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ИТОГИ И ПЕРСПЕКТИВЫ РАЗВИТИЯ ЭНТОМОЛОГИИ В ВОСТОЧНОЙ ЕВРОПЕ

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NOTE ON DISTRIBUTION AND BIONOMICS OF *HARMONIA AXYRIDIS* PALLAS IN SOUTHERN AND EASTERN EUROPE (INSECTA: COLEOPTERA: COCCINELLIDAE)

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Additional records Harmonia axyridis Pallas, 1773 from Southern and Eastern Europe (Belarus, Bulgaria, Hungary, Montenegro and Ukraine) are given. Some ecological characteristics of H. axyridis are discussed.

INTRODUCTION

Harlequin ladybird (*Harmonia axyridis* Pallas, 1773) is an invasive species, rapidly spreading in Europe, North America, South America and Africa. This species is dangerous both for native species of entomofauna, in particular, for local ladybirds, being their trophic competitor and destroying their pre-imaginal stages. In addition, harlequin is noted as a pest of some agricultural plants. The species that has been used as a species of biological control since the 1930s, has become dangerous for regional biodiversity. The study of the distribution and bionomics of this species is very important at present.

In Europe, harlequin ladybird colonized most countries (Roy et al., 2015). Feral populations of *Harmonia axyridis* were registered in Ukraine in 2007 (Verizhnikova & Shylova, 2013), in Hungary and Bulgaria – in 2008 (Merkl, 2008; Tomov, Trencheva, Trenchev & Kenis, 2009), in Montenegro – in 2009 (Gligorović, Ibrahimović & Gligorović, 2016) and Belarus – in 2011 (Roy et al., 2015). A study of coccinellid materials from Southern and Eastern Europe provided some additional data on the distribution and ecological characteristics of this important species in this regions.

MATERIAL AND METHODS

The material for the article was the authors' collections and the collection material provided by colleagues. The material is deposited in S.K. Ryndevich's and A.O. Lukashuk's collections.

Specimens were examined using a Nikon SMZ-745T and Nikon SMZ-800 stereomicroscopes.

RESULTS

The annotated check-list of *Harmonia axyridis* Pallas, 1773 including information on some ecological features is given below.

Additional records for regional fauna

Belarus. Brest reg., Kobrin, park, on *Populus* sp., 27.VII.2011, leg. A.O. Lukashuk, 1 specimen; Brest, garden, 23.07.2014, leg. A.O. Lukashuk, 15 specimens; Kobrin distr., 5.X.2015, leg. V.N. Zuev, 1 specimen; Brest reg., Baranovich, on window, 4.X.2015, leg. Lapkovskaya E.M., 1 specimen; Baranovich, in the building, in while wintering, 4.X.2015, leg. Ryndevich S.K., 1 specimen; Baranovich, in the building, in while wintering, 19.X.2016, leg. Gavrilyuk N.I., 5 specimen; Baranovich, caught in in car, in while wintering, 26.X.2016, leg. Karpinskiy A.S., Kozel M.I., Korolev S.V., 1 specimen; near Baranovich, dry meadow near the railway, 9.VII.2017, leg. Gavrilyuk N.I., 2 specimens; same data, but 19-29.VII.2017, 28 specimens; same data, but 6.VIII.2017, 3 specimens; near Baranovich, dry meadow near the road, 10-26.VII.2017, leg. Gavrilyuk N.I., 15 specimens; near Baranovich, edge of a pine forest, 27.VII.2017, leg. Gavrilyuk N.I., 2 specimens; near Baranovich, caught in while fly, 15.VI.2018, leg. Ryndevich S.K., 1 specimen; Baranovich, at light, 1.IV.2019, leg. Ryndevich A.V., 18 specimens.

Bulgaria: Zlatni Pyasatsi /Golden Sands/, at light, 7.IX.2019, leg. Ryndevich A.V., 1 specimen; 0.5 km W Zlatni Pyasatsi /Golden Sands/, Natural Park Zlatni Pyasatsi, forest, 9.IX.2019, leg. Ryndevich S.K., 1 specimen.

Hungaria, Budapest, park, 7.V.2011, leg. V.N. Zuev, 2 specimens.

Montenegro: Rafailovichi, at light, 20.VIII.018, leg. Sokolts T.O., 1 specimen.

Ukraine: Odessa reg., Chernomorsk, at light, 28-31.VII.2017, leg. Ryndevich A.V. & Ryndevich S.K., 9 specimens; same data, but 2-3.VIII.2017, 5 specimens.

Note on ecological features.

The beetles actively migrate in the dusk and at night time and fly into the light (the fact recorded in Belarus, Bulgaria, Montenegro and Ukraine).

In Belarus, the beetles winter mainly in dwelling like other species of ladybirds. Wintering of *Harmonia axyridis* was observed in October, when daytime temperatures were +6-8 °C. The emergence of the beetles from wintering was observed in early April, when daytime temperatures were +8-10 °C.

The find of harlequin ladybird while wintering (in October 2016 in Baranovichi, Belarus) in a car which came from Minsk region seems to be interesting. This suggests the possibility of resettlement of *Harmonia axyridis* using vehicles.

The relative abundance of *Harmonia axyridis* is low in comparison with other species of local of ladybirds and is 2.7%. The relative abundance of wintering *Coccinella septempunctata* (Linnaeus, 1758) in anthropogenic and natural ecosystems in Baranovichi district is 23.7%, while *Coccinella quinquepunctata* (Linnaeus, 1758) – 16.5 %. However, there is a tendency to increase the number of harlequin ladybird, since back in 2015, only a few specimens of this ladybird were recorded in Baranovichi district.

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