Entomological Review, Vol. 76, No. 2, 1996, pp. 155–168. Translated from Entomologicheskoe Obozrenie, Vol. 75, No. 1, 1996, pp. 60–74.

Review of the Family Attelabidae (Coleoptera) of Western Siberia

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Received December 6, 1993

Abstract—The leaf-rolling weevil family Attelabidae is represented in Western Siberia by 9 genera including 19 species (*Auletobius irkutensis, A. sanguisorbae, Pselaphorhynchites nanus, P. tomentosus, Coenorrhinus germanicus, C. interpunctatus, C. pauxillus, Hapiorhynchites pubescens, H. caeruleus, Involvulus cupreus, Rhynchites auratus, Rh. cyanocephali, Byctiscus rugosus, B. betulae, B. populi, Deporaus mannerheimi, D. betulae, Apoderus coryli, A. erythropterus*).

Species of the family Attelabidae (leaf-rolling weevils) play an important part in biocenoses of Western Siberia. Many of them are agricultural and forest pests. The plum weevil *Involvulus cupreus* (L.) in the forest zone of Ob' Region damages up to 20% of buds and 14–18% of fruits of rennet (Babenko, 1982). In the forest zone of Novosibirsk the wrinkled leaf-rolling weevil impairs the decorative properties of poplars and reduces their photosynthesizing surface, gnawing twigs and rolling leaves into leaf-bales. The damage inflicted by leaf-rolling weevils on trees and shrub in Western Siberia has been noticed by many Siberian entomologists (Bassel', 1929; Kulik and Shevtsova, 1940; Mitlyuchenko, 1946, 1951; Egorov, 1958; Prokof'ev, 1966; Opanasenko, 1973, 1987; Kobets and Opanasenko, 1976; Babenko and Krivets, 1981; Babenko, 1982; etc.).

First data on the distribution of leaf-rolling weevils in Siberia were generalized in catalogs of Heyden (1880–1881) and Winkler (1930) where, respectively, 13 and 41 species were described. In a number of faunistic works isolated data on leaf-rolling weevils have been reported (Lavrov, 1926, 1927; Cherepanov and Opanasenko, 1963; Korshunov, 1973; Opanasenko, 1978, 1984; Krivets, 1984; etc.). The biology of some species of Western Siberia has been studied by Mitlyutchenko (1946, 1951), Prokof'ev (1966), Korshunov and Opanasenko (1973), Opanasenko (1973, 1987), and Babenko (1982). Noteworthy are works of Ter-Minasyan (1950, 1955, 1974), concerned with the leaf-rolling weevils of the USSR, where a great body of information was presented on the species from the region we study.

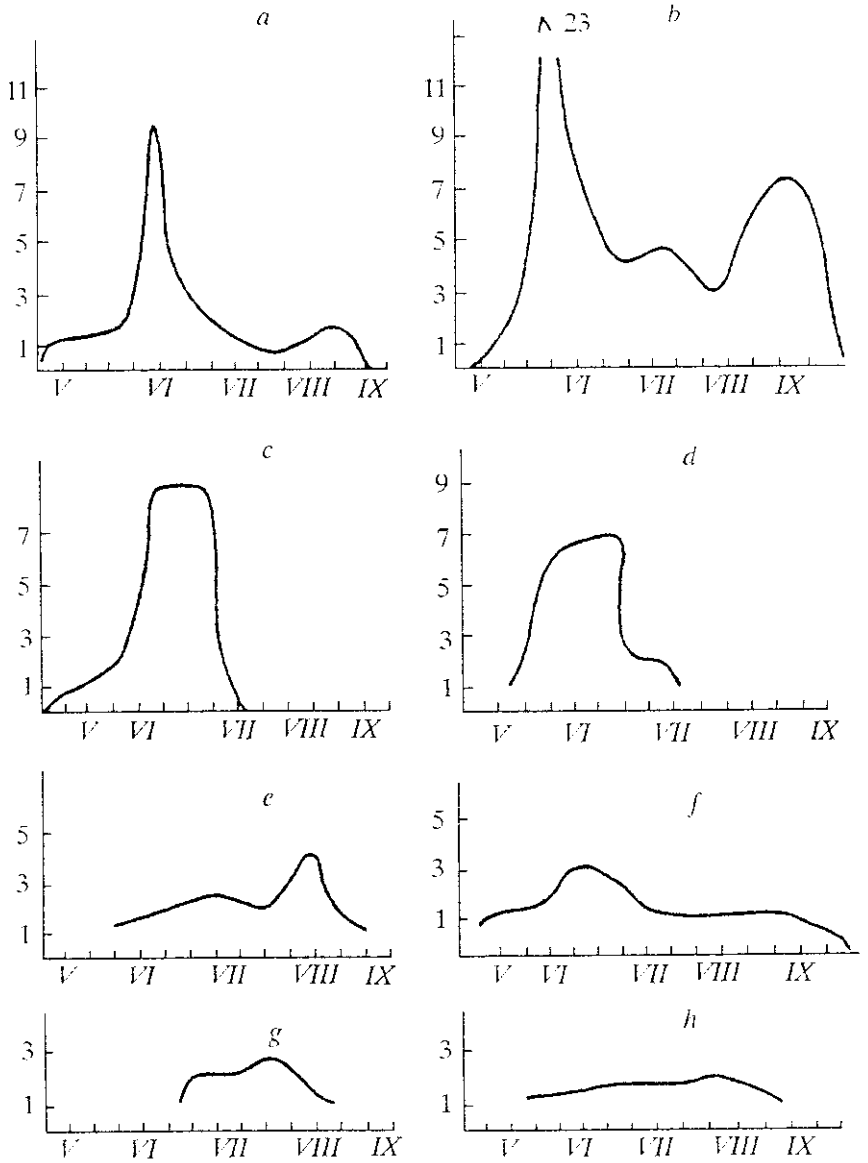
The present work is based on materials from authors' collections and those kept in the Zoological museum of the Biological Institute, Siberian Branch of the Russian Academy of Sciences.

