

## **Phytotherapy as a preventive and adjuvant for the rhinitis**

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**Abstract:** Rhinitis is a condition present in the world, caused by irritation and inflammation of the nasal mucosa. The most common symptoms are a feeling of nasal stuffiness, runny nose and post-nasal drip. Most often is allergic type, usually triggered by the presence of allergens in the air such as pollen or animal dander and hair. This particular type of rhinitis can also be associated with different symptoms, such as sneezing, nasal itching, cough, headache, weakness, malaise, cognitive slowing in addition to a range of symptoms that are related to the eyes, such as eye pruritus, conjunctivitis, persistent lacrimation, periorbital edema. As therapy the antihistamines and antibiotics are used frequently that are not free from undesirable side effects. The herbal medicine is therefore a viable alternative in the prevention of this disease alleviates uncomfortable symptoms that accompany it.

**Keywords:** medicinal plants, active ingredients, supplements, herbal preparations

### **I. INTRODUCTION**

Vasomotor rhinitis is a chronic inflammation of the nasal mucosa, which causes more or less persistent obstruction especially of the nose and sneezing and increased secretions. It is distinguished from the more famous allergic rhinitis in the organism for the absence of antibodies specific IgE (immunoglobulin E), produced upon contact with certain allergens, such as pollen, animal dander, dust mites, foods etc., especially obstruction causes more or less persistent of nasal cavities, as well as sneezing and increased secretions. However even when the classical allergy tests give negative results, cannot be ruled hypersensitivity reactions of the organism at the origin of chronic inflammation.

Vasomotor rhinitis is determined by an uncontrollable mechanism of congestion and decongestion turbinate's, particular structures cavernous wall of the nasal cavities, which normally contributes to heat, filter and humidify the air inhaled form, so as to make it suitable to pass in lower airways. It is often accompanied by bad breath, altered taste perception, conjunctivitis, headache, cough and runny nose. The latter is a characteristic symptom of rhinitis, with continuous emission of mucus from the nose. Rhinitis is also associated with inflammation of the throat and to the appearance of sore throat, cough and hoarseness.

In vasomotor rhinitis it is highlighted a form allergic and one non-allergic (65% -70% of all rhinitis). The allergies have a genetic component and arise from abnormal reaction to substances in the environment, dust mites, pollen or animal hair. In allergies you may be associated also: bronchial asthma, urticaria, atopic dermatitis, particularly in children, ear infections.

The non-allergic rhinitis, very frequent, especially in adulthood; they may depend on an alteration of the mechanisms of congestion-decongestion turbinate's, by the presence of inflammatory cells in the nasal mucosa, by infectious episodes, or from inappropriate use of the common nasal decongestants. The symptoms include nasal obstruction, sneezing in bursts, itching of the nose, the mouth and ears, nasal drip.

The use of cortisone drugs, antihistamines and antibiotics, especially if used for long periods of time and several times during the year, involve the occurrence of undesirable effects, for which it is preferred to apply the vaccination and to preventive measures. The nasal cytology is a special test that is able to distinguish between forms not allergic, inflammatory and infectious and therefore allows for recourse to adequate care. Vasomotor rhinitis non allergic type is little known and little studied and often evolves into chronic rhinitis for the abuse of pain medications and a decongestant with time becomes significant. The herbal medicine is an excellent method preventive or curative in the case of a chronic phenomenon, because it is well tolerated by patients for long periods of time without undesirable side effects

### **II. USE OF PHYTOTHERAPIC PREPARATIONS**

For the treatment of rhinitis, it is primarily used in the field of herbal plants with balsamic effect, immune stimulant and decongestant. There are numerous medicinal plants used for the cure and the prevention of rhinitis and rhinopharyngitis.

The preparations are the most common infusion and herbal tea that are used both as a beverage for internal use to relieve respiratory disorders, and as a nasal wash, warm slightly to relieve the discomfort of inflammation or as mouth washes.

The ancient practice of fumigations using essential oils transported by water vapor evolved into the more modern technique of aerosol therapy, while maintaining the antiseptic and antibacterial properties. In a similar way, nasal sprays and oropharyngeal based teas and herbal teas, help reduce inflammation, performing simultaneously soothing and emollient. Nanotechnology is a modern science which in recent years has been widely spread in the field of medicine and biology by offering the possibility to organize and manipulate matter at the nanoscale in order to control the fundamental structure and behavior of matter itself. Through it you can get innovative systems with chemical-physical characteristics able to favor the solubility and bioavailability of poorly soluble drugs in water, capable of increasing the permanence in the circulation of drugs, or direct them to a specific site of action [1][2][3][4].

Currently several nanoparticles systems are studied as potential medicinal new generation. Among them remarkable development have had the nanopolymeric particles, produced from different types of polymers both of natural and synthetic origin. Polymeric nanoparticles can be used for the local or systemic treatment of various diseases; they are characterized by a polymer matrix in which the drug can be dispersed to form nanospheres or enclosed to form nano capsules[1][5].

