PECULIARITIES OF SOME WEEVILS (COLIOPTERA CURCULIONIDAE) OF THE FERGANA VALLEY

[1]Abdurashidov Abdulaziz Baxtiyorovich.* [1] Yuldashev Nasirdjan Muxamedjanovich,
[1] Sertaev Muxametamin Mametjanovich
[1]Tashkent pediatric medical institute, Tashkent, Republic of Uzbekiston
https://doi.org/10.5281/zenodo.10030208

Abstract. *The Article describes the results of field research conducted in April□October 2021 in the Fergana Valley which Weevils (Curculionidae) were studied. Beetle collections were carried out in six districts of the Fergana Valley that are Izbascan, Asaka, Shahrikhan, Chust, Pap, and Mingbulak districts. Insects were caught with nets and shovels and knives were used to collect insects living in the soil and under tree barks. Devices were also used to capture beetles. Tweezers and magnifying glasses were used to dissect and examine insects. The beetles caught in the field were stored in test tubes and jars. A total of 1381 specimens of weevil beetles were collected. Currently, this collection is stored in the NUU Museum. In the Fergana Valley Otiorhynchus ovatus, Otiorhynchus velutinus, Sibinia Subirrorata, Arthonomus pomorum, Tychius Polylineatus, Notaris Acridilus, Sibina Pusilla, Sibinia Zuberi, Sibinia Primita, Sibiba Taschkentica, and other species were found. The article provides a general description of weevils and primary information on the species composition and morphological features of the identified species. For each species, the place and dates of their discovery are given. A conclusion is made about the need to conduct similar studies in all regions of the Republic of Uzbekistan.*
Keywords: *insects, beetles, weevils, rostrum, Fergana Valley.*

Introduction: The family of beetles Curculionidae (weevils or elephant weevils) has more than 50 thousand species, and most of them inhabit tropical regions of the Earth. These beetles are named weevils or elephants due to the presence of a rostrum, which is a part of the beetle's head capsule elongated into a tube. The family Curculionidae is divided into two sections: Adelognatha (short-proboscis weevils) and Phanerognatha (long-proboscis weevils).These two groups of beetles differ from each other precisely in the length of the rostrum. The rostrum of long-proboscis weevils is more than twice its thickness at the base (photo 1a), while that of short-proboscis weevils does not exceed twice its width at the base (photo 1b). The larvae of most long-proboscis beetles develop inside plant tissue, while the larvae of a larger number of short-proboscis beetles develop in the soil. Most weevil beetles, their imaginal and larval stages are phytophagous and some species are phytosaprophagous. Due to their feeding habits, weevil larvae can cause damage to field, vegetable, orchard, forest, exotic and industrial crops, as well as plant stocks, by developing in tissues, fruits, and seeds (photos 2a and 2b).

Therefore, it is very important to study their distribution and protecting agricultural plants, as well as food supplies in the form of fruits and seeds. Considering this circumstance, this work aimed to study the species composition of weevils in the Fergana Valley in the Republic of Uzbekistan.

a **b**

Photo 1. Beetles of the Family Curculionidae: a – Curculio elephas (https://commons.wikimedia.org/w/index.php?curid=486342), b – Otiorhynchus raucus (https://commons.wikimedia.org/wiki/File:Otiorhynchus_raucus_01.JPG.).

a **b**

Photo 2. Weevil beetle Anthonomus pomorum (Linnaeus, 1758) (a), affected by weevil beetles - chickpea seeds Anthonomus pomorum (Cicer arietinum) (Linnaeus, 1758) (b)

The purpose of the study. Study of the species composition of weevil beetles found in the Fergana region of the Republic of Uzbekistan.

Research material and methods. Collections of weevil beetles were carried out in 6 districts (Izbaskan, Asaka, Shakhrikhan, Chust, Pap and Mingbulak) of the Fergana Valley in early April and late October 2021. To catch insects they used nets, shovels and knives, and devices for capturing beetles. Tweezers and a magnifying glass were used to dissect and examine insects. Test tubes and jars were used to store caught beetles in the field. A total of 1381 specimens of weevil beetles were collected. Currently, this collection is stored in the NUU Museum. In general, the

species of weevils as Otiorhynchus ovatus, Otiorhynchus velutinus, Sibinia Subirrorata, Arthonomus pomorum, Tychius Polylineatus, Notaris Acridilus, Sibina Pusilla, Sibinia Zuberi, Sibinia Primita, Sibiba Taschkentica and others were found in the Fergana Valley.

