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**RHOPALOSIPHUM RUFIBDOMINALE SASAKI (HEMIPTERA:APHIDIDAE) ON WHEAT
IN BULGARIA**
(SHORT RESEARCH NOTES)

Pavlin Vasilev

Agricultural University – Plovdiv, Bulgaria
E-mail: p_vasilev@au-plovdiv.bg

Abstract

The rice-root aphid, *Rhopalosiphum rufiabdominale* (Sasaki) (Hemiptera: Aphididae) is a polyphagous species with a worldwide distribution. In June 2020, colonies of *Rhopalosiphum rufiabdominale* were observed on the roots of wheat in the region of Pernik, the village of Batanovci, Bulgaria. The damage is caused by the nymphs and the adults while sucking plant sap from the roots and producing honeydew. The damaged plants have a yellowish colour, retarded growth and aphid colonies present on the roots. High densities cause wilting of the whole plant and result in its death. This is the first record of the presence of *Rhopalosiphum rufiabdominale* on wheat roots in Bulgaria.

Keywords: Rice-root aphid, *Rhopalosiphum rufiabdominale*, wheat, damage.

INTRODUCTION

The genus *Rhopalosiphum* (Koch, 1854) includes 13 species, 8 of which are found in Europe (Blackman and Eastop, 2000). Five species have been described in Bulgaria (Grigorov et al., 2004). The rice-root aphid, *Rhopalosiphum rufiabdominale* (Sasaki) (Hemiptera: Aphididae) is a polyphagous species and has a worldwide distribution. The place of origin of the species is Japan, where it is holocyclic with main hosts *Prunus* spp. (*yedoensis*, *mume*, *donarium* varieties, *persica*, etc.). Plants of the families *Poaceae*, *Cyperaceae* and particularly *Solanaceae* (potato, tomato) are secondary hosts. In most parts of the world, *R. rufiabdominale* is anholocyclic on the roots of secondary host plants (Blackman and Eastop, 2000). In Japan it is considered as the most common aphid on upland rice which may cause crop injury (Yano et al., 1983). Incidence of *R. rufiabdominalis* on different rice cultivars in India was studied by Dani and Majumdar (1978). In Egypt, rice-root aphid was found on the roots of *Nicotiana tabacum* and *Orobanche* sp. (Bodenheimer,

Swirski, 1957), and in an Australian glasshouse it was found damaging young banana plants (Hughes and Eastop, 1991). *R. rufiabdominale* has been reported from the southern countries in Europe (Spain, Italy, Greece, Portugal, France, Bulgaria), and also occasionally from greenhouses in Poland and Finland (Labanowski, 2008). Populations have been found on courgettes under glass in Italy (Ciampolini et al., 1993). In Bulgaria this species was found on the roots of *Oryza sativa* (Tashev, 1965). The aim of the present study was to determinate the aphid species on the wheat roots (*Triticum aestivum* L.).

MATERIALS AND METHODS

In June 2020, a high infestation by aphids was observed on the wheat roots (*Triticum aestivum* L. (Poaceae) in the region of the village of Batanovci, Pernik. The wheat plants were collected together with the roots and were brought to the laboratory at the Department of Entomology, Agricultural University – Plovdiv for identification. Based

on the morphology and using identification keys (Blackman and Eastop, 2000), the species was identified as *Rhopalosiphum rufiabdominale*.



Fig. 1. Map of the Republic of Bulgaria with the site where *Rhopalosiphum rufiabdominale* was recorded.

RESULTS AND DISCUSSION

Coming from the same genus, rice-root aphid (*R. rufiabdominale*) and cereal oat aphid (*R. padi*) look similar, though cereal oat aphid tends to have a hairier body and shorter setae on the antennae (Sunil and Poorani, 2018). The wingless forms (apterae) on the roots of the secondary host plants are dark-green or olive with usually reddish area at the posterior end of the abdomen between and around the siphunculi. The abdomen of the winged form (alata) is similarly coloured. Both apterae and alatae vary in length from 1.2 to 2.2 mm.

On macroscopic level, *R. rufiabdominale* can be easily confused with *R. nymphaeae* due to similar body shape and coloration. The identification of the collected specimens confirmed that all of them were rice-

root aphid *R. rufiabdominale*. The damage is caused by an adult and a nymph feeding on the roots, by sucking the root sap. The infested plants have yellowish colour, the growth is retarded compared to non-infested plants in the same field. High aphids' densities can cause wilting of the whole plant and may result in its death. Aphids also produce honeydew; the deposits can promote mold or fungal growth known as sooty mold. Below the surface, this may resemble a light dusty halo, not dissimilar to powdery mildew spots (Cranshaw et. al. 2019). There are no previous reports of the presence of *R. rufiabdominale* on wheat roots in Bulgaria (Fig. 2), although cereal growers from the region of Pernik have observed colonies and damage symptoms on the wheat plants a year before the current study.



Fig. 2. Macroscopic image of *Rhopalosiphum rufiabdominale* on wheat roots

There is evidence that *R. rufiabdominale* is an effective vector of barley yellow dwarf virus (BYDV) (Paliwal, 1980; Jedlinski, 1981). BYDV is distributed worldwide and is considered one of the most economically important diseases of cereals in the world (Riedell et al. 2003). In our study was not observed symptoms of BYDV.

CONCLUSION

This is the first record of *Rhopalosiphum rufiabdominale* on roots of wheat in Bulgaria. The rice root aphid might substantially endanger graminaceous (possibly also stone-fruit) crops in the country. Having in mind its potential to cause damage and vector virus disease, a larger survey is needed to establish its distribution in Bulgaria.

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