THE FAUNA OF BEETLES (COLEOPTERA) OF THE TURKESTAN REGION

Abdikassym A.A., Tolymbek G.M., Sailauova B.B., Zhalgasbek M.A.,
Ospanova G.S., Bozshatayeva G.T.
M. Auezov South Kazakhstan State University, Shymkent, e-mail: bozshataeva69@mail.ru

One of the objectives to research is to study the species composition and ecology of ground beetles inhabiting the nearby areas of the center of Turkestan region, the second – the study of xylophilic Coleoptera, which gives valuable information on the General state of ecosystems, patterns of development biocenosis of Turkestan region, the third – coccinellide, which are important regulators of the number of phytophages, including aphid –sucking pests and vectors of viral diseases of agricultural plants. As known, representatives of the family of ground beetles (Coleoptera, Carabidae) play an important role in natural and anthropogenic landscapes, methods of collecting beetles are simple, and the definition is not associated with the use of labor-intensive methods. This may explain the choice of beetles of the family Carabidae as a model as flight time and to monitor the status of biocenosis, biological method of combating pests of agriculture. Analysis of the literature data shows that possible indicator groups of insects in Kazakhstan is the account of species composition and number of beetles – black beetles, ground beetles, xylophilic beetles, etc. According to preliminary data, the species composition of beetles living on the territory of three districts of Turkestan region varies: the most diverse in terms of species Tulkubas district. Among the caught ground beetles predators are such species as Cicindelaturkestanica, Calosomasycophanta, Lebiacyanocephala, Lebiapunctata, Lebiacruxminor, Carabusgranulatus. Seven species of xylophilic beetles belonging to three families were registered in the study area.

Keywords: species composition, ground beetles, saproxylic beetles, coccinellides, abundance, frequency of occurrence

Now ladybugs are purposefully used in the biological method of pest control. One larva of a ladybug during its development destroys up to 500-700 aphids, and an adult beetle per day – 50-60 aphids.

The study of coccinellids of South-East Kazakhstan is devoted to the work of G. I. Savoy, which was composed of definitive tables for 133 species of larvae and 180 species of imago coccinellids. [1, 2]

Ground beetles – among Coleoptera belong to the largest and most diverse family. Currently, the number of species in this family is estimated in numbers from 20 to 40 thousand, which determines their importance as the most important components of communities that play a huge role in maintaining natural homeostasis.

Ground beetles are of great importance in environmental studies, they respond quickly to changes in microclimatic and soil-plant conditions, therefore they are often used as one of the convenient bioindicators for assessing the state of the environment. [3]

Large ground beetles of the genera Calosoma and Carabus eat shaggy caterpillars (for example, unpaired (Lymantriadispar L.) and Siberian (DendrolimussibiricusTschetw) silkworms, which in nature have almost no other natural enemies.

However, there are also herbivorous species in this family, some of which are primary pests of grain crops (for example, bread ground beetle or peun – Zabrustenebrioides).

The wide ecological plasticity of the family members is the reason for their widespread abundance. Ground beetles inhabit almost the entire range of latitudes from cold tundra to deserts.

Due to the large size and bright color, representatives of some groups of ground beetles are of aesthetic importance, are also a favorite collectible. [4]

In Kazakhstan, representatives of about 100 families of the order of Coleoptera, belonging to the 2 largest sub-orders: carnivores (Adephaga) and Polyphaga (Polyphaga).

Inhabit all habitats land, except the eternal snows of the highlands, and freshwater (the most numerous and noticeable predaceous diving beetles Dytiscidae, Hydrophilidae water scavenger beetles and whirligig beetles Gyrinidae).

Most numerous in terrestrial ecosystems, are ground beetles (Carabidae), Rove beetles (Staphylinidae),scarab (Scarabaeidae), chernotsky (Tenebrionidae) blister beetles (Meloidae), leaf beetles (Chrysomelidae), Longhorn beetles (Cerambycidae), weevils (Curculionidae).

