

FIRST RECORD OF *LISSORHOPTRUS ORYZOPHILUS*
KUSCHEL (COLEOPTERA: CURCULIONIDAE)
IN THE REPUBLIC OF NORTH MACEDONIA

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Abstract

The rice water weevil, *Lissorhoptrus oryzophilus* Kuschel (Coleoptera: Curculionidae), is one of the most destructive pests of rice worldwide. Native to North America, the species has progressively expanded its distribution to Asia and Europe, where it has established stable populations and caused significant economic losses. In June 2023, regular field inspections conducted in two commercial rice fields in the Kocani rice growing region of the Republic of North Macedonia revealed the presence of adult specimens and characteristic feeding damage on rice plants. A total of 27 adult individuals were collected using an entomological sweep net under permanent flooding conditions. Identification was based exclusively on morphological characteristics observed under stereomicroscopy and comparison with published taxonomic keys.

This study represents the first confirmed record of *L. oryzophilus* in the Republic of North Macedonia and indicates a potential risk for rice production in the region.

Key words: rice water weevil, first record, invasive species, rice pest, North Macedonia

Introduction. The rice water weevil, *Lissorhoptrus oryzophilus* Kuschel, is considered one of the most important rice pests worldwide [1]. The species

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originates from North America but has expanded its range over recent decades into Asia and Europe, where it has become widely established and economically significant. In 1976 it was accidentally introduced into Japan [1], and in 1988 was detected in China and Korea [2]. In Europe, its presence has been documented in Italy [3], France [4] and Spain [5]. In 2017, GIANTSIS et al. [6] record the first appearance of the rice water weevil in Greece, showing that the pest is spreading all over the continent.

Both adults and larvae contribute to plant damage. Adult weevils with their feeding cause characteristic damage to the plant's leaves, in the form of elongated scars and the larvae feed on roots and prune those [3]. Larval feeding reduces nutrient uptake, plant vigor and yield [7, 8]. The pest is strongly associated with flooded rice systems, where water management practices influence population development [9, 10].

Given the importance of rice production in the Kocani region, the introduction of this invasive pest may represent a serious threat to local agriculture. The objective of the present study was to confirm and document the occurrence of *L. oryzaophilus* in the Republic of North Macedonia.

Material and methods. Field surveys were conducted in the Kocani rice-growing region (41.916° N, 22.412° E) (Fig. 1), Republic of North Macedonia, at two localities (Bosevica and Slatina) in June 2023, in two commercial rice fields. The fields were managed under standard agronomic practices, typical for the region, including permanent flooding during the vegetation period.



Fig. 1. Map of North Macedonia showing the sampling site in the Kocani rice-growing region

Sampling and observations were carried out on 2 June and 24 June 2023, when the most pronounced damage symptoms were recorded under local production conditions. In the surveyed fields, the most significant damage was observed after the development of the third and fourth leaf of rice plants, corresponding to approximately 30–40 days after sowing.

Sampling was performed through visual inspections along transects within the selected fields. Adult specimens were collected using an entomological sweep net. At each sampling point, the net was drawn through the water over a distance of 1 m, and the procedure was repeated three consecutive times per location. In total, 27 adult specimens were collected.

Plants exhibiting feeding symptoms were examined in situ, and the root systems were inspected for larval presence and feeding damage.

Collected specimens were preserved in 96% ethanol for further examination.

Identification of the pest was based exclusively on morphological characteristics of adult specimens observed under stereomicroscopy and compared with published taxonomic keys [11, 12].

Voucher specimens have been deposited in the entomological collection of the Faculty of Agriculture, Goce Delcev University, Stip.

Results. Adult specimens of *L. oryzophilus* were detected in both surveyed rice fields. Characteristic feeding scars in the form of narrow longitudinal lesions were observed on rice leaves. The pest was predominantly recorded during the early flooding stage of crop development, consistent with its known biological behaviour.

