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PHYTONEWS

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NEW PRODUCTS

The following new liquid extracts are now available:

	STRENGTH	LATIN NAME	PRICE 200ml	500ml
Albizzia	1:2	Albizzia lebbeck	13.75	29.90
Adhatoda	1:2	Adhatoda vasica	14.20	30.90
Akeake	1:2	Dodonaea viscosa	16.50	35.80
Bayberry	1:2	Myrica cerifera	20.80	46.50
Horopito	1:2	Pseudowintera colorata	17.90	39.20
Pasque Flower	1:2	Anemone pulsatilla	14.50	31.70

A limited range of **capsule preparations**, all made from organically-grown or wildcrafted herbs, is now available.

We are also now able to supply **2L packs** of a limited number of Liquid Extracts..
For full details of these, see the new Phytomed Pricelist.

Elecampane effective against Tuberculosis?

A recent American study found root extracts of Elecampane (Inula helenium) showed significant *in vitro* activity against Mycobacterium tuberculosis. The compounds found to be responsible for this activity were identified as lactone components of the volatile oil, alantolactone, isoalantolactone and a derivative. Similar compounds from the North American plants Sweet Coneflower (Rudbeckia subtomentosa) and Montanoa speciosa, also exhibited activity in the bioassay used.

While these *in vitro* tests do not translate to *in vivo* activity, Elecampane has long been used for respiratory tract infections, and in former times was regarded as a specific treatment for Tuberculosis. Alantolactone has also been shown to stimulate the immune system (Wagner, 1985), and together with isoalantolactone has previously exhibited antibacterial and antifungal activity (see Chem Abstr 87, 162117, 1977)

Refs:

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ECHINACEA - A REVIEW

Introduction

Echinacea species, commonly known as Purple Coneflower, have a long history of medicinal use. The North American genus Echinacea contains nine species, but of these 3 are commonly used medicinally. These are *Echinacea angustifolia, Echinacea purpurea*, and *Echinacea pallida*. This review will describe the use of Echinacea in traditional and modern herbal medicine (phytotherapy), and summarise the pharmacological data obtained from research undertaken to date.

In Germany, more than 2.5 million prescriptions for Echinacea-based medications were written by general practitioners in 1993 (Melchart et al, 1994). More than 500 different Echinacea-containing products and phytomedicines, (including a variety of homoeopathic preparations) were listed by German pharmacists in 1996 (Grimm & Muller, 1999).

Parts used

The root, both fresh and dried, was the most common part used in traditional herbal medicine. The herb/aerial parts were also sometimes used, and have been shown to contain active constituents in recent years.

While information about pre-colonial use of Echinacea species is limited, records indicate that Echinacea angustifolia was the main species used. The Eclectics also preferred this species, and were rather vocal about the alleged inferiority of the other Echinacea species (Ellingwood, 1919).

Traditional Uses

Many North American Indian tribes used Echinacea root both topically and systemically for a wide range of infectious and inflammatory conditions. Externally, it was applied for burns, snake bites and other septic conditions, and the juice or infusion of the root was taken internally for toothaches, colds, sore throats, tonsillitis, measles, mumps, smallpox and venereal disease (Foster, 1991).

Early settlers to the midwest adopted Echinacea as an antiseptic for wound abscesses and boils. Echinacea preparations were made available to the medical profession in 1887, and its popularity grew rapidly among Eclectic practitioners. It was considered of great value for syphilis, blood poisoning, boils, carbuncles, abscesses, glandular inflammation, tuberculosis, meningitis, as well as acne, eczema, psoriasis, cancerous growths, and a wide range of other infections (Ellingwood, 1919; Felter & Lloyd, 1983). By 1921 Echinacea and its preparations had become the most widely sold medicine from an American medicinal plant (Foster, 1991). It was listed in the National Formulary from 1916 to 1950, where it was described as having diaphoretic, antibiotic and antiseptic properties.