The nanoparticles systems, due to their shape, are able to protect the drug from enzymatic degradation, favoring its spread through the epithelium, modify the pharmacokinetics and tissue distribution and increase the intracellular penetration. They may be administered by all routes of classical and are able to promote both the bioavailability both the therapeutic efficacy of the drug delivered. It was highlighted by several studies, following mucosal application, the smaller the particle size, the greater the possibility that nanoparticles carry the drug through the mucosa itself [3][6]

N-carboxymethyl chitosan, a chitosan derivative, natural polymer obtained from residues of fish products, is a substance very versatile that lends itself to a number of formulations. Among its properties were ascertained the hemostasis, the re-epithelialization of tissues, properties anti-inflammatory and soothing, bactericidal / bacteriostatic, full biocompatibility, biodegradability and muco-adhesiveness. Being non-toxic, N-carboxymethyl chitosan may be used in any desired percentage in cosmetic applications and pharmaceutical formulations.[7]. They have been developed formulations of toothpastes and mouthwashes, for oral diseases where effectively improves the health of the gums and mucous membrane and of oropharyngeal spray for vehicular oils essential from the action expectorant and antibacterial [8]

Even buds products as glycerin macerate are useful to relieve allergy symptoms. Introduced around 1950 as a result of investigations of the Belgian doctor Pol Henry the buds products are obtained from processing embryonic tissues fresh vegetables, particularly from the buds, rich in substances that contribute to the growth of the plant. The harvest time varies depending on the species of the plant and of the part to be collected: for the underground parts such as roots, barks of roots or rhizomes the most suitable period is autumn to when these parts are stored are the nutrients and vital; for shoots and young aerial parts, gems, harvest time is spring. The plant parts, once collected are ground and left to soak for 21 days in alcohol (45 ° -65 °) and glycerin which is a less aggressive solvent alcohol and prevents the deterioration of the components, get glycerin macerate or glycerinates. At the end of the maceration period are performed decanting, the squeezing of the solid residue and filtration and finally bringing them to the dilution at the concentration of 0.1%.

The key feature of the buds therapy is precisely to exercise in terms of energy, mainly detoxifying action: the buds derivatives not act solely on the excretory organs such as liver, kidneys, skin, intestines, lungs, but on all organs, according to the specific action of remedies used. The buds derivatives are easy to administer, are not toxic and can be associated with traditional herbal medicine, the homeopathy and other therapies including drug.

### III. ACTIVE INGREDIENTS TARGETED ACTION ON THE RESPIRATORY SYSTEM

Medicinal plants are rich in active ingredients that are extracted with different methods and are the phytocomplex that exerts its action on the airways (Table1, 2). For the treatment of nasopharyngitis are given the mouthwash to gargle *Matricaria recutita*, *Citrus limonum*, *Quercus pedunculata*, Iceland moss, plants rich of flavonoids and tannins which provide an astringent and anti-inflammatory activity as well as antimicrobial. For their decongestant, antimicrobial, mucolytic and anti-inflammatory action fumigations of different essential oils are used that are mixed together :

*Matricaria recutita*, *Lavandula angustifolia*, *Eucalyptus globulus*, *Thymus vulgaris*, *myrtus*, *Pinus silvestris*.

***Matricaria recutita*** belongs to the Asteraceae family and the drug is made from the flowering tops which contain an essential oil, containing bisabolol, soothing calming, soothing, and also blue chamazulene, alcohols and glycosides. Chamomile has anti-inflammatory action, antispasmodic, emollient and protective [9].

***Lavandula angustifolia*** belongs to the Lamiaceae family and the drug is represented by flowers that contain an essential oil made from linolil acetate, linololo, cineole and tannins. Lavender is a decongestant in cases of colds and flu [10] [11].

**Eucalyptus globulus** belongs to the family of Myrtaceae and the essence of eucalyptus is obtained by distillation of fresh or dried leaves: sweet-smelling, fresh taste, aromatic and pungent. Essential oil contains eucalyptol, aromatic aldehydes, terpenes compounds, tannins resins. Whatever the route of administration, after absorbing the essential oil is eliminated through the lungs where it exerts antiseptic, balsamic and expectorant. It is used in colds, tracheobronchitis in the form of herbal tea, infusion, tincture [12][13].

**Thymus vulgaris** belongs to the family of Lamiaceae and glandular hairs found on the leaves contain the essence rich of thymol, carvacrol, cymene, linalool and tannins. The extract is used in preparations for the expectorant action, litica secreted with the addition of the antibacterial activity of thymol and carvacrol. Herbal teas are used to combat cough, bronchitis, colds and sore throat [14].

