DOI: 10.14744/eer.2024.47955
Eur Eye Res 2024;4(0):00–00

EUROPEAN EYE RESEARCH

CASE REPORT

Thelazia eye infection: The first human case in Türkiye

Atakan Isbilir,[1] Soykan Ozkoc,[2] Elvan Yilmaz,[3] Canan A Utine[1]

[1]Department of Ophtalmology, Dokuz Eylul University, Izmir, Türkiye
[2]Department of Microbiology, Dokuz Eylul University, Izmir, Türkiye
[3]Department of Ophtalmology, Odemis State Hospital, Izmir, Türkiye

Abstract

Thelaziasis is generally a zoonotic disease that affects the eyes of domestic and wild animals. It is transmitted by flies belonging to the *Drosophilidae* family. While rare in humans, there have been occasional reported cases in low-socioeconomic families living in rural areas. An 83-year-old male farmer with a history of trauma and previous loss of vision in one eye presented with complaints of itching in the affected eye. Upon examination, worm-like parasites were observed in the inferior fornix of the affected eye, leading to a referral to our center. Two worms were mechanically extracted from the right eye. The diagnosis was confirmed as *Thelazia* spp. through parasitological laboratory testing. This case holds significance as it represents Türkiye's first reported human case of ocular thelaziasis.

Keywords: Ocular thelaziasis; parasites; zoonotic eye disease.

Thelaziasis is an ocular infestation caused by nematodes that belong to the *Thelazia* genus. These parasites infest the conjunctival sac, lacrimal duct, and lacrimal gland.[1] While the primary hosts for this parasite are domestic and wild carnivores such as dogs, cats, foxes, and wolves, there have been occasional reports of infestations in humans.[2,3]

Thelaziasis in humans is rare but more prevalent in rural communities with substandard living conditions and close interaction with animals.[1,4] Clinical manifestations of thelaziasis include conjunctivitis, ocular pruritus, excessive tearing, congestion, and discharge. In severe infections, corneal edema and ulceration may also be observed.

Herein, we report the first human case of ocular thelaziasis in Türkiye, in a farmer male patient from a rural area of İzmir.

Case Report

An 83-year-old male farmer resident of Ödemiş had been admitted to the state hospital in his region with the primary complaint of itching in the right eye. Upon slit-lamp examination, mobile worm-like lesions were observed in the inferior fornix of the phthisical right eye. He had been referred to our clinic for a definitive diagnosis, an investigation of possible systemic involvement, and systemic treatment if required.

His examination revealed a visual acuity of light perception in the right eye and 0.7 in Snellen lines in the left eye. A slit-lamp examination revealed two moving worms in the inferior tarsal conjunctiva, which hid back to the phthisical

Cite this article as: Isbilir A, Ozkoc S, Yilmaz E, Utine CA. *Thelazia eye* infection: The first human case in Türkiye. Eur Eye Res 2024;4(0):00–00.

Correspondence: Canan A Utine, M.D. Department of Ophtalmology, Dokuz Eylul University, Izmir, Türkiye
E-mail: cananutine@gmail.com
Submitted Date: 12.02.2024 **Revised Date:** 09.04.2024 **Accepted Date:** 03.05.2024 **Available Online Date:** 00.00.2024

globe from the enlarged and deepened conjunctival fornices upon exposure to intense light (Figs. 1a and b). There was no conjunctival congestion, corneal edema, or corneal ulceration. The intraocular pressure was hypotonous with palpation in the right eye. The left eye findings, including the intraocular pressure and fundus examination, were within normal limits, except for grade 2 nuclear sclerosis.

His past medical history included sequential ocular interventions in our clinic in 2019 following trauma to the right eye which included perforation repair, anterior chamber lavage due to total hyphema, and vitreoretinal surgical operations. The right eye had been phthisical since then, with no previous discomfort. The fundus could not be visualized due to distorted anterior segment structures; therefore, an ultrasonography (USG) examination was performed. The USG findings were consistent with phthisis bulbi features, such as increased choroidal thickness, calcification, and reduced axial length, despite the attached retina. Due to the patient's reduced vision and ocular surface sensation, he did not notice any moving parasites and solely presented with complaints of itching.

