



SPECIES OF THE GENUS SCYMNUS FOUND IN UZBEKISTAN

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Abstract

In this article, the taxonomy, morphology and meeting coordinates of species belonging to the genus *Scymnus* (Kugelann, 1794) distributed in the Kashkadarya region are highlighted. As a result of our scientific research, the systematics of the genus *Scymnus* (Kugelann, 1794) distributed in the mountains, hills, cultivated deserts and agrocenoses of the Kashkadarya region, and the studied species composition, as well as the distribution area around the world, were presented.

Keywords: *Scymnus* (Kugelann, 1794), *Scymnus frontalis*, *Scymnus manipulus*, *Scymnus subvillosus*, *Scymnus* (Nephus) *bipunctatus*, *Scymnus rubromaculatus*.

Introduction

Coccinellids, or lady beetles (Coccinellidae), represent a family of insects comprising approximately 6,000 species distributed across 360 genera. The biology, ecology, systematics, and geography of representatives of this family have been extensively studied by numerous foreign entomologists [1, 3, 5, 6, 7, 8, 9, 10, 11, 12, 13].

In Uzbekistan, the bioecology and taxonomy of coccinellids have also been investigated by various researchers. Studies have identified 106 species and subspecies belonging to 25 genera within the country [1, 2]. A.K. Mansurov explored the species composition, ecological characteristics, and agricultural significance of coccinellids in southern Uzbekistan, identifying 42 entomophagous species and 2 phytophagous species within this family [4].

Scientific research conducted in Uzbekistan from 2020 to 2023 identified several species of the genus *Scymnus* (Kugelann, 1794), including *Scymnus frontalis* (Fabricius, 1787), *Scymnus* (S.Str.) *manipulus* (Fürsch & Kreisel, 1967), *Scymnus subvillosus* (Goeze, 1777), *Scymnus* (Nephus) *bipunctatus* (Kugelann, 1794), *Scymnus rubromaculatus* (Goeze, 1777), and *Scymnus apetzi* (Mulsant, 1846).





Our research focused on the systematics and species composition of insects belonging to the genus *Scymnus* (Kugelann, 1794), which are distributed across the vertical zones of the Kashkadarya region, as well as in reclaimed desert areas and agrocenoses. Using international databases such as GBIF and ITIS, we analyzed the geographic range and taxonomic characteristics of species within the *Scymnus* genus.

The global distribution of these species was analyzed using the Global Biodiversity Information Facility (GBIF) database. Taxonomy and nomenclature of the coccinellids were conducted based on data from the Integrated Taxonomic Information System (ITIS) [14, 15].

Taxonomic Classification:

- Order: Coleoptera (Linnaeus, 1758)
- Suborder: Polyphaga (Emery, 1886)
- Infraorder: Sucujiformia (Lameere, 1938)
- Superfamily: Coccinelloidea (Latreille, 1807)
- Family: Coccinellidae (Latreille, 1807)
- Subfamily: Coccinellinae (Latreille, 1807)
- Genus: *Scymnus* (Kugelann, 1794)

1. *Scymnus frontalis* (Fabricius, 1787)

Identification Location and Date: Kashkadarya Region, Koson District, on apricot (*Armeniaca vulgaris*), 3 males, 2 females, 564 m, coordinates 39°02'54" N, 65°35'14" E; Kasbi District, on maize (*Zea mays*), 1 male, 3 females, 746 m, located at 38°56'29" N, 65°24'28" E (15.07.2021).

Distribution: Western Europe, Mongolia, Near East, CIS - European part beyond the Carpathians, Caucasus, Siberia, Irkutsk, Yakutia, Kazakhstan, Kyrgyzstan, Uzbekistan [14, 15].

Morphological Identification: Yellow-fronted ladybird beetle. Adult body length 2.8–3.4 mm. Head and elytra are black, with one or two yellow spots on each elytron.

2. *Scymnus* (S.Str.) *manipulus* (Fursch & Kreisel, 1967)

Identification Location and Date: Kashkadarya Region, Kaltakol village, on red clover (*Trifolium pratense*), 1 male, 2 females, 182 m, coordinates 38°59'27" N, 65°07'06" E; Beshkent District, Yantok village, on camelthorn (*Alhagi maurorum*), 2 males, 2 females, 387 m, coordinates 38°59'15" N, 65°40'17" E (05.07.2021).

