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Traditional wild medicinal plants

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Traditional Wild Medicinal Plants

***Artemisia judaica* L.** شيح

1. Names & Synonyms

***Artemisia judaica* L.** (1, 2).

Family: Compositae (Asteraceae) (3).

Arabic: Sheeh شيح (3).

English: Judean wormwood, Wormwood (1).

2. Geographical distribution

Mediterranean region, all the deserts including Sinai, Red Sea coastal strip, Gebel Elba and the surrounding mountainous region (3).

3. Parts used for medicinal purposes

Leaves (3) and the aerial parts collected during the flowering stage (1).

4. Major chemical constituents (3)

-Volatile oil:

North Coast plant sample (1.4±0.05 g/100 g fresh leaves):

Piperitone (45.0%), *trans*-ethyl cinnamate (20.8%) and ethyl-3-phenyl propionate (11.0%) were the predominant components, followed by spathulenol (6.27%), *cis*-ethyl cinnamate (5.64%), 2,6-dimethyl phenole (1.39%) and methyl cinnamate (1.06%) (4).

Sinai Peninsula plant sample (0.7% (w/w):

The major components of the essential oil were piperitone (32.4%), camphor (20.6%), *trans*-ethyl cinnamate (8.2%) and terpinene-4-ol (4.6%). The essential oil of *A. judaica* L. is rich in monoterpenoids and ester of cinnamic acid (5).

The difference in the volatile oil content of *A. judaica* were found to be due to several factors such as plant age, season, different parts of the plant and also differences found in the samples which were collected from different place (6,7).

- Sesquiterpene Lactones: The bitter principle judaicin, 1-epi-erivanin, 1-epi-isoerivanin, 13-O desacetyl eudesma afraglaucolide, 13-O-desacetyl-1α

hydroxyafraglaucolide, 13-O-desacetyl-1β-hydroxyafraglaucolide, 13-O-desacetyl-1α-hydroxyisoafraglaucolide and seco-isoerivanin pseudo acid (8).

- Flavonoid glycosides: 7-glucoside, 7-glucuronide, 4′-glucoside, 7-gentiobioside, 7-diglucuronide, 7-rutinoside of apigenin and chrysoeriol; the 7,3′-diglucoside of chrysoeriol; the 3′-glucoside, 4′-glucoside; 7-gentiobioside; 7,3′- diglucoside of luteolin; as well as the C-glycosides vicenin-2, schaftoside, isoschaftoside, neoschaftoside and neoisoschaftoside **in addition to aglycones** such as casticin, apigenin, acacetin, hispidulin, pectolinarigenin, cirsimaritin, luteolin, chrysoeriol, jaceosidin, eupatilin, cirsilineol and 5,7,3′-trihydroxy-4′,5′-trimethoxyflavon (9,10).

The 70% ethanolic extract of *A. judiaca* has a total phenolic content of 83.5±7.1mg gallic acid equivalent/g and a total flavonoidal content of 63.1±8.6mg quercetin equivalent/g (11).

5. Traditional medicinal uses (3)

A. **Oral**: Anthelmintic, stomachic, expectorant, diaphoretic, analgesic, and antispasmodic in case of intestinal colic.

B. **Inhalation**: Relieve cold congestion.

A. ***judaica* 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** (1,3)

   Pour freshly boiled water on 2 teaspoonful of the herb in a cup, cover the cup with the lid and let infuse for 5 minutes. Drink it sweetened if desired (12).

2. **Inhaled leaves** (1, 3)

7. Posology and method of administration correlated to medicinal use

Preparation 1
Indication A
Average daily dose: 3 cups/ day (12)

Method of administration: Oral use.

Preparation 2
Indication B
Method of administration: Inhalation.

Duration of use:
If the symptoms persist longer than 2 weeks during the use of the medicinal product, a doctor or a pharmacist should be consulted.

8. Contraindications

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

9. Special warnings and precautions for use

- None reported
- If the symptoms worsen during the use of the medicinal product, a doctor or a pharmacist should be consulted.

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

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.
- No fertility data available.

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 reported.
- 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 protective effect of oral administration of *A. judaica* extract (70% alcoholic extract) (300mg/kg and treated daily for 28 days) against hepatorenal damage in a high-fat diet/streptozotocin (HFD/STZ) rat model of hyperlipidemia and hyperglycemia was investigated. The results illustrated the antihyperglycemic, antihyperlipidemic, antioxidant, anti-inflammatory, and antiapoptotic activities of the plant extract against hepatorenal injury in HFD/STZ-induced diabetes Histopathological screening confirmed the biochemical findings (11).

