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First Report of Ribeiroia (Platyhelminthes: Trematoda) Infection in Frogs From Turkey.

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Abstract: Frog meat is one of the most desired dishes in some famous world restaurants. Turkey exports millions of frogs collected from the nature in each year. Knowledge on the parasitic fauna of the frogs is very limited. The frogs (*Rana ridibunda* Pallas, 1771.) collected from central Anatolia (Ankara province and its vicinity) for exporting to EU countries were examined for tissue parasites.

At inspection, yellow colored cystic structures with a diameter of 0.40 - 0.55 mm were observed among muscles. Number of the cysts in examined 33 frogs varied from 12 to 61.

In the microscopic examination of the cysts, metacercariae of the genus *Ribeiroia* (Trematoda: Psilostomidae) were identified for the first time in Turkey.

In North America, *Ribeiroia* is known to cause limb deformities in amphibians, and, since the infection has been included in the list of emerging diseases, these observations have evoked concern within the scientific and business communities.

Key Words: *Ribeiroia*, Frog, Turkey.

Türkiye’de Kurbağalarda ilk Ribeiroia (Platyhelminthes: Trematoda) Enfeksiyonu

Özet: Kurbağa eti dünyaca meşhur bazı restoranlarda en çok tercih edilen menülerden birisidir. Türkiye her yıl doğadan toplanan milyonlarca kurbağayı ihraç etmektedir. Kurbağaların parazitik faunası hakkındaki bilgileri-miz sınırlıdır. Avrupa Birliği ülkelerine ihraç etmek üzere Orta Anadolu’dan (Ankara ve çevresi) toplanan kurbağalar (*Rana ridibunda* Pallas, 1771.) doku parazitleri açısından muayene edilmiştir.

Çıplak gözle yapılan muayenelerde, kaslar arasında çapları 0,40 – 0,55 mm arasında değişen sarı renkli kistik yapılar gözlenmiştir. Muayene edilen 33 kurbağanın herbirindeki kist sayısı 12 ile 61 arasında değişmiştir.

Kistlerin mikroskopik muayenesinde Türkiye’de ilk kez *Ribeiroia* (Trematoda: Psilostomidae) cinsine ait parazitlerin metaserkerlerine rastlanmıştır.

Kuzey Amerika’da *Ribeiroia* enfeksiyonlarının amfibialarda bacak deformitelerine neden olması ve bu enfeksiyonun acil önlem alınması gereken hastalıklar listesinde yer alması yüzünden, bulgular bilim ve iş dünyasının ilgisini çekmiştir.

Anahtar Kelimeler: *Ribeiroia*, Kurbağa, Türkiye.

Introduction

Among the frog species found in Anatolia only 5 species belonging to the genus *Rana* Linnaeus, 1758 have economical importance¹. Knowledge on the parasitic fauna of this frog

species is very limited^{4,6-10}. To date, any infection caused by *Ribeiroia* spp. have not been reported in Turkey.

Infection by the trematod parasite *Ribeiroia* spp. has achieved notoriety in the USA for

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its effects on amphibian limb development.^{2,3}. Prevalence of the infection in frogs varies from 1 to 90% in various regions in America³. Outside of North America, Ribeiroia has never previously been recorded in a frog, and there is only one report of the parasite in a bird from Europe⁵.

In the taxonomy of the genus Ribeiroia only three species are recognized: *R. ondatrae* in the Americas; *R. marini* in the Caribbean and *R. congolensis* in Africa³.

Trematodes in the genus Ribeiroia have an indirect life cycle involving planorbid snails as first intermediate hosts, fishes or amphibians as second intermediate hosts and birds or mammals as definitive hosts. Although rarely pathogenic in definitive hosts, Ribeiroia infection can cause severe pathology and mortality in snails and amphibians. In snails, the infection causes complete castration within few weeks, and large scale introduction of Ribeiroia can eliminate snail population totally³. In amphibians, malformations typically involve the hind limbs, including missing limbs and parts of limbs, extra limbs and skin webbings^{2,3}. In birds, adult parasites can cause severe proventriculitis rarely³.

Here we report the first occurrence of this parasite in Turkish frogs.

Case History

Cystic structures among the muscles of the frogs (*Rana ridibunda* Pallas, 1771.) collected from central Anatolia (around Ankara province) for exporting to EU countries fascinated by the workers during the dressing procedure in the slaughterhouse of a firm. Totally 33 infected frogs brought to our laboratory for a detailed examination. At inspection, yellow colored cysts were observed among muscle fibers, and, the cysts were counted. Some cysts were dissected out for both microscopic examination and taking measurements. The cysts pressed slightly for excysting the content and were examined under X4 and X10 magnifications.

Results and Discussion

Yellow colored cysts were detected among muscle fibers in whole body of the frogs.

(*Rana ridibunda* Pallas, 1771). Apparently, the cysts were more intensive in hind limbs than other parts of the body. Total number of the cysts varied from 12 to 61 in each frog.. Diameter of the cysts were 0.40 - 0.55 mm.

Parasites found in the cysts were identified as the metacercariae of Ribeiroia spp de-

pending on their esophageal diverticula described by Johnson et al.³

Identification of the parasite in species level is not possible by examining metacercaria morphologically³. Adult parasites should be examined for full naming.

Malformations such as missing of limbs or part of limbs have not been observed in infected frogs.

Further studies are necessary to detect the infection rates and severity of malformations in adult amphibians in different regions of Turkey, and, whether larval amphibians die due to malformations before maturation. If the infection is found at high levels, preventive measures should immediately be taken to reduce parasite abundance.

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