Constituents

a) Caffeic acid derivatives - including the caffeic acid ester echinacoside; cynarin (1,5-di-o-caffeoylquinic acid), which is characteristic of E. angustifolia roots; cichoric (chicoric) acid (2,3,-o-dicaffeoyltartaric acid), particularly in E. pallida and E. purpurea.

b) Alkylamides - a wide range of these, mainly isobutylamides such as echinacein, found particularly in roots of E. angustifolia and E. purpurea, but largely absent from E. pallida.

c) Polyacetylenes - mainly ketoalkynes and ketoalkenes, found particularly in fresh roots of E. pallida, but largely absent from E. angustifolia and E. purpurea.

d) Essential oil - present throughout the plants, and containing borneol, bornyl acetate, pentadeca-8(Z)-en-2-one, germacrene D, caryophyllene and caryophyllene epoxide as important components.

e) Polysaccharides - found particularly in aerial parts of E. purpurea.
f) Miscellaneous constituents include anthocyanidins (particularly in Echinacea flowers), and traces of the pyrrolizidine alkaloids tussilagine and isotussilagine in E. angustifolia and E. purpurea.

Although closely related plants phytochemically, somewhat different actions are bound to be produced by each species due to their different makeup of constituents.

Pharmacological studies

Immune system stimulation

The activity of Echinacea appears to be mainly directed towards activation of the non-specific cellular immune system, to increase resistance to a wide range of potential or developed infections from bacteria, viruses and other pathogens. This activation of the phagocytic abilities of macrophages, is probably the main mechanism of action of Echinacea against infections.

The ability of Echinacea to stimulate the immune system is well documented, and contrary to popular belief, is not a recent discovery. In 1915 an Eclectic physician, Dr Unruh, made one of the earliest observations on the effects of Echinacea angustifolia on white blood cells:
"More than one hundred blood counts were made in cases of infectious diseases, mainly tuberculosis. The results showed that the Echinacea increases the phagocytic power of the leukocytes……, and the elimination of waste products is stimulated to a degree which puts this drug first rank among all alteratives" (in Ellingwood, 1919).

Numerous studies have subsequently shown immune stimulation or modulation by Echinacea components or extracts *in vitro* (Wagner, 1985; Bauer et al, 1988, 1989; Gaisbauer et al, 1990; Wagner & Jurcic, 1991; Wildfeuer & Mayerhofer, 1994; Burger et al, 1997; See et al, 1997). Like many medicinal plants, more than one active constituent appears to be responsible for this activity.

While much of the early work focussed on polysaccharide components as having the most significant activity, these studies were conducted *in vitro* or using parenteral preparations (Stimpel M et al, 1984; Wagner et al, 1988*;* Bauer & Wagner 1991; Steinmuller et al, 1993)*.* Polysaccharides, however, are large molecules and known to be poorly absorbed from the gastrointestinal tract (Vince et al, 1990), and activity *in vitro* cannot therefore be extrapolated to activity *in vivo* after oral dosage. Also, polysaccharides are present in all plants, and *in vitro* immunomodulatory activity has been shown for a large number of them (Wagner et al, 1983). It is therefore unlikely that polysaccharide constituents contribute much to the activity of oral Echinacea preparations.

More relevant research into the various fractions of Echinacea, points to the lipophilic (ethanol-extracted) components, particularly alkylamides, as being the most active constituents (Bauer et al, 1988, 1989, 1996). Thus a crude indicator of the quality of Echinacea root liquid extracts, is the degree of the tingling and burning sensation on the mucous membranes of the lips and mouth produced by these components following oral ingestion. The caffeic acid derivative, cichoric acid, also produces marked stimulation of phagocytosis both *in vitro* and *in vivo*, and probably makes a considerable contribution to the activity of ethanolic Echinacea extracts (Bauer & Wagner, 1991; Wichtl, 1994).

In vivo immunostimulant activity has been shown in a number of animal and human studies for extracts of Echinacea (Bauer et al, 1988; Schranner et al, 1989; Wagner & Jurcic, 1991; Bukovsky et al, 1993, 1995). Bauer et al (1988) showed that oral administration of ethanolic extracts of roots of all 3 species increased phagocytosis significantly, and these results correlated with stimulation of phagocytosis in the *in vitro* granulocyte test.

