



*Original Contribution*

**RARE PARASITOSEs IN OUR OPHTHALMIC PRACTICE**

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**ABSTRACT**

The term parasite is a word originating from Greek language and it means someone who feeds from others' table. Humans are hosts to nearly 300 species of parasitic worms and over 70 species of protozoa. Tasks and goals - to make a retrospective analysis of rare cases of eye parasitoses in our practice. Materials and methods - patients were investigated for the period of 15 years in Eye Clinic „St. Nikolay“-Varna. The clinical cases noted concern eye diseases caused by *Dirofilaria*, *Thelazia* and *Demodex*. Results - for 15 years time, from 2008 to 2023 there has been one case of *Dirofilaria* of the eyelid, one case of *Thelazia* of the conjunctiva and *Demodex*-blepharitis in 6 patients. All of them had no reported travel abroad or contact with exotic animals. In Bulgaria, apart from our case with *Thelazia*, no similar case has been described, especially for such a small baby. In the case of *demodex*-blepharitis, we consider it a disadvantage that we have not referred our patients for parasitological examination more often. Conclusion - Cases in humans with parasites with ocular localization are relatively rare, but aren't casuistry. We should search for them actively and think of differential diagnosis.

**Key words** - ocular parasitoses, *Thelazia*, *Dirofilaria*, *demodexosis*

**INTRODUCTION**

The term parasite is a word originating from Greek language and it means someone who feeds from others' table. The parasites are very diverse. They are classified according to different categories, for instance whether they inhabit their host permanently or temporary, whether they are ectoparasites or endoparasites, what type of worms or acari they are, etc. Humans are hosts to nearly 300 species of parasitic worms and over 70 species of protozoa (1). Some of them enter directly through the conjunctiva, others infect the eye from the inside through blood flow. For instance the most common parasitosis, which affects the eyes and the appendages of the eyes are (2):

**Demodex**-it is caused by acari who live in the lipid glands and hair follicles of the eyelashes. The life cycle from egg to adult acar is between 14 and 18 days.

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**Dirofilaria** - is a mosquito-borne zoonotic nematode infection, the people are accidental dead-end hosts of the nematode. When the eyes are affected, there is a sensation of movement, slight pain and itching.

**Thelazia** is a kind of nematode worms which parasitize the eyes and associated tissues. They are often called "eyeworms". Adults are usually found in the eyelids, tear glands, tear ducts.

**Toxoplasmosis** is a chronic parasite invasion caused by the intracellular protozoa *Toxoplasma gondii*. It often manifests itself with involvement of the fundus of the eye - chorioretinitis.

**Toxocariasis** is a chronic infectious disease caused mainly by the nematode - roundworm *Toxocara canis* and rarely *Toxocara cati*. Ocular larva migrans (OLM) is a syndrome, manifesting as uveitis, endophthalmitis, visual impairment or even blindness in the affected eye.

**Echinococcosis** is a very common illness caused by canine tapeworm. It may present as parasitic cysts in the orbital region.

**Cysticercosis**-a disease caused by the larvae of the pork tapeworm *Taenia solium*, which can

affect the eye and lead to diminished vision. In some cases, cysticerci may be found in the eyeball, extraocular muscles, and under the conjunctiva.

**Trichinellosis** is a parasitic disease caused by helminths, which develop from nematode *Trichinella spiralis* that have colonated the human body. About the eye - a key finding is a palpebral edema which is often associated with proptosis and chemosis.

**Tasks and goals**-to make a retrospective analysis of rare cases of eye parasitosis in our practice.

### MATERIALS AND METHODS

Patients were investigated for the period of 15 years in Eye Clinic „St. Nikolay“ - Varna. The clinical cases are eye diseases caused by *Dirofilaria*, *Thelazia* and *Demodex*. The patients are examined with the classical working algorithm-vision after autokeratorefractometry, tonometry,

biomicroscopy and ophthalmoscopy. The suspected parasitosis are directed for compulsory consultation and treatment by parasitology specialist. The *Demodex* tests are made in the parasitological laboratory “Status” in town of Varna. The data are processed with the scotch tape over glass slide method. The result from the histological test - a biopsy N:2201.03/5052 is made in the Department of Clinical Pathology „St. Marina“-Varna.

