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Surrounding Plants as Reliable Immune Boosters

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Abstract

Recently, due to the growth of environmental pollution and the increase in the resistance of microorganisms to artificially create chemical drugs, there has been an urgent need for a radical change in the direction of the medical preparations development, for changing chemicals to naturally produced ones based on herbal natural remedies. Since homeopathy is a branch of medicine that includes not only herbal preparations, but also chemical ingredients, our newly developed patent—although it belongs to the field of homeopathy—is its offshoot aimed solely at maintaining the body's strength without harming it, increasing the survival of the body in a polluted environment removing toxins from the body by strengthening adaptive immune mechanisms. Thus, thyme, cumin, oregano, licorice, and other natural resources of the earth, which are the basis of our patent, successfully fight cold and diseases of the upper respiratory tract. The article presents a methodology for the development of a new herbal preparation, its dosage, and use as the main ingredient in a treatment course in infectious diseases.

Keywords

Herbal Composition, Homeopathic Medicine, Immune Booster, Patent

1. Introduction

Pulse of pharmacy: an urgent need for homeopathic medicines

Children and the elderly are the most vulnerable part of society in terms of microbial attack. Because of their close symbiotic relationship with the gut mi-

crobiota, humans are now perceived as "meta-organisms" [1]. The intestines of children and the elderly suffer for two reasons: in children, the microbiota is not yet fully formed, and in the elderly it is already subject to pathological changes due to the use of many toxins and xenobiotics throughout life. Therefore, the use of drugs of chemical origin in these two groups of the population often leads not to recovery, but to a complication of the process. Abushaheen M.A. and co-workers (2020) reviewed the prevalence, main clinical implications and clinical causes of antibiotic resistance [2]. According to available data, the antibiotic resistance of most pathogenic and opportunistic strains is the main reason for the deterioration of the condition of patients during treatment, and therefore there is a growing interest in medicine to replace synthetic chemicals with natural products rich in biologically active compounds, such as medicinal plants and an urgent need to develop homeopathic remedies for widespread use by both children and the elderly.

The main effect of homeopathic medicines is based on the stimulation of body protective functions, restoration of adaptation mechanisms by triggering and regulation of cytokines that stimulate switching of antibody isotypes in B cells, differentiation of T cells and activation of immune system [3]. Phenolic compounds as well as flavonoids present in the plants are well known as antioxidants. The medical aspect of them attracts attention for health promotion, and the manifestation of antibacterial action, anti-cancer, cardioprotective effect, immune system stimulation and anti-inflammatory result, skin protection from UV radiation, etc. [4]. The basis of homeopathic medicine is the "principle of similarity". Widely known is the phenomenon of effects inversion through three possible mechanisms: the non-linearity of the reactions manifestation depending on the dose, the difference in the initial pathophysiological state of individual patients and the difference in the pharmacokinetics of a homeopathic remedy in different individuals. Homeopathic medicines interact with sensitive systems of chemical reactions regulation resulting in their reorganization. This entails a coherent response to the drug leading to healing of cellular, tissue and neuro-immuno-endocrine homeodynamics. The data suggest that even ultra-low doses of drugs can incorporate structural or frequency information that is included in the regulation processes at the physical-electromagnetic level leading to high clinical efficacy of remedy [5]. The homeopathic medicine impacts on basophils, lymphocytes, granulocytes and fibroblasts are considered by Bellavite P *et al.* [6]. To data, the licorice helps in the release of cytokines entail changes in the background interleukins (IL), tumor necrosis factors (TNF) and so forth. Licorice exhibits anti-inflammatory properties, inhibiting the LPS-induced IL-1β, -6, and -8 and TNF-α responses of macrophages. It inhibits the phosphorylation of macrophage intracellular signaling proteins, for example, nuclear factor-kappa B p65 nuclear transcription factor and Jun proto-oncogene-encoded activator protein 1 transcription factor involved in inflammatory signaling pathways, due to which the licorice extract is proposed for the development of a

new therapy treat periodontitis-associated tissue destruction [7]. The ultimate effect of homeopathic medicines is realized by vegetative-nervous, endocrine, metabolic systems.

