

## Insects inhabiting Saker (*Falco cherrug*) nests in Hungary

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**This study describes the species composition of insects reared from larval assemblages collected from Saker nests. Eight coleopteran and one dipteran species had been reared, none of which appear to be specific to raptors's nests as a habitat. They are either characteristic to carcasses, or known to occur in manure, or commensals living in a variety of mammalian and avian nests. Some of these species may participate in the transmission of pathogens.**

**Keywords: falcon, nidicolous, nest-dwelling, insect**

### 1. Introduction

Nests of altricial and semialtricial birds tend to harbour species-rich insect faunas (Nordberg 1936, Hicks 1971). Apparently, nests of cavity nesting birds and nests of large bodied birds represent particularly suitable habitats for the development of arthropods (see e.g. Krištofik *et al.* 1994, 1996, 2002, Masan & Krištofik 1995, Szabó *et al.* 2002). A recent description of a species new to science collected from

raptors' nests in Hungary (Papp 1998) further highlights the need of exploring this segment of the Central European fauna.

Falconiform raptors are characterized by semialtricial nestlings living in relatively large nests throughout long periods of development. Typically, large quantities of food remain, such as body parts of prey animals, bone, skin, hair, feather and pellets accumulate under the chicks and the emergent smell tends to attract a variety of insects. Most insects deposit eggs onto the food remains and disappear from the nests, thus only larvae represent the majority of species. Larvae are difficult to identify and therefore most authors rear them into adults for identification. The importance of this nest-dwelling insect fauna is poorly understood. Nest faunas comprising raptor specialist parasites and commensals may well represent a valuable component of biodiversity (Rózsa 1992). On the other hand, however, if this fauna contains parasitic species or species acting as vectors of pathogens, its presence may also exert a negative effect on nestling development.

Here, we aim to describe results of our efforts to rear and identify insects collected from Saker (*Falco cherrug*) nests in Hungary. To our best knowledge, this is the first study to explore the insect fauna occurring in Saker nests.

## 2. Materials and methods

Samples were taken from 25 nests (15 natural and 10 artificial sites) during the summer of 2000 by János Bagyura. Each sample comprised of about 200-400 cm<sup>3</sup> rotting material taken directly from below the Saker chicks. Samples often included avian and mammalian body parts such as legs of Pigeons (*Columba livia*), heads of small passerines (*e.g.* Blue Tit, *Parus caeruleus*), skin fragments of Suslik (*Spermophilus citellus*). Lajos Rózsa carried out rearing of adult insects. Samples were kept in plastic boxes on a balcony under natural climate conditions, but not exposed to direct sunshine. A large number of small holes on the top and bottom of boxes let in fresh air while prohibited insects larger than 0.5 mm to get into the boxes from the outside. Boxes were opened on every 2nd day to provide moisture by means of a water aerosol and to collect emergent adult insects. Most of these were found after 2-6 weeks of rearing, and rearing was given up when 2 weeks passed after the collection of the last adult specimen. Admittedly, rearing was far from being efficient, thus only a minority of larvae could be reared into adults and identified to species. Firstly, the natural supply of food remains was cut off in our boxes, thus insect larvae could have starved. Secondly, some samples dried during the hot summer period, while others were too wet and became invaded by fungi. However, similar conditions may often occur in the falcons' nests as well.

## 3. Results and discussion

Adults of 8 coleopteran and 1 dipteran species were reared. Beetles were identified by Otto Merkl, while the flies were identified by L. Papp, Hungarian Natural History Museum (HNHM), Department of Zoology. All specimens are found in the collections of HNHM, Budapest. A list of species is presented in Table 1, completed with some information about their previously known habitats and feeding habits, date and localities of our collections and the number of individuals. Due to raptor conservation interests, we use only county names to refer to localities.

Overall, none of the species found in our study are specific to raptors' nests as a peculiar habitat, but either characteristic to different types of carcasses, or known to occur in manure, or nidicolous species living in the nests of a variety of mammalian and avian hosts. The hematophagous fly *Carnus hemapterus* was widespread and abundant on Saker chicks, however, this species was not reared from the samples. These larvae develop in avian nests, overwinter there as pupae, and the emergence of the parasitic adults is synchronised with the hatch of nestlings (Liker *et al.* 2001), thus we could not rear it within our short study period.

