2007; 14(2-3):147-52.
35. Nasin T, Hosseini MJ *et al*. The effect of Achillea millefolium extract on spermatogenesis of male wister rats. Human and experimental toxicology, 2010.
36. Yalda Z, Mehdi F *et al*. *Achillea millefolium* L. Hydro-alcoholic extract protects pancreatic cells by down regulating IL- 1β and iNOS gene expression in diabetic rats. Int J Mol Cell Med. 2014; 3(4):255-262.
37. Khalid GM, Basher AG *et al.* β-Cell protective efficacy, hypoglycemic and hypolipidemic effects of extracts of *Achillea millefolium* in diabetic rats. Chinese journal of natural medicine. 2012; 10(3):185-189.
38. Ruqaya M, Al Ezzy *et al.* Hepatoprotective Effects of *Achillea millefolium* methanolic extract on carbon tetrachloride induced hepatotoxicity on albino male mice. Int. J Adv Res Boil Sci. 2017; 4(8):98-109.
39. Yaeesh S, jamal Q *et al.* Studies on hepatoprotective, antispasmodic and calcium antagonist activities of the aqueous-methanol extract of Achillea millefolium. Phytother Res. 2006; 20(7):546-51.
40. Vazirinejad R, Ayoobi F, Arababadi MK, Eftekharian MM, Darekordi A, Goudarzvand M *et al*. Effect of aqueous extract of Achillea millefolium on the development of experimental autoimmune encephalomyelitis in C57BL/6 mice. Indian J Pharm. 2014; 46:303.

41. Barettaa PI, Felizardoa RA, Bimbatoa VF, Dos Santosa MG, Kassuyab CA *et al*. Anxiolytic-like effects of acute and chronic treatment with Achillea mille folium L. extract. J Ethnopharmacol. 2012, 46-54.