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THE EFFECTS OF MEDICINAL PRODUCTS ON HELMINTHS

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Abstract. This thesis examines the effects of medicinal products on helminths and their significance in the treatment of helminth infections. The main mechanisms of action of anthelmintic drugs on the vital activities, development, and reproduction of parasites are analyzed.

Keywords: helminth, helminthiasis, medicinal product, anthelmintic drug, parasite, treatment, prevention.

Introduction. Helminthiases are a group of diseases caused by helminths that parasitize the bodies of humans and animals. These infections can adversely affect the general condition of the organism, the digestive system, and the immune system. Anthelmintic drugs play an important role in the treatment of helminthiases.

Currently, medicinal products belonging to various pharmacological groups are used to treat helminthiases. Their mechanisms of action depend on the biological characteristics of the helminths. Albendazole and mebendazole are broad-spectrum anthelmintic drugs that disrupt microtubule function and glucose metabolism in parasites. As a result, an energy deficiency develops in helminths, impairing their vital activities. Pyrantel acts on the neuromuscular system of helminths, causing paralysis. Consequently, the parasites are expelled naturally from the intestine. This drug is used against certain intestinal nematodes.

Praziquantel is primarily used against tapeworms and flukes. It disrupts calcium ion regulation in parasite cells, resulting in muscle contraction and paralysis. Ivermectin is effective against certain nematodes and interferes with the normal functioning of their neuromuscular systems. The efficacy of anthelmintic drugs depends on the species of helminth, the stage of infection, the drug dosage, and the individual characteristics of the patient or animal. Therefore, the use of these medicines without professional advice and appropriate supervision is not recommended.

Helminthiases are considered one of the pressing problems in both medical and veterinary practice. Helminths parasitize the bodies of humans and animals, adversely affecting the functioning of various organs and systems. In particular, helminths that parasitize the digestive system can impair nutrient absorption, trigger allergic and toxic reactions, and cause immunological changes. Synthetic anthelmintic drugs, such as albendazole, mebendazole, praziquantel, and others, are widely used to treat helminthiases. However, in some cases, adverse drug reactions, the development of drug resistance, and the need for long-term preventive measures create a demand for alternative approaches. Therefore, investigating the anthelmintic properties of phytopreparations derived from medicinal plants is of considerable scientific and practical importance.

To analyze the effects of biologically active compounds contained in phytopreparations on helminths, investigate the anthelmintic properties of medicinal plants, and assess their prospects for the prevention and treatment of helminthiases.

The study involved an analysis of scientific literature and research findings concerning the anthelmintic effects of phytopreparations. Biologically active compounds found in medicinal plants and their mechanisms of action against parasites were examined. The methods of literature analysis, comparison, synthesis, and scientific-theoretical evaluation were employed. The anthelmintic properties of medicinal plants are primarily associated with the active components of their chemical composition. Essential oils, alkaloids, flavonoids, terpenoids, phenolic compounds, and other substances found in phytopreparations may affect the vital processes of parasites in various ways.

Garlic (Allium sativum L.) contains sulfur-containing biologically active compounds that exhibit activity against microorganisms and certain parasites. Experimental studies have indicated that garlic-based preparations may suppress the vital activities of some helminths.

Pumpkin seeds (Cucurbita spp.) have long been used in traditional medicine as a remedy against parasites. Cucurbitacins, biologically active compounds found in pumpkin, may affect the motility and vital activities of certain parasites.

Wormwood (Artemisia spp.) also exhibits anthelmintic properties due to its essential oils and other biologically active substances. However, some components of wormwood may exert toxic effects at high concentrations; therefore, the uncontrolled use of preparations derived from this plant is not recommended.

Clove (Syzygium aromaticum) contains eugenol and other phenolic compounds with biological activity. Under experimental conditions, the effects of plant extracts on certain developmental stages of parasites have been investigated. Onion (Allium cepa L.) contains sulfur-containing compounds, flavonoids, and other biologically active substances. Investigating its potential antiparasitic properties represents another promising area of research.

The mechanisms through which phytopreparations affect helminths may involve several pathways. These include disruption of the parasites' neuromuscular activity, impairment of energy metabolism, damage to cell membranes, inhibition of feeding processes, and interference with the development of eggs and larvae.

At the same time, the term "natural" does not imply that a preparation is entirely safe. Some medicinal plants may contain toxic substances. Therefore, the use of phytopreparations as anthelmintic agents requires their standardization, determination of active compound concentrations, establishment of safe dosages, and scientific validation of their clinical efficacy.

Conclusion. Medicinal products play an important role in treating helminthiases and reducing their complications. Drugs such as albendazole,

mebendazole, pyrantel, praziquantel, and ivermectin impair the vital activities of helminths or eliminate them through different mechanisms of action. The appropriate selection of anthelmintic drugs and their administration at the prescribed dosage improve treatment outcomes. In addition to pharmacological treatment, adherence to personal hygiene and sanitation practices is essential for preventing helminth infections.

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