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BIOECOLOGICAL CHARACTERISTICS OF SPECIES OF THE GENERA SITONA GERMAR, 1817 (COLEOPTERA: CURCULIONIDAE) DISTRIBUTED IN FERGANA VALLEY

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Abstract: *A study was conducted to study and analyze the distribution, biology and ecology of species of the genus Sitona Germar, 1817 in the Fergana Valley, as well as the food spectrum. Researches were conducted in a number of regions of Andijan, Fergana and Namangan regions of the Fergana Valley, in various agrobiocenoses. Determining the number of weevils and collecting their samples was carried out on the basis of the route-monitoring method, starting from March, every 5-7 days during the vegetation of plants, and on the routes, 3 times a month in the areas where pest control was not carried out. As a result of research, Sitona callosus Gyllenhal, 1834, Sitona crinitus Herbst, 1795., Sitona cylindricollis Fåhraeus, 1840., Sitona flavescens Fabricius, 1787., Sitona humeralis Steph Sitona inops Gyllenhal, 1832., Sitona lineellus Bonsdorff, 1785., Sitona longulus Gyllenhal, 1834., Sitona sulcifrons Thunberg, 1798 distribution was recorded and bioecology was studied.*

Key words: *Entiminae, Fabaceae, Hortobiont, Oligophagous, Monovoltine*

INTRODUCTION

Sitona is an important genus belonging to the family Curculionidae (Entiminae). The genus *Sitona* is widely distributed throughout the Palearctic and Nearctic regions and includes more than 100 species [2]. Species of the genus *Sitona* differ from other genera of Curculionidae by their short and thick rostrum.

Almost all species of the genus *Sitona* are associated with leguminous plants (Fabaceae). They spend all stages of their life cycle on leguminous plants, while overwintering on other wild plants [1]. Many species of *Sitona* are considered important agricultural pests: their larvae feed on the root systems of leguminous plants, whereas adults damage the aboveground parts of plants, mainly the leaves.

The larvae of *Sitona* species feed on the roots of representatives of the family Fabaceae, causing injuries to the root system and creating favorable conditions for the development of harmful bacteria and fungi [3,4,5,6]. Considering these

characteristics, the study of species belonging to the genus *Sitona* is of great scientific and practical importance.

Under the conditions of Uzbekistan, alfalfa has both major and secondary pest species, and several species of weevils belonging to the genus *Sitona* damage both the underground and aboveground parts of the plant. Adult forms of weevils such as *Sitona cylindricollis* Fahr., *S. longula* Gyll., *S. callosus* Gyll., *S. humeralis* Steph., *S. fronto* Fst., *S. crinitus* Hbst., *S. lineellus* B. sd., and *S. inops* Gyll. feed on alfalfa leaves and cause considerable damage [8]. *Sitona cylindricollis* Fahr. develops in two generations per year [9].

MATERIALS AND METHODS

Observations and specimen collection aimed at studying the distribution and bioecology of representatives of the genus *Sitona* Germ. (Curculionidae family) in the Fergana Valley were carried out from March to June 2024. As a result of the study, during April–May at temperatures of 24–38 °C, the occurrence of *Sitona callosus* Gyllenhal, 1834; *Sitona crinitus* Herbst, 1795; *Sitona cylindricollis* Fåhraeus, 1840; *Sitona flavescens* Fabricius, 1787; *Sitona humeralis* Steph.; *Sitona inops* Gyllenhal, 1832; *Sitona lineellus* Bonsdorff, 1785; *Sitona longulus* Gyllenhal, 1834; and *Sitona sulcifrons* Thunberg, 1798 was recorded in several regions of Andijan, Fergana, and Namangan provinces of the Fergana Valley (Fig. 1).

Specimens were collected according to generally accepted entomological methods. The name of the collection site, collection date, number of weevils, and host plant species were recorded, and the collected data were processed accordingly. Permanent preparations and collections of individuals required for morphometric and morphological studies were prepared under laboratory conditions. The methods developed by M.H. Ahmedov, J. Qo‘shaqov, and I. Zokirov were used for pest monitoring, counting, collection, species identification, and preparation of collections and permanent slides [23].

Entomological sweep nets, forceps, brushes, and glass jars with perforated plastic lids (0.5–2 L capacity) were used for collecting weevil specimens. In addition, depending on the behavior of the weevils and their location on host plants, specimens were collected manually, while soil-dwelling representatives were obtained by digging the soil.

The abundance of weevils and specimen collection were carried out using the route-observation method. Monitoring was conducted every 5–7 days in stationary plots and three times per month along observation routes throughout the vegetation period beginning in March, in fields where no pest control measures had been applied.

Species identification of the collected weevils was performed using the works of several specialists in the field [19,20,21,22], and species nomenclature was

clarified accordingly. For identification of some species, online electronic identification platforms were also consulted [24].