Activation of the cellular (humoral) component of the immune system, has also been alleged by some authors. The addition of Echinacea purpurea extract to peripheral blood mononuclear cells (PBMC) from both normal individuals and patients with either chronic fatigue syndrome or the acquired immunodeficiency syndrome (AIDS), enhanced natural killer cell activity as well as antibody-dependent cellular cytotoxicity against human herpes virus (See et al, 1997). Such activity has yet to be proven *in vivo* for humans

however, and immunostimulant polysaccharides with poor oral bioavailability could have been responsible for this *in vitro* effect.

Stimulation of cytokine production by human macrophages cultured in low concentrations of fresh Echinacea purpurea juice, has also been documented by American researchers (Burger et al, 1997). Such effects remain unproven for oral administration *in vivo*, however, and a recent controlled study involving 12 cancer patients found that oral therapy with Echinacea had no detectable effect on cytokine production by lymphocytes (Elsasser-Beile et al, 1996).

Direct anti-microbial activity

While much if not all of the anti-microbial activity of Echinacea appears to relate to its immunostimulant properties, activity against specific micro-organisms has been demonstrated using Echinacea extracts.

In vitro anti-viral activity has been documented against Influenza, Herpes and Vesicular viruses for ethanolic and aqueous extracts of Echinacea (Wacker & Hilbig, 1978; Thompson, 1998). A topical preparation containing an aqueous extract of Echinacea purpurea, has recently shown good antiviral activity against numerous strains of Herpes simplex virus, including acyclovir-resistant strains (Thompson, 1998). Echinacea angustifolia was also apparently used successfully both topically and internally by the Eclectics to treat patients infected by rabies, a viral disease, as well as impetigo, tetanus, and other wound infections (Ellingwood, 1919).

Antibacterial activity against Escherichia coli, Proteus mirabilis, Pseudomonas aeruginosa, and Staphylococcus aureus has been shown for a preparation containing Echinacea and other herbal ingredients, with slight activity against Staphylococcus aureus and Proteus mirabilis attributed to Echinacea (Westendorf, 1982).

The caffeic acid derivatives echinacoside and cichoric acid have antibacterial and antiviral activity (Wichtl, 1994). Echinacea polyacetylenes are bacteriostatic and fungistatic, although these compounds are readily oxidised by atmospheric oxygen so that in dried roots and most Echinacea preparations hydroxylated derivatives are found.

Insecticidal activity has been shown by various isobutylamides, including those found in Echinacea (Jacobson, 1954).

Anti-inflammatory activity

Several of the reported traditional uses of Echinacea by American Indian tribes, implicate an anti-inflammatory action, at least from topical application. Anti-inflammatory properties have been shown from topical application of a root extract of Echinacea angustifolia, which was more effective in the croton oil mouse ear test than the topical non-steroidal anti-inflammatory drug benzydamine (Tragni et al, 1985, 1988).

The mechanism of anti-inflammatory action is unknown, although inhibition of cyclooxygenase and 5-lipoxygenase has been shown *in vitro* for alkylamides from Echinacea angustifolia (Muller-Jakic et al, 1994), and several essential oil components of Echinacea possess anti-inflammatory activity. Anti-inflammatory activity has been reported for topical adminstration of the polysaccharide fraction from Echinacea purpurea (Tubaro et al, 1987).

It seems likely, however, that much of the anti-inflammatory effects of Echinacea are probably produced as a secondary consequence of increasing the phagocytic activity of macrophages.

Analgesic and local anaesthetic activity

Several Indian tribes used Echinacea root for toothaches, and it was also used to bathe burns. Jugglers are said to have bathed their arms and hands in the juice of Echinacea, before picking up pieces of boiling hot meat apparently without pain. The Winnebago Indians used Echinacea to make the mouth insensible to heat so that they could put a live coal in the mouth for show (Foster, 1991).