The authors are grateful to V. G. Mordkovich for furnishing a possibility to study the collection of leaf-rolling weevils kept in the Zoological museum of the Biological Institute, Siberian Branch of the Russian Academy of Sciences. We take an opportunity to thank M. E. Ter-Minasyan and B. A. Korotyaev (Zoological Institute, Russian Academy of Sciences) for assistance in determining leaf-rolling weevils.

Six eco-geographical zones occupy the territory of Western Siberia: tundra, forest-tundra, taiga, small-leafed forests, forest-steppe, and steppe. In view of the zonal division with respect to height, mountain zone is singled out in the Altai-Sayany mountain system. Consider the distribution of leaf-rolling weevils over natural zones (Table 1). In tundra, leaf-rolling weevils do not occur owing to unfavorable temperature regime and lack of forage plants. In forest-tundra, 3 species have been found. Six species have been reported from the taiga zone. The widest species diversity is achieved by leaf-rolling weevils in small-leafed forests (13), forest-steppe (17), steppe (15), and mountain regions (14).

The population density of various leaf-rolling weevil species on plants is illustrated by Table 2. The highest number of species were found on willow (8), birch (7), and aspen and poplar (5 each).

The species developing on forest-shrub vegetation constitute the dendrophilous complex consisting of 16 species. Species related to herbaceous vegetation (herbophils) are much fewer in number than dendrophils—3 species. As regards the number, 72.1% of imago were collected from poplar, 8.4% from aspen, 4.3% from birch, and 4.6% of beetles from other plants. Consequently, poplar is subject to the strongest attack of leaf-rolling weevils.



Seasonal behavior of the numbers of weevils of mass species. *Abscissa*—months; *ordinate*—average number of weevils in one collection. Figure at the top of interrupted curve represents the peak value. (*a*) *Byctiscus betulae* (L.); (*b*) *B. rugosus* (Gebl.); (*c*) *Rhynchites auratus* (Scop.); (*d*) *Deporaus betulae* (L.); (*e*) *Byctiscus populi* (L.); (*f*) *Apoderus coryli* (L.); (*g*) *Auletobius sanguisorbae* (Schrank); (*h*) *Apoderus erythropterus* (Gmelin).

Leaf-rolling weevils develop in various parts of plants, which can be seen from Table 3, they mine leaves and twigs of 7 (46.6%) species. Leaf-bales are rolled by 6 (40%) species. Large chestnut weevils are represented by 2 (13.4%) species.

Leaf-rolling weevils may be subdivided into several phenological groups. Let us use the distribution adopted by Opanasenko (1978, 1984). Commonly, spring-autumn, spring, and summer groups are distinguished. To the spring-autumn group refer the species (*Coenorrhinus pauxillus, Involvulus cupreus, Byctiscus rugosus, B. betulae, B. populi, Apoderus coryli*) whose imagoes emerge from wintering sites in spring and feed on plants at this time. The development of larvae continues during the whole summer. In autumn, beetles of a new generation emerge and retire to hibernation in September. The spring group is composed of the species (*Coenorrhinus germanicus, Rhynchites auratus, Deporaus betulae*) wintering in the stage of beetle remaining in the pupigerous cradle in August–September. The summer group includes the species (*Auletobius irkutensis, A. sanguisorbae, Pselaphorhynchites nanus, P. tomentosus, Haplorhynchites pu-*

Table 1. Distribution of leaf-rolling weevils over natural zones in Western Siberia