**Myrtus communis** belongs to the family of Myrtaceae and the drugs is contained in the leaves and fruits. The leaves in the form of infusion have properties antiseptic, disinfectant, anti-inflammatory and astringent to the high presence of tannins; they present balsamic action that make them useful in bronchitis. The infusion and decoction of fruits have action astringent, balsamic and refreshing.[15][16][17].

**Pinus sylvestris** is a tree belonging to the family of Pinaceae. The drug is made from the buds, resin, needle-like leaves and bark from which we extract the essential oil. Essential oils balsamic offer immediate natural relief for coughs, favoring respiration and elimination of phlegm[18].

Their appointment may be for internal use (2 drops in a teaspoon of honey) or they can be diluted in a neutral cream that can be rubbed around the nostrils or on the chest, to facilitate breathing during sleep; or be widespread in the environment and used for inhalation in fumigations. A tea antiseptic expectorant can be obtained by mixing *Eucalyptus globulus* leaves 25 g; *Pinus sylvestris* conical buds 25 g; *Mentha piperita* leaves 25 g; *Polygala senega* roots 25 g; where the antibacterial essential oils joins the emollient mucilage.

The fumigations represent a very simple technique and consist of inhalation of vapors. Just fill a bowl with boiling water, add a few drops of essential oil and breathe in the vapors emitted vigorously, with a towel covering the whole head.

A nasal wash or irrigation can be particularly useful to reduce the amount of mucus in the nostrils. It is to use a saline solution or a herbal tea made from herbs with decongestant properties in the nostrils by means of a syringe or a nasal irrigation device.

#### IV. ALLERGIC RHINITIS

Allergic rhinitis is characterized by the presence of specific antibodies in the body, immunoglobulin E, produced upon contact with certain allergens such as pollen, animal dander, dust mites, food. When the rhinitis is allergic, it is advised to avoid the source of allergy and then take antihistamines, generally synthetic, which, however, present a range of side effects of which the plants are devoid instead. Numerous plants shown to modulate inflammation and are to be recommended in the case where the excessive use of synthetic drugs has led to the chronic rhinitis.

The essential oil of **Melaleuca viridifolia**, known as **Tea tree oil**, obtained by steam distillation from the leaves of the plant has very strong smell and taste very intense and characteristic: it is a powerful antiseptic, antibacterial, antifungal and antiviral properties as well as having deodorants, preservatives, and slightly anesthetic. The Tea tree oil contains about 48 organic compounds such as 1,8-cineole,  $\alpha$ -terpineol, limonene,  $\beta$ -phellandrene,  $\alpha$ -pinene, linalool and piperitone. The substances most significant are: the Terpinene and cineole that must be present in the finished product in very specific percentages, more than 30% of Terpinene and less than 15% of cineole, respecting the balance found in nature, to highlight the quality essential oil[19] [20].

This has antibiotic properties at very wide spectrum of bacteria, viruses and fungal infections. It can be used for internal use, in case of viral infections that cause fever, such as bronchitis, colds, sore throat; also it acts in cases of cystitis, candidiasis and herpes. It is a good remedy to fight the flu syndrome characterized by the presence of mucus and phlegm; if inhaled, is able to carry out fluidifying and expectorant action on the respiratory tract, it acts on the stuffy nose and cough.

The oil of **Perilla frutescens L.**, annual herbaceous plant of the family of Lamiaceae, extensively cultivated in China, Japan, Korea, India and Vietnam, also known as Chinese basil, comes as a liquid light yellow, clear and transparent, with a characteristic aromatic smell very rich in essential fatty acids including omega 3: oleic acid (12-22%), linoleic acid (11-16%), alpha-linolenic acid (52-64%), gamma-linolenic acid (0-1%), palmitic acid (5-7%), stearic acid (1-3%). Just linolenic acid is to be the 'anti-inflammatory action is effective in the treatment of bronchial asthma that chronic allergic rhinitis. *Perilla frutescens* has inhibitory action on the most important chemical mediators of inflammation and allergies, such as histamine and leukotrienes, and lowers the levels of IgE antibodies implicated in allergies [21] [22].

The buds of **Ribes nigrum** are rich in flavonoids and glycosides, known to stimulate the production of cortisol by the adrenal glands. The buds derivatives are effective to reduce inflammation and as a mild antihistamine. A positive effect both on the skin is that in the respiratory tract and is recommended in all forms

of pollen allergy, of medications, of rhinitis and allergic conjunctivitis and of bronchial asthma. The presence of essential oil rich in omega 3 fatty acids, has direct effects on the obstruction of the respiratory tract, resulting in an effective remedy in cases of bronchitis and colds. For its immunostimulant activity, it fights fatigue and increases resistance to cold fostering disease prevention flu[23][24].