The components responsible for this effect are probably the isobutylamides, found particularly in Echinacea angustifolia. Several isobutylamides have a local anaesthetic action (Bowden & Ross, 1963; Jacobson, 1967), and these compounds are also responsible for the tingling sensation experienced when good quality Echinacea angustifolia and purpurea roots are chewed.

Clinical Trials

While a great deal of data has been obtained from *in vitro* and *in vivo* studies into the immunostimulant activities of Echinacea preparations, relatively few clinical trials have been conducted to date.

Several trials have been undertaken with commercial preparations containing fresh juice of the aerial parts of Echinacea purpurea, and mixtures of Echinacea with other phytomedicines. However, most of these involved intravenous injections to small groups of patients, and were not randomised or controlled (Hobbs, 1989).

Melchart et al (1995), describes and discusses the results of five placebo-controlled randomised studies investigating the immunomodulatory activity of various Echinacea preparations given for four or five consecutive days to a total of 134 healthy volunteers. Of these studies, only 2 showed significant enhancement of the phagocytic activity of polymorphonuclear neutrophil granulocytes compared with placebo, one using an intravenous homoeopathic preparation containing Echinacea angustifolia, and one an oral alcoholic extract of Echinacea purpurea root. Studies using oral preparations of Echinacea pallida roots, Echinacea purpurea herb and a more dilute homoeopathic preparation of Echinacea angustifolia, failed to produce significant effects. Leukocyte counts were not influenced significantly in any study.

While the authors comment that the negative results of these 3 studies could relate to the different methods for measuring phagocytosis and small sample sizes, the type of Echinacea preparations and small dosages used, were probably most contributory.
Extracts of the aerial parts of all three Echinacea species, have been shown to exhibit significantly lower activity on macrophage phagocytic abilities than extracts made from the roots (Bauer et al, 1989; 1996).

The same investigators recently conducted a double-blind, placebo-controlled clinical trial involving more than 300 healthy volunteers, which failed to find a significant effect of Echinacea angustifolia and Echinacea purpurea roots as a prophylactic against colds (Melchart et al, 1998). Again, however, the particular Echinacea extract used in this 12 week trial, was a very dilute 1:11 strength (i.e. 1 part by weight of herb to 11 parts by volume) liquid extract, and the dose of 100 drops (about 5ml) per day, too low for such a preparation.

Results were recently published from another German trial which failed to detect a statistically significant reduction in the incidence, duration or severity of colds and respiratory infections compared to placebo (Grimm & Muller, 1999). During the 8 week treatment period, 65% of 54 patients in the Echinacea group and 74% of 54 patients in the placebo group had at least one cold or respiratory infection. The median duration of colds and respiratory infections, was 4.5 days in the Echinacea group and 6.5 days in the placebo group.

Once again, however, these disappointing results are probably largely accounted for by the type of Echinacea preparation and dosage regime used in this trial. The preparation used was a liquid made from expressed juice of whole flowering plants of Echinacea purpurea, harvested without the roots. Additionally, the percentage alcohol used as a solvent in the preparation was only 22%, which would have only poorly extracted the lipophilic alkylamide components. For such a preparation the dosage taken of 4ml twice daily, would probably not have provided sufficient levels of active constituents to produce the desired effect.

More favourable results were obtained by Braunig et al (1992), who demonstrated a statistically significant effect of a stronger 1 in 5 strength Echinacea root extract in reducing the duration and severity of colds and flu.

Favourable results were shown also from a randomised, double-blind, placebo-controlled trial involving use of an Echinacea preparation consisting of squeezed sap of Echinacea purpurea, in persons especially susceptible to colds (Hoheisel et al, 1997). Of those who took Echinacea at the first sign of a cold, 60% avoided developing full colds, compared to 40% in the placebo group. In addition, those volunteers who did develop significant symptoms, recovered twice as fast as those in the placebo group (4 as opposed to 8 days).

