Egyptian Herbal Monograph

Volume 1

Traditional wild medicinal plants

Egyptian Drug Authority (EDA)

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***Achillea fragrantissima* (Forssk.)** القيصوم

1. Names & Synonyms (1-3)

***Achillea fragrantissima* (Forssk.)**
Family: Compositae (Asteraceae)
Syn.: *Santolina fragrantissima* Forssk.
Arabic: Gesoom جصوم (name used by the local community of Sinai Peninsula), Alegiaan الجيانَ و Baboonig بابونجَ
English: Lavender cotton

2. Geographical distribution

Oases of the Western Desert (Kharga), Mediterranean region, all the deserts of the country including that of Sinai, as well as the Red Sea coastal strip (3).

3. Parts used for medicinal purposes

The herbs and flower heads (3).

4. Major chemical constituents (3)

-Essential Oil: Caryophyllene oxide, camphor, bisabolene epoxide, sesquisabinene hydrate, 1-terpinen-4-ol viridiflorol, guaienol, limonene, menthol, azulene, thujone (4-9).

-Monoterpenes and Triterpenes: Two highly oxygenated santoline derivatives (irregular oxygenated monoterpenes) (10), chondrillasterol (11), traxasterol acetate and pseudo-taraxasterol acetate (12).

-Sesquiterpene Lactones: More than 10 compounds were isolated e.g. achillolide A, achillolide B, 1-oxoafraglaucolide and others (12, 13, 14).

-Flavonoids: Apigenin, apigenin 7-*O*-glucoside, luteolin 7-*O*-rhamnoside, 3'-methyl luteolin 7-*O*-glucoside, 7-*O*-rhamno-4'hydroxyflavone, and others (11, 12, 15).

Fatty Acids: Lauric, myristic, palmitic, stearic, linoleic, linolenic oleic and arachidic acids (12, 16).

Others: Bitter substance (keissosid) which yielded galactose and aglycone, tannins of the catechol type, 2-acetylmethyl-4-hydroxy-6-methyltetrahydropyran (12).

5. Traditional medicinal uses (17)

A. Gastrointestinal disturbances (anti-spasmodic, astringent, carminative, stomachic).
B. Respiratory diseases (expectorant, cough).
C. Anthelmintic.
D. For scorpion and snake bites.
E. Skin diseases (skin inflammations, wound healing, abscess, purulent sore and as insect repellent).
F. Antipyretic and in case of fever.

***A. fragrantissima* is a traditional medicinal plant for use in the specified indications exclusively based upon long-standing use.**

6. Herbal Preparations correlated to medicinal use

1. **Infusion** (17)

Pour freshly boiled water on 2 teaspoonful of the flowering herb in a cup; cover the cup with the lid, infuse for 5 minutes and drink it sweetened if desired.

2. **Decoction**

2.1. Add 2 teaspoonful of the flowering herb in a pot, pour cold water, boil and simmer for 10 minutes then pour into a cup and drink it sweetened if desired (17).

2.2. Prepared by boiling the ground leaves with water (17, 18).

3. **Oil** (17, 18).

7. Posology and method of administration correlated to medicinal use (17)

Preparation 1, 2.1
Indication A-D
Dosage: 3 cups/day.
Method of administration: Oral use (17).

Preparation 2.2, 3
Indication E, F
Apply the extract of the boiled leaves in water after cooling the extract.
Wash the body with the decoction.
Method of administration: Topical use (17,18).

8. Contraindications

Hypersensitivity to active substances and to other plants of the same family.

9. Special warnings and precautions for use

- If the symptoms worsen during the use of medicinal product, a doctor or pharmacist should be consulted.

- Monitoring of blood glucose level should be done regularly when used for diabetics as *A. fragrantissima* has been used in traditional medicine for diabetes.

10. Interactions with other medicinal products and other forms of interactions

None reported.