Research results and their analysis. Subfamily Entiminae

Subfamily Entiminae

1. ***Otiorhynchus ovatus (Linnaeus, 1758)*** – Small black mower

Synonyms: Otiorhynchus globulipennis Gyllenhal, 1834; Otiorhynchus pabulinus Panzer, 1798; Otiorhynchus rosae DeGeer, 1775.

Material: 161 specimens were collected from this type of weevil. Among them from the Izbaskan district (Daminboychek) 68♀ copies (04. 05. 2021), Asaka district (Kunzhi) 27♀ copies (04. 17. 2021), Shakhrikhan district (Dastirkhonchi) 32♀ copies (05. 01. 2021), Chust district (Dasht oksuv korsun) 34♀ copies (20. 05. 2021).

Morphobiological features: Otiorhynchus ovatus, the strawberry weevil is one of the many species of the weevil family (Curculionidae). The 1st and 2nd segments of the antennal flagellum are almost equal in length. The front back is covered with coarse grains, which on the disk merge into longitudinal wrinkles. Body dark brown to black, shiny. The antennae and legs are reddish-brown. Length 4.5-5.5 mm. In fact, no males have ever been observed in this species. Plants that the strawberry weevil feed on include strawberries, raspberries, rhododendron, grapes and peppermint, and they are also known to feed on grasses.

Geographical distribution: European part of Russia, Central Asia, Western Europe, introduced to North America.

2. Otiorhynchus velutinus (Germar, 1823)

Synonyms: Otiorhynchus cerdanensis Jacquet, 1888; Otiorhynchus desbrochersi Stierlin, 1896; Otiorhynchus exilis Boheman, 1842; Otiorhynchus globithorax Boheman, 1842.

Material: Only 176 specimens were collected from this type of weevil, of which in the Asaka region (Kunzhi) 32 specimens - 14♀ and 18♂ (04. 17. 2021), in the Shakhrikhan district (Dastirkhonchi) 45 specimens - 15♂ and 30♀ (01. 05. 2021), in the Pap region (Uyghur) 29 copies – 14♂ and 19♀ (11. 06. 2021), in the Chust region (Dasht oksuv korsun) 34 copies – 21♀ and 13♂ (20. 05. 2021) and in the Mingbulak district (Beshkapa) 36 copies - 14♂ and 19♀.

Morphobiological features: Otiorhynchus velutinus is a species of weevils from the subfamily Entiminae. Beetle is 4 - 6 mm long. The body colour is brownish-brown or reddish-brown in color, covered with thick light hairs. The first segment of the antennal flagellum is significantly longer than the second, distinctly longer than the width at the apices. The elytra is ovoid, the posterior part of the sutural interval is slightly swollen in a ridge-like manner.

Geographical distribution: inhabit the steppes. Beetles can be found on dense turf grasses. Steppe and forest-steppe zones of the European part of Russia, Southern Urals, Siberia, Crimea, Ukraine, Kazakhstan, Transcaucasia, Western and Central Asia, Eastern Europe, France.

Subfamily Tychiinae

3. Tychius polylineatus (Schoenherr, 1835)

Synonyms: Tychius bertolinii Stierlin, 1894; Tychius brevicollis Rey, 1895; Tychius clavipes Rey, 1895; Tychius griseus Schaeffer, 1908.

Material: 163 specimens were collected from this type of weevil, of which in the Asaka district (Kunzhi) 55 specimens - 30♀ and 25♂ (04. 17. 2021), in the Shakhrikhan district (Dastirkhonchi) 38 specimens - 16♂ and 22♀ (01 05. .2021), in the Pap region (Uyghur) 29 copies

- 17♂ and 12♀ (06. 11. 2021) and in the Chust region (Dasht oksuv korsun) 41 copies - 25♀ and 16♂ (05. 20. 2021).

