

# HEARTWORM SCREENING METHODS IN DOGS, CATS AND HUMAN

## METODE DE REALIZARE A SCREENING-ULUI ÎN CAZUL DIROFILARIOZEI LA CÂINI, PISICI ȘI OAMENI

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### SUMMARY

Heartworm disease ( a zoonosis disease which must be discovered and treated early enough in order to prevent its spreading ) represents a real challenge for veterinary practitioners because of its common clinical signs and most of all because of its cronical evolution. The fact that mosquito's bite is the most frequent cause of heartworm infection makes that the spreading area of the disease to be a large one ( we can find dirofilariosa in every area where temperature and humidity are high) . The purpose of this paper is not only to raise awareness about the importance of heartworm diagnosis but to describe one of the most efficient diagnostic tool. Diagnostic methods should detect both microfilariae and antigen

In the last few years, concurrent with international trade development, the incidence of dirofilariosis in Romania has increased. The intermediate host of *Dirofilaria Immitis* (the mosquito) finds in Romania proper development conditions: temperatures of over 14 degrees and high humidity.

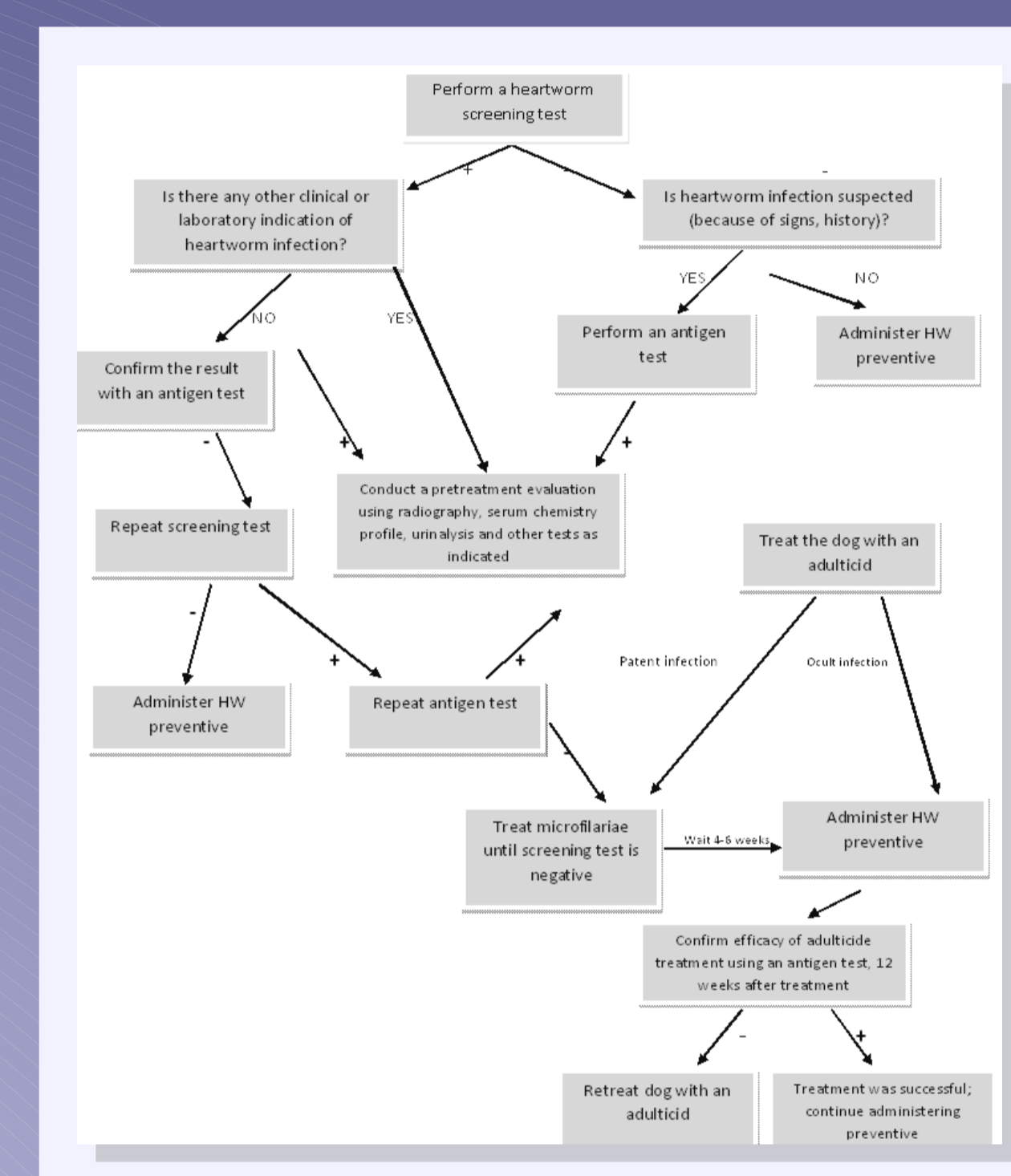
In most of the human cases of dirofilariosis, *Dirofilaria repens* is the etiological agent that causes cutaneous changes. Literature does not mention any case of human dirofilariosis in our country, as opposed to Hungary, where the first case is mentioned in 1879. It seems that the number of cases gradually increased lately if we consult the latest research. The diagnosis in these cases was made following a detailed case history and after a careful examination of the parasites found in different areas: subconjunctival space and the subcutaneous tissue of the thigh, forearm.