Morphological examination confirmed the diagnostic features of *L. oryzophilus*, including body size, general grayish colouration, and characteristic elytral markings. The examined adult specimens measured approximately 3 mm in body length and exhibited a grayish-brown body covered with fine scales. The species is characterized by a slender and slightly curved rostrum, geniculate antennae with a distinct club, and elongated oval elytra. A longitudinal dark marking extending along the dorsal surface and the characteristic body shape distinguished *Lissorhoptrus oryzophilus* from other curculionid species that may occur in agricultural habitats. The examined specimens showed all diagnostic features consistent with published descriptions of *L. oryzophilus* (Fig. 2).

In addition to the presence of adult specimens, characteristic damage symptoms were observed on rice plants, including longitudinal feeding scars on leaves and injury to the root system typically associated with larval feeding (Fig. 3). Although no larvae were recovered from the collected plant material, the affected plants exhibited reduced root development and root pruning, symptoms consistent with those previously described for *Lissorhoptrus oryzophilus* infestations [7, 8]. Adult specimens of *L. oryzophilus* were collected from the same fields where root damage was recorded, supporting the association between the observed symptoms and the presence of this pest.

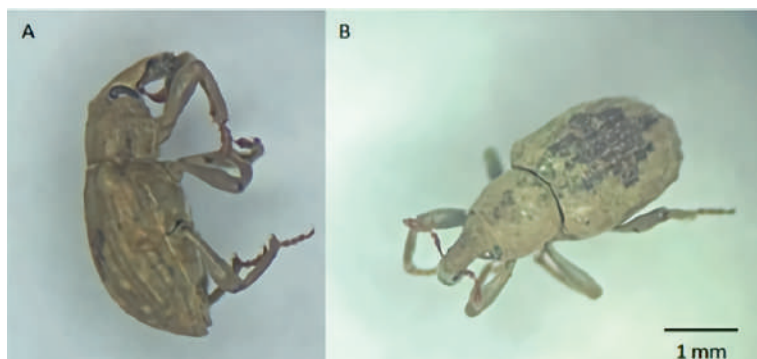


Fig. 2. Adult specimens of *Lissorhoptrus oryzophilus* collected from rice fields in the Kocani region, Republic of North Macedonia. (A) Lateral view showing the characteristic elongated rostrum. (B) Dorsal view showing the longitudinal markings of the elytra. Scale bar = 1 mm



Fig. 3. Feeding damage on rice plants caused by *Lissorhoptrus oryzophilus* observed in rice fields in the Kocani region, North Macedonia. Characteristic longitudinal feeding scars are visible on the leaves, while the root system shows signs of larval feeding damage

Discussion. The detection of *L. oryzaophilus* in the Kocani region represents the first confirmed record of this species in the Republic of North Macedonia. Considering its documented expansion across southern and southeastern Europe, the occurrence in North Macedonia is consistent with a continuing spread in the Balkan Peninsula.

The pathway by which *L. oryzaophilus* was introduced into the country remains uncertain. Possible introduction of the species into the country may include the movement of agricultural machinery, irrigation water, or transport of contaminated plant material. Given the geographical proximity of rice-growing areas in the neighbouring rice-growing regions in the Balkan Peninsula [6], natural dispersal or accidental human-mediated introduction cannot be excluded. However, these pathways remain hypothetical and require further investigation.

The species is well adapted to flooded rice production systems [8, 10], which predominate in the Kocani region. Such agroecological conditions may facilitate successful establishment and population growth. Given the economic importance of rice cultivation in the country, the presence of this invasive pest raises concerns regarding potential yield reductions and increased management costs.

Although the current findings are limited to two fields, the detection of multiple adult individuals suggests that the species may already be established locally. Further monitoring and systematic surveys are necessary to determine its distribution range and population density within the country.

Conclusion. This study confirms the first occurrence of *L. oryzaophilus* in the Republic of North Macedonia. The detection of adult specimens and characteristic feeding damage indicates that the species is present under local rice-growing conditions and may pose a future risk to national rice production. Continued monitoring and research are required to assess its spread and economic impact.

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