Species	Natural zones							
	forest-tundra	taiga			small-leafed forests	forest-steppe	steppe	mountain regions
		northern	middle	southern				
Auletobius irkutensis Fst.				+	+	+		+
A. sanguisorbae (Schr.)					+	+	+	+
Pselaphorhynchites nanus (Payk.)					+	+	+	+
P. tomentosus (Gyll.)						+	+	+
Coenorrhinus germanicus (Hbst.)					+	+	+	+
C. interpunctatus (Steph.)							+	
C. pauxillus (Germ.)						+		
Haplorhynchites pubescence (F.)					+	+	+	
H. coeruleus (Deg.)							+	
Involvulus cupreus (L.)				+	+	+	+	+
Rhynchites auratus (Scop.)				+	+	+	+	+
Rh. chamaecerasi T.-Min.						+		
Byctiscus rugosus (Gebl.)					+	+	+	+
B. betulae (L.)	+	+	+	+	+	+	+	+
B. populi (L.)	+	+	+	+	+	+	+	+
Deporaus mannerheimi (Humm.)						+		+
D. betulae (L.)	+	+	+	+	+	+	+	+
Apoderus coryli (L.)				+	+	+	+	+
A. erythropterus (Gmelin)					+	+	+	+

hescens, *H. coeruleus*) in which larvae winter and reproduction occurs in June–July, occasionally even in August. The seasonal abundance of mass species is illustrated in the figure. The average numbers of beetles taken in one collection are given for separate ten-day periods. An increase in population is observed at the end of spring and beginning or second half of summer.

In view of difficulties in determining leaf-rolling weevils, we present a key to species and genera of leaf-rolling weevils from Western Siberia. It was composed on the basis of tables prepared by Ter-Minasyan (1955, 1965) and Baitenov (1974).

KEY TO GENERA AND SPECIES OF LEAF-ROLLING WEEVILS OF WESTERN SIBERIA

1(4). Claws fused at base. Inner margin of fore tibiae crenulate, tibiae with hamus at outer apical angle. Body bare. Anterior margin of pronotum with clearly pronounced wide constriction. Rows of punctures on elytra dense. .....*Apoderus* Ol.

2(3). 1–2 shortened striae between 3rd and 5th elytral inter-row spaces. Parasutural stria behind scutellum deviating sideways. Shortened stria present behind scutellum. Black, pronotum base and elytra red; rarely, head, entire pronotum, and legs red, or wholly monochromatically black. Length 6–8 mm. On birch. .....*A. coryli* (L.).

3(2). Elytra with 8 regular rows of punctures. Parasutural stria not deviating behind scutellum. Rows of punctures thinner, inter-row spaces flat. Head conical. Black, elytra black to red; rarely, legs and abdomen red-yellow. Length 3.5–4.5 mm. On burnet, brier. .....*A. erythropterus* (Gmelin).

4(1). Claws free, divided or with dens, rarely simple. Inner margin of fore tibiae increnulate, tibiae simple with only small spur on inner apical angle. Body commonly covered with erect hairs; rarely nearly bare dorsally.

Table 2. Population density of various leaf-rolling weevil species on plants

Species	Collected from plant species indicated, %										
	total, %	birch	aspen	poplar	willow	apple-tree	cherry	haw-thorn	brier	herbace-ous plants	stratum
Auletobius irkutensis	1.52									1.52	
A. sanguisorbae	2.32									2.32	
Pselaphorhynchites nanus	0.5	0.2			0.2					0.05	0.1
P. tomentosus	0.31	0.05			0.05						
Coenorrhinus germanicus	0.5									0.13	0.36
Haplorhynchites pubescences	0.4				0.05						0.36
Involvulus cupreus	0.5		0.1			0.05	0.1			0.05	0.22
Rhynchites auratus	1.52						1.52				
Byctiscus rugosus	68.53			67.6	0.13	0.71					
B. betulae	7.95	0.4	5.93	1.03	0.22			0.27		0.05	0.05
B. populi	3.9	0.2	1.56	0.45	0.05					0.22	1.43
Deporaus mannerheimi	0.13	0.1									0.05
D. betulae	4.69	2.95		0.1	0.2						1.47
Apoderus coryli	4.87	0.31	0.05	0.05	0.1						4.38
A. erythropterus	8.41		0.05						0.22		2.14
In all	100	4.15	7.69	69.29	0.94	0.76	1.62	0.27	0.22	1.61	10.67

5(8). Elytra uniformly punctate, but puncture striae not pronounced. .....*Auletobius* Desbr.

6(7). Elytra covering pygidium. Dorsally without metallic shine. Pronotum at middle distinctly convex-rounded laterally. Elytra finely and densely punctate. Length 2.8–3.0 mm. On burnet. ....*A. irkutensis* Fst.

7(6). Elytra not covering pygidium. Dorsally with metallic shine, blue-black. Pronotum longer than wide, uniformly rounded laterally. Elytra more densely punctate. Length 2.0–2.5 mm. On burnet. .....*A. sanguisorbae* (Schrank).