Since the parasites were located on the conjunctival surface, they could be removed solely with conjunctival forceps without incision. Figure 2 illustrates the appearance of the parasite immediately after being removed with forceps.

Two worms were extracted with sterile conjunctival forceps, placed in a 0.9% NaCl solution, and sent to the microbiology department for a definitive diagnosis. The examination result was reported as *Thelazia* spp. (Figs. 3 a-d), but the exact species of *Thelazia* could not be identified due to the unavailability of a proper parasitological setup.

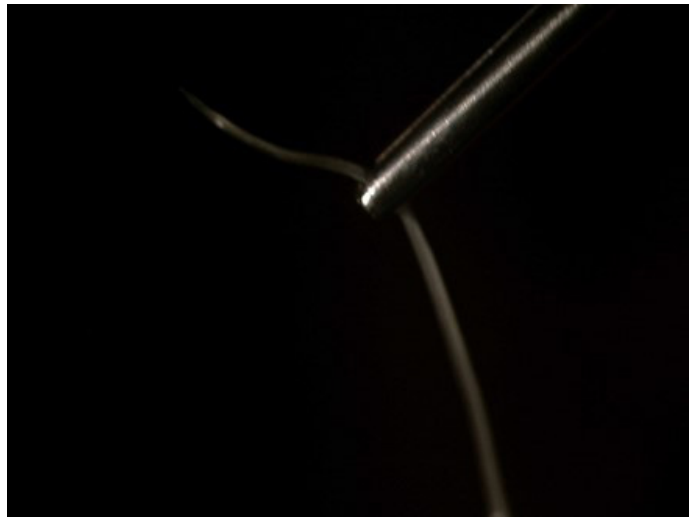

Fig. 2. *Thelazia* spp. after extraction from the right eye with conjunctival forceps.

The patient was prescribed topical antibiotics and ointment and discharged from the hospital. Two weeks later, a follow-up appointment was scheduled. During the follow-up examination, no symptoms were present. No worms were observed at the slit-lamp examination, and the ocular surface was quiet, with no signs of inflammation. Therefore, the topical treatments were discontinued.

Discussion

Human thelaziasis has been rarely documented globally. In Europe, 11 cases of human thelaziosis have been reported. [5] Two species are responsible for thelaziasis in humans: *Thelazia callipaeda* and *Thelazia californiensis*. *T. callipaeda* is commonly found in Asia, whereas *T. californiensis* is typically identified in the United States. Our case originated