A positive effect using larger doses of Echinacea for 7 days to treat symptoms of the common cold, was revealed by a well-designed, randomised, double-blind, placebo-controlled study conducted recently in Sweden. Patients selected were prone to the common cold but otherwise healthy, and began the treatment immediately after the onset of the first cold symptoms. Of the 41 healthy volunteers who took a daily dose of 6 tablets a day of a proprietary preparation made from both root and aerial parts of Echinacea purpurea, the relative reduction in a range of 12 symptoms was significantly more than that of the placebo group. Significantly, an even greater reduction in symptoms was produced in another group of 49 patients who took a more concentrated version of this Echinacea preparation (Brinkeborn et al, 1999).

Interactions

No evidence of any interactions between Echinacea and other phytomedicines or drugs, has been reported in the scientific or phytotherapist literature to date.

Adverse effects and Contraindications

These are rare and generally mild, and in clinical trials conducted to date few adverse reactions have been reported. In none of these trials have serious side effects been revealed (Hoheisel et al, 1997; Brinkeborn et al, 1999; Grimm & Muller, 1999).

The majority of adverse effects involved the gastrointestinal tract, with an aversion to the distinctively strong taste or mild transient nausea being most commonly reported.

An estimated 200 million tablets and liquid doses containing Echinacea were taken by Australian consumers during 1998 (Myers & Wohlmuth, 1998). Of the 11 reports involving Echinacea that were made to the Australian Adverse Drug Reactions Advisory Committee (ADRAC) between July 1996 and September 1997, 3 reports were of suspected asthma, and one each of unspecified rash, rash/myalgia/nausea, and urticaria (Mullins, 1998).

Several case reports of anaphylaxis have been reported from injectable preparations of Echinacea used in Europe. The German *Commission E* Monograph for Echinacea angustifolia, reports that in rare cases allergic reactions of the immediate type are possible (Blumenthal, 1998). It advises against parenteral but not oral administration where there is a tendency for allergy, especially against *Asteraceae (Compositae*, Daisy family plants).

A report of a case of Echinacea-associated anaphylaxis was recently published in the Medical Journal of Australia (Mullins, 1998). The patient, a 37 year old woman with
a history of atopy, experienced a burning of the mouth and throat immediately after taking, among various other dietary supplements, an aqueous-ethanolic liquid extract of Echinacea containing predominantly Echinacea angustifolia. Within 15 minutes she developed tightness in the chest, generalised urticaria and diarrhoea, but all symptoms resolved completely after she took the antihistamine promethazine.

The above appears to be the first case of severe allergy reported from an oral preparation, and the causal association of Echinacea in this instance has been refuted (Myers & Wohlmuth, 1998). A more likely explanation of the immediate pharyngeal irritation experienced by this patient is the content of isobutylamide constituents, well-known to cause marked pharyngeal tingling and increased salivation (Bauer & Wagner, 1991).

The *Commission E* monograph also advises against internal use of Echinacea in systemic conditions such as tuberculosis, leukaemia, collagen disorders, multiple sclerosis, AIDS, HIV infection, and other autoimmune diseases. Several other authors also recommend that Echinacea be avoided in autoimmune conditions, due to their knowledge of this phytomedicine simply as an 'immunostimulant'.

Such an alleged contraindication, however, is based upon an overly simplistic impression of the mode of action of Echinacea, and not supported by clinical data. No such contraindication is mentioned by other official texts such as the British Herbal Pharmacopoeia (1993) and British Herbal Compendium (1992), as well as several reputable authors (Weiss, 1988; Wichtl, 1994; Leung & Foster, 1996).

As mentioned earlier, there is little convincing evidence to date from *in vivo* studies that Echinacea enhances immunoglobulin production by the humoral component of the immune system, or stimulates production of IgE antibodies thought to be responsible for triggering asthma. While activation of pro-inflammatory cytokines such as Tumour Necrosis Factor (TNF) has been reported (Newall et al, 1996), this involved *in vitro* investigations, and a similar in vivo effect seems unlikely (Bauer, 1996; Elsasser-Beile et al, 1996).

