



UNIVERSITY OF AGRONOMIC SCIENCES AND VETERINARY MEDICINE – BUCUREȘTI



POLYPHENOLIC EXTRACT USED IN VETERINARY MEDICINE AS AN ADJUVANT IN ANTICANCER CHEMOTHERAPY (CHIMIOHELP)

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DESCRIPTION OF THE INVENTION

Main purposes of the invention.

This invention relates to a natural product as syrup with antioxidant properties, for veterinary use, intended for animals with cancer treated with chemotherapy drugs.



Bilberry (*Vaccinium myrtillus*)



St. John's Wort
(*Hypericum perforatum*)



Sea buckthorn (*Hippophae rhamnoides*)



Hawthorn (*Crataegus monogyna*)



Celandine (*Chelidonium majus*)

The product consists of a concentrated polyphenolic extract, with a concentration of 5 g gallic acid equivalent /100 ml (5 g GAE/100 ml) and a sucrose content of 40%. The product exhibits antioxidant activity, reduces the toxicity of chemotherapy drugs and the chemoresistance of tumors. These properties have been tested in clinical laboratories of Faculty of Veterinary Medicine Bucharest.

The results indicate the following properties of the product:

1.The antioxidant activity. A) In vitro studies. The extract has the ability to neutralize reactive oxygen species (hydroxyl radical, superoxide anion, hydrogen peroxide, singlet oxygen, hypochlorite anion) and reactive nitrogen species (nitric oxide); it is able to inhibit the oxidation of polyunsaturated fatty acids; it acts as a chelator of transition metal ions, especially Fe²⁺ ion, which is considered a generator of hydroxyl radicals in Fenton reaction.

B) In vivo studies. Experiments on rats have shown that, in liver, the extract improves the activity of antioxidant enzymes catalase (CAT), glutathione peroxidase (GPx) and superoxide dismutase (SOD), reduced glutathione increases and the concentration of compounds that react with thiobarbituric acid (malondialdehyde, MDA) decreases. Experiments performed on pets (dogs) have demonstrated that the product increases the activity of erythrocyte antioxidant enzymes r-CAT, r-SOD and r-GPx and lowers the level of erythrocyte malondialdehyde r-MDA.

2.Reduction of chemotherapy's toxicity. Research conducted on rats and pets (dogs) have demonstrated that concomitant administration of chemotherapy (cyclophosphamide, ifosfamide, gemcitabine, vincristine, cytosine arabinoside) with CHIMIOHELP product resulted in an improvement of biochemical parameters markers of hepatic cytolysis (alanine aminotransferase, aspartate aminotransferase, alkaline phosphatase) and the rise of serum albumins level.

Reduction of tumors' chemoresistance

Research conducted in female dogs with mammary tumors showed that administration of CHIMIOHELP in parallel with chemotherapy decreased the tumors chemoresistance against administered drugs.

Technical problem solved.

CHIMIOHELP solves the following problems:

- ❖ it annihilates reactive oxygen species (ROS) and reactive nitrogen species (RNS) released by the action of the stress caused by neoplastic disease, but also by the administered antitumoral drugs (chemotherapy);
- ❖ it improves the activity of antioxidant enzymes involved in the process of annihilation of ROS and RNS;
- ❖ it increases the level of reduced glutathione in the liver;
- ❖ it reduces the oxidation of lipids in cell membranes, improving their permeability and membrane potential;
- ❖ it exerts hepatoprotective effect;
- ❖ it decreases multidrug resistance to chemotherapeutic drugs, thus improving antitumoral effect of these therapeutic products.

Claims.

Product consisting of a concentrated polyphenolic extracted from bilberry fruits (*Vaccinium myrtillus*), aerial parts of St. John's Wort (*Hypericum perforatum*), fruits of sea buckthorn (*Hippophae rhamnoides*), fruits of hawthorn (*Crataegus monogyna*) and aerial parts of celandine (*Chelidonium majus*), with a concentration in polyphenols of 1 ... 20 g gallic acid equivalent /100 ml (g GAE/100ml) and a sucrose content of 10 ... 40%, characterized in that it can be used as an adjuvant in treatment with chemotherapeutic drugs in animals.

FIELDS OF APPLICATION: VETERINARY PHARMACEUTICAL INDUSTRY, VETERINARY THERAPY, VETERINARY MEDICINE

MEDALS / AWARDS OF INVENTION

PNCDI III - Programme 1 - Subprogramme 1.1. Human Resources Rewarding research results - Patents, PRECBVT-2017 - PN-III-P1-

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