The buds derivatives of **Rosehip** has immunomodulatory properties, giving to the prepared an effective action against all forms of allergy. In particular its intake improves immune response in the respiratory tract in patients with allergic tendency and in children. The anti-inflammatory properties are an important therapeutic use in acute inflammation involving alterations of the nasal membranes, eyes and respiratory tract resulting in the production of catarrh. For such properties, the Rosehip is not only an excellent remedy in the prevention and treatment of allergic rhinitis, conjunctivitis and asthma caused by contact with pollen, but it is recommended in diseases of childhood such as tonsillitis, rhinopharyngitis, ear infections, coughs and colds [25][26]

The buds derivatives obtained by maceration of fresh buds of **Alnus glutinosa** and **Alnus incana** are active in all inflammatory syndromes characterized by mucus production, whatever the tissue compromise. And it is indicated as a decongestant and suppurative inflammatory processes in the nasal mucous and in chronic forms of rhinitis and sinusitis. The buds derivatives of *Alnus Glutinosa* than ownership catarrh and anti-inflammatory had an regulating vessel activity, also improving circulation in the brain

The **fungus** also known as **Reishi**, is a parasitic fungus typical of oak and chestnut trees, where it binds to the cortex. The fungus is hard and woody and is not immediately edible: the purposes of care, the mushroom is dried, then macerated and reduced to fine crumbs, then sifted and turned into a powder from the powdery consistency. It is used not only for the preparation of infusions, decoctions, but also in tablets, and the compound exhibits a high anti-inflammatory activity, as well as an antitumor effect, still in the course of study and scientific investigation. It is rich in organic germanium, a mineral of distinctive antiviral and anti-inflammatory activity, and oleic acid and ganoderic acid.[27] The fungus also appears to counteract the release of histamine, the presence of ganoderic acid is therefore useful in case of urticaria and allergic reactions. As anti-inflammatory agent, for the presence of substances by the effect cortisone, it acts while reducing pain, possible swelling and accelerating healing processes. Its action is also exerted on the immune system by stimulating the activity of T lymphocytes and Natural Killer cells. In vitro tests a useful action was confirmed against certain viruses, flu such as herpes simplex; also it presents activities to mycosis such as candida.

**Curcuma Longa** belongs to the family of the Zingiberaceae and is used both for the food that officinale. The vibrant yellow powdered root is used as a food coloring. It is a spice from the beneficial properties known since ancient times, widely used in traditional Indian medicine; it can be used for its strong anti-inflammatory power as a natural remedy in cases of allergic rhinitis. It is used the underground part of the stem containing molecules of nutritional reserves, which need to be stored a short processing: the rhizome is washed, blanched, dried and ground into a powder fine. The solution obtained by boiling two tablespoons of turmeric powder in water can be consumed in the maximum amount of 3 g /day. The chemical components are the major curcuminoids: curcumin (diferuloylmethane), and demetoxicurcumina bisdemetoxicurcumina. The active ingredient is the curcumin, which has a spicy flavor, slightly bitter, earthy and distinctly an odor similar to mustard. It has, in addition to the antioxidant and anti-inflammatory properties, antitumor activity, able to inhibit the reproduction of breast cancer cells[28]

## V. CONCLUSIONS

An important role in diseases of the upper airways is certainly represented by the herbal medicine of which the various forms of application can relieve inflammatory symptoms which occur more easily on nose, throat, bronchial tubes. A careful choice of the active ingredients in the various medicinal plants makes the phytotherapy suitable for both adults and children, who, especially in early childhood, are subject to more frequent rhinitis and for which are to be preferred drugs effective but less aggressive of the synthetic drugs.[29]. The simplicity of intake of the various phytotherapeutic products and the absolute absence of toxicity makes it possible, in addition, a prevention system also long-lasting and repeatable several times during the year.

**VI TABLE**

Phytocomplexes	Activities of phytocomplexes
Grindelia, Eucalyptus, Pine, Liquorice, Plantain	Expectorant
Grindelia, Sundew, Thyme	Antispasmodic
Essential oils, Propolis	Antiseptic / antibacterial
Propolis, Plantain, Helichrysum	Antiinflammatory
Mauve, Altea, Linden, Licorice, Honey	Soothing / emollient
Echinacea, Astragalus, Uncaria	Immunomodulatory
Blackcurrant, Ginkgo biloba	Antiallergic

Tab. 1 Active ingredients present in the action of the medicinal plants and phytocomplexes

Active ingredients of medicinal plants	Actions phytocomplexes
Essential oils	Expectorant
Saponins	Antispasmodic
Polyphenols	Antiseptic / antibacterial
Terpenes	Anyiinflammatoria
Resins	Soothing / emollient
Mucilage	Immunomodulatory
Iridoid glycosides	Antiallergic
Naphthoquinones	

Tab.2 Actions of the plant compounds on the respiratory system

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