Representatives of these families, meet the criteria of indicator species, can be widely used in assessing the state of various ecosystems. [5]

According to Ishkov E.V. et al (2001) in the Aksu-Dzhabagly nature reserve, located in Tulkubas district of the Turkestan region, there are about 700 species of beetles belonging to 300 genera and 41 family of the ground beetles – 113 species, the fauna of beetles of dendrophagus – 73 species, 25 species of ladybirds, 34 species of darkling beetles. The first place in the number of species is the family of weevils, or elephants. In these beetles the head is extended into a long tube, often exceeding

the length of the body. All weevils are herbivorous, larvae and adults feed on roots, stems, flowers, fruits, etc.

The ground beetles belonging to the group of carnivorous beetles are widespread in Aksu-Dzhabagly, although there are both predators and herbivorous species among them. Among the predatory interesting horse Turkestan – medium-sized beetle metal-green with red spots on the back. He very quickly runs round, well flies, prefers dry open spaces. The larva lives in burrows, where it lies in wait for prey, catching that, pierces the mandibles and sucks.

The largest beetles of this family belong to the genus of real ground beetles (Carabus). They are 7 species in the reserve, most of them are Western Tien Shan endemics and differ in the early spring period of activity.

Close to them are large, averaging 3 inches long, the most beautiful we have-odorous Krasotel and Callisthenes Kushakevicha. The first is painted in Golden-green, the second – in blue-purple with a metallic sheen.Krasotel in the reserve are scarce, found mostly in the reeds, and juniper bushes, very useful, because it destroys the larvae and pupae of lepidopteran pests.

Kallistenes Kushakevich – West Tien Shan endemic – most common in the foothills and low steppe. Beetles are most active in April – may, at this time 14-18 individuals can be counted on 1 kilometer of the route 1-2 meters wide.

Common in the reserve ground species of ground beetles – dull (8 species) and black runners (7 species), small bembidions (11 species). Species with an interesting biology, mention should be made of Libi – beautiful, metallic-green, blue (labiolingually and point) or black cross with red and yellow pattern (Libya-Crusader) beetles with a flattened body with small dimensions.

In Aksu-Dzhabagly they are found in the belts of steppes and juniper, often on trees and shrubs, usually under the bark of juniper, birch. Adult individuals feed on aphids and other insects, and their larvae parasitize on pupae of leaf beetles. [6]

In connection with all the above, we can conclude that the study of ground beetles and other Coleoptera is of great practical importance.

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Overall, in the Turkestan region the fauna of ground beetles and beetles of dendrofagous, coccinellides understudied, and data on ecology of these beetles are few.

Materials and research methods

The material served as gathering of authors, 2018, the Survey was conducted by the routing method. To collect the material used generally accepted methods in entomology: insect sampling with entomological net and hand picking. In connection with all the above, we can conclude that the study of ground beetles is of great practical importance.

Barber traps were also used to collect insects, in which a formaldehyde solution was used as a fixing fluid. [7, 8]

Results of the research and discussion

Turkestan region is located in the South of Kazakhstan, within the Eastern part of the Turan lowland and the Western spurs of the Tien Shan. Most of the territory is flat, with the hilly-ridge Sands Kyzyl Kum steppe Sochi (South-West, on the left Bank of the Syr Darya) and moyynqum (in the North, on the left Bank of Chu).

The Northern part is occupied by the Betpak-Dala desert, in the far South – the Hungry steppe. The middle part of the region is the Karatau ridge, in the South-East – the Western outskirts of Talas Alatau, Karzhantau and Ugam (the highest point – Sairam peak). The major rivers – the Syr Darya and its tributaries Keles Kurkeles, ARIS, Bugun etc.) crosses the region from South to Northwest, and the Chu river (downstream) flowing to the North and disappearing in the Sands of the Moyynqum.