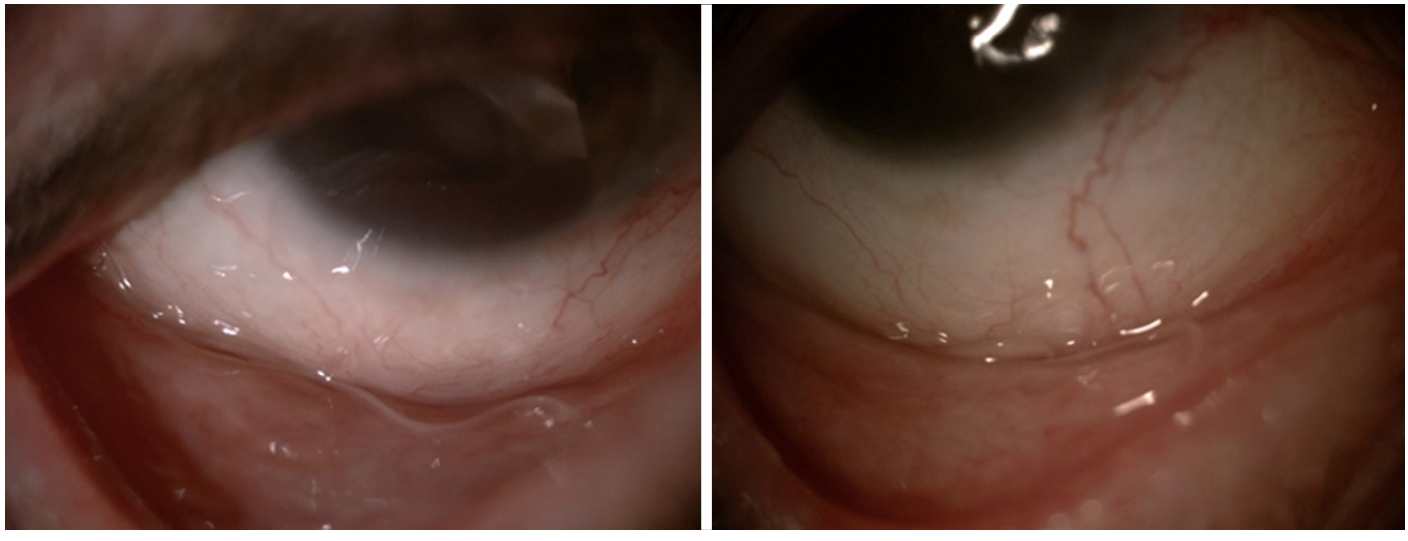

Fig. 1. Mobile worms are observed in the inferior fornix in the anterior segment of the case.