8(5). Elytra with regular striae and wide or narrow spaces in between.

9(12). Temples behind eyes with transverse constriction. Rostrum short. .....*Deporaus* Leach.

10(11). First segment of hind tarsus longer than 2nd and 3rd together. Pronotum as long as wide. Body dark blue or black, occasionally with greenish tinge, narrow. Legs slender. Length 2.5–3.5 mm. On birch. ....*D. mannerheimi* (Humm.).

11(10). First segment of hind tarsus shorter than, or equal in length to 2nd and 3rd together. Pronotum shorter than wide. Body black, without metallic shine. Hind femora in males thickened. Length 2.5–4.0 mm. On birch, aspen, poplar ... .*D. betulae* (L.).

12(9). Temples behind eyes with parallel sides or somewhat broadened behind. Rostrum long.

13(18). Outer margin of hind coxae not reaching to episterna of mesothorax. Commonly, bare dorsally for the most part. .....*Byctiscus* Thoms.

14(17). Larger. No convex, shining shoulder rib.

15(16). Elytra with coarse sculpture, covered with deep puncture rows. Opaquely green, with copper shine, rarely blue. Length 5.5–6.5 mm. On poplar, apple tree. .....*B. rugosus* (Gebl.).

16(15). Elytral sculpture less coarse. Puncture striae on elytra irregular. Elytra strongly shining. Green, blue, occasionally with copper tinge. Length 4.6–6.0 mm. On aspen, birch, willow. ....*B. betulae* (L.).

17(14). Smaller-sized. Convex, shining, impunctate flange extending from shoulder to elytrum apex. Rostrum markedly longer than head. Green dorsally, with copper-bronze tinge; scutellum, rostrum, and body ventrally, blue. Length 3.8–5.6 mm. On aspen, poplar. .....*B. populi* (L.).

18(13). Hind coxae elongate, reaching to the inner margin of episterna or going beyond them. Commonly pilose dorsally.

19(28). Elytra with shortened scutellar stria. Species small-sized.

20(23). Body narrow, strongly elongate. Elytra nearly twice as long as wide. Hairs accumbent. Eyes strongly convex. ....*Pselaphorhynchites* Schils.

21(22). Frons wider than eye diameter. Fore tibiae without apical spicule from inside. Scutellar stria hardly discernible. Length 1.8–2.5 mm. On willow, birch. .....*P. nanus* (Payk.).

22(21). Frons not wider than eye diameter. Fore tibiae with apical spicule from inside. Puncture striae deeper, scutellar stria pronounced. Length 2.2–2.8 mm. On willow, birch. .....*P. tomentosus* (Gyll.).

23(20). Body not long, wide, ovate. Elytra more than 1.5 times longer than wide.....*Coenorrhinus* Thoms.

24(25). Last but one stria on elytra not shortened. Last stria divided at base into two short striae. Spaces in elytra shining, weakly convex. Black, with metallic shine. Length 1.6–3.0 mm. On hawthorn. .....*C. germanicus* (Hbst.).

25(24). Last but one stria on elytra shortened, connected with the last before elytrum apex. Last stria simple at base.

26(27). Rostrum longer, weakly and uniformly curved or nearly straight. Elytral spaces with regular puncture rows. Dark blue, occasionally with greenish shine. Length 2.5–3.0 mm. On fruit trees. .....*C. interpunctatus* (Steph.).

27(26). Rostrum shorter, rather strongly curved near base of antennae. Last but one stria connected with the last in the middle of elytra or immediately behind the middle. Puncture striae deeper and sparsely rugose, convex. Black, with steely shine. Length 1.8–3.0 mm. On apple tree and other fruit trees. .....*C. pauxillus* (Germ.).

28(19). Elytra without shortened scutellar stria. Species larger-sized.

29(30). Body without metallic shine, black or black with red. .....*Homalorhynchites* Voss.

Pronotum covered with small sparse punctures. Wholly supplied with long black hairs. Body black. Length 2.5–3.5 mm. On sunrose. .....*H. aethiops* (Bach.).

30(29). Body metallic-blue, green, purple, or of some other coloring.

31(34). Last but one stria on elytra not shortened, not fusing with the last in middle of elytrum. .....*Haplorhynchites* Voss.

32(33). Head without constriction laterally behind eyes. Spaces between rows of punctures on elytra wider than striae themselves, flat, densely and irregularly punctate. Length 5.0–5.5 mm. On foliage trees. .....*H. pubescens* (F.).

33(32). Head with constriction laterally. Elytra with regular, wide rows of punctures. Spaces convex, narrow, much narrower than striae, covered with rows of very fine punctures. Length 2.5–3.5 mm. On fruit trees. .....*H. coeruleus* (Deg.).

34(31). Last but one stria on elytra shortened, fusing with the last near middle of elytra.

