METHOD OF PREPARATION OF A FUNGAL GLUCANE HYDROGEL HAVING ANTIBACTERIAL AND IMMUNOSTIMULANT ACTIVITY, AND USE THEREOF

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A method of preparation of a fungal glucane hydrogel having antibacterial and immunostimulant activity by alkaline deproteinization and subsequent elimination of water-soluble components consists in that the obtained insoluble glucan is subsequently hydrated by wet grinding at a rotational speed of 3000 to 9000 rpm for 10 to 20 min. to a swelling volume in water of 50 to 500 ml/g. Then it is adjusted by heat sterilization at a temperature of 90 to 110° C. for 20 to 30 min., what results in a gel which is formed by fungal polysaccharide with the β-(1,3)-D-bond in the principal chain, with a concentration of 0.5 to 3% by weight. The fungal glucane hydrogel may be utilized for preparation of commestical, pharmaceutical and foodstuff products.

2 Claims, No Drawings
METHOD OF PREPARATION OF A FUNGAL GLUCANE HYDROGEL HAVING ANTI-BACTERIAL AND IMMUNOSTIMULANT ACTIVITY, AND USE THEREOF

TECHNICAL FIELD

Present invention relates to a method of preparation of a fungal glucane hydrogel having antibacterial and immunostimulant activity, and to its use.

BACKGROUND ART

Some of the natural polysaccharides are characterized by immunostimulant and other pharmacological properties. The main carrier of the immunostimulant activity in natural polysaccharides are those polysaccharides, which have the β-(1,3)-D-glycosidic bond in the principal polysaccharide chain. It has been proven that immunoglucones enhance immunity against various bacterial and virus diseases, they exhibit anticancer activity, potentiate the effect in radiotherapy and chemotherapy of oncological patients. Immunostimulant polysaccharides exist in cell walls of bacteria, yeasts and several fungi, especially of the Basidiomycetes genus. Immunopharmacologically active substances, to which the β-(1,3)-D-glycanes belong, are able to nonspecifically modify an extensive set of bacterial, fungal, parasitological and virus diseases. The mechanism of glucan action differs considerably from that of chemotherapeutics and antibiotics.

An immunostimulant glucan is according to the SK patent No. 262560 isolated from fruiting bodies of oyster mushroom (Pleurotus ostreatus) is hydrated in a high-speed mixer in 5 l of water for 20 minutes at the rotational speed of 6000 rpm. Under these conditions, glucan is hydrated to the swelling volume in water of 250 ml/g, and the resulting viscous gel is subsequently heat sterilized at a temperature of 110°C for 20 min.

EXAMPLES OF EMBODIMENTS

Example 1

100 g of glucane, prepared from fruiting bodies of oyster mushroom (Pleurotus ostreatus) is hydrated in a high-speed mixer in 5 l of water for 20 minutes at the rotational speed of 6000 rpm. Under these conditions, glucan is hydrated to the swelling volume in water of 250 ml/g, and the resulting viscous gel is subsequently heat sterilized at a temperature of 110°C for 20 min.

Example 2

5 kg of fungal glucan hydrogel, prepared according to Example 1, is homogenized in a homogenizer with 10 kg of ointment base AMBIDERMAN, with addition of chemostabilizer, N, N-cetyl-N, N-trimethylammonium bromide, in an amount of 0.1%, referred to the weight of the resulting cream, suitable for dermal applications at various diagnoses of skin diseases or to surgical wounds and skin defects.

Example 3

1 kg of fungal glucan is hydrated in 50 l of water in a high-speed mixer for 30 minutes at the rotational speed of 6000 rpm. Then 200 g of citric acid, 40 g of benzoic acid and 40 kg of fructose are added and it is sterilized at a temperature of 110°C for 20 min. After sterilization 50 l of sterile water are added, in which 1 kg of Ca-ascorbate has been dissolved. After homogenization of both components microbiologically stabilized syrup is obtained and filled in 100 ml glass vials. The resulting syrup contains 10 mg of glucan hydrogel in 1 ml of syrup. The product is suitable especially for children in prophylactic and therapeutic treatment against various child’s diseases.

Example 4

The glucan hydrogel in an amount of 100 mg/l is fed in a 1000 l tank with milk before milk sterilization. After sterilization and cooling the glucan hydrogel is inoculated with yoghurt culture in a regular technological process. The
yoghurt produced contains 10 mg of immunoglucan in 100 ml of yoghurt. It is suitable especially for infant food and gerontologic population.

INDUSTRIAL APPLICABILITY

The fungal glucan hydrogel is suitable for preparation of products having antibacterial and immunostimulant properties in foodstuff and pharmaceutical industry. It is also suitable for preparation of creams for various purposes in cosmetic industry, as it exhibits good application properties.

The invention claimed is:

1. A method of preparing a fungal glucan hydrogel having antibacterial and immunostimulant activity, by the following steps:
   1. alkaline deproteinization of fruiting bodies of oyster mushroom (*Pleurotus ostreatus*);
   2. subsequent elimination of water soluble components to obtain insoluble glucan;

3. followed by hydration and defibration of the insoluble glucan by wet grinding, wherein the wet grinding is carried out at a rotational speed of 3000-9000 rpm for 10-20 minutes and to a swelling volume in water of 50 to 500 ml/g.;

4. followed by heat sterilization at a temperature of 90 to 110°C. for 20 to 30 minutes, resulting in the hydrogel which is formed by the fungal polysaccharide from the fruiting body of *Pleurotus ostreatus*, with the β-(1,3)-D-glycosidic bond in the principal chain, in a concentration of 0.5 to 3% by weight.

2. The method according to claim 1, characterized in that the resulting gel is formed by fungal polysaccharide with the β-(1,3)-D-bond branched at every fourth anhydroglucose unit.

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