11. Fertility, pregnancy and lactation

- Safety during pregnancy and lactation has not been established. In the absence of sufficient data, the use during pregnancy and lactation is not recommended.
- Studies in animals have shown that the plant extract did not affect fertility (19) <<see section 15. Relevant biological activities >>.

12. Effects on ability to drive and use machines

No studies on the effect on the ability to drive and use machines have been performed.

13. Undesirable effects

- None known.
- If adverse reactions occur, a doctor or a pharmacist should be consulted.

14. Overdose

No case of overdose has been reported.

15. Relevant biological activities

- The safety and side effects of the different extracts (water, ethanolic and methanolic) of *A. fragrantissima* given acutely or on repeated doses (125 and 250 mg/kg) in rats, were studied. Acute and subchronic toxicity, as well as reproductive (fertility, embryotoxicity and teratogenecity, peri-and postnatal study) effects were recorded on treated and control rats. Daily administration of the plant extract revealed no significant changes on the body weight, heart rate,

and other physiological parameters. The plant extract induced a significant increase in total proteins and globulins in rats. It did not induce any abnormal liver and kidney functional changes as demonstrated by serum biochemical analysis in rats. Interestingly, the plant extract induced a significant decrease in alkaline phosphatase (ALP), urea and creatinine. Significant decrease in blood glucose level was detected in animals receiving 250 mg/kg of the extract. The plant extract did not affect fertility. Dosed males showed comparable data with the controls when dosed at 250 mg/kg b.wt. It did not cause any embryotoxic, teratogenic or any deleterious effects on the dosed females and their offspring. Litter size, survival rate and weight gain were comparable between groups. *A. fragrantissima* extract is a well-tolerated substance and had a wide safety margin. The tested plant extracts did not induce any toxic effects even on repeated administration in rats for 2 months. Additionally, no evidence of impaired fertility, or teratogenic potentials at higher doses up to several times the recommended maximum human doses were detected (19).

- The anti-inflammatory activity of *A. fragrantissima* extracts tested using the animal model of carrageenan-induced paw edema, was comparable to that of diclofenac (20, 21). The substance responsible for the anti-inflammatory effects of the plant could be a sesquiterpene lactone achillolid A. This lactone reduces levels of pro-inflammatory and toxic mediators and levels of intracellular reactive oxygen species in lipopolysaccharide-activated microglial cells (22, 23). Moreover, both non-polar and polar fractions revealed protective effects against rat ulcerative colitis and gastric ulcers (20).

- *A. fragrantissima* essential oil shows antimicrobial activity against gram-positive and gram-negative bacteria. It is also effective against *Listeria monocytogenes*, *Pseudomonas aeruginosa*, *Klebsiella* sp. and *Salmonella enteritidis* (24, 25). *A. fragrantissima* also acts against poliovirus, rotavirus Wa, human adenovirus 7 and coxsackievirus B4 (26, 27) and two fungal species *Candida albicans* and *Aspergillus niger* (28).

- Ethanolic extract of *A. fragrantissima* and its compounds significantly inhibited α-glucosidase activity *in vitro*, more potent than the positive control acarbose, used as an oral anti-diabetic drug (29). In streptozotocine and high-fat diet induced diabetic rats, elevated blood glucose levels, serum lipid profile, liver functions, and kidney functions were improved after *A. fragrantissima* extract treatment, as well as oxidative-stress and pro-inflammatory markers (30).

- The myorelaxant effect of *A. fragrantissima* is linked to the presence of the flavonoid cirsilol (31), which has been shown to effect relaxation of isolated rat ileum, bladder and uterus, and inhibits acetylcholine-induced contractions. Cirsilol is a low affinity competitive ligand of central benzodiazepine receptors and has sedative effects (32).

16. Additional Information

The effects of *A. fragrantissima* on humoral and cellular immunity in the rat model was tested. The oil extract appears to possess immunoprotected effects (both humoral and cellular immunity) in mice model (33).

17. Date of compilation/last revision

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