2. Patents on Homeopathic Herbal Drug Development

The known homeopathic composition (RF Patent 2192846, 2002), which may be useful for therapeutic and prophylactic purposes in various diseases. This invention contains 95% gelatin and 5% glycerin, and as an active pharmacological principle, a remedy of mineral, animal and vegetable origin in a homeopathic dilution of 700 doses. That homeopathic composition is developed in the form of a film.

Another homeopathic preparation is developed on the well-known classical method on the basis of *Arnica montana* (**Figure 1**). This preparation consists of sugar granules impregnated with a 30-hundredth homeopathic dilution made from the oxalis plant [8]. The small amount of biologically active substances contained in this tool shortens its use in children and the elderly. The closest to the new remedy obtained in our laboratory is a herbal drug made from licorice (*Glycyrrhiza glabra*) [9]. But the low amount of biologically active ingredients in this tool also limits its use in children and the elderly.

2.1. New Herbal Immune Booster Composition Development and Its Advantages

The purpose of the present invention (Patent 033111) [10] was to prepare sugar granules and drops from a composition based on herbs and medicinal plants used for significant strengthening the immune system in respiratory tract diseases in children and the elderly. In order to solve the set goal, we added following newly collected medicinal plants to the extract prepared from freshly collected licorice. These additionally added plants were: thyme grass, inula roots, cumin and oregano grass. The plants should be taken in final ratio licorice: thyme: inula:cumin:oregano 4:2:1:2:1. Based on our invention (Patent 033111), the homeopathic remedy can be prepared in solid and liquid forms, more precisely in

Figure 1. *Arnica montana.*

the form of drops and granules. Sugar granules are used as an auxiliary agent for granules proceeding, while 25% ethyl alcohol, for the development of drops. The essence of the proposed invention is that the ingredients of the newly collected plants listed above really amplify immune response in children, the elderly and patients with diabetes and may be used in the treatment of upper respiratory tract diseases. During the study of patients who received the new homeopathic remedy developed in our laboratory, the allergy background was absent. All medicinal plants included in the invention have an antispasmodic effect, and the simultaneous use of drugs with the same effect results in their synergism leading to noticeable spasm reduction. In this regard, the use of the components in small doses reduces the occurrence of unwanted side effects. This new drug shows an immunomodulatory effect, which perfectly manifests itself during seasonal complications in patients with chronic diseases of the upper respiratory tract; the drug also successfully prevents inflammatory reactions in the body and disease exacerbation.

The thyme (**Figure 2**) is ultra useful in the plant composition due to presence chytrate, organic acids, flavonoid glycosides, carotenes, resins, vitamins B and C, tannins, useful bitterness, simol and thymol, Caffeic acid, hydroquinones derivates, terpenoids and biphenyl compounds [11]. First of all, thyme impacts on the body as antiseptic: Thyme exhibits the antifungal, anti-inflammatory, and antibacterial properties and is used as a preservative in foods, cosmetics, and toiletries, as well as in mouthwash [12]. Finally this plant shows anti-inflammatory, analgesic, expectorant, bronchodilator, antispasmodic effects [13].

Cumin (**Figure 3**), which is also part of our newly developed drug, contains vitamins C, P, 2% - 6% of essential oils, 10% - 30% of choline, proteins, sugar, coumarin, stigmasterin, as well as trace elements [14]. This plant is used in the treatment of lung-bronchial diseases, asthma, hoarseness, and exhibits an expectorant, antipyretic effects, may be used as a digestion enhancer; and increases appetite as well [15].

The newly developed preparation contains also *Inula* (**Figure 4**) rich in eskiterpene lactones including alantolactone, inulin and mucilage, as well as manganese, magnesium, potassium, calcium, and iron trace elements. Inula rhizomes

Figure 2. The thyme.

Figure 3. Cumin.

