

Original papers

Morphometric characteristics of *Dirofilaria repens* Railliet et Henry, 1911 parasite of dogs in Poland¹

Aleksander W. Demiaszkiewicz, Grażyna Polańczyk¹, Barbara Osińska²,
Anna M. Pyziel, Izabela Kuligowska, Jacek Lachowicz

W. Stefański Institute of Parasitology, Polish Academy of Sciences, 51/55 Twarda Street, 00-818 Warsaw, Poland

¹ Veterinary Clinic, 3 A Sportowa Street, 05-822 Milanówek, Poland

² Faculty of Veterinary Medicine, Warsaw University of Life Sciences, 159 C Nowoursynowska Street, 02-776 Warsaw, Poland

Corresponding autor: A.W. Demiaszkiewicz; E-mail: aldem@twarda.pan.pl

ABSTRACT. Specimens of the nematode *Dirofilaria repens* Railliet et Henry, 1911 were isolated from scrotum and subcutaneous connective tissue of three dogs in Mazowieckie and Lubelskie provinces. It is the first record of the mature nematode of this species in the dog in Poland. Redescription, morphometrical data and figures are presented.

Key words: *Dirofilaria repens*, dog, Nematoda, Poland

Introduction

Dirofilaria repens is a widely dispersed parasite of dogs, cats and wild carnivores in the southern Europe. Mature nematodes of *D. repens* are localized in the nodules in the subcutaneous or intramuscular connective tissue of animals [1–2]. During the course of invasion of this parasite nodular multifocal dermatitis, presence of itching exanthemas in the form of papules, and also alopeciae, erythema, hyperpigmentations of skin and its hyperkeratosis are observed. Sometimes purulent inflammatory changes can be seen in the skin. Local pathological changes in skin are associated with the presence of mature nematodes under the skin, or microfilariae inside it. Sometimes invasion of the parasite has an asymptomatic course. It is possibly caused by the generalized cardio-hepato-renal insufficiency, brought about by the microfilariae form circulating in blood, which can cause sudden death of an infected dog [3–6].

Dirofilariasis as a zoonosis is dangerous also for the man. On the territory of the European Union

there have already been diagnosed over 270 cases of human dirofilariasis. Most of them were evoked by nematodes *D. repens*, and only 10 cases by *D. immitis*. Until 1995 year 410 cases of human dirofilariasis have been described in 30 countries all over the world. Other 270 cases were registered in 25 countries in the years 1995–2000. Nematodes were located in the subcutaneous connective tissue in different regions of the body, in the lungs, omentum, epididymis and spermatic cord, palpebra and under conjunctivae, and also in the lymphatic nodules. The diameter of tumors with parasites oscillated from 10 up to 25 mm. Subcutaneous and pulmonary tumors evoked by *D. repens* were sometimes falsely recognized as those of neoplastic origin. Dirofilariasis in men has been most often diagnosed during postoperative histological examination [7–9]. In Poland one case of subconjunctival and 5 cases of subcutaneous human dirofilariasis caused by *D. repens* have recently been found. All cases of human dirofilariasis in Poland have been diagnosed in patients who have visited endemic countries recently [10–12]. However, two out of three cases

¹ This project was financed by National Centre for Science, grant No N N308 560540.

diagnosed in Slovakia have appeared to be autochthonic ones [13].

Not long ago an opinion prevailed that the northern border of occurrence of this parasitosis reached Cherbourg in France [14]. But till 2005 the native dirofilariasis of dogs were found in Slovakia [15–16], in 2006 in the Czech Republic [17], and in 2009 in the Netherlands and Germany [18–19]. It shows dispersion of the range of this parasitosis to the north. Probably it is connected with the progressive warming of climate.

Not very detailed descriptions of this species, which were made many years ago on the basis of the materials collected in the Southern Europe and in the tropical countries, were published in some difficult to obtain journals and books. Therefore, finding mature nematodes *D. repens* for the first time in Poland in the three dogs [20] provoked us to redescribe the species on the basis of specimens from Poland.

Material and methods

The infected dogs originated from Mazowieckie and Lubelskie provinces. These were the autochthonic invasions since the investigated dogs had never been abroad. Mature nematodes were isolated from the cave of scrotum and subcutaneous connective tissue. Altogether 8 specimens of *D. repens* were found: 5 females and 3 males.

The nematodes were preserved in 70% alcohol with the addition of 5% glycerol. After alcohol evaporation, temporary microscopic preparations were made of the nematodes in glycerol, and then used for morphological examinations and for measurements. Photos and measurements were performed using OLYMPUS 50 BX microscope and Cell D program. The material has been stored in the collection of the W. Stefański Institute of Parasitology of the Polish Academy of Sciences in Warsaw.

