SOME EFFECTIVE MEDICINAL PLANTS FOR DRY COUGH TREATMENT

Nino Qurashvili
Associate Professor, ALTE University

Medea Chikava
Professor, Georgian Technical University

ABSTRACT

Antitussives are remedies that allay dry coughing. Some may work through soothing irritability (respiratory demulcents); others are claimed to relieve coughs at source, by removing congestive mucus or other mobile provocations.

Such cough suppressants are not ideal treatments and could even be counterproductive if they reduce cleansing the lungs. However, there are many cases where they provide helpful relief and they may be the only solution for coughing not due to movable irritants (for example, nervous cough on the one hand, tumors on the other). Indications for antitussive remedies are non-productive, severe or persistent cough refractory to expectorants, nervous cough, cough due to external irritation or obstruction.

Liquorice (Glycyrrhiza glabra L) is one of the herbs widely used as an antitussive. The plant facilitates movement of mucus from the respiratory tract and soothes cough. Marshmallow (Althaea officinalis) relieves oral and pharyngeal mucosa cough because of its antitussive properties. For medical purposes roots, flowers, and leaves of Marshmallow are used. Cetraria islandica (Iceland moss), also known as true Iceland lichen or Iceland moss has long history of usage as an antitussive, demulcent remedy because of high content of mucilage.

Conclusion. The following article summerizes folk medicine and scientific data on some antitussive plants that can successfully be used for dry cough treatment. Some well tested receipts from folk medicines have to be actively consumed together with synthesized medications.

Key words: Cough, antitussive, demulcent, Liquorice (Glycyrrhiza glabra L), Marshmallow (Althaea officinalis), Iceland moss (Cetraria islandica).

მშრალი ხველის სამკურნალოდ გამოყენებული ზოგიერთი ეფექტური სამკურნალო მცენარე

ნინო ყურაშვილი,
ალტე უნივერსიტეტის
ასოცირებული პროფესორი
მედეა ჩიქავა
სტუ-ს პროფესორი

რეზიუმე

მშრალი ხველის შესამცირებლად გამოიყენება ხველის დამთრგუნავი საშუალებები. ზოგიერთი ხსნის გაღიზიანებას (სასუნთქი გზების დამთრგუნველები), სხვები მოქმედებენ ხველის გამომწვევზე და ორგანიზმიდან გამოდევნიან შეგუბებულ ლორწოს ან სხვა გამღიზიანებლებს.

ხველის მსგავსი დამთრგუნველები არ წარმოადგენენ განკურნების იდეალურ საშუალებას და შესაძლოა კონტრპროდუქტიულებიც იყვნენ, რადგან აფერხებენ ფილტვების გაწმენდის პროცესს. თუმცა არსებობს შემთხვევები, როცა მათი გამოყენება შვებას იძლევა და, შესაძლოა, ერთადერთი გამოსავალი იყოს არაგარეგანი გამღიზიანებლით გამოწვეული ხველის შემთხვევაში (მაგალითად, ნერვული ან სიმსივნით გამოწვეული ხველა). ხველის დამთრგუნველები გამოიყენება არაპროდუქტიული, ამოსახველებელი საშუალებების მიმართ რეზისტენტული მწვავე და დაუოკებელი ხველის, ნერვული ხველის ან გარე გამაღიზიანებლით ან ობსტრუქციით გამოწვეული ხველის შემთხვევაში.

ძირტკბილა (Glycyrrhiza glabra L) ფართოდ გამოიყენება, როგორც ხველის დამთრგუნავი საშუალება. იგი აადვილებს ნახველის გამოდევნას სასუნთქი სისტემიდან და ამშვიდებს ხველას. ტუხტი (Althaea officinalis) ამშვიდებს ხველას ორალურ და ფარინგეალურ ლორწოვან გარსზე მისი დამთრგუნავი მოქმედების გამო. სამედიცინო მიზნებისთვის გამოიყენება მცენარის ფესვები, ყვავილები და ფოთლები. ისლანდიურ ხავსს, რომელიც ასევე ცნობილია ისლანდიური ლიქენის სახელწოდებით, აქვს ხველის დამთრგუნველად გამოყენების ხანგრძლისვი ისტორია მასში შემავალი ლორწოს გამო.

დასკვნა. სტატიაში თავმოყრილია ხალხურ მედიცინასა და სამეცნიერო კვლევებში არსებული მონაცემები ზოგიერთ ხველის დამთრგუნველ მცე-

ნარეულ საშუალებაზე, რომლებიც წარმატებით გამოიყენება მშრალი ხველისას. ხალხურ მედიცინაში კარგად გამოცდილი ზოგიერთი რეცეპტი აქტიურად უნდა იქნას გამოყენებული თანამედროვე სამკურნალო საშუალებებთან ერთად.

საკვანძო სიტყვები: ხველა, ხველის დამთრგუნველი, ძირტკბილა(Glycyrrhiza glabra L), ტუხტი (Althaea officinalis), ისლანდიური ხავსი (Cetraria islandica).