Distribution: Southern Palearctic type. Found in Afghanistan, Caucasus, Stavropol, Azerbaijan, Turkmenistan, southern Tajikistan (Dzhimkol), Kyrgyzstan (Issyk-Kul), Uzbekistan - particularly in mountainous deserts around Kashkadarya [14, 15].





3. *Scymnus subvillosus* (Goeze, 1777)

Identification Location and Date: Kashkadarya Region, Guzar District, on white poplar (*Populus alba*), 1 male, 2 females, 886 m, coordinates 38°36'16" N, 66°16'37" E; Kasbi District, on apple tree (*Malus domestica*), 2 males, 2 females, 746 m, coordinates 38°56'29" N, 65°24'28" E (12.06.2021).

Distribution: Western Europe, CIS—Ukraine, Transcarpathia, Caucasus (Georgia, Azerbaijan, Armenia, Dagestan), Siberia, Kazakhstan, Central Asia, Uzbekistan [14, 15].

Morphological Identification: Garden weevil beetle. Body length 1.8–2.5 mm, elongated-oval, yellowish-brown, covered in dense hairs. Elytra are dark yellow to light brown with dark sutures, with parallel punctures and long hairs along the seams.

4. *Scymnus (Nephus) bipunctatus* (Kugelann, 1794)

Identification Location and Date: Kashkadarya Region, on cotton plant (*Gossypium*), 1 male, 2 females, 886 m, coordinates 38°36'16" N, 66°16'37" E; Kamashi District, 1 female, 824 m, coordinates 38°48'38" N, 66°28'54" E (08.06.2022).

Distribution: Southern Palearctic distribution. Found in Western Europe, Asia Minor, Mongolia, Crimea, Caucasus, Kazakhstan, Central Asia, Syrdarya and Tashkent regions, and southern Uzbekistan [14, 15].

Morphological Identification: Two-spotted beetle. Adult body length 1.8–2.4 mm, glabrous. Elytra are black with one or two reddish-yellow spots in the lower half of each elytron.

5. *Scymnus rubromaculatus* (Goeze, 1777)

Identification Location and Date: Kashkadarya Region, Denov District, on alfalfa (*Medicago sativa*), 2 males, 2 females, 884 m, coordinates 38°23'19" N, 66°01'25" E; Kamashi District, on *Chenopodium album*, 3 males, 2 females, 824 m, coordinates 38°56'01" N, 66°14'39" E (07.06.2021).

Distribution: Southwest Palearctic type. Found in Western Europe, CIS - European part, Ukraine, Central Asia, Uzbekistan (Bukhara, Kashkadarya, Surkhandarya, Jizzakh, Fergana) [14, 15].

Morphological Identification: Red-spotted beetle. Body oval-shaped, length 2–2.5 mm. Each black elytron has a red stripe. Antennae and legs are yellow-brown.

6. *Scymnus apetzi* (Mulsant, 1846)

Identification Location and Date: Kashkadarya Region, Yakkabog District, on alfalfa (*Medicago sativa*), 2 males, 2 females, 191 m, coordinates 38°55'37" N, 66°46'26" E;





Kamashi District, on cotton (*Gossypium herbaceum*), 2 males, 3 females, 824 m, coordinates 38°49'29" N, 66°24'12" E (12.07.2021).

Distribution: Found in Turkey, Portugal, France, Australia, and Uzbekistan [14, 15].

Morphological Identification: Body length 2–3 mm. Elytra are covered with fine black hairs, each elytron has one red spot.

Conclusion

The study of the genus *Scymnus* (Kugelann, 1794) in the Kashkadarya region has enriched the understanding of the taxonomy, geographic distribution, and ecological significance of these coccinellid species. Through the integration of field observations, laboratory analyses, and data from global databases such as GBIF and ITIS, six species were identified and comprehensively described: *Scymnus frontalis*, *Scymnus manipulus*, *Scymnus subvillosus*, *Scymnus bipunctatus*, *Scymnus rubromaculatus*, and *Scymnus apetzi*.

These findings underscore the importance of *Scymnus* species as aphid predators in agroecosystems, especially in crops like apricots, maize, alfalfa, and cotton. The ecological and geographical analysis also highlights the adaptability of these species to various environmental conditions, including mountainous regions, deserts, and agrocenoses.

By leveraging international databases, the research provided a taxonomic classification aligned with global standards, ensuring the scientific accuracy and accessibility of the findings. Future research should focus on the adaptation mechanisms of these beetles under climate variability and their role in integrated pest management systems to support sustainable agriculture in Uzbekistan and beyond.

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