Figure 4. Inula and rhizomes.

may be used in treatment of rheumatism, cough and purulent wounds, and as an anticancer tool as well [16]. In traditional medicine, Inula is used due to its anti-inflammatory, anthelmintic, antipyretic, antiseptic and antiphlogistic activities [17]. This plant is also used for treatment of lung and gastroduodenal disorders. Inula extracts exhibit antifungal, antioxidant, antiulcerogenic, and cytotoxic activities on large variety of cancerous cells as well. Sesquiterpene lactones from Inula viscosa exhibit the biological effects associated with the cytotoxic and anti-inflammatory activities [18].

Oregano (**Figure 5**) is the next medicinal plant in our composition, and the entire aerial part of that vegetation is medicinal [19]. This herb is rich in ascorbic acid, tannins, essential oils, and bitterness [20]. The main components of oregano essential oil are carvacrol, β-fenchyl alcohol, thymol and γ-terpinene.

Oregano extract in hot water exhibits the powerful antioxidant properties and contains the highest level of phenols. To date, oregano essential oil inhibits bacterial growth, causing the greatest growth inhibition of Listeria strains (L. monocytogenes and L. innocua) [21]. Oregano is used in cooking and as an expectorant in respiratory tract diseases; it is also helpful in cold and suffocation.

Glycyrrhiza glabra (**Figure 6**) contains up to 23% glycyrrhizin [22] (potassium and calcium salts of glycyrrhizic acid), 27 structurally related flavonoids, sterols, organic acids, coumarins, essential oils, vitamin C (10 - 30 mg%) and other compounds. Licorice exhibits an anti-inflammatory effect, and is an efficient

Figure 5. Oregano.

Figure 6. Licorice (*Glycyrrhiza glabra*).

expectorant, as well as emollient in bronchial asthma.

It is a traditional phytotherapeutic tool effective in inflammation of the upper respiratory tract, is prescribed in the hyperemia of bronchial tissues. Homeopathic remedies prepared on the basis of licorice roots are used in the symptomatic treatment of allergic reactions in pediatrics [23].

The remedy developed in Azerbaijan Medical University at the Technology and Organization of Pharmacy Department laboratory is prepared according to the following procedure:

The newly collected roots and herbs mentioned above are crushed to obtain a porridge-like mass, 70% ethyl alcohol is poured on the mass in the ratio of 1:5, then kept for 30 minutes, then carefully squeezed. The obtained parent extract is potentized with demineralized water up to 6D dilution potential, with shaking at each dilution step. Then, depending on the form of further developing drug, the resulting extract is added on the sugar granules, or to the 25% ethyl alcohol; the latter is used for obtaining the drop form.

2.2. The Effect of the Drug Depends on Its Correct Intake

Despite the fact that the developed remedy does not show allergic reactions, it is desirable to dose the drug correctly to achieve the desired therapeutic effect without the accumulation of active substances in the body. Suggested remedy's granules are taken sublingually 30 minutes before meals or 1 hour after meals,

while drop form is dropped in the required dose to small amount of water and is dissolved, then swallowed after keeping it in the oral cavity for a while. During acute inflammation, asthma attacks the drug is taken every 15 minutes for 2 hours in the required dose.

Dosage of drops:

Adults and teenagers need 15 drops, while children of 6 - 12 years old need 10 drops, children of 2 up to 6 years old - 5 drops 3 times a day. It is recommended to shake the liquid several times before drinking. The drug should be stored away from heat and sunlight. For diabetic patients, drop form is recommended to avoid the sugar presente in the granules.

Dosage of granules:

For adults and adolescents, 5 granules are required, while for children of 6 up to 12 years of age, 3 granules are enough, and for children of 2 - 6 years of age 1 - 2 granules 3 times a day sublingually. One granule for newborns from 1 month to 1 year, after pre-soaking in 1 - 2 ml of boiled water. Granules should be protected from moisture.

The course of treatment with help of the medicine developed depends on the severity of the disease. Treatment with the proposed remedy is always accompanied by an improvement in the general condition and the elimination or relief of cough.