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Antitussives are remedies that allay coughing. Some may work through soothing irritability (respiratory demulcents); others are claimed to relieve coughs at source, by removing congestive mucus or other mobile provocations (expectorants).

However, the term 'antitussive' is often used specifically to refer to remedies that depress the cough reflex and, in particular in herbal terms, to those with appreciable levels of cyanogenic glycosides. Such cough suppressants are not ideal treatments and could even be counterproductive if they reduce cleansing of the lungs. However, there are many cases where they provide helpful relief and they may be the only solution for coughing not due to movable irritants (for example, nervous cough on the one hand, tumors on the other). Indications for antitussive remedies are non-productive, severe or persistent cough refractory to expectorants, nervous cough, cough due to external irritation or obstruction (e.g.tumor) (3).

Respiratory antitussive or demulcent herbs contain mucilage and have a soothing and anti inflammatory action on the lower respiratory tract. Although the mechanism is not clear, an opposite effect to that of the stimulating expectorants has been postulated.

Indications for respiratory antitussives are:

- Dry, non-productive, irritable cough
- Coughing in children
- Asthmatic wheezing and tightness

Respiratory antitussives may be contraindicated in profuse catarrhal or congestive conditions of the mucosa. Respiratory demulcents are best taken before meals. They are particularly effective taken in cold aqueous infusions. However, if gastro-oesophageal reflux is contributing to the pathology, as can be the case in asthma, they should be taken after meals. Long-term therapy with respiratory demulcents is usually well tolerated.

To some most effective plant remedies traditionally used as respiratory antitussives and demulcents belong Liquorice (Glycyrrhiza glabra L), Marshmallow **(**Althaea officinalis), and Iceland moss (Cetraria islandica).

Liquorice (Glycyrrhiza glabra L) is one of the herbs widely used as antitussive as well as expectorant by Western herbal clinicians and is also a major herb of the Chinese, Kampo and Ayurvedic traditions. It has a long history, being used by the ancient Chinese, Egyptians and Greeks. The generic name Glycyrrhiza is derived from the Greek meaning 'sweet root' and it is the dried root and stolons that are the parts used medicinally. The sweet taste of licorice root is due to the presence of glycyrrhizin, an intensely sweet saponin (3).

The plant facilitates movement of mucus from the respiratory tract and soothes cough. Traditionally Licorice has been used for treatment of bronchitis and cough as well as peptic ulcer, gastritis; adrenal insuffciency, Addison's disease; urinary tract inflammation.

Glycyrrhiza glabra is a member of the Fabaceae (Leguminosae or pea) family, the Faboideae subfamily and the tribe Galegeae(as is the genus Astragalus) (4). It is a perennial herb (Figure 1), up to 150cm tall, with a thick rhizome of dark, reddish-brown colour outside and yellowish inside (Figure 2), from which its stolons and roots

arise. Leaves are compound, imparipinnate, 5 to 14cm long with 11 to 17 leaflets that are ovate, oblong lanceolate or elliptical in shape. Flowers are zygomorphic, of pea flower structure,in densely flowered racemes: petals purple, calyx glandular and five-toothed. Fruit is a flat legume (pod), up to 35mm long (5) (Figure 3).

Figure 1. Glycyrrhiza glabra

Figure 2. Licorice root

Figure 3. Licorice fruit

Key constituents of Licorice are triterpenoid saponins: primarily the sweet tasting glycyrrhizin (GL)(6), which is a mixture of the potassium and calcium salts of glycyrrhizic acid (glycyrrhizinic acid)(7); other saponins are also present (8). There were discovered a wide range of flavonoids (1% to 1.5%) that impart

a yellow colour to the root: flavanones (including various liquiritigenin glycosides such as liquiritin and

rhamnoliquiritin)(9), chalcones (including isoliquiritin) and isoflavonoids (including glabridin, glabrone and

formononetin)(10). Other compounds include sterols, coumarins, fatty acids (C2 to C16), phenolics and arabinogalactans(11). Early research found that oral doses of glycyrrhizinic acid exerted an antitussive effect similar to codeine(13).

Because of the mineralocorticoid-like action of glycyrrhizin, the average daily dose should not exceed 5-15 g of dried herb (equivalent to 200-600 mg glycyrrhizin) and the course of treatment should not exceed 4-6 weeks (14).

In folk medicine of Georgia Licorice has been well known and very effective expectorant. *Elexirium for Chest,* liquid that is sweet greyish-brown transparent expectorant is prepared as follows: Licorice root extract – 60 parts, alcohol – 49 parts, liquid ammonia – 10 parts, anise oil – 1 part and water – 180 parts. The extract should be taken 20-40 drops 2-3 times a day for adults and children shoud take the number of drops equal to their age` (i.g.3 years old – 3 drops) (12).

Higher dosage or longer use could lead to adverse effects consisting of sodium and water retention, blood pressure elavation, potassium loss and edema (14).

