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INVASIVE HARLEQUIN LADYBIRD *HARMONIA AXYRIDIS* (PALLAS, 1773) (COLEOPTERA: COCCINELLIDAE) PREYED BY BLACK REDSTART *PHOENICURUS OCHRUROS*

One pair of Black Redstarts *Phoenicurus ochruros* nested under the wodden patio of a house in Brzozówka village (52°20'N, 20°38'E) in the Kampinos National Park (Central Poland) in the breeding season 2015. Several pellets of Black Redstarts were collected near the nest and under the nearby birch *Betula pendula*. All pellets were entirely composed of undigested chitinous exoskeletons of insects consumed by Black Redstarts. Closer examination of one pellet collected on July 19, 2015 revealed the presence of elytra and other fragments of exoskeleton of the Harlequin Ladybird *Harmonia axyridis* forma *succinea* (Fig. 1).

For certain reasons, this finding is worth mentioning. In general, ladybirds are rarely preyed either by vertebrates or invertebrates. The bitter taste and toxicity that are advertised by warning coloration and intensive smell of pyrazines usually

provide ladybirds with a sufficient protection against predators (Ceryngier *et al*. 2012). Nevertheless, some birds, such as the common House Martin *Delichon urbica* and the Tree Sparrow *Passer montanus*, can attack and eat ladybirds or fed their nestlings with them (Mizer 1970, Wieloch 1975, Krištín 1986, Orłowski and Karg 2013). Harlequin Ladybird , that seems to be especially well protected chemically (Sloggett *et al*. 2011), is preyed by those birds less readily than native European ladybirds (Electronic Appendix to Orłowski and Karg 2013, Veselý *et al*. 2016). In contrast, within its native range in eastern Asia, the Harlequin Ladybird was reported to be the ladybird species most frequently eaten by birds. Principal bird predators of *H. axyridis* there are the Grey-headed Woodpecker *Picus canus* and the Eurasian Nuthatch *Sitta europaea*. Those two species were observed preying on *H. axyridis* in its mass winter aggregations (Kuznetsov 1997).

As the Harlequin Ladybird is an invasive alien species in Europe, both Americas and Africa that causes declines of native ladybirds and may be an agricultural and household pest (Roy *et al.* 2016), the recognition of its natural enemies in the invaded areas is of importance for its possible management. More detailed studies on the diet of the Black Redstart and other insect-eating birds would show to what extend these birds can contribute to the limitation of *H. axyridis* numbers.

Key words: Poland, *Harmonia axyridis,* avian predation.

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INWAZYJNA BIEDRONKA AZJATYCKA *HARMONIA AXYRIDIS* (PALLAS, 1773) (COLEOPTERA: COCCINELLIDAE) W POKARMIE KOPCIUSZKA *PHOENICURUS OCHRUROS*

Streszczenie

Jedna z wypluwek kopciuszka znalezionych w dn. 19 VII 2015 w Brzozówce w Kampinoskim Parku Narodowym zawierała pokrywy skrzydłowe i inne chitynowe fragmenty biedronki azjatyckiej *Harmonia axyridis* forma *succinea.* Obserwacja jest warta odnotowania gdyż biedronki bardzo rzadko łowione są przez drapieżniki z uwagi na gorzki smak i zawartość toksycznych związków w ich ciele. Rozpoznanie naturalnych wrogów biedronki azjatyckiej jest dodatkowo ważne z uwagi na potencjalny negatywny wpływ tego inwazyjnego gatunku na ojczystą faunę.

Słowa kluczowe: Polska, *Harmonia axyridis,* drapieżnictwo ptaków.

Photo 1. Elytra of the Harlequin Ladybird *Harmonia axyridis* forma *succinea* in the pellet of Black Redstart *Phoenicurus ochruros*, Brzozówka – Kampinos National Park, 19 July, 2015 (photo J. Romanowski)
Fot. 1. Pokrywy skrzydłowe biedronki azjatyckiej H*armonia axyridis* f. *succinea* w wypluwce kopciuszka *Phoenicurus ochruros*, Brzozówka – Kampinoski Park Narodowy, 19 VII 2015 (fot. J. Romanowski)