Morphobiological features: The rostrum is slightly curved, and when viewed from above it is almost parallel to the side. The eyes are strongly convex, protruding noticeably beyond the contour of the head. The pronotum is transverse, 1.15-1.29 times wider than its length, strongly rounded on the sides, rather strongly narrowed towards the base, moderately convex above. The elytra are elongated (the ratio of length to width is 1.34 - 1.44), almost parallel-sided in the anterior half, moderately convex above. The body is blackish-brown, the apex of the rostrum, the antennae (except for the club), the tibiae and tarsi are reddish, the femurs are dark brown, the antennal club is black. The dorsum is predominantly covered with dense adjacent hair-like (length to width ratio 6:9) scales: the base of the rostrum, forehead, midline of the pronotum and odd intervals of the elytra (except for the suture) in grayish-white scales; the remaining surface is in grayish-brown scales with a golden or brass tint.

Geographical distribution: Middle zone and south of the European part of Russia, Central Asia.

Subfamily Curculianinae

***4. Anthonomus pomorum (Linnaeus, 1758*)**

Synonyms: Anthonomus duprezi Hoffmann, 1954; Anthonomus obsoletus Desbrochers, 1892; Anthonomus rubromaculatus Desbrochers, 1895.

Material: 159 specimens were collected from this type of weevil, of which in the Izbaskan district (Daminboychek) 71 specimens - 26♂ and 45♀ (04. 05. 2021), in the Asaka district (Kunzhi) 32 specimens - 19♀ and 13♂ (17. 04. 2021), in the Shahrikhan region (Dastirkhonchi) 27 copies - 9♂ and 18 ♀ (05. 01. 2021) and in the Pap region (Uyghur) 29 copies - 17♂ and 25♀ (06. 11. 2021).

Morphobiological features: Apple flower beetle or apple weevil - flower beetle - an agricultural pest. The rostrum is parallel-sided, with a distinct median carina. Elytra with a very oblique band behind the middle. Fore femora with very large teeth. The antennal flagellum is 7-segmented, the 1st and 2nd segments are thin. The pronotum is weakly transverse, tapering more noticeably conically towards the apex. Length 3.4 - 4.3 mm.

Geographical distribution: Most of the Palaearctic, except for the northern regions.

5. Notaris acridulus (Linnaeus, 1758)

Synonyms: Notaris punctum Billberg, 1820; Notaris insularis Faust, 1882.

Material: 137 specimens were collected from this type of weevil, of which in the Izbaskan district (Daminboychek) 45 specimens - 6♂ and 39♀ (05. 04. 2021), Asaka district (Kunzhi) 21 specimens - 18♀ and 3♂ (17. 04. 2021), in the Pap region (Uyghur) 32 copies – 10♂ and 22♀ (06. 11. 2021) and in the Chust region (Dasht oksuv korsun) 39 copies – 22♀ and 17♂ (05. 20. 2021).

Morphobiological features: very similar to N. scirpi, but the sides of the abdomen and the episternum of the hind thorax are without scales. The shape of the anterior dorsum is similar to that of N. scirpi, but the anterior dorsum is quite large compared to the elytra. The elytra, except for the anterior part of the sutural interval, have distinct thin grains. Elytra behind the middle of the 3rd space, with a yellow spot. The antennae and legs are red-brown. In the highland subspecies ssp. montanus the body is black, almost naked, the tibiae, tarsi and antennae are rusty-red, the elytral spaces are more convex, and the grooves are very deep. Body length 3.2 - 4.9 mm. Beetles are common near various bodies of water and in marshy areas.

Geographical distribution: Russia, Kazakhstan, Central Asia, Central and Northern Europe, Sudetes and Carpathians.

Subfamily Tychiinae

6. Sibinia (Dichotychius) subirrorata (Faust, 1885)

Synonym: Sibinia ochraceosquamosa Voss, 1959.

Material: 122 specimens were collected from this type of weevil, out of which in the Asaka district (Kunzhi), 27 specimens - 15♀ and 12♂ (04. 17. 2021), in the Shakhrikhan district (Dastirkhonchi), 32 specimens - 14♂ and 18♀ (01. 05. 2021), in the Pap region (Uyghur), 29 specimens – 17♂ and 12♀ (06. 11. 2021), and in the Chust region (Dasht oksuv korsun), 34 specimens – 20♀ and 14♂ (05. 20. 2021).