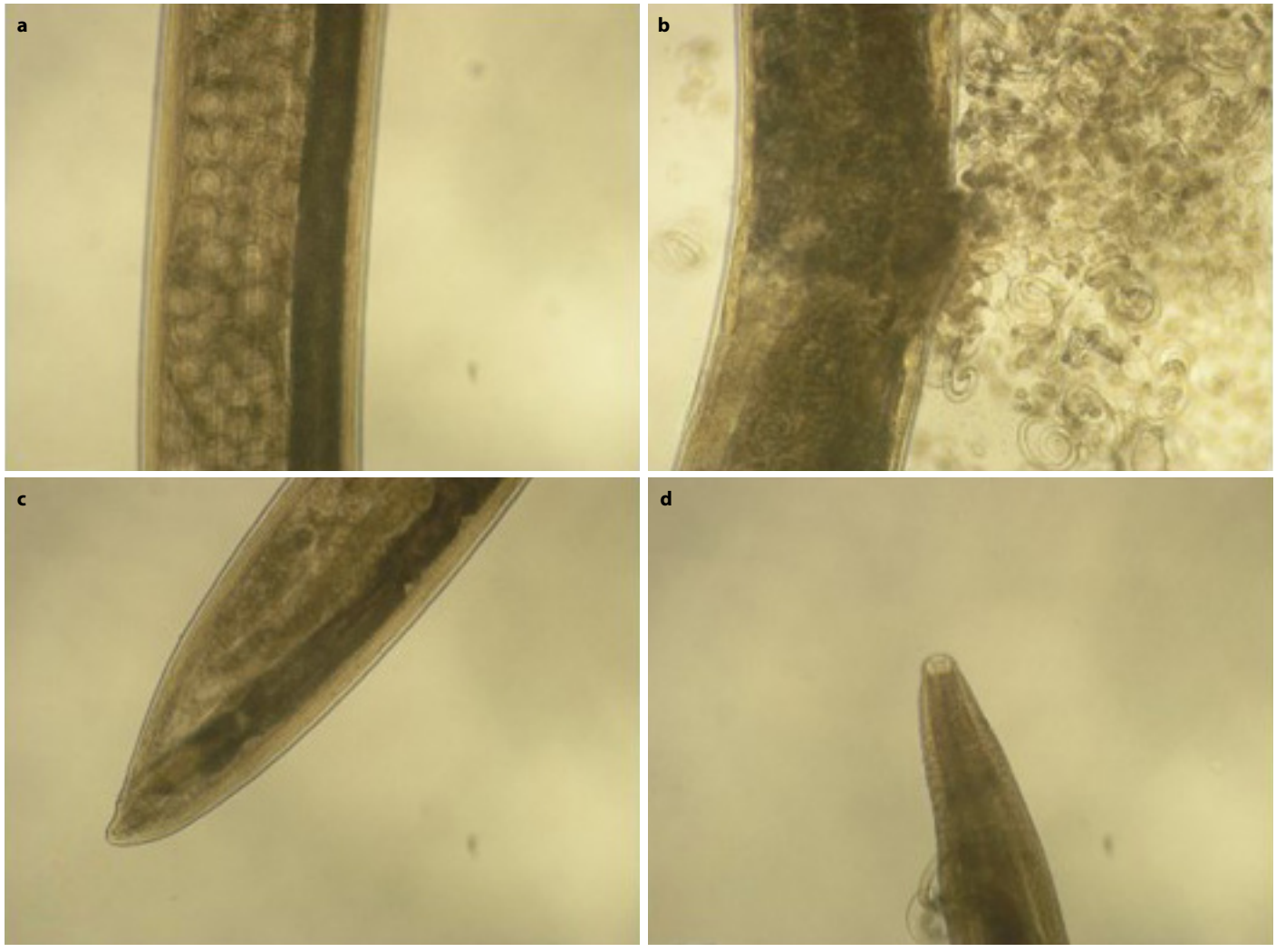

Fig. 3. Numerous eggs inside worms abdomen. **(a)** The eggs of the parasite have been dispersed into the environment through the mechanical breakdown of the parasite in the laboratory setting. **(b)** Anterior buccal cavity. **(c and d)** Posterior of the worm and anal opening.

from a rural family whose livelihood depends on agriculture and livestock. Unhygienic living conditions are a significant predisposing factor for human thelaziasis.

Adult *Thelazia* parasites are cream colored and white, with transversely striped cuticles. Males are 5–13 mm in length and 0.5 mm in width, with a curved posterior end and two spicules of unequal lengths. Female parasites are 6–17 mm in length and 0.6 mm in width, with a vulva near the posterior end and associated ovaries and uterus. As observed in Figure 3a, they may contain a significant number of eggs, which measure 57 × 35 µm and contain embryos.

An individual or animal carrying the initial stage larvae is found in lacrimal secretions. Arthropod vectors, feeding on these infected secretions, ingest the larvae. Within 2–3 weeks, the larvae undergo three molts inside the vector's midgut, maturing into infective third-stage larvae. The definitive host becomes infected when the vector feeds on lacrimal secretions and releases L3 larvae into the eye. Inside the eye of the infected individual, the third-stage larvae develop into adult worms within approximately 35 days.[6] As illustrated in Figure 4, it is important to note that humans are considered accidental hosts in this parasitic cycle. Previous studies have provided evidence that *Thelazia* parasites enter the eye region through intermediate hosts and deposit their larvae in the conjunctiva.[7] Larvae do not invade the conjunctiva. Therefore, limited inflammation occurs in the conjunctiva.

Two eye parasites can be confused with thelaziasis based on their appearance: *Loa Loa* and Onchocerca volvulus.

L. Loa disease can cause symptoms related to the eyes, typically involving a condition known as "Calabar swelling," characterized by swelling and edema around the eyes. *L. Loa* worms are often visible in the subdermal, particularly in the eye area with subconjunctival, leading to a condition