35(36). Last tarsal segment not longer than 1st. Puncture striae on elytra deeper, spaces in between more convex. Prothorax in males without spines laterally. .....*Involvulus* Schrank.

Pronotum elongate, coarsely punctate. Rostrum not longer or slightly longer than pronotum.

Table 3. Relationship of leaf-rolling weevils with various plant parts

Species	Leaf rollers	Miners		Fruit-damaging species
		leaves	twigs	
Pselaphorhynchites nanus		+		
P. tomentosus		+		
Coenorrhinus germanicus			+	
C. interpunctatus		+		
C. pauxillus		+		
Haplorhynchites pubescences			+	
H. coeruleus			+	
Involvulus cupreus				+
Rhynchites auratus				+
Byctiscus rugosus	+			
B. betulae	+			
B. populi	+			
Deporaus mannerheimi		+		
D. betulae	+			
Apoderus coryli	+			
A. erythropterus	+			

Bronze. Length 3.5–4.5 mm. On stone fruit trees. ..... *In. cupreus* (L.).

36(35) Last tarsal segment longer than 1st. Puncture striae on elytra in the form of rows of punctures, spaces between striae flat or weakly convex. Prothorax in males with spines or tubercles. ..... *Rhynchites* Schneid.

37(38). Larger in size. Pronotum in males wide, much wider than one elytrum. Rostrum longer than pronotum. Pygidium finely and densely punctate. Golden green or golden red. Length 5.5–9.0 mm. On stone fruit trees, apple tree. .... *Rh. auratus* (Scop.).

38(37). Smaller in size. Rostrum as long as pronotal disk. Head more elongate, sculpture of pronotum and elytra coarser. Pygidium very finely and sparsely punctate. Copper-green occasionally, pronotum purple, strongly shining dorsally. Length 4.8–5.4 mm. On steppe cherry. ..... *Rh. chamaecerasi* T.-Min.

SYSTEMATIC LIST

Subfamily RHYNCHITINAE Thomson, 1859

Tribe AULETINI Reitter, 1912

Auletobius (Parauletes) irkutensis Faust, 1893.

Found on herbaceous vegetation in glades of birch groves and birch-pine forests, in meadows, and near water reserves in Tomsk, Novosibirsk, and Kemerovo Provinces, and in Altai Territory.

Beetles registered from the beginning of June to the end of August, in abundance from beginning of June till the end of July. Copulation in July. Herbophil. Larva develop in burnet buds.

Eastern Palaearctic species.

Material. Tomsk Prov.: Tika, 5–7.VIII.1953, 1 specimen (Kovalev), 11–28.VIII.1957, 1 specimen (Kovalev); Molchanovo, 13.VII.1988, 1 specimen (Nikitin); Urtam, 11.VIII.1957, 1 specimen. Novosibirsk Prov.: Novosibirsk, 9.VI.1927, 1 specimen (Pogodina), 29.VI–20.VII.1929, 2 specimens, 10.VIII.1929, 1 specimen, 10.VII.1947, 1 specimen, 16.VII.1972, 1 specimen; Kaily, 14.VI–7.VII.1962, 3 specimens (Grigor'ev); Zonovo, 28.VI.1961, 2 specimens (Stebaev); Nov. Sharap, 10.VI.1961, 3 specimens; Kozikha, 7.VII.1961, 2 specimens; Korolevka, 25.VIII.1959, 1 specimen; Kirza, 15.VII.1991, 2 specimens (Legalov); L'nukha, VII.1991, 1 specimen; Skala, 25.VII.1992, 1 specimen (Legalov); Karpysak, 27.VII.1993, 1 specimen (Legalov); Shurygino, 21.VII, 1 specimen. Kemerovo Prov.: Berikul', 4.VII.1969, 1 specimen (Piven'); valley of Baza River, 9.VII.1969, 1 specimen (Piven'); Surtaikha, 1986, 1 specimen (Syachina). Altai Territory: Zyat'kovo, 21.VI.1958, 1 specimen (Opanasenko); Abai, 19.VII.1954, 2 specimens, 8.VIII.1954, 1 specimen.

Auletobius (s. str.) *sanguisorbae* (Schrank, 1798).

Found in birch and aspen-birch groves, on slashes and pine forest margins, in meadow-steppe areas, and near water reserves of Omsk, Novosibirsk, and Kemerovo provinces and Altai Territory.

Beetles registered from the end of June till the beginning of September. Herbophil. Imagoes feed additionally on burnet, damaging stems and buds. Copulation in July. Larvae develop in burnet buds, preliminarily gnawed by female.

Transpalaearctic species.