The advantage of the presented homeopathic herbal composition in comparison with known remedies is that it is absolutely harmless to newborns. In addition, it has no contraindications and side effects with long-term use. The drug exhibits an immunomodulatory effect, shows healing properties, and manifests as an expectorant in bronchitis. In patients with thrombosis, its administration results in the thinning effect. Its anti-inflammatory effect is successfully combined with antispasmodic and sedative effects, which makes it an indispensable remedy for inflammation of the genitourinary system. The immunomodulatory effect also contributes to the manifestation of the antiseptic effect of the drug developed in infections.

Thanks to the vitamins and minerals included in our patented preparation, it has a general tonic and invigorating effect on the body, which is especially important after debilitating diseases and anorexia in children. In all these cases, the appetite-increasing and digestion-improving effect of the new drug comes to the fore.

The drug is convenient for use by patients of all age groups; it can be used in combination with allopathic drugs. The drug dissolves quickly in the oral cavity and has a pleasant taste, which ensures ease of use in both pediatrics and geriatrics.

3. Conclusion

The developed remedy is perfect both for strengthening the body during off-season shakes and in the treatment of infectious diseases as an immune booster. The proposed patent tool can be used by a wide range of people, in-

cluding the elderly and children, as well as diabetics.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

[1] Biagi, E., Candela, M., Fairweather-Tait, S., Franceschi, C. and Brigidi, P. (2011) Aging of the Human Metaorganism: The Microbial Counterpart. *Age*, **34**, 247-267. https://doi.org/10.1007/s11357-011-9217-5

[2] Abushaheen, M.A., Muzaheed, Fatani, A.J., Alosaimi, M., Mansy, W., George, M., Acharya, S., Rathod, S., Divakar, D.D., Jhugroo, C., Vellappally, S., Khan, A.A., Shaik, J. and Jhugroo, P. (2020) Antimicrobial Resistance, Mechanisms and Its Clinical Significance. *Disease-a-Month*, **66**, Article ID: 100971. https://doi.org/10.1016/j.disamonth.2020.100971

[3] Bellavite, P., Marzotto, M., Olioso, D., Moratti, E. and Conforti, A. (2014) High-Dilution Effects Revisited. 2. Pharmacodynamic Mechanisms. *Homeopathy*, **103**, 22-43. https://doi.org/10.1016/j.homp.2013.08.002

[4] Tungmunnithum, D., Thongboonyou, A., Pholboon, A. and Yangsabai, A. (2018) Flavonoids and Other Phenolic Compounds from Medicinal Plants for Pharmaceutical and Medical Aspects: An Overview. *Medicines*, **5**, Article No. 93. https://doi.org/10.3390/medicines5030093

[5] Bellavite, P., Ortolani, R., Pontarollo, F., Pitari, G. and Conforti, A. (2007) Immunology and Homeopathy. 5. The Rationale of the 'Simile'. *Evidence-Based Complementary and Alternative Medicine*, **4**, Article ID: 634864. https://doi.org/10.1093/ecam/nel117

[6] Bellavite, P., Conforti, A., Pontarollo, F. and Ortolani, R. (2006) Immunology and Homeopathy. 2. Cells of the Immune System and Inflammation. *Evidence-Based Complementary and Alternative Medicine*, **3**, Article ID: 401503. https://doi.org/10.1093/ecam/nek018

[7] Bodet, C., La, V.D., Gafner, S., Bergeron, C. and Grenier, D. (2008) A Licorice Extract Reduces Lipopolysaccharide-Induced Proinflammatory Cytokine Secretion by Macrophages and Whole Blood. *Journal of Periodontology*, **79**, 1752-1761. https://doi.org/10.1902/jop.2008.080052

[8] Arnika. Ne boleem. Medisina i zdorovye. Lekarstva. https://www.neboleem.net/arnika.php

[9] Maharramova. S.H. (2007) Methodical Phoundations of Organization of Homeopathic Service in Azerbaijan Republic. Azerbaijan Medical University, Baku.

[10] Velieva, M.N. and Maharramova, S.H. (2019) Homeopathic Composition Based on Licorice. Patent No. 033111.