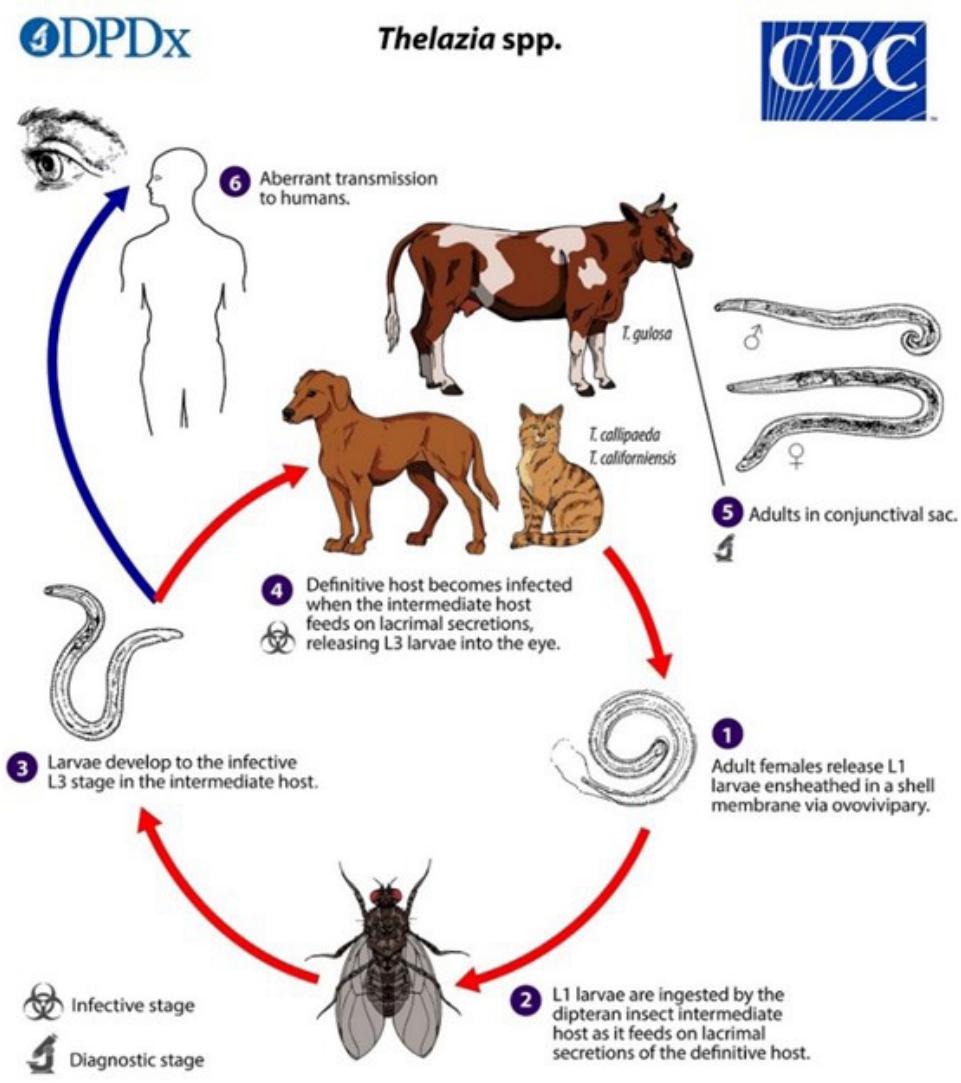

Fig. 4. Life cycle of Thelazia[8]

sometimes referred to as "eye worm." The treatment for *L. Loa* infection typically involves systemic antiparasitic medications such as ivermectin and diethylcarbamazine. It is generally distinguished from thelaziasis by being subconjunctival and subdermal.

Onchocerca volvulus causes "River blindness," often characterized by subcutaneous nodules caused by microscopic larvae moving under the skin and sometimes by eye swelling. The diagnosis of onchocerca volvulus is usually based on a skin biopsy. A small sample is taken from the skin and examined under a microscope, typically obtained from infected individuals' back or hip regions. Ivermectin is commonly used in the treatment of Onchocerca volvulus infection. This medication kills the microscopic larvae of the parasite, alleviating symptoms and halting the progression of the disease. When used for an extended period, doxycycline can reduce the reproductive ability of Onchocerca volvulus. Doxycycline therapy may be applied in cases resistant to ivermectin or when exploring additional treatment options. Onchocerca volvulus tends to cause more systemic spread than thelaziasis and is characterized by edema in the eyes and periorbital region rather than the conjunctivitis typically seen in thelaziasis.

As depicted in Figure 1, thelaziasis is typically found predominantly on the conjunctival surface; thus, ocular thelaziasis is generally limited to the eyes. Consequently, eradication of the ocular worms is generally sufficient for a cure. However, if ocular thelaziasis has progressed to a severe level and local treatments are insufficient, systemic treatment may be considered. Systemic treatment may be recommended if there is a risk of the parasite spreading to other organs or systems. In systemic treatment, levamisole is recommended orally at 5 mg/kg or as a 2 mL injection into the conjunctival sac. Alternatively, a subcutaneous dose of 2

mg/kg of ivermectin has also been proven effective in Asia and Europe.[4,8,9] In our case, mechanical removal of the worms and topical antibiotic treatment proved sufficient.

While topical treatment is generally not required in humans, and the evidence for these treatments is limited, imidacloprid and moxidectin have a proven value in treating animals.[10] Treating animals is important to reduce the transmission of thelaziasis to humans.

The limited awareness among European physicians regarding the zoonotic potential of *T. callipaeda* may result in inaccurate diagnosis, leading to inadequate treatment and prolonging the survival of the parasites and their associated effects. Due to the low awareness in Europe, this zoonotic parasite, more commonly seen in Asia and the United States, may increase human cases in Europe.

