

Boneset

Species (Family)

Eupatorium perfoliatum L. (Asteraceae/Compositae)

Synonym(s)

Feverwort, Thoroughwort. Snakeroot has been used to describe poisonous *Eupatorium* species.

Part(s) Used

Herb

Pharmacopoeial and Other Monographs

BHP 1983^(G7)

PDR[®] for Herbal Medicines 2nd edition^(G36)

Legal Category (Licensed Products)

GSL – as Boneset and *Eupatorium*.^(G37)

Constituents^(G22,G41,G48,G64)

Flavonoids Flavonol (kaempferol, quercetin) glycosides including astragalin, hyperoside and rutin; eupatorin (flavone) and dihydroflavonols.⁽¹⁾

Terpenoids Sesquiterpene lactones including euperfolin and euperfolitin (germacranolides), eufoliatin (guianolide), eufoliatorin (dilactone guaiane) and euperfolide.⁽²⁾ Sesquiterpenes, diterpenes (dendroindic acid, hebeclinolide), triterpenes (α -amyrin, dotriacontane) and sterols (sitosterol, stigmasterol).

Other constituents Volatile oil, resin, wax, tannic and gallic acids, bitter glucoside, inulin, polysaccharides and sugars.

Food Use

Boneset is not used in foods.

Herbal Use

Boneset is stated to possess diaphoretic and aperient properties. Traditionally, it has been used for influenza, acute bronchitis, nasopharyngeal catarrh, and

specifically for influenza with deep aching, and congestion of the respiratory mucosa.^(G7,G64)

Dosage

Herb 1–2 g or by infusion three times daily.^(G7)

Liquid extract 1–2 mL (1:1 in 25% alcohol) three times daily.^(G7)

Tincture 1–4 mL (1:5 in 45% alcohol) three times daily.^(G7)

Pharmacological Actions

In vitro and animal studies

Immunostimulant activity (*in vitro* stimulation of granulocyte phagocytic activity) has been demonstrated by high dilutions (10^{-5} – 10^{-7} g/100 mL) of various sesquiterpene lactones isolated from *E. perfoliatum*.⁽³⁾ In addition, immunostimulating actions (granulocyte, macrophage and carbon clearance tests) have been documented for polysaccharide fractions from *E. perfoliatum*.^(3,4)

An ethanol extract of the whole plant has exhibited weak anti-inflammatory activity in rats.^(G41) Many activities have been documented for flavonoid compounds including anti-inflammatory activity.

Side-effects, Toxicity

Contact dermatitis has been reported for *Eupatorium* species but not specifically for boneset (*E. perfoliatum*).^(G51) Cytotoxic properties have been documented for a related species, *E. cannabinum*, and are attributed to the sesquiterpene lactone eupatoriopiricin. This compound has not been documented as a constituent of boneset. Hepatotoxic pyrrolizidine alkaloids (PAs) have been isolated from various *Eupatorium* species although none have been documented as constituents of boneset (*E. perfoliatum*).⁽⁵⁾

Instances of allergic and anaphylactic reactions have been associated with the sesquiterpene lactone constituents in German chamomile, although no reactions specifically involving boneset have been documented.

The US Food and Drugs Administration (FDA) has classified bonaset as a herb of undefined safety.^(G22)

Contra-indications, Warnings

The allergenic potential of sesquiterpene lactones is well recognised. Individuals with a known hypersensitivity to other members of the Asteraceae family (e.g. chamomile, feverfew, ragwort, tansy) should avoid using bonaset. Individuals with existing hypersensitivities/allergies should use bonaset with caution.

Pregnancy and lactation The safety of bonaset taken during pregnancy has not been established. In view of the lack of toxicity data and the possibility of constituents with allergenic activity, the use of bonaset during pregnancy and lactation should be avoided.

Pharmaceutical Comment

The constituents of bonaset are fairly well documented and include many pharmacologically active classes such as flavonoids, sesquiterpene lactones (typical for the Asteraceae family) and triterpenes. Immunostimulant activity (*in vitro*) has been reported for sesquiterpene lactone and polysaccharide components, possibly supporting the traditional use of bonaset in influenza. Many pharmacological

studies have focused on the cytotoxic/antitumour actions of sesquiterpene lactone components of various *Eupatorium* species, although these actions have not been reported for sesquiterpene lactones isolated from bonaset. Little is known regarding the toxicity of bonaset. Hepatotoxic pyrrolizidine alkaloids, which have been documented for other *Eupatorium* species, have not been reported for bonaset.

References

See also General References G7, G20, G22, G31, G32, G36, G37, G41, G48, G51 and G64.

- 1 Herz W *et al.* Dihydroflavonols and other flavonoids of *Eupatorium* species. *Phytochemistry* 1972; 11: 2859–2863.
- 2 Herz W *et al.* Sesquiterpene lactones of *Eupatorium perfoliatum*. *J Org Chem* 1977; 42: 2264–2271.
- 3 Wagner H. Immunostimulants from medicinal plants. In: Chang HM *et al.*, eds. *Advances in Chinese Medicinal Materials Research*. Singapore: World Scientific, 1985: 159–170.
- 4 Wagner H *et al.* Immunostimulating polysaccharides (heteroglycans) of higher plants. *Arzneimittelforschung* 1985; 35: 1069.
- 5 Pyrrolizidine Alkaloids. Environmental Health Criteria 80. Geneva: World Health Organization, 1988.