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VETERINARY SCIENCES

EFFECTIVENESS OF THE APPLICATION OF AN IMPROVED METHOD OF LABORATORY COPROSCOPIC DIAGNOSTICS OF TOXOCAROSIS IN DOGS

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Introduction. *Toxocara canis* is a nematode that causes toxocarosis in dogs, which has zoonotic potential. *T. canis* larvae are transmitted transplacentally from females to newborn puppies and, after a complex hepatopulmonary migration, develop into sexually mature helminths in the small intestine. In young and adult dogs, after alimentary ingestion of parasite eggs, larvae hatch, migrate to skeletal muscles, kidneys, liver and heart and persist for years as somatic larvae. Somatic larvae in the tissues of females are activated during pregnancy and are a reservoir of invasion.

Toxocarosis is a common nematodosic infection in dogs that can also lead to human infection through the consumption of meat contaminated with eggs. Consumption of fruits and vegetables contaminated with dog feces containing *T. canis* eggs can also lead to human infection. In humans, Toxocara causes a visceral form of the disease, where the larvae migrate to various organs such as the liver, lungs, heart, skin, eyes, and rarely the central nervous system.

Therefore, it is important to diagnose the disease in dogs in a timely manner to prevent human infection. Scientific literature indicates that the presence of intestinal nematodes in dogs is usually checked using coproscopic methods, the most common

of which are smear and flotation. Direct smear is a rapid method that requires minimal equipment and a small amount of feces. At the same time, this procedure is inaccurate, with very low sensitivity, and also leaves a large amount of fecal residue on the glass, which complicates the visualization of eggs. To overcome these problems, flotation methods have been developed, which have different diagnostic efficiency. Therefore, it is relevant to test new, improved methods of laboratory coproovoscopic diagnosis of toxocarosis in dogs.

Objective: The aim of the study was to determine the diagnostic efficacy and sensitivity of an improved quantitative method for detecting *Toxocares* eggs in dog feces.

Materials and methods. In order to establish the effectiveness of the improved method of coproscopic examination of dogs for the presence of eggs of the causative agent of toxocarosis, a comparison of flotation methods was carried out: improved, Fulleborn`s, Kotelnykov-Khrenov`s, Melnychuk`s. A total of 60 stool samples were examined (15 stool samples by each method). The exposure was 10 min. Sensitivity (%) and indicators of toxocarotic invasion intensity (eggs/g) were determined. The floatant coagulation ability was also evaluated, namely: a small number of small foreign debris; simultaneous detection of a large number of small and a small number of large debris; a large number of both small and large foreign debris).

Statistical processing of the results of experimental studies was carried out by determining the arithmetic mean (M), standard deviation (SD), and probability level (P) using the one-way analysis of variance technique using Fisher's exact test.

Results and discussion. The conducted studies have shown that the least sensitive method for diagnosing toxocarosis in dogs was the Fulleborn method (80 %). All other methods showed 100 % sensitivity (Fig. 1).

When determining the indicators of toxocarotic invasion using the improved method, the largest number of toxocares eggs was detected. Which on average was 102.1 eggs/g. Other methods of coproovoscopy showed lower efficiency in diagnosing toxocarosis in dogs, namely: Fulleborn`s – 61.7 eggs/g, Kotelnykov-Khrenov`s – 88.3 eggs/g, Melnychuk`s – 88.8 eggs/g (Fig. 2).