### RESULTS

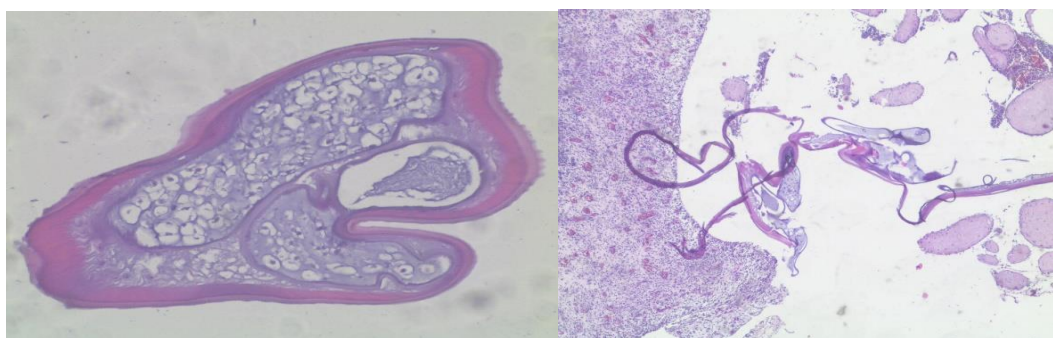
Discovering ophthalmomyiasis is usually accidentally during medical examination. For the period of 15 years, from 2008 to 2023 there has been one case of *Dirofilaria* of the eyelid, one case of *Thelazia* of the conjunctiva and *Demodex*-blepharitis in 6 patients. The first case of *Dirofilaria* is reported on 22.10.2008, it was a 43 years old female R.P.G. She presents with “a moving thing” on the eyelid and swollen lymph nodes. The clinical manifestation from the first examination is shown on **Figure 1**.



**Figure 1.** Primary medical examination of an eyelid of a patient with *Dirofilaria*-it moves

The patient hasn't travelled abroad and has no contact with exotic animals. The examination showed a very small moving bulge on the upper left eyelid of the left eye, slight redness in the anterior segment, fundus was clear, swollen lymph nodes were present. After appropriate parasitological treatment, a surgery was performed to remove the bump from the forehead on 15.02.2009. Were found 2 parasites with a length of about 2 cm, but with

degenerative changes up to fibrosis, due to the parasitological treatment. The result from the histological test on 17.02.2009 - a biopsy N:2201.03/5052, made in the Department of Clinical Pathology „St. Marina“, is shown on **Figure 2**. A hematoxylin and eosin stain was performed, showing mature connective tissue with a large amount of granulation tissue and parts of a *Dirofilarial* parasite.



**Figure 2.** The histological result of *Dirofilaria* with a granulomatous inflammatory reaction – HES, (20X, 10X)

The second case is a 7 month old baby V.D.P. whose mom acknowledged “whitish worms” on the eyelid of the left eye. During the examination a foreign body was found in the conjunctival saccus and a planned surgery is performed. On the 02.09.2021 were removed 7 small whitish parasites with size about 5-13mm. The result is shown on **Figure 3**. After a special parasitological consultation and native microscopic morphological identification, the

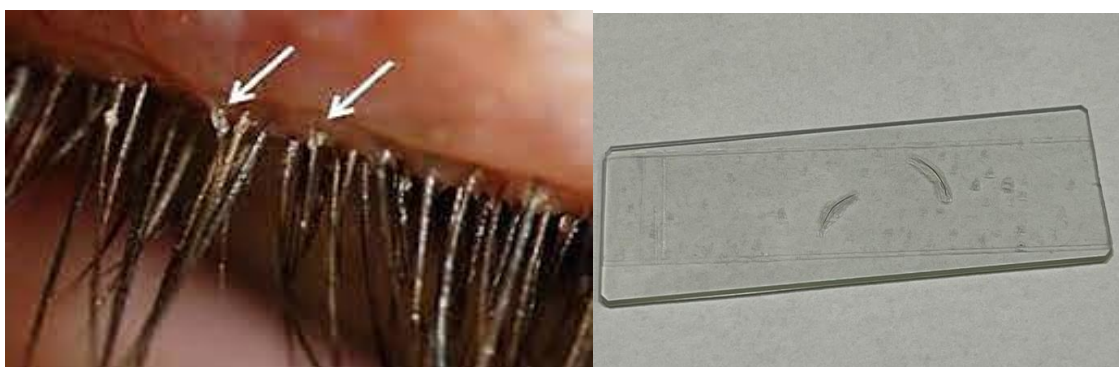
type of ophthalmomyiasis was categorically confirmed-*Thelazia callipaeda*. The vectors are small flies of the genus *Drosophila*, which are biologically unique in that they feed on eye secretions and tears. There wasn't any information for travelling to exotic destinations again. Postoperative period was smooth although the young age of the patient. There wasn't any risk for his eyesight.



**Figure 3.** *Thelazia callipaeda* of a 7 months old baby during our surgery

Most of our cases are blepharitis caused by *Demodex*. For the period of the clinical investigation there were 9 patients sent for parasitological consultation, six of them were positive for *Demodex*. Among them there were two children (15 and 16 years old) the rest were mostly women between 41-58 years and one male patient-44 years old. The tests were made in the parasitological laboratory “Status” in town of Varna. The data was processed with the

scotch tape over glass slide method (2). The clinical manifestation in all of the patients were typical for blepharitis with chronic atopic symptoms, **Figure 4**. Male patient V.I. was presented with three episodes of repetitive superficial epithelial defects mainly on the left eye, accompanied with pain syndrome. All patients are treated with etiological and symptomatic treatment.



