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Research Note

Collyriclosis in Red-backed shrikes *Lanius collurio* from Israel and Czech Republic

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Article info	Summary
Received November 10, 2017 Accepted February 20, 2018	One juvenile Red-backed shrike <i>(Lanius collurio)</i> with a cutaneous cyst of <i>Collyriclum faba</i> under its beak was observed in Israel on 13 October 2016. Another Red-backed shrike (adult female) with multiple cutaneous cysts around the vent was observed in Průhonice, Czech Republic on 19 June 2017. A third Red-backed shrike (adult male) with three cutaneous cysts around the vent was observed in Mariánské Radčice, Czech Republic on 16 July 2017. In the Israeli case, two adult trematodes <i>C. faba</i> were found in the cutaneous cyst. In the two Czech cases, <i>C. faba</i> was identified indirectly by analysing the cutaneous cyst morphology. <i>C. faba</i> had never been recorded previously in Israel. Keywords: Collyriclosis; Czech Republic; Israel; Red-backed shrike

Introduction

Trematodes *Collyriclum faba* (Bremser in Schmalz, 1831) are parasites of a number of bird species, mainly passerines (Passeriformes) and rarely other birds (e.g. Anseriformes, Galliformes, Apodiformes), in an extraordinarily broad geographical area including some parts of Eurasia and Africa as well as North, Central and South America (Blankespoor *et al.*, 1985; Literák *et al.*, 2003; Literák *et al.*, 2011; Rzad & Busse, 2015; Tahas *et al.*, 2017).

C. faba occurs in pairs within a subcutaneous cyst, the location of which on the host body is the base for distinguishing three ecotypes of *C. faba*: in the femoral or tibial regions (leg ecotype), in the area of the host's vent or in the abdominal area (vent ecotype) or above the coccygeal gland (rump ecotype). Considerably less frequently, the cysts may occur also in the thoracic, sternal and orbital regions and rarely near the eyes and beak (Literák *et al.*, 2003; Literák *et al.*, 2011; Heneberg & Literák, 2013).

Birds are infected in endemic foci, but they often are found outside these foci. Sometimes birds become infected during seasonal migration in different locations while using endemic foci as food sourced (Literak & Sitko, 2006). It is assumed that in Europe the first intermediate host is the small aquatic snail *Bythinella austriaca agg.* (von Frauenfeld, 1857), which occurs focally in the springs of tributaries to the Danube in the Alpine-Carpathian region, and that the second intermediate host is an insect (mayfly) of the family Heptageniidae (Heneberg *et al.*, 2015). The cutaneous cysts are able to develop quickly in 13 – 19 days or less (Literák *et al.*, 2003). In cases of their having smaller numbers of cysts the infected birds may successfully recover, but a larger number of cysts can have fatal consequences for the hosts (Literák *et al.*, 2003; Okulewicz & Sitko, 2012).

In this communication, we describe three new independent cases of collyriclosis in Red-backed shrikes (*Lanius collurio*).

Materials and Methods

One juvenile Red-backed shrike with a subcutaneous cyst at the base of the lower mandible was captured and ringed during

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the autumn migration at the International Birding and Research Center, Eilat, Israel (29.57N, 34.97E) on 13 October 2016. Its body was thoroughly checked and no other cysts were found. The Red-backed shrike showed no sign of being in poor condition. The shrike was released into the wild after ringing and examination. No additional birds with cutaneous cysts among 163 Red-backed shrikes were observed at that time (from 28 August to 31 October 2017). The netting location in a semi-desert area in a southern part of the Arava Valley is used by migrating birds as a migration stop in the desert.

An adult female Red-backed shrike was captured and ringed in Průhonice, Czech Republic (50.01N, 14.56E) on 19 June 2017. The cysts encircled the vent. Around the close vicinity of the cloaca the cysts were polluted by excrements. Since 2012 there have been mist-netted and ringed at this site 500 – 600 passerines yearly, including seven Red-backed shrikes. No cutaneous lesion had been noted in any previous case.

An adult male Red-backed shrike was captured and ringed at Mariánské Radčice, Czech Republic (50.56N, 13.68E) on 16 July 2017. The bird showed no other pathological changes and was released back into the wild. Since 2011, there have been mist-net-ted and ringed another 31 Red-backed shrikes at this site, none of which showed any cutaneous lesion.