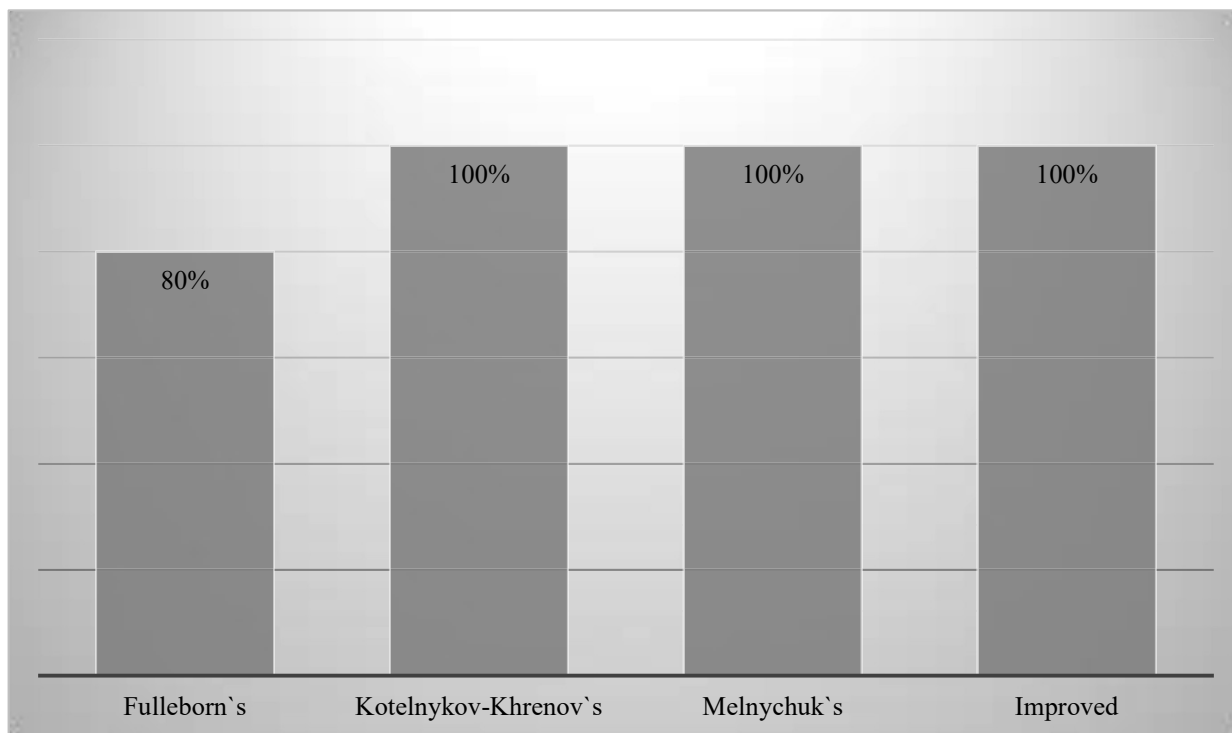


Fig. 1. Sensitivity of improved and well-known methods of coproscopic diagnosis of toxocarosis in dogs

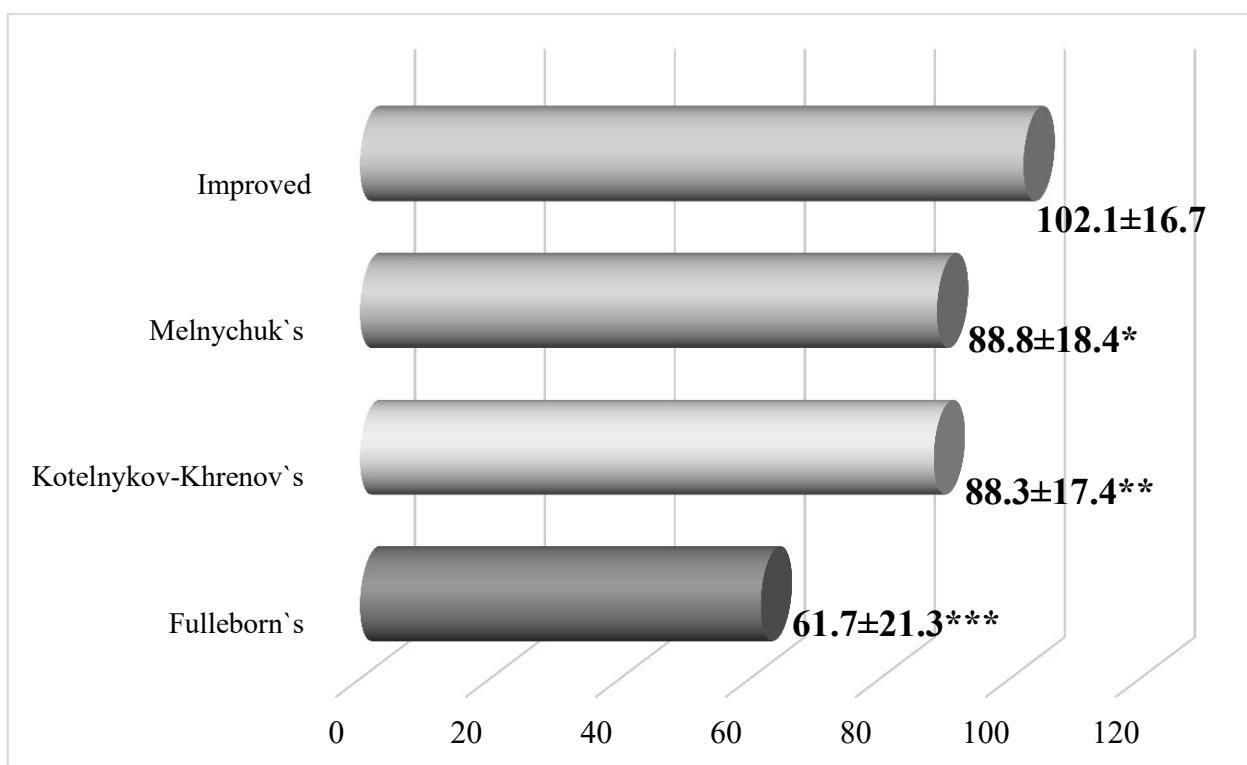


Fig. 2. Intensity indicators of toxocarosis in dogs (eggs/g): P<0.05; P<0.01; P<0.001 – relative to the improved method

Also, when using the improved method, the flotation solution exhibited the highest coagulation properties with respect to undigested feed residues. At the same

time, a small amount of small undigested feed residues floated to the surface of the flotation solution.

Analyzing the obtained data, it can be noted that the high efficiency of the improved method of coproovoscopic examination of dogs for the presence of *Toxocara canis* eggs is based on the use of a flotation solution that has a sufficiently high specific gravity (1.34 g/cm^3), which allows raising *Toxocara* eggs to the surface. At the same time, the efficiency of the improved method is increased by the fact that the proposed composition of the flotation solution exhibits coagulation properties in relation to undigested food residues. This facilitates the study and detection of *Toxocara* eggs.

Conclusions.

1. It was established that the sensitivity of the improved method of coproovoscopic examination of dogs for the presence of *Toxocara canis* eggs reaches 100 %.

2. The improved method of diagnosing toxocariasis in dogs exceeds the effectiveness of the well-known methods of Fulleborn, Kotelnykov-Khrenov, Melnychuk by 13.03–39.57 % ($P < 0.05 \dots P < 0.001$).