**Figure 4.** *Demodex* blepharitis and a scotch tape over glass slide method

## DISCUSSION

Exact statistical data about ophthalmomyiasis and parasite diseases in Bulgaria are not found. There are sporadic results published as sensational news, therefore there is no exact information on that data. In his study Velev V. (2020) (2) for a period 2010-2019 describes 7 patients - 6 females and 1 male, with a subconjunctival or periorbital form of

*Dirofilaria repens* infection. In another study Vutova (2019) (3) for a period 2009–2018, presents 18 cases (12 female and 6 male) of people infected with *Dirofilaria repens*, but not only eyes localization. The medical eye clinic “Zrenie”-Sofia (4) describes a case of subconjunctival dirofilariasis in 64-year-old female patient. *Dirofilaria* was long 130 mm and wide 0.61 mm. Another single case of

Dirofilaria is described by an ophthalmologist in General Military Hospital Pleven (5). It was removed from the eye of the 76-year-old patient in the course of cataract surgery. There are summarized data by Harizanov et al. (6) for a longer period 1973-2011. They reported 47 cases of Dirofilaria disease in humans with subcutaneous, subconjunctival and genital invasion. Chakarova et al. investigate the different possibilities for diagnosis of human dirofilariasis in our country (7).

Thelaziosis is a zoonosis, caused by the nematodes of genus Thelazia. From the genus there are two species causing infection in humans. They are spread mainly in East Asia but the numbers are growing in Europe and in humans. In Europe (8) till 2019 there are 11 reported cases. According to Jilong Shen's (9) survey the human thelaziosis is an underestimated parasitological disease. It can be subclinical or symptomatic through epiphora, conjunctivitis and keratitis. Paradžik et al., 2016 (10) presents a case of the first ophthalmic thelaziosis in a male patient in Croatia. The newest publication is from scientists of Spain (11). There is a reported case in 2023 of thelaziosis of 2 years old girl. In Bulgaria apart from our case, there aren't any other published ones especially of such young child.

There are two types of acari reported that dwell in the human eyelid - Demodex folliculorum and Demodex brevis and can cause a wide spectrum of findings in the anterior segment. They differ by the preferred place of contamination - D.folliculorum is located in the base of the eyelashes, whereas D.brevis prefers the meibomian glands, contributing respectively causing anterior and posterior demodex blepharitis. In a Korean survey from 2022 (12) 9 patients with demodex blepharitis were evaluated. Interestingly in addition to the blepharitis, two patients have had recurrent chalazion and 3 of them have had keratitis. All of them were treated with 50% oil from tea tree for 6 weeks. In a retrospective examination of 6 patients with demodex, Kheirkhah A. et al. (13) also reports corneal involvement, mainly superficial vascularization and marginal infiltration. In a new Chinese survey from 2023 (14) 40 patients with keratitis are compared to 80 healthy people. The conclusion is that demodex colonization should be taken under consideration and should be treated with patients with keratitis, with or without blepharitis. The retrospective examination of

Lingi Yan (15) of 12 patients from the age 2,5 to 11 with chronic blepharoconjunctivitis shows that standard treatment is not effective. The symptoms improves for 2 weeks after treatment with tea tree oil, which confirms the diagnosis. According to survey of Shah (16) et al. (2022) the treatment usually includes topical application of tea tree oil with its active component terpinen-4-ol. There are researches for using ivermectine, metronidazole, selenium sulfide as a second line of treatment. The hygiene and the tea tree are also a main recommendation in Capasso's survey (17). Our patients are treated in a similar way, the case with the superficial keratitis was harder to cure. It seems that demodicosis is a widespread eye disease. We consider it a disadvantage that we have not referred our patients for parasitological examination more often. It is easy, harmless, fast and not expensive, but has high diagnostic value. Acari are microscopic parasites with 8 legs, which can be found by microscopic analysis with the slit lamp with 40x magnification or through scotch line examination with high magnification.

## CONCLUSION

Cases in humans with parasites with ocular localization are relatively rare, but aren't casuistry. We should search for them actively and think of differential diagnosis. The social significance of the parasitosis with an eye localization is major, due to the risk of visual impairment. It is desirable to be described and published in literature in order to facilitate the process of making statistics. There is a need to popularize the problem among the specialists engaged in clinic, diagnosis, therapy and prevention of these diseases like GP doctors, ophthalmologists, pathologists and parasitologists.

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