Based on the obtained conclusions, the most recent systematic names were adopted.

Figure 1. Study areas in the Fergana Valley: territories of Andijan, Fergana, and Namangan provinces.

RESULTS

As a result of the research conducted to study the distribution and bioecology of representatives of the genus *Sitona* Germ. (Curculionidae family) in the Fergana Valley, the occurrence of *Sitona callosus* Gyllenhal, 1834; *Sitona crinitus* Herbst, 1795; *Sitona cylindricollis* Fåhraeus, 1840; *Sitona flavescens* Fabricius, 1787; *Sitona humeralis* Steph.; *Sitona inops* Gyllenhal, 1832; *Sitona lineellus* Bonsdorff, 1785; *Sitona longulus* Gyllenhal, 1834; and *Sitona sulcifrons* Thunberg, 1798 was recorded in the Andijan, Fergana, and Namangan provinces of the Fergana Valley.

Bioecology

Sitona callosus Gyllenhal, 1834

Hortobiont. Oligophagous species. Adult weevils feed on the leaves, shoots, and stems of alfalfa. The larvae gnaw nitrogen-fixing root nodules. In early spring, the species develops on weeds and cultivated perennial leguminous plants such as alfalfa.

Sitona flavescens Fabricius, 1787

Hortobiont. Oligophagous species. Damages young alfalfa seedlings.

Sitona humeralis Steph.

Oligophagous and univoltine species. Occurs in and damages the root zone of alfalfa. It is mainly associated with alfalfa and wild plants and overwinters in alfalfa fields.

Sitona longulus Gyllenhal, 1834

Oligophagous species. Damages alfalfa and other leguminous plants. The larvae overwinter in alfalfa roots and feed on root nodules. In early spring, adults emerging from larvae damage the stems, leaves, and shoots of alfalfa.

Sitona inops Gyllenhal, 1832

Oligophagous species. Adult weevils feed on the leaves, shoots, and stems of alfalfa.

Sitona sulcifrons Thunberg, 1798

Oligophagous species. Damages alfalfa and other leguminous plants. The larvae overwinter in alfalfa roots and feed on root nodules.

Sitona crinitus (Herbst, 1795)

Hortobiont. Polyphagous species. Young seedlings feed on the green parts of plants. In early spring, the species damages the first leaves, growth points, and cotyledons of pea plants. Young larvae gnaw nitrogen-fixing root nodules. According to the results of previous studies, severe infestation of leguminous crops may result in yield losses exceeding 50% (A. Xolliyev, 2018).

Sitona cylindricollis (Fåhraeus, 1840)

Oligophagous species. During the seedling stage of legumes, it feeds on the green parts of plants. In addition, it damages melon crops, cereals, and alfalfa, and is also widely distributed on wild plants.

In early spring, it develops on weeds and cultivated perennial legumes such as alfalfa. Adult beetles also move to pea plants, where they feed on flowers, while larvae feed on root nodules. The conducted studies revealed that this species is the dominant representative of the genus *Sitona* Germar, 1817 on pea plants.

Sitona lineellus Bonsdorff, 1785

Hortobiont. Oligophagous species. Feeds on the leaves, shoots, branches, and flowers of leguminous plants.

Overwintered beetles initially feed on the leaves of perennial legumes and later occur on pea plants during the flowering stage, which corresponds to the end of May and the first ten days of June. During the present study, the species was recorded on pea plants for the first time on 22.05.2024.

CONCLUSION

As a result of the conducted research, the occurrence of *Sitona callosus* Gyllenhal, 1834; *Sitona crinitus* Herbst, 1795; *Sitona cylindricollis* Fåhraeus, 1840; *Sitona flavescens* Fabricius, 1787; *Sitona humeralis* Steph.; *Sitona inops* Gyllenhal, 1832; *Sitona lineellus* Bonsdorff, 1785; *Sitona longulus* Gyllenhal, 1834; and *Sitona sulcifrons* Thunberg, 1798 was recorded in the territories of Andijan, Fergana, and Namangan provinces of the Fergana Valley. Among the recorded species, *Sitona crinitus* Herbst, 1795; *Sitona cylindricollis* Fåhraeus, 1840; and *Sitona lineellus* Bonsdorff, 1785 were identified as the main pests of pea plants. It was also established that: *Sitona lineellus* Bonsdorff, 1785 includes pea plants in its

seasonal feeding spectrum; *Sitona cylindricollis* Fåhraeus, 1840 is a species specialized in the pea agrobiocenosis. In general, weevils not only damage cultivated plants but also cause serious losses to stored pea products in storage facilities. Comprehensive studies on the biology of these species may provide opportunities for the development of effective pest management strategies against them.

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