We diagnose and manage the treatment of conjunctivitis in numerous patients. This pathogen should be included in the differential diagnosis of bacterial and allergic conjunctivitis, especially in patients from rural areas. Thelaziasis clinical manifestations usually occur as a single eye infection.[11] Considering this zoonotic agent in patients diagnosed with conjunctivitis in a single eye would be beneficial.

Conclusion

Although ocular thelaziasis has been previously observed in animals in Türkiye, this case holds particular significance as it is Türkiye's first reported human case. Our case emphasizes the need for veterinarians and ophthalmologists in our country to be aware of this zoonotic parasite. Protection from thelaziasis is possible by taking preventive measures such as maintaining personal hygiene, keeping the environment clean, and providing public education about the disease.

Informed Consent: Written informed consent was obtained from the patient for the publication of the case report.

Peer-review: Externally peer-reviewed.

Authorship Contributions: Concept: A.I., S.O., E.Y., C.A.U.; Design: A.I., S.O., E.Y., C.A.U.; Supervision: A.I., S.O., E.Y., C.A.U.; Resource: A.I., S.O., E.Y., C.A.U.; Materials: A.I., S.O., E.Y., C.A.U.; Data collection and/or processing: A.I., S.O., E.Y., C.A.U.; Analysis and/or Interpretation: A.I., S.O., E.Y., C.A.U.; Literature search: A.I., S.O., E.Y., C.A.U.; Writing: A.I., S.O., E.Y., C.A.U.; Critical reviews: A.I., S.O., E.Y., C.A.U.

Conflict of Interest: None declared.

Use of AI for Writing Assistance: Not declared.

Financial Disclosure: The authors declared that this study received no financial support.

References

1. Otranto D, Dutto M. Human thelaziasis, Europe. Emerg Infect Dis 2008;14:647–9.
2. Otranto D, Dantas-Torres F, Mallia E, DiGeronimo PM, Brianti E, Testini G, et al. Thelazia callipaeda (Spirurida, Thelaziidae) in wild animals: Report of new host species and ecological implications. Vet Parasitol 2009;166:262–7.
3. Beugnet F, Halos L, Guillot J. Internal non-gastrointestinal parasitoses-thelaziosis. İn: Textbook of Clinical Parastiology in Dogs and Cats. 2nd ed. Zaragoza, Spain: Servet; 2018. p. 200–2.
4. Bradbury RS, Breen KV, Bonura EM, Hoyt JW, Bishop HS. Case report: Conjunctival infestation with Thelazia gulosa: A novel agent of human thelaziasis in the United States. Am J Trop Med Hyg 2018;98:1171–4.
5. Do Vale B, Lopes AP, Da Conceição Fontes M, Silvestre M, Cardoso L, Coelho AC. Thelaziosis due to Thelazia callipaeda in Europe in the 21st century-a review. Vet Parasitol 2019;275:108957.
6. Krishnachary PS, Shankarappa VG, Rajarathnam R, Shanthappa M. Human ocular thelaziasis in Karnataka. Indian J Ophthalmol 2014;62:822–4.
7. Otranto D, Traversa D. Thelazia eyeworm: An original endo-and ecto-parasitic nematode. Trends Parasitol 2005;21:1–4.
8. CDC. Global Health, Division of Parasitic Diseases and Malaria. Available from: https://www.cdc.gov/dpdx/thelaziasis/index.html. Accessed May 8, 2024.
9. Naem S. Thelazia species and conjunctivitis. In: Pelikan Z, editor. Conjuctivitis A Complex and Multifaceted Disorder. Vol. 13. Croatia, Europe: INTECH Open Science/Open Minds; 2011. p. 201–32.
10. Otranto D, Basano FS, Pombi M, Capelli G, Nazzari R, Falsone L, et al. Effectiveness of the spot-on combination of moxidectin and imidacloprid (Advocate®) in the treatment of ocular thelaziosis by Thelazia callipaeda in naturally infected cats. Parasit Vectors 2019;12:25.
11. Otašević S, Božinović MT, Tasić A, Petrović A, Petrović V. Thelazia callipaeda and eye infections. Acta Fac Med Naiss 2014;31:171–6.