

DEVELOPMENT TECHNOLOGY OF PRODUCTION BIOCIDAL AND DEODORIZING AGENT FROM PLANT RAW MATERIAL

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The aim of the research is development of the technology of production of means in the form of tablets of medical plants which has a biocidal and deodorizing properties to eliminate unpleasant odors and repel pests of natural materials.

There are known natural medicines to kill pests that damage wool fabrics, leather and fur – lavender, camphor and turpentine. [1]. The disadvantages of these preparation include their low efficiency.

There are known chemicals to protect the wool and fur from pests such as naphthalene, dichlorvos, nitrodyes (2,4-dinitronaftol-1; a dinitro-orto-krezol and salt 2,4-dinitro-1-naphthol-6 sulfonic acid), glyoxal, derived of triphenylmethanel, o- and p-dichlorobenzene, pentachlorophenol, fluorine-containing compounds (antimony Sodium Fluorine; triethanolamine Fluoride; Sodium fluorosilicate; boron Potassium fluoroacetate; 1,6-diamino -2, X-diflourine hexane). A common disadvantage of all these chemical means of pest control in household or industrial conditions is the necessity to saturate the fur, wool and products made from these solutions of these toxic substances and to systematically apply spraying these toxic substances on fur, wool and all areas where you store these products, due to the large effort and high toxicity and danger for humans (especially naphthalene is a nerve and blood poison for humans causing diseases of the skin, internal organs and cataracts) and for the environment.

There is a well-known preparation for moth that damage fur, wool, fur and wool items which proposes the use of menthol as a repellent [2]. Menthol can be used both in pure form and in mixture with any inert filler. The advantage of this preparation is creation of highly efficient and environmentally friendly means of protection against moths which due to its repellent properties provides reliable protection from moths and the disadvantages include the high cost of menthol and the limited use of this preparation due to the fact that high concentrations of menthol can cause serious allergic reactions such as skin rash, itching, redness and irritation and also can lead to difficulty breathing, chest tightness, swelling of the mouth, lips, face and so on.

There is known compositional preparation for a long fumigating action of the active component which consists of a carrier and active component in which carrier use table salt in pill or substance that contains table salt and as the active substance use volatile substance – natural essential oils and synthetic aromatic substances or substances from a number of repellents or substances of insecticides [3].

Also known preparation for moles which can be used as non-toxic preparation for pest control which contains shavings of soap and kernel acorns which dried and ground to obtain a powder [4]. Mass fraction of soap is 30-70% and the mass fraction of the powder from the kernels of the acorns is 30-70%. The disadvantage of this preparation is the low efficiency.

In the formulation of deodorizing and antimicrobial agents as a raw material of plant origin was elected as the leaves of sage, peppermint leaves and grass of thyme ordinary.

It is known that the antimicrobial properties has plant raw materials due to its content of essential oils. Peppermint leaves contain essential oil (3%) monoterpene nature: menthol, menthone, pulegone, piriton, carvone, terpinene-4-ol, Octan-3-ol, menthofuran, methyl acetate, methyl valerate, limonene, α - and β -pinene, and other terpenoids. The natural antibiotics in the composition of mint (Phytoncides) have disinfectant and antimicrobial properties. Sage leaves contain essential oil (1,5-2,5%) – bicyclic monoterpenoids (thujone, cineole, borneol, bornyl acetate, β -pinene, and camphene), di - and triterpenoids (rosmarinic acid (2-3%) and other terpenoids. Grass of thyme contains monoterpene phenols (thymol, carvacrol and n-cymene, α -pinene, γ -terpinene, linalool, α -borneol, and caryophyllene) which show aromatic and antimicrobial properties.

With the development of technology of production of tablets based on vegetable raw materials usually use the method of wet granulation due to the fact that extracts from vegetable raw materials or the crushed raw materials are of poor fluidity and insufficient properties of the adhesion between the particles, their physicochemical characteristics do not allow to proper baling characteristics.

In the development of the composition of the tablets of the powdered medicinal raw materials as auxiliary substances used a new generation of effective multifunctional excipients based on poorly replaceable hydroxypropylcellulose L-HPC grades LH-11 and NBD-022 (Skin-Etsu Chemical Co., Ltd. (official partner of HARKE Pharma GmbH, Germany), which allows to obtain tablets by direct pressing. The addition of Aerosil provides absorbent properties of the means which also extends the functionality of the means.

The crushed raw leaf of sage or peppermint or herb thymus common sifted through a sieve with a pore diameter of 0.5 mm. To the mixer was added 0,255-0,270 g (85-90 %) of the crushed plant materials (leaves of sage or peppermint leaves or herb of common thyme), 0,0285-0,0405 g (9,5-13,5 %) hydroxypropylcellulose and 0,0015-0,0045 g (0,5-1,5 %) Aerosil and mixed to obtain a homogeneous mixture for 40-60 minutes. The resulting mixture is conducted of tableting by direct pressing on tablecover press at the same pressure (120 MPa).

The result of the research was proposed the composition and the technology of production of biocidal and deodorizing means in the form of tablets with ether vegetable raw materials by direct pressing. There was conducted determination of technological parameters of the mixture, the bulk volume and fluidity of the mixture to establish the physico-chemical and technological characteristics in the process of pressing.

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