[11] Lourenço, S.C., Moldão-Martins, M. and Alves, V.D. (2019) Antioxidants of Natural Plant Origins: From Sources to Food Industry Applications. *Molecules*, **24**, Article No. 4132. https://doi.org/10.3390/molecules24224132

[12] The Uses of Thyme Oil for Health. Healthline. https://www.healthline.com/health/thyme-oil#:~:text=In%20a%20study%20reported%20in,Staphylococcus%20aureus%2C%20and%20Helicobacter%20pylori

[13] Oliviero, M., Romilde, I., Beatrice, M.M., Matteo, V., Giovanna, N., Consuelo, A.,

Claudio, C., *et al.* (2016) Evaluations of Thyme Extract Effects in Human Normal Bronchial and Tracheal Epithelial Cell Lines and in Human Lung Cancer Cell Line. *Chemico-Biological Interactions*, **256**, 125-133. https://doi.org/10.1016/j.cbi.2016.06.024

[14] Merah, O., Sayed-Ahmad, B., Talou, T., Saad, Z., Cerny, M., Grivot, S., Evon, P. and Hijazi, A. (2020) Biochemical Composition of Cumin Seeds, and Biorefining Study. *Biomolecules*, **10**, Article No. 1054. https://doi.org/10.3390/biom10071054

[15] Johri, R.K. (2011) Cuminum Cyminum and Carum Carvi: An Update. *Pharmacognosy Reviews*, **5**, 63-72. https://doi.org/10.4103/0973-7847.79101

[16] Ozkan, E., Karakas, F.P., Yildirim, A.B., Tas, I., Eker, I., Yavuz, M.Z. and Turker, U.A. (2019) Promising Medicinal Plant *Inula viscosa* L.: Antiproliferative, Antioxidant, Antibacterial and Phenolic Profiles. *Progress in Nutrition*, **21**, 652-661.

[17] Lauro, L. and Rolih, C. (1990) Observations and Research on an Extract of *Inula viscosa* Ait. *Bollettino della Societa Italiano di Biologia Sperimentale*, **66**, 829-834.

[18] Messaoudi, M., Chahmi, N., El Mzibri, M., Gmouh, S., Amzazi, S., Benbacer, L. and El Hassouni, M. (2016) Cytotoxic Effect and Chemical Composition of *Inula viscosa* from Three Different Regions of Morocco. *European Journal of Medicinal Plants*, **16**, 1-9. https://www.researchgate.net/publication/309184459 https://doi.org/10.9734/EJMP/2016/28340

[19] Luo, X., Sedman, J. and Ismail, A.A. (2019) Microencapsulation of Oregano (*Origanum vulgare* L.), Rosemary (*Rosmarinus officinalis* L.) and Sage (*Salvia officinalis* L.) Essential Oils in β-Lactoglobulin. *Journal of Food Science & Technology*, **4**, 970-985. https://www.researchgate.net/publication/337790425 https://doi.org/10.25177/JFST.4.9.RA.612

[20] Teixeira, B., Marques, A., Ramos, C., Serrano, C., Matos, O., Neng, N.R., Nogueira, J.M., Saraiva, J.A. and Nunes, M.L. (2013) Chemical Composition and Bioactivity of Different Oregano (*Origanum vulgare*) Extracts and Essential Oil. Journal of the Science of Food and Agriculture, **93**, 2707-2714. https://doi.org/10.1002/jsfa.6089

[21] Matos, O., Neng, N.R., Nogueira, J.M., Saraiva, J.A. and Nunes, M.L. (2013) Chemical Composition and Bioactivity of Different Oregano (*Origanum vulgare*) Extracts and Essential Oil. *Journal of the Science of Food and Agriculture*, **93**, 2707-2714. https://doi.org/10.1002/jsfa.6089

[22] Valiyeva, M.N., Mamedov, Y.C., Veliyev, P.M. and Amirova, M.F. (2022) The Richest Licorice Medicinal Composition on the Public Health Guard. *International Journal of Innovative Science and Research Technology*, **7**, 1098-1106. https://www.ijisrt.com/

[23] Valiyeva, M.N., Amirova, M. and Mammadova, P. (2022) About Beneficial Features of Medicinal Preparations of Licorice. *International Journal of Research in Academic World*, **1**, 14-19.