Althaea officinalis, the marsh mallow or marshmallow, (15) is a species of flowering plant (Figure 4) indigenous to Europe, Western Asia and North Africa. The generic name Althea is derived from the Greek word which means "to heal". Thus, this herb is used to stimulate the body's healing capacity.

This herbaceous perennial has stems which die down in the autumn, They typically grow 90 to 120 cm but can reach 2.0 m and put out only a few lateral branches (16).

The leaves (Figure 5) are shortly petioled, roundish, ovate-cordate, 50 to 75 mm long, and about 30 mm broad, entire or three to five lobed, irregularly toothed at the margin, and thick. They are soft and velvety on both sides, due to a dense covering of stellate hairs. The lilac-pink flowers (Figure 6) are shaped like those of the common mallow.

Marshmallow relieves oral and pharyngeal mucosa cough because of its antitussive properties. It eliminates the extra mucosa from the oral cavity and respiratory system hence, widely used to manage the cough. For medical purposes roots, flowers, and leaves of the plant are used (17).

Figure 4. Marshmallow

Figure 5. Marshmallow leaves

Figure 6. Marshmallow flowers

The following demulcent/antitussive formula can be used to relieve an irritable cough:

Althaea offcinalis glycetract	1:5	80 mL
Glycyrrhiza glabra (high in glycyrrhizin)	1:1	20 mL
	Total	100 mL

Dose: 4mL sipped undiluted (that is no water is added) as required up to 6 times a day (8).

In Georgian folk medicine Althaea officinalis has been used for centuries as an antitussive remedy. The formula was as follows: 1 tea spoon flower of the plant was boiled in 1 glass of water, cooled for 2 hours, filtrated and taken 1 tea spoon 3 times a day (17).

Cetraria islandica (Iceland moss), also known as true Iceland lichen, is an Arctic-alpine lichen, which erect or upright, leaflike habit gives it the appearance of a moss, where its name likely comes from. Icelandic

moss isn't moss. It's actually lichen. Lichen is a dual organism consisting of a type of fungi and algae or bacterium. Both coexist together to allow it to exist in harsh climates. This symbiotic relationship keeps Icelandic moss well protected and nourished. While fungi lack the plant pigment chlorophyll and can't undergo photosynthesis, algae can undergo this process to provide nourishment, and the fungi provide protection from the environment (18).

Figure 7. Cetraria islandica (Iceland moss)

It is often of a pale chestnut color, but varies considerably, being sometimes almost entirely grayish-white; and grows to a height of from 7.6 to 10.2 centimetres the branches being channelled or rolled into tubes, which end in flattened lobes with fringed edges. (19)

In commerce it is a light-gray harsh cartilaginous body, almost colorless, and tastes slightly bitter. It contains about 70% of lichenin or lichen-starch, a polymeric carbohydrate compound isomeric with common starch. It also yields a peculiar modification of chlorophyll (called thallochlor), fumaric acid, lichenostearic acid, and cetraric acid (which gives it the bitter taste). It also contains lichesterinic acid and protolichesterinic acids.

Iceland moss (figure 8) grows abundantly in the mountainous regions of northern countries, and it is specially characteristic of the lava slopes and plains of the west and north of Iceland. It is found on the mountains of north Wales, northern England, Scotland and south-west Ireland. In North America its range extends through Arctic regions, from Alaska to Newfoundland,

Figure 8. Natural Icelandic moss

and south in the Rocky Mountains to Colorado, and to the Appalachian Mountains of New England(19).

For centuries, Icelandic moss has been used as a European folk medicine to treat various ailments such as colds, coughs, respiratory illness, and digestive issues.

The main ingredient of the moss is Cetraric acid or cetrarin, a white micro-crystalline powder with a bitter taste, is readily soluble in alcohol, and slightly soluble in water and ether. It has been recommended for medicinal use by alternative medicine sites, in doses of 0.2 to 1 g as a bitter tonic and aperient. It is traditionally used to relieve chest ailment, irritation of the oral and pharyngeal mucous membranes and to suppress dry cough(20).

Figure 9. Cetraria islandica lozenges

The plant has long history of usage as an antitussive and demulcent remedy because of high content of mucilage.

Here is a formula of its water extract preparation: 2 tea spoons of the moss is added 2 glasses of cold water and until the extract starts boiling, removed from heat, sieved and cooled. This amount is a dose for one day (21).

Icelandic moss has had some reported side effects. One study showed that consuming Isla-Moos lozenges (80 mg Icelandic moss extract per lozenge) for 2 weeks led to itching, nausea, abdominal pain, heartburn, and burning inside the mouth in less than 1% of participants (6 out of 1,848) (22). Further, because Icelandic moss absorbs pollutants, it may contain high amounts of lead and other heavy metals, though more data is needed.

Having analysed folk medicine and scientific data on antitussives, we concluded that number of medicinal plants can successfully be used for dry cough treatment and well tested receipts from folk medicines have to be restored and consumed together with synthesized medications.

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