Morphobiological features: The rostrum is slightly curved and longer than the anterior back in the male by 1.00 - 1.08 times, and in the female by 1.14 - 1.28 times. The antennae of the male are attached in the apical third of the rostrum, and those of the female are attached closer to its middle. The front back is weakly transverse, widest in the main half, rounded and narrowed forward from the base. The body is elongated, elongated. The elytra are elongated, almost parallel-sided, reddish-brown, with dense oval or elliptical scales pressed in the middle, located in one regular row, on the spaces and grooves of the elytra. The upper body is covered with yellowish or reddish-brown scales, with an admixture of white scales on the legs, head, base of the rostrum, sides of the anterior back, and on the grooves of the elytra. The lower part of the body, the sides of the anterior back, and the epimeres are entirely covered with dense white scales. Length: 1.4 □ 2.0 mm.

Geographical distribution: Dagestan, Kazakhstan, Uzbekistan, Turkmenistan, Afghanistan, Turkey.

7.* Sibinia (Dichotychius) staticis *(Becker, 1864)

Synonyms: Sibinia minutissima Tournier, 1873; Sibinia zuberi Desbrochers, 1873.

Material: 162 specimens were collected from this type of weevil, out of which in the Izbaskansky district (Daminboychek), 68 specimens - 28♂ and 40♀ (04. 05. 2021), in the Asaka district (Kunzhi), 33 specimens - 21♀ and 12♂ (17. 04. 2021), in the Shahrikhan region (Dastirkhonchi), 32 specimens - 14♂ and 18♀ (01. 05. 2021), and in the Pap region (Uyghur), 29 specimens - 17♂ and 12♀ (11. 06. 2021).

Morphobiological features: The upper edge of the rostrum is slightly convex and longer than the front back, in the male it is 0.93 - 0.98 times, and in the female it is 1.03 - 1.10 times. The eyes are flat. The front back is more or less cone-shaped, the constriction at its anterior edge is sloping, and slightly rounded on the sides. The elytra are rather convex, oval or slightly obovate. The antennae, legs, and rostrum are reddish-yellow. The upper body has large, thick, slightly depressed in the middle, brownish or grayish scales, round or oval on the front back and elliptical on the elytra. Often the base of the front back, the suture space, and the sides of the elytra are covered with whitish scales without a metallic sheen. Usually, the scales on the first interval of the elytra are arranged in a somewhat chaotic order, while on the lateral ones, on the contrary, they form completely regular rows. The lower part of the body is covered with dense grayish-white scales. Length: 1.3 □ 1.7 mm.

Geographical distribution: Volgograd region of the Russian Federation, Kazakhstan, Central Asia.

8. Sibinia taschkentica (J. Faust, 1886)

Synonyms: Sibinia dohrni Becker, 1864; Sibinia indigena Desbrochers des Loges, 1907; Sibinia subvittata Schilsky, 1908; Sibinia zebra Gyllenhal, 1835.

Material: A total of 140 specimens were collected from this weevil species. In the Izbaskan district (Daminboychek), 49 specimens were collected - 21♂ and 28♀ (04. 05. 2021). In the Asaka district (Kunzhi), 29 specimens were collected - 20♀ and 9♂ (17. 04. 2021). In the Chust region (Dasht oksuv korsun), 62 specimens were collected - 41♀ and 12♂ (20. 05. 2021).

Morphobiological features: The female has a strongly curved rostrum. The body is wide, with a strongly transverse anterior dorsum that narrows noticeably towards the base. The anterior margin is usually narrow and separated by a sharp groove. The elytra have a pale golden suture spot that is usually distinct, reaching halfway along the elytra and occupying two internal spaces in width. Additionally, there is a stepped band running from the 6th space to the apical slope on the suture. The lower legs are usually completely red, occasionally dark.

Geographical distribution: Russia, Kazakhstan, Central Asia, Central and Northern Europe, Sudetes and Carpathians.