The region is located in a zone of sharply continental climate. Fertile soil, plenty of sunlight, vast pastures create great opportunities for the development of various sectors of agriculture in the area, primarily irrigation farming and grazing sheep. High yields give crops of cotton, rice, as well as gardens and vineyards.

For the study of Coleoptera of the Turkestan region was selected three districts-Tyulkubas, which houses the Aksu-Dzhabagly reserve and the Sairam-Ugam national Park; Sairam – rasparenny near the city of Shymkent and Baidibek, typical gray soils with significant tracts of salt licks and salt marshes.

On the basis of collections, study of collection materials, as well as with the involvement of literary data, the preliminary data on beetles-ground beetles living in the territory of the Turkestan region (the table contains a preliminary list of ground beetles of certain regions of the region).

Preliminary composition of ground beetles and their occurrence in some regions of Turkestan region

Typeofgroundbeetles	Tulkubasdistrict	Sairamdistrict	Baidibekdistrict
CallistheneskuschakevitschiBallion	+	_	_
Calosomasycophanta	+	_	_
ScaritessalinusDejean	+	+	+
ScaritesterricolaBonelli	+	+	+
LebiacyanocephalaLinnaeus	+	+	+
Lebiapunctata	+	+	+
Lebiacruxminor	+	+	_
ChlaeniusextensusMannerheim	+	-	-
CicindelaturkestanicaBallion	+	-	-
Bembidionquadrimaculatum (Linnaeus, 1761)	+	+	+
CarteruscalydoniusRossi	+	_	_
Carabusgranulatus	+	+	+

Of the above ground beetles, Cicindelais a predatory species. Calosoma sycophanta turned out a very effective means of dealing with the Gypsy moth (most often the victims of the entomophage that unpaired and ringed caterpillar moth, American white butterfly, the oak leafroller).

Beetle Callistheneskus is Tien Shan endemic. Lebiacyanocephala, Lebiapunctata, Lebiacruxminor are regulators of the number of harmful insects, so adults feed on aphids, and their larvae parasitize on pupae of leaf beetles. Carabusgranulatus beetles and their larvae, like most ground beetles, benefit by destroying pests.

According to preliminary data, seven species of xylophilic beetles belonging to three families have been registered in the territory of Turkestan region:

1. FamilyScolytidaeLatreille, 1806 – Bark Beetles.

Family woodworm – Xyleborinus saxeseni (Ratzeburg, 1837). The polyphagous Gypsy bark beetle, damage the trees and shrubs. It occurs very often in different types of plantations of mixed and deciduous forests, which develops on different broad-leaved species. Damages poplars and willows.Lays rather deep moves, which develops black ambrosianae mushrooms.Attacks the fallen and standing weakened trees of different age.

The zabolonnikom wrinkled Scolytusrugulosus Ratzeburg, 1837 (Smediaterraneus Eggers, 1922). Lives on all fruit trees, hawthorn and forest plantations with the presence of fruit trees. Scolytusrugulosus is the most dangerous of the sapwood in wild and cultivated fruit plantations.

2. FamilyBuprestidae – Zlatki. The Genus Julodis.

Spotted zlatka – Julodisvariolarisvariolaris (Pallas, 1771). At the larval and imago stage, it can harm seedlings and young fruit trees. Beetles gnaw the bark of young branches, leaf stalks, can gnaw the buds of fruit trees, preferring stone. With mass reproduction, their damage can lead to defoliation of young trees. The economic importance of this species as a pest is greatest in the southern regions with arid climate.