It is in fact, conceivable that the effect of Echinacea to enhance phagocytic activity and thus promote the clearance and inactivation of pathogenic organisms, could be beneficial in some autoimmune diseases where more of an 'immunomodulatory' effect is required. Thus an improvement in phagocytic activity might help encourage the elimination of microorganisms whose chronic presence could conceivably be a factor in immune system dysregulation and chronic inflammatory conditions such as asthma. This concept is somewhat supported by recent research on new treatments for asthma which has linked immune system activation (specifically a type of T helper lymphocyte), with having a protective effect against the prevalence of asthma symptoms. Clinical trials are currently underway in New Zealand to assess the efficacy of novel mycobacterial vaccines on both asthma severity (Shirtcliffe et al, 1999), and the autoimmune skin condition psoriasis (Tan, 1999).

Based upon information from the traditional use of Echinacea, the number of doses of Echinacea products consumed in recent years, and the very small numbers of allergic reactions reported to date, there seems little evidence that oral ingestion of Echinacea poses any risk of life-threatening allergic reactions. Nevertheless, severe hypersensitivity reactions can occur to almost any food or medicine on a rare basis. It is likely that those who have a tendency to allergic reactions, particularly to *Asteraceae* family plants, may be somewhat more prone to hypersensitivity reactions from Echinacea.

It may therefore be advisable that strongly atopic patients do not take Echinacea unless this is under the supervision of a suitably trained health practitioner.

Both acute and chronic administration of Echinacea purpurea to rats and mice, in doses far in excess of those used in human therapy, has failed to show any evidence of toxic effects, and tests for mutagenicity and cytotoxicity have given negative results (Mengs et al, 1991; Thompson, 1998).

The pyrrolizidine alkaloids found in E. angustifolia and E. purpurea lack the 1,2-unsaturated necine ring system associated with hepatotoxicity for other such alkaloids (Bauer & Wagner, 1991). The statement by Miller (1998), that if used beyond 8 weeks Echinacea could cause hepatotoxicity and therefore should not be used with other known hepatoxic drugs, remains totally unsubstantiated

Dosage and preparations

Information from the traditional uses of Echinacea by American Indians, and subsequently the Eclectics and modern western phytotherapists, favours use of a root preparation made from Echinacea angustifolia or Echinacea purpurea as having the strongest activity in enhancing phagocytic activity by macrophages.

Tablet and liquid preparations of Echinacea are now becoming increasingly available in Australia and New Zealand. These are, however, widely variable in terms of their content and part(s) of Echinacea species as well as recommended dosage, and many products containing subtherapeutic levels or lacking any content of the stronger root, are to be found.

The importance of adequate dosage when prescribing Echinacea, was emphasised by the Eclectics, who used up to half an ounce of root every 2-3 hours during the acute stages of severe infections such as tetanus, diphtheria and meningitis (Ellingwood, 1919).

Those trials which have shown a positive effect for Echinacea in the prophylaxis or treatment of colds and upper respiratory tract infections, have generally used somewhat larger doses than those used in trials which have failed to produce a significant effect.

Due to the mode of action of Echinacea, it is advisable that loading (i.e. large) doses are taken during the early stages of infection. Once symptoms begin to resolve, this dose can then be reduced to two thirds or even half that taken earlier, and treatment continued until all symptoms disappear or are well on their way. If taken in sufficiently large doses at the very first signs of a cold, it is not infrequently observed that even 1-2 days treatment can suppress development of further symptoms.

Recommended adult dosage regime for a 1 in 2 strength dried root liquid extract:

Prophylaxis of colds and flu and most other infections:
5ml per day.

Treatment of colds, flu and upper respiratory tract infections:
8 to 10ml two to three times daily, reducing to 5ml two to three times daily once symptoms begin to resolve.

Treatment of more acute infections:
10ml three times daily.