Material. Omsk Prov.: Isil'kul', 15.VII.1926, 1 specimen (Salamatov). Novosibirsk Prov.: Novosibirsk, 20.VII–2.VIII.1929, 2 specimens, 15.VII.1963, 2 specimens, 23.VI.1973, 2 specimens (Opanasenko); Yarki, 18–31.VII.1963, 7 specimens (Grigor'ev), 1–10.VIII.1963, 2 specimens (Grigor'ev); Verkhn. Chik, 11.VII.1960, 2 specimens (Ivanovskaya); Skala, 5.VII.1992, 1 specimen (Legalov); Nov. Sharap, 28.VI.1958, 1 specimen, 5.VII.1958, 3 specimens; Zonovo, 28.VI.1961, 3 specimens (Stebaev); Kaily, 26–27.VI.1962, 4 specimens, 3–11.VII.1962, 3 specimens; Razdol'e, 14.VII.1993, 4 specimens (Legalov); Parovoznaya, 3.VII.1972, 1 specimen (Momot); Zav'yalovo, 28.VI.1985, 3 specimens (Chekanov), 10.VII.1985, 1 specimen (Chekanov); Proletarskii, 22.VII.1962, 2 specimens; Krasnyi Yar, 29.VII.1961, 3 specimens; Ubinskoe, 20.VII.1962, 1 specimen; L'nikha, VII.1991, 2 specimens; valley of Chulym River, 21.VII.1962, 3 specimens (Tibatina). Kemerovo Prov.: Salair, 11.VII.1966, 1 specimen (Opanasenko). Altai Territory: Zalesovo, 13.VIII.1960, 2 specimens (Opanasenko); bank of Chulyshman River, 2.VII.1959, 1 specimen; Chiri, 27.VIII.1963, 1 specimen (Opanasenko).

Tribe RHYNCHITINI Thomson, 1859

Pselaphorhynchites nanus (Paykull, 1792).

Found in Novosibirsk Prov. and environs of Teletskoe Lake. Previously the species was registered from the environs of Barnaul (Heyden, 1880–1881).

Beetles knocked off birches in forest-steppe groves and collected from willows near water reserves in the second or third ten-day period of June. In this time, copulation and feeding were observed. As reported by Roginskaya (1966), 77% of this species was collected from birch near Moscow. In addition, beetles occur on aspen and hazel (Roginskaya, 1966) and alder (Ter-Minasyan, 1950). According to observations of Meteso-va *et al.* made in Kazakhstan, imagoes gnaw leaves and flowers of apple-trees.

Transpalaearctic species.

Material. Novosibirsk Prov.: Novosibirsk, 14.VI.1989, 1 specimen (Legalov), 26–30.VI.1991, 3 specimens (Legalov); Mochishche, 15.VI.1987, 1 specimen (Legalov); Nov. Sharap, 13.VI.1958, 3 specimens; Spirino, 19.VI.1971, 1 specimen (Opanasenko). Altai Territory: Teletskoe Lake, Yailyu, 18.VI.1963, 1 specimen; Kamensk distr., 14.VI.1929, 1 specimen (Pogodina).

Pselaphorhynchites tomentosus (Gyllenhal, 1839).

Found in Novosibirsk Prov. and Altai Territory. Registered from environs of Omsk (Lavrov, 1927).

Beetles found from the end of May till the middle of August in birch-aspen and willow groves and mixed forests. Dendrophil.

We observed feeding of imago on willows. In addition to willow, damages birch, alder, and aspen (Ter-Minasyan, 1950, 1955).

Transpalaearctic species.

Material. Novosibirsk Prov.: Kol'tsovka, 10.VII.1959, 1 specimen; Yarkovo, 20.VII.1989, 1 specimen (Bataeva); Novosibirsk, 1–10.VIII.1988, 1 specimen (Legalov), 14.VI.1992, 1 specimen (Legalov). Altai Territory: Zyat'kovo, 21.VI.1958, 1 specimen (Cherepanov); Krasnodubrovskii, 22.VI.1958, 1 specimen (Cherepanov); Kamenskii distr., 5.VI.1929, 1 specimen (Pogodina).

Coenorrhinus (s. str.) *germanicus* (Herbst, 1797).

Beetles collected from the end of May till the beginning of July in larch-birch, birch-aspen, and pine forests, on meadowy banks of rivers in Novosibirsk Prov. and Altai Territory. Dendrophil. According to observations of Prokof'ev (1966), beetles leave wintering sites in spring and feed gnawing holes in young leafstalks and floral shoots, causing their wilting. In the second half of May the female lays up to 30 eggs, placing them one at a time into leafstalks or floral shoots. Below the place of oviposition, the female gnaws circularly the leafstalk so that it breaks off. Larvae emerge in 1.5–2 weeks. During 1.5 months larvae feed inside leafstalks that have fallen off and then leave them to pupate in soil at a depth of up to 10 cm. Beetles emerge in 3–4 weeks, remaining to winter. According to Ter-Minasyan (1950, 1955), the beetle damages raspberry, hawthorn, hazel, vetch, rose, strawberry, etc.

Transpalaearctic species.