- Toxicological and pharmacological studies were carried out on the water and alcoholic extracts of *Artemisia judaica* (*A. judaica*) plant. Results obtained revealed that no mortalities in mice following oral administration of aqueous extract of *A. judaica* up 50 to 5g/kg, while in the alcoholic extract the LD was 9.17g/kg. Single and multiple doses (0.25 and 0.5 g/kg b.wt.) for the water extract, (0.5 and 1 g/kg b.wt.) for the alcoholic extract produced insignificant effect on serum cholesterol levels but there was significant decrease in serum triglycerides levels. The single and multiple doses of both water and alcoholic extracts significantly reduced the blood glucose level in experimentally diabetic rats while no significant effect was shown on normal rats (13).
- Volatile oil prepared from flowering branches has insecticidal, anthelmintic, anti - inflammatory, analgesic, anti-pyretic and stimulant effects (14, 15).
- The hydro-methanolic extract obtained from aerial parts of *A. judaica* (AJ-HA) was investigated for its potential to inhibit key blood sugar modulating enzymes in vitro and its antioxidant activity with phytochemical composition. AJ-HA was tested for in vitro hypoglycemic effect by its potential to inhibit pancreatic α-amylase, intestinal α-glucosidase and dipeptidyl peptidase IV (DPP IV). Antioxidant activity was determined by assessing the potential of the extract through scavenging of 1,1-diphenyl-2-picrylhydrazyl (DPPH) radicals.54. Quantitative phytochemical evaluation was performed by determining the total content of phenolics, saponins, flavonoids, tannins and alkaloids. Interestingly the extract showed inhibitory potential for all the three key enzymes that are involved in modulating the blood glucose levels namely: α-amylase, α-glucosidase and DPP IV with IC50s in the range of 758.96–2447.40 µg/mL. AJ-HA also showed significant scavenging activity for DPPH radicals with IC50 of 85.89 µg/mL. Quantitative estimations confirmed the abundance of various phytochemical classes particularly saponins and tannins (16).
- The ethanol extracts of *A. judaica* was evaluated for its efficacy against a protozoan parasite (*Blastocystis*). Two different molecular subtypes of *Blastocystis* were used. Significant growth inhibition of *Blastocystis* was observed when exposed to *A. judaica* (99.3%) with minimal inhibitory concentration (MIC_{90}) at 2000 µg/mL. Under the effect of the extract, changes in *Blastocystis* morphology were noted, with the complete destruction of *Blastocystis* forms after 72 h with the dose of 4000 µg/ml (17).
- The analgesic, hepatoprotective, antidiabetic and antioxidant activities of 80% aqueous methanol extract (AME) of Artemisia Judaica aerial parts were investigated. Analgesic activity was evaluated using acetic acid induced writhing in mice; antipyretic activity was assessed using yeast suspension- induced hyperthermia in rats; anti-inflammatory activity was evaluated using carrageenan-induced paw edema; antidiabetic activity was estimated in alloxan hyperglycemia while hepatoprotective effect was studied by measuring liver enzymes in CCI4-

induced hepatotoxicity rats and antioxidant activities. The results indicated that AME was nontoxic; it exhibits significant analgesic, antipyretic, anti-inflammatory, antidiabetic, hepatoprotective and antioxidant activities in a dose- dependent manner (18).

- The antimicrobial activity of methanolic extracts of *Artemisia Judaica* plant against Staphylococcus aureus Sp. and others pathogenic bacteria, was evaluated in vitro. These bacteria are commonly found in hospital-acquired infections. The methanolic extract of Artemisia Judaica effective against the isolates microorganisms, S. aureus, E. coli, P. aeruginosa, The diameter of zone of inhibition was found to be in the range of 14 – 30 mm against various bacterial strains tested, with maximum diameter against bacteria (S. aureus, 30 mm). The methanolic extract of Artemisia Judaica presented the highest anti-staphylococcus aureus activity and was effective against others bacterial strains tested (19).
- The *in vitro* cytotoxic activity of *A. judaica* ethanolic extract was screened against a panel of cancer cell lines. The results revealed its cytotoxic activity against a lung cancer (A549) cell line with a promising IC50 of 14.2 µg/mL compared to doxorubicin as a standard. This was confirmed through the downregulation of antiapoptotic genes, the upregulation of proapoptotic genes, and the cell cycle arrest at the G2/M phase. Further in vivo study showed that a solid tumor mass was significantly reduced, with a tumor inhibition ratio of 54% relative to doxorubicin therapy in a Xenograft model. *A. judaica* is a fruitful source of polyphenols that are well-known for their antioxidant and cytotoxic activities. Herein, *A. judaica* L. may serve as an adjuvant therapy or a promising source of leading structures in drug discovery for lung cancer treatment (20).
- *Artemisia judaica* (ArJ) essential oil constituents and their wound healing activity were studied. The *in vitro* antioxidant and antibiofilm activities of ArJ essential oil as well as the *in vivo* pro/anti-inflammatory and oxidative/antioxidant markers were investigated. The ArJ results demonstrated potent wound healing effects, comparable to silver sulfadiazine (SS), attributable to antioxidant and anti-inflammatory effects as well as a high proportion of oxygenated monoterpenes and cinnamate derivatives (21).

16. Additional information

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17. Date of compilation/last revision

13/10/2022

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