Despite the suggestion by some authors that long term use of Echinacea results in reduced efficacy, there is no evidence of this to date. Long term prescribing for chronic conditions was sometimes undertaken by the Eclectics, and a large number of consumers of over-the-counter preparations have taken Echinacea regularly in recent years without any perceived reduction in efficacy.

Nevertheless, it is probably advisable that in most situations in clinical practice, Echinacea is taken as a prophylactic only for days, weeks or sometimes months at a time when infections are most likely, breaks being taken during the summer months. For persons not prone to recurrent or potentially severe infections, prophylactic treatment is generally not recommended, but treatment should begin at the first sign of infection.

Combinations:

Due to the strong and rather unpleasant taste of Echinacea root liquid extract, it is often useful to add a small amount of flavouring (eg 5-15% of a liquid extract of Liquorice, Peppermint, or Fennel) to the extract prior to administration.

Depending on the condition of the patient it is being prescribed to, Echinacea can usefully be combined with other phytomedicines exhibiting specific pharmacological properties (see notes in Clinical Summary section).

Echinacea can safely be given alongside conventional treatments such as antibiotics or symptomatic treatments for colds and flu (Wichtl, 1994), and in fact can help reduce the need for such treatments, as well as prevent potential adverse effects such as thrush.

CLINICAL SUMMARY FOR ECHINACEA

Actions:

immunostimulant, immunomodulatory, anti-inflammatory, anti-bacterial, antiviral, antiseptic, vulnerary.

Therapeutic indications:

Internal use:
- prophylaxis of colds and influenza
- supportive therapy for colds and chronic infections of the respiratory tract and lower urinary tract
- chronic viral and bacterial infections
- mild septicaemia
- furunculosis
- skin complaints

External use:
- poorly healing wounds and chronic ulcerations
- furunculosis
- bacterial infections

Dosage:

1 in 2 strength dried Echinacea Root Liquid Extract:

Prophylaxis: 5-10ml once daily
Treatment of acute infections: 8-10ml, two to three times daily
Treatment of chronic infections: 5-10ml, one to two times daily.
Dried root capsules, 500mg:

3-4 capsules, one to three times daily

Suggested combinations:

- **w**ith 10-15% v/v Liquid extract of Liquorice, Fennel, Aniseed or Peppermint, as a flavouring
- with 20-40% v/v Liquid extracts of Elderflower, Peppermint or Ribwort, as decongestants
- with 20-40% v/v Liquid extracts of Liquorice, Marshmallow, White Horehound, Elecampane, Hyssop or Wild Cherry, as cough remedies
- with other appropriate phytomedicines as indicated for the particular condition.

Adverse reactions and cautions:

Reaction to the strong taste of the liquid extract, particularly transient pharyngeal and oral mucosa irritation, and increased salivation.
Mild, transient nausea.
Type 1 hypersensitivity reactions in rare individuals, particularly where a history of atopy or allergy to *Asteraceae* family plants.

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Wildcrafting of Echinacea outlawed in U.S. States

A second U.S. State, North Dakota, passed legislation on March 23rd of this year making the digging of Echinacea purpurea or Echinacea angustifolia illegal. Fines of up to US$10,000 can be imposed on those caught willfully removing either species from private or state land without express permission. The state of Montana has also placed a three year moratorium on the harvesting of wild Echinacea angustifolia, as well as a range of other native species whose prevalence in the wild has declined dramatically in recent years.

This development brings into prominence the seriousness of concerns about harvesting raw materials for the herb industry from the wild, which has lead to a serious strain on some species in certain countries. While Echinacea purpurea is now being grown commercially on a large scale in many countries, less of the more expensive and difficult to grow Echinacea angustifolia is available from commercial growers.

It is the policy of Phytomed to always seek to source commercially grown supplies of threatened herbs where available, or obtain these species from wildcrafters that replant and harvest with sustainability in mind. All Phytomed Echinacea products (Liquid extracts, capsules and dried root) are produced from Echinacea species sourced from commercial growers rather than wildcrafters.

Written by Phil Rasmussen

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