Material. Novosibirsk Prov.: Novyi Sharap, 19.VI.1958, 1 specimen; Erestnaya, 20.VI.1961, 1 specimen; Zonovo, 27.V.1961, 1 specimen (Stebaev); Serezhnik, 13.VI.1926, 1 specimen; Krasnoobsk, 24.VI.1987, 1 specimen (Ryabov); Novosibirsk, 1.VI.1927, 1 specimen (Pogodina). Altai Territory: Vysokaya Griva, 18.VI.1958, 1 specimen (Opanasenko); Rogovskii, 22.VI.1958, 1 specimen (Kravtsov); Teletskoe Lake, Samysh, 19.VI.1965, 1 specimen.

Coenorrhinus (s. str.) *interpunctatus* (Stephens, 1831).

Not found in our studies. Registered from Southern Siberia (Ter-Minasyan, 1950) and North Kazakhstan (Baitenov, 1974).

Dendrophil. Larvae develop in petioles and median vein of the leaf of fruit and other foliage species. Damage strawberry and other soft fruit cultures (Ter-Minasyan, 1950).

Western Palaearctic species.

Coenorrhinus (s. str.) *pauxillus* (Germar, 1824).

Registered from the environs of Omsk (Lavrov, 1927) where the beetles occasionally occur on apple trees.

According to data of Ter-Minasyan (1950), the beetles appear in crowns of apple, pear, cherry, plum, bird cherry, hawthorn, and other trees in early spring. During additional feeding, beetles damage fruit and leaf gemmae and flower buds. Copulation occurs during blossoming of the apple tree, oviposition starts with the end of blossoming. Females lay eggs into the petiole or median vein of a leaf, damaging leaf tissues around the place of oviposition, with the result that the leaf becomes brown. One female can lay up to 100 eggs. Egg development takes 6–8 days. Larvae feed inside the petiole and median vein of the leaf, so that it dies and falls off. The development of larvae continues in fallen leaves. Having finished their development larvae abandon the leaves and pupate in soil at a depth of up to 13 cm. Beetles emerge from pupae in autumn. Part of them go out for additional feeding, part remain in soil till next-year spring.

Western Palaearctic species.

Homalorhynchites aethiops (Bach, 1854).

Presumably, this species was registered as *Rh. ursus* Gebl. by Gebler (1830) from Ust'-Kamenogorsk.

Develops on sunrose (Helianthemum) (Ter-Minasyan, 1950).

Western Palaearctic species.

Haplorhynchites (s. str.) *pubescens* (Fabricius, 1775).

Beetles collected in June by sweeping over meadow vegetation in the Novosibirsk Province. One beetle found on willow. Dendrophil. Related to hawthorn, alder, feathered columbine, etc. (Ter-Minasyan, 1950; Matesova *et al.*, 1962).

Material. Novosibirsk Prov.: Novyi Sharap, 19–20.VI.1958, 1 specimen; bank of Uburmatva River, 25.VI.1962, 1 specimen; Novodubrovka, 18.VI.1961, 1 specimen (Zolotarenko); Kaily, 15.VI.1962, 1 specimen (Grigor'ev); Zonovo, 12–19.VI.1961, 2 specimens (Stebaev); Novosibirsk, 1.VI.1927, 1 specimen (Pogodina); Serezhnik, 12.VI.1926, 1 specimen; Skala, 6.VI.1991, 1 specimen (Legalov).

Haplorhynchites (Teretriorhynchites) coeruleus (Degeer, 1775).

Not found in our studies. Registered from Southern Siberia (Ter-Minasyan, 1950) and Northern Kazakhstan (Baitenov, 1974).

Dendrophil. According to observations of Savkovskii (1983) made in Ukraine, beetles appear in spring and feed on buds of fruit trees. Females lay eggs into young twigs after foliage expansion. Below the place of oviposition they gnaw deep pits in the twigs which then wither and break off. Larvae feed inside the twig. In the middle of summer they go into soil and winter in cradles. Pupation occurs in summer of the following year. Emerged beetles winter without leaving the cradles. Generation two-year. Development occurs on apple, pear, cherry, plum, mountain ash, hawthorn, roses, alder, etc. (Ter-Minasyan, 1950, 1974; Savkovskii, 1983).

Transpalaearctic species.

Involvulus cupreus (Linnaeus, 1761), plum weevil.

Found in lime-tree forests, gardens, and herbage of Tomsk, Novosibirsk, and Kemerovo Provinces and Altai Territory. Bassel' (1929) observed the plum weevil in the environs of Barnaul on hawthorn. Krivets (1984) reported finding the beetle in the northern part of Kuznetsk Ala Tau.