The most important elements that contribute to the increasing cases of dirofilariosis in Romania consist of: the climatic conditions, international trade development and the fact that people travel along with their pets, bringing in contaminated animals from countries with a high dirofilariosis prevalence. There is little information available about the incidence of dirofilariosis in our country. However, infections in dogs ranges from 2-17% in Bulgaria, Greece and Turkey up to 65% in Romania and some areas considered to be endemic[4]. Spiru Haret University published some studies about the heartworm incidence in Romania: 12 out of 52 examined dogs were detected as being contaminated. The lack of information has led to the creation of **PetEpiNetVet Network**, a network that provides assistance to owners and veterinarians.

The clinical signs that follow the heartworm infection consist of: anorexia, ascites, edema, tachycardia, tachypnea, cahexie, weight loss, syncope, cough, cough with blood streak, epistaxis, paresis - paralysis, cutaneous nodules, right heart failure - in case of massive contamination with filaria- , flu pipe. All these clinical signs should lead us to a confirmation diagnosis that can be done by at least two ways.

Heartworm treatment includes two aspects: heartworm prophylaxis that consists of drugs which belonging to macrocyclic lactones or macrolides class (ivermectin, selamectin, moxidectin) and adulticide therapy (milbemycin, ivermectin).

If any specific signs are found during clinical examination, the animal needs further testing in order to see if a heartworm infection occurred. If the test is positive there is no need for another diagnosis tool. On the other hand, if the test is negative but the animal continues to present specific symptoms an immunologic diagnosis is necessary. Microfilariae detection can be done by: fresh blood examination, concentration methods (Knott test and the filter test) and histochemical exam. *Dirofilaria immitis* microfilariae identification based on morphology is considered a definitive proof of infection (specificity 100 %).



Serological tests used for heartworm surveillance/diagnostic:

#### ELISA:

- detecting adult forms antibodies (AB-ELISA);
- detecting adult forms antigens (AG-ELISA);