Results and discussion

Description (all dimensions in mm). Long, thin, white-yellow nematodes with rounded anterior and posterior ends (Fig. 1–2). The cuticle with distinct longitudinal and tender transverse striations (Fig. 3). The small, circular oral opening surrounded by four pairs of cephalic papillae and a pair of amphids. Pharynx short, divided into muscular and glandular sections, but sometimes without sharp line of



Fig. 1. Anterior end of female



Fig. 2. Posterior end of female

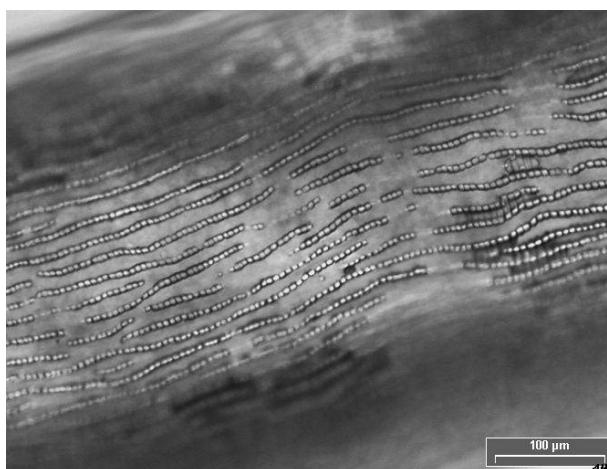


Fig. 3. Striations of cuticula

demarcation. The intestine has a smaller diameter than the pharynx. Females are larger than males.

Male. Body length 63 (56–70). Nerve ring is situated at a distance of 0.162 (0.160–0.165) from the anterior end of the body. Length of pharynx 0.713 (0.696–0.730) and its maximum width 0.040



Fig. 4. Posterior end of male – lateral view with spicules

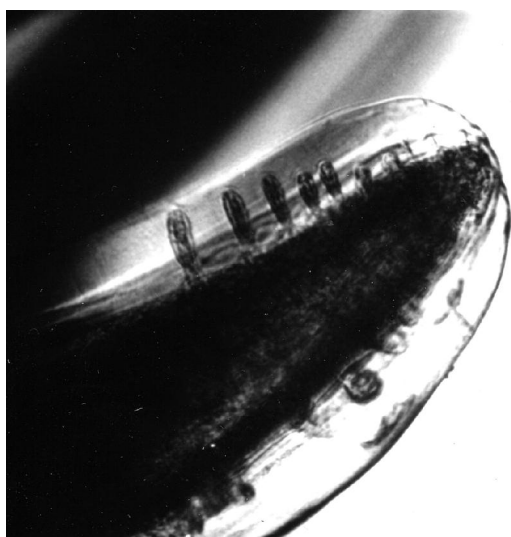


Fig. 5. Tail – ventral view with caudal papillae
Scale bar=100 μ m

(0.036–0.045). Width of anterior end 0.145 (0.142–0.148), width at pharynx end 0.293 (0.269–0.317), maximum width 0.325 (0.298–0.379) and width at cloaca level 0.099 (0.095–0.104). Posterior end of the body with well developed cuticular alae is spirally twisted in two turns. The copulatory spicules of different shape and size. The left spicule is longer than right. The left spicule is 0.541 (0.537–0.547) in length and its anterior end is 0.022 (0.020–0.027) in width. The right spicule is 0.185 (0.181–0.189) long and its anterior end 0.027 (0.023–0.035) wide (Fig. 4). Caudal papillae placed asymmetrically. On one side of the body 5–6 preanal papillae and 5 postanal papillae, and on the other side 4–5 preanal papillae and 5 postanal papillae. Length of tail 0.077 (0.073–0.082) (Fig. 5). Maximum thickness of cuticula 0.032 (0.028–0.035).

Female. Body length 154 (147–161). Nerve ring is situated at a distance 0.295 (0.291–0.298), and

vulva at a distance 1.555 (1.445–1.629) from the anterior end of the body. Length of pharynx 0.966 (0.915–1.037) and its maximum width 0.089 (0.077–0.102). Width of anterior end 0.217 (0.207–0.230), width at nerve ring level 0.290 (0.283–0.298), width at level of vulva 0.503 (0.499–0.508), width at pharynx end 0.417 (0.411–0.421), maximum width 0.532 (0.490–0.570) and width at level of anus 0.145 (0.128–0.169). Length of tail 0.085 (0.073–0.102). Maximum thickness of cuticula 0.052 (0.047–0.060). Paired phasmids open on the tip of the tail.

Microfilariae. Length 0.329 (0.296–0.362), maximum width 0.007 (0.005–0.008), sheath absent. Anterior end obtuse rounded, tail long with pointed ending.

The presented morphometric characteristics show that the examined nematodes belong to the species *Dirofilaria repens*. This species was described by Railliet et Henry, 1911 on the basis of nematodes found in the subcutaneous connective tissue of dogs in Italy [21]. The species was found among dogs in Vietnam in the same year [22]. The species had been previously redescribed on the basis of materials originating from Venezuela [23]. Russian researchers considered filariae found under the skin of lids, peritoneum and under the conjunctivae to belong to *D. repens* species [24]. The detailed description of that particular species was made by Le Van Hoa and Le Thi Ty basing on nematodes isolated from *Felis viverina* and *Felis silvestris* from Vietnam as well as nematodes from dogs found by Bauche and Bernard also in Vietnam, which were deposited in Veterinary School in Alfort in France [25]. The dimensions of the males and females of *D. repens* examined in Poland generally correspond to the data given by other authors. In our investigations a higher number of parameters was considered, also a photographic documentation was performed. Owing to the increasing number of cases of dirofilariasis in our country, the presented morphometric characteristics of those nematodes can be useful in diagnostics of invasions in dogs and humans.

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Received 6 September 2011

Accepted 11 October 2011