Ethical Approval and/or Informed Consent

The research related to animals use has been complied with all the

relevant national regulations and institutional policies for the care and use of animals.

Results

In all three cases, cutaneous cysts were identical by shape, colour and size. Also, their structures, including texture of surface and microscopic entry on each cyst, were identical. In the Israeli case, the cyst of size 6 mm was partially necrotic and contained two live oval parasites, the cutaneous trematode *C. faba*. In the second case, the extraordinary cutaneous lesions with rather large numbers of cutaneous cysts were found on this bird (Fig. 1). A total of 16 cysts from 6 to 9 mm in size were localized around the vent and another 6 cysts were around the upper and lower rectrices area. Most of the cysts were with smooth yellow-greyish surface. Each cyst contained a tiny entry hole on its upper central part. In the later case, three cutaneous cysts were found around its vent, each with a tiny visible hole on its upper central part. Sizes of the cysts ranged from 6 to 9 mm.

Discussion

The extent, localization and timing of the cysts' occurrence varied, but they nevertheless were within the characteristic areas known for cutaneous cysts caused by *C. faba* on other bird species, which means typically localized on the vent or rarely near the beak (Literák *et al.*, 2011; Heneberg & Literak, 2013). We concluded that



Fig. 1. Cutaneous cysts of Collyriclum faba in a Red-backed shrike (Lanius collurio), Průhonice, Czech Republic, 19 June 2017. Photographed by Vlastimil Osoba.

the cutaneous cysts observed in the Red-backed shrikes were in all three cases caused by *C. faba*. We report here collyriclosis in Israel for the first time. Formerly, Red-backed shrike was found as a host of *C. faba* only in Tajikistan (Borgarenko, 1984). In that case, 22 Red-backed shrikes were examined and one bird beared one *C. faba* cyst.

Infections with multiple cysts are rare, and they can cause the death of the host (Literák *et al.*, 2003). It has been reported that 86 % of hosts carry only 4 cysts or less (Blankespoor *et al.*, 1985). Only one of the Red-backed shrikes reported here could have suffered from collyriclosis because of the number of cysts found on its body.

In endemic foci of collyriclosis within central Europe, cutaneous cysts of *C. faba* have been found in birds from the end of May to mid-September, with the prevalence peaking in July and August (Literák *et al.*, 2003). No location, on which Red-backed shrikes with *C. faba* were reported here, is known as an endemic focus of collyriclosis. Moreover, these findings were unique not followed by any similar finding in any of a number of other birds examined at these locations which could indicate a presence of an endemic focus of collyriclosis such as in the Carpathian Mountains (Literák *et al.*, 2003). This situation and the fact, that Red-backed shrike is strictly migrating bird species, are reasons why we suppose that birds in these three cases were infected elsewhere in endemic foci of collyriclosis on their spring or autumn migration routes.

The population of Red-backed shrikes breeding in central Europe including Czech Republic and Slovakia winter in Subsaharan Africa (Cepák *et al.*, 2007). Departure of birds from Czech Republic and Slovakia starts in August and their migration route goes southeast through Hungary, Serbia and Greece, then the birds continue to Africa through Egypt. Small portion of birds goes south and it is admitted that they migrate over Apennines as Norwegian birds (Cepák *et al.*, 2007). Backwards, they arrive from the south but mostly south-east, using again mainly migration route via the Balkan Peninsula (Tøttrup *et al.*, 2011; Cepák *et al.*, 2008; Šťastný *et al.*, 2011).

It seems that the shrikes during migration make frequent but short stopovers, a strategy that requires favourable feeding conditions along the entire migratory route. There are several countries with endemic foci of *C. faba* occurrence that could be used as resting and food source areas for Red-backed shrikes on their migration. The time period for cysts development is still rather unclear, but, assuming it to last several weeks from the beginning of infection, we hypothesize that Red-backed shrikes on their spring migration could be infected in Italy, Slovenia and Austria. These countries have endemic foci of collyriclosis (Brglez, 1977; Govoni *et al.*, 1987; Prosl & Loupal, 1985). The case of collyriclosis in Red-backed shrike from Israel was in a bird that could have been infected during autumn migration in the central European Carpathian foci (Literák & Sitko, 1997; Literák *et al.*, 2003; Literák & Sitko, 2006).

Conflict of interest

Authors state no conflict of interest.

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