Juniper zlatka – Anthaxia (Melanthaxia) conradti.Damages Juniperus (Juniperus). The larvae of jewel beetles gnaw under bark flat, sharp-edged, sinuous, gradually widening passages, maskoobraznoe wavy tightly clogged with wood dust. Years in April – may, often delayed until July. Female lays eggs in cracks and under bark scales on weakened trees and juniper felling remains. Larvae gnaw long, winding, gradually expanding and weakly touching the wood moves. They spend the winter, in spring they turn into pupae. Then through a decade of in – bugs. In gold beetles gnaw through the flight opening, which has the form of more or less elongated, sometimes very narrow ellipse. One side, corresponding to the back of the beetle, is flatter, the other – corresponding to its abdominal surface, more convex. Young beetles feed on the flowers of a dandelion, then hips.

3.TheCerambycidae Family Is Barbels.

Gray long-moustached beetle – Acanthocinus griseus (Fabricius, 1793) – beetle from the family of barbels prefers coniferous trees (pine Pinus, fir Abies, spruce Picea).

Development lasts 1-2 years. Adult beetles appear from April to August. Larvae live and develop in coniferous and deciduous wood. Usually the beetle inhabits wind or felled trees, but sometimes it can attack quite healthy ones.

When a large number of larvae of the Longhorn beetle eat all podkrovie space, hammering it compressed sawdust and thus preventing the settlement of other xylophagous.

Moustache violet (woodcutter violet flat) – Callidium violaceum (Linnaeus, 1758). It develops under the bark in the surface layers of dried coniferous wood. Adults are active in may – July. The female lays eggs in the cracks of the bark. Larvae lay long winding passages going into the thickness of the wood. Both larvae and beetles winter, leaving in depth of wood. Prefers coniferous and fruit trees.

Ragium ribbed – Rhagium inquisitor (Linnaeus, 1758). The larva develops under the bark of fallen trees of all conifers, occasionally and deciduous. Inhabits both dead and old trees and stumps of conifers. The trees usually takes the shadow side of the trunks. The large number found in the stacks of planks and slabs. Larvae gnaw bark, bast and wood, paving winding passages.

We also found five species of coccinellide/ Adoniavariegata (Goeze, 1777), Hippodamiaun decimnotata(L., 1758). – met in fairly wet areas of grass, Propylaea quatuordecimpunctata (L., 1758) –eurybiont, Coccinella septempunctata (L., 1758) – widespread eurybiont, Adalia bipunctata (L.,1758) – eurybiont.

Conclusion

According to preliminary date, the species composition of beetles living on the territory of three districts of Turkestan region varies: the most diverse in terms of species Tulkubas district.

Among the caught ground beetles predators are such species as Cicindela turkestanica, Calosoma sycophanta, Lebia cyanocephala, Lebia punctata, Lebia cruxminor, Carabus granulatus.

Xylophilic beetles are represented by 7 species belonging to 3 families:

– Scolytidae – family woody – Xyleborinus saxeseni, wrinkled sapwood – Scolytus rugulosus;

– Buprestidae – spotted zlatka – Julodis-variolaris, juniper zlatka – Anthaxia (Melanthaxia) conradti;

– Cerambycidae – Longhorn beetle gray long mustache and small – Acanthocinus griseus, moustache violet (cleaver violet flat) – Callidium violaceum, rage – ribbed Rhagium inquisitor.

Coccinellidae is represented by 5 species: Adonia variegate, Coccinella septempunctata prefer open, relatively dry habitats and are most numerous on the tops of river watersheds, agricultural lands and roadsides.

Propylaea quatuordecimpunctata – chortoantobiont. The most common and abundant species in the area.

Hippodamia (Semiadalia) undecimnotata – hygrophil, was found in fairly wet areas of grass along the rivers.

Coccinellid kind Adaliabipunctata L. – the inhabitants of the forest zone, agricultural areas, exterminate the aphids on tree species, the primary natural enemies of aphids with fruit crops.

Among the found species, the most numerous species of ladybugs in the territory of the Turkestan region was Adoniavariegate, Adaliabi punctata, Coccinella septempunctata and Propylea quathuordecimpunctata that, thus they play an important role in reducing the number of harmful insects and can therefore act as promising targets for the control of aphids.

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