#### Immunofluorescence:

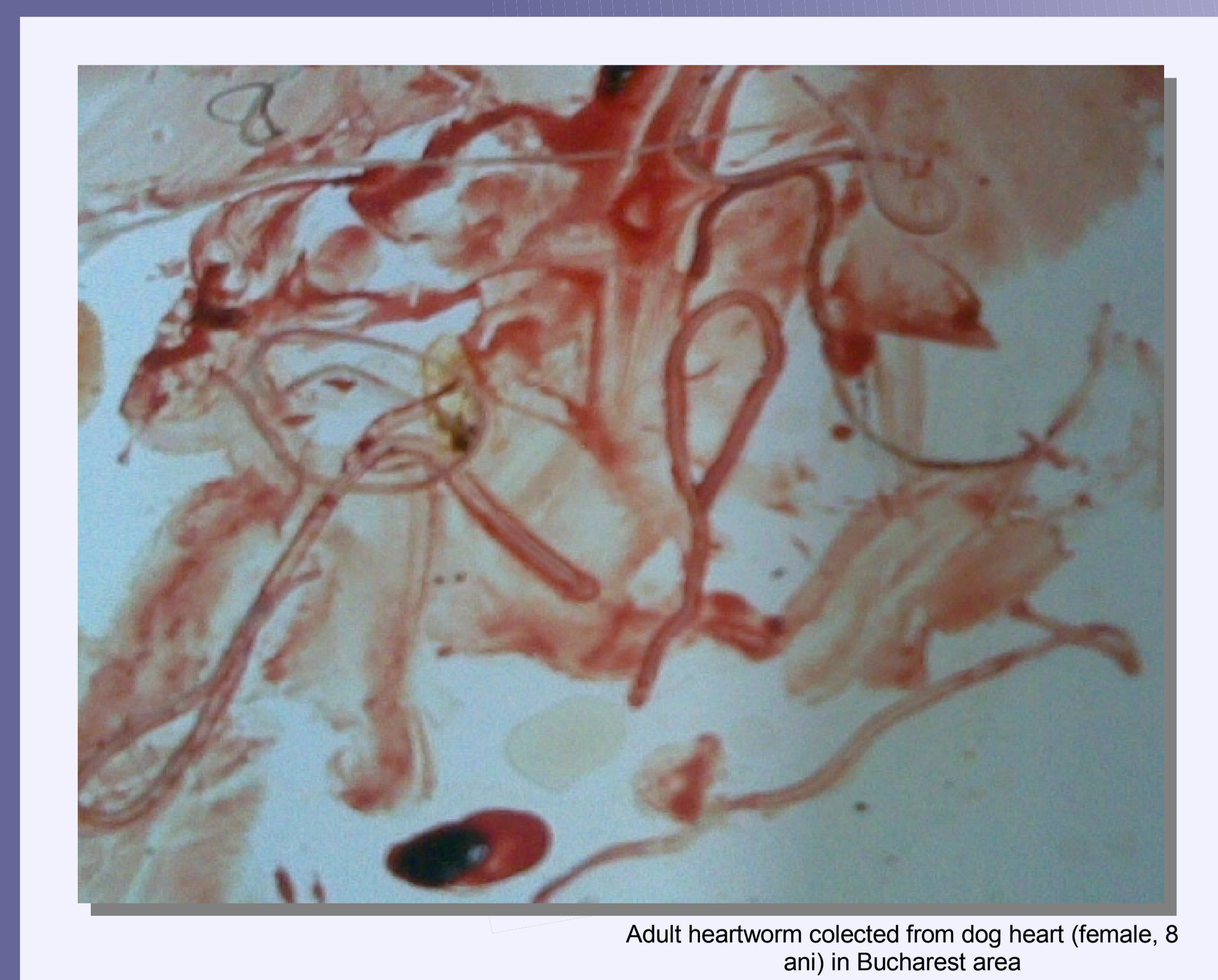
- detecting microfilariae - specific antibodies (MF-IFA);
- detecting specific adult forms antigens (AG-IFA);

#### HEARTWORM IC – BIOPRONIX – AGROLABO

The efficacy was demonstrated by Agrolabo specialists in several clinical studies. Also, our unpublished studies revealed their practical value and that they are a very helpful diagnosis tool for field veterinarians. It is a simple and fast method; the results can be interpreted in 10-15 minutes; it doesn't require special equipment and can be made at any veterinary clinic or field; it has a sensitivity of 97.98%.

#### TEST PROCEDURE

- Using the appropriate pipette, dispense one drop of whole blood, serum or plasma sample into window no. one of the device.
- Add two drops of diluent to window no. one of the device.
- After 10 minutes read the result, do not read the result after more than 15 minutes.
- Result interpretation.



Adult heartworm collected from dog heart (female, 8 ani) in Bucharest area

#### RESULT INTERPRETATION

If the test is negative, a red line will only appear in window number (internal control line).

If the test is positive, two red lines will appear: one in window number two (test line) and one in window number three (internal control line).

The test is considered invalid if no line appears in window number 3 of the device (internal control line), even if a line appears in window number two (test line).

For a complete screening veterinarians should use two diagnostic methods: one for microfilariae and the other for specific antigen detection. Moreover, for an efficient diagnosis it is important to choose high sensitivity and specificity tests.

Important to note is that currently, the easiest and most suitable method for screening is the immunochromatographic test - it is fast (results in 10 minutes) and easy to use.

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