Apparently, Saker nests and poultry farms share some insect species. At least one of these, the lesser mealworm (*Alphitobius diaperinus*) is a well-known vector organism (see *e.g.* McAllister *et al.* 1996, Watson *et al.* 2000) potentially capable to transmit pathogens to Saker nest either from poultry farms, or from other raptors' nests. It may be worth mentioning here, that Saker nestling morbidity

Tab 1. A list of insects reared from saker nests.

Taxa	Characteristics	Date (all in 2000), locality (county)	Number of individuals
<b>Coleoptera:</b> <b>Dermestidae</b>			
<i>Dermestes bicolor</i> (Fabricius, 1781)	This species inhabits nests of a variety of animals and feeds on feather, hair and dried meat.	19. 05., Jász-Nagykun-Szolnok	1
		11. 05., Borsod-Abaúj-Zemplén A	1
		11. 05., Borsod-Abaúj-Zemplén B	3
		14. 05., Heves A	1
		14. 05., Heves B	2
<b>Tenebrionidae</b>			
<i>Alphitobius diaperinus</i> (Panzer, 1797)	A cosmopolitan pest occurring in stored food such as bran and flour. Also occurs in avian nests (Šustek & Krištofik, 2002, 2003) and common in poultry farms where it feeds on droppings and preys on fly larvae.	11. 05., Borsod-Abaúj-Zemplén A	3
		11. 05., Borsod-Abaúj-Zemplén B	2
<b>Trogidae</b>			
3. <i>Trox scaber</i> (Linnaeus, 1767)	Common on dry carcasses, also known to occur in nests of predators. Larvae feed on keratin.	11. 05., Borsod-Abaúj-Zemplén B	3
<i>Trox perrisii</i> (Fairmaire, 1868)	Living exclusively in nests, this species feeds on feathers and remains of carcasses. Relatively rare in Hungary, with about 20 known occurrences.	11. 05., Borsod-Abaúj-Zemplén B	2
<b>Histeridae</b>			
<i>Carcinops pumilio</i> (Erichson, 1834)	A cosmopolitan species that occurs in avian and mammalian nests, stables, pens etc., had also been collected at rubbish-heaps. Preys on fly larvae.	19. 05., Heves	5
		11. 05., Borsod-Abaúj-Zemplén A	3
<i>Gnathoncus nanus</i> (Scriba, 1790)	Known to occur in avian and mammalian nests, rare in stables and pens. Feeds on fly larvae.	19. 05., Heves	1
		11. 05., Borsod-Abaúj-Zemplén B	1
<i>Saprimus tenuistrius sparsutus</i> (Solsky, 1876)	Common on carcasses, preys on fly larvae.	19. 05., Heves	1
<i>Saprimus subnitescens</i> (Bickhardt, 1909)	Common on carcasses, preys on fly larvae.	21. 05., Heves	1
		12. 06., Heves	1
		11. 05., Borsod-Abaúj-Zemplén B	1
<b>Diptera:</b> <b>Carnidae</b>			
<i>Meoneura prima</i> (Becker, 1903)	New to Hungary, previously known from North America, North Africa, Europe, Jordan and Afghanistan, where it was collected from the manure of domestic animals, and also from umbelliferous flowers (Papp 1978, 2001)	17. 05., Pest	4

due to *Mycoplasma buteonis* infection had already been documented in Hungary (Erdélyi *et al.* 1999). Recently, this beetle was also abundantly found in nests of cavity nesting birds in Slovakia (Šustek & Krištofik 2002, 2003), thus its occurrence in the nest fauna of the Saker is not surprising. Unfortunately, we cannot compare our result to the nest-dwelling insect fauna of other falcon species due to the lack of information on other species.

Briefly, insects inhabiting Saker nests are either nidicolous species or species typical to carcasses or manure. Some of them may have a role in transmitting pathogens from poultry farms or from other raptors to Saker chicks.

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## Összefoglalás

### Rovarfajok előfordulása magyarországi kerecsensólyom (*Falco cherrug*) fészkekben

Dolgozatunk célja leírni a kerecsenfészkekben gyűjtött rovarlárvákból kinevelhető kifejlett rovarok fajlistáját. Nyolc bogár- és egy légyfajt sikerült kinevel-

nünk, azonban ezek egyike sem a ragadozómadár-fészkek specialistája. Egy részük dögökről ismert, mások jellemzően trágyában fordulnak elő, megint mások a legkülönbözőbb madarak és emlősök fészkeiben is élnek. Néhány faj a madár-kórokozók továbbításában jelentős lehet.

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