***9. Sibinia primita (Herbst, 1795*)**

Synonyms: Sibinia gyllenhali Desbrochers des Loges, 1895; Sibinia signata Panzer, 1806. Material: A total of 161 specimens were collected from this type of weevil. In the Izbaskan region (Daminboychek), there were 71 specimens - 29♂ and 42♀ (04. 05. 2021). In the Pap region (Uygur), there were 35 specimens - 17♂ and 18♀ (11. 06. 2021). In the Chust district (Dasht oksuv korsun), there were 41 specimens - 25♀ and 16♂ (20. 05. 2021). And in the Mingbulak district (Beshkapa), there were 54 specimens - 21♂ and 32♀ (25. 09. 2021).

Morphobiological features: The pronotum is barely wider than long, slightly rounded on the sides, and slightly narrowed forward. The rostrum is black, only dark brown at the apex. The elytra have a golden brown scutellar spot and stripes on the pronotum, with a metallic sheen. The posterior edge of the scutellum is bordered by wide yellow scales, which are sometimes scattered singly on the spaces and grooves. The antennae and femurs are dark brown, while the tibiae and tarsi are brownish-red. The length ranges from 1.4 to 1.8 mm.

Geographical distribution: The species is found in Russia, the Caucasus, the Mediterranean, Southern, Western, and Central Europe, southern Sweden, North Africa, Central Asia, and Iran.

Conclusion: The Fergana Valley is located in the southwestern part of the vast Tien Shan mountain system. The climate of the Fergana Valley varies somewhat among the regions depending on their altitude, proximity to the mountains, and distance from the western, open, most arid, windy part of the valley. Average monthly temperatures in July range from +23 °C in the west to +28 °C in the central parts of the valley, with maximum temperatures reaching +43 °C. Average January temperatures range from -0.9 °C in the west to -2.5 °C in the east. The family Curculionidae belongs to the superfamily Curculionoidea of the suborder Polyphaga within the order Coleoptera (Lawrence, Newton). Members of the family are widespread and play an important role in biocenoses as primary consumers, while various predators feed on weevils. Obligate herbivory serves as a prerequisite for the appearance of pests. Some species, which develop at the expense of agricultural crops and forest species, have become significant pests of agriculture and forestry. The proportion of harmful species in the fauna is more than 30%. Several species feed on weeds and limit their spread. Therefore, it is important to understand the composition and zonal characteristics of the weevil fauna and to identify potential pests among

them. Species of economic importance, as well as rare and relict species, require protection. In order to prepare an entomological collection and study anatomical and morphological structures, insects must be killed using appropriate methods. Stains were used to kill ground insects. Species such as Otiorhynchus ovatus, Otiorhynchus velutinus, Sibinia subirrorata, Arthonomus pomorum, Tychius polylineatus, Notaris acridilus, Sibinia staticis, Sibinia primita, Sibinia taschkentica, and others were collected from the Fergana Valley. They differ from each other in appearance, diet, distribution, reproduction, and other characteristics. Some weevil species have a long development period (55-65 days), while others have a short period (25-30 days). There are weevils that reproduce through parthenogenesis (e.g., Otiorhynchus ovatus). After description, all captured insects were transferred for storage to the museum of the Faculty of Biology at NUUz. Similar studies in other regions of the Republic of Uzbekistan are considered necessary.

Conflict of Interest: The author declares that there is no conflict of interest regarding the study.

REFERENCES

1. Горностаев Г.Н. Насекомые СССР (Справочники-определители географа и путешественника). – Москва: Мысль, 1970. – 372 с.
2. Исаев А.Ю. Определитель жесткокрылых Среднего Поволжья (Ч. III. Polyphaga - Phytophaga). Ульяновск: Вектор-С, 2007. – 256 с.
3. Коротяев Б.А. Материалы к познанию Ceutorhynchinae (Coleoptera, Curculionidae) фауны СССР и Монголии // Насекомые Монголии. Л., 1980. – Вып. 7. – С. 167-282.
4. Юферев Г.И. Отряд Coleoptera - Жесткокрылые // Животный мир Кировской области (беспозвоночные животные). Дополнение. Киров: Изд-во ВГПУ, 2001. – т. 5. – С. 120-180.
5. http://www.zin.ru/.../sibminza.htm.
6. http://www.colpolon.biol.uni.wroc.pl/index.htm
7. http://www.zin.ru/.../otiovakm.htm
8. http://www.colpolon.biol.uni.wroc.pl/index.htm