Beetles registered from the end of May till the middle of August. In the middle of September found again. Dendrophil. Beetles occurred on bird cherry, aspen, and apple-tree. According to Babenko (1982), beetles in Tomsk Province winter on ground surface under plant litter. Overwintered beetles appear in spring in the period of turgescence of apple-tree gemmae and feed on them, and later on leaflets. After apple and chokeberry fruits are formed, females start to oviposit. One female lays from 60 to 120 eggs. It gnaws a wide coniform cavity in the fruit pulp and deposits one egg on its bottom. After oviposition the female nibbles away part of the fruit pedicle. Such fruits rapidly fall off. In fallen fruits, larvae emerge from eggs in 8–10 days. They feed on the flesh of fruits and in 3–4 weeks leave them. Pupation in soil at depths up to 3 cm. Occasionally larvae pupate in the seed chamber of fallen fruits. Pupal stage lasts 1.5 month. Young beetles go out of the soil and feed on leaves till light frosts. In Western Siberia the plum-tree weevil develops on apple and chokeberry, more rarely on plum, hawthorn, and pear (Prokof'ev, 1966; Babenko, Krivets, 1981; Babenko, 1982). In other parts of the area also damages cherry, sweet cherry, blackthorn, and mountain ash (Ter-Minasyan, 1950). Beetles can feed on alder and birch.

Transpalaearctic species.

Material. Tomsk Prov.: Bakchar, 10.VIII.1947, 1 specimen. Novosibirsk Prov.: Novosibirsk, 2.VI.1971, 1 specimen (Opanasenko). Kemerovo Prov.: Kuzdeevo, 1967, 1 specimen; Kuzdeevo distr., 23.V.1948, 1 specimen; Geolog, 10.VII.1970, 1 specimen. Altai Territory: Khvoshchevsk forest area, 8.VI.1957, 2 specimens (Opanasenko); Oior, 16.IX.1961, 1 specimen; Bystryi Istok, 12.VI.1958, 1 specimen (Opanasenko); Barnaul, 20.VI.1927, 1 specimen (Bassel'), 24.V.1979, 1 specimen.

Rhynchites auratus (Scopoli, 1763), cherry weevil.

Beetles collected in Altai (Malyi Krasnoyarsk, Kozlushka, environs of Barnaul) and Novosibirsk Province. According to Babenko (1982), they have been found in the environs of Tomsk. Kulik and Shevtsova (1940) registered the cherry weevil on cherry from the Omsk province.

Dendrophil. Beetles feed on twig bark, leaf petioles, and flower buds of various stone fruit trees, including sweet cherry, steppe cherry, and bird cherry. According to Slivkina (1958) and Khairushev (1974), the cherry weevil damages in North Kazakhstan up to 30, 75, and 63% of fruits of bird cherry, cherry, and wild black

cherry respectively. In poor stone fruit harvest years inhabits fruits of small-fruit apples (Bassel', 1929; Khairushev, 1974). Observations made in the environs of Novosibirsk indicate that on plots of the Central Siberian Botanical Gardens weevils live on bird cherry, laying eggs into its berries. Maac's, pin, wild black, sand, and silver cherries growing on the same plots were not inhabited. First adults noticed on trees in the beginning of May, no beetles found after 11.VII. Females lay eggs into the solid shell of the fruit stone during the whole active period. A count performed in the end of July on 702 drupes has shown that 99, or 14.1%, of them had eggs, which is indicated by the presence of a plug. Egg development continues about 10 days, and approximately 30 more days are necessary for larval development. Last-instar larvae gnaw an exit hole in fruit covers and fall on the ground. Emergence of larvae starts in the third ten-day period of July and was noticed by us beginning with July 31. By this time 13 larvae had emerged from 1345 berries. In the first five-day period of August, 70% of larvae emerged, and by the middle of the month the emergence was complete. A total of 97 larvae have emerged, i.e., 7.2% of fruits suffered damage. Comparison between the percentage of infested fruits and that of fruits with developed larvae shows that 51% of the progeny is lost in preimaginal stages of development prior to pupation. Larvae emerged from fruits remained to winter in soil at depths of up to 10 cm.

Material. Novosibirsk Prov.: Novosibirsk, 5.V.1968, 1 specimen, 28.V.1984, 1 specimen (Legalov), 1–12.VII.1974, 11 specimens (Opanasenko); Skala, 23.V.1992, 1 specimen (Legalov); Kupino, 30.V.1985, 2 specimens. Altai Territory: Malyi Krasnoyarsk, 19.VI.1925, 4 specimens (Vereshchagin); Kozlushka, 9–10.VII.1925, 1 specimen (Lebedev); Barnaul, 14.VI.1927, 1 specimen (Bassel').

Rhynchites chamaecerasi Ter-Minasyan, 1966.

Beetles found in the environs of Kurgan (Kurgan Prov.) on steppe cherry (Ter-Minasyan, 1950, 1966).

Distributed in the south of Western Siberia.

Tribe BYCTISCINI Voss, 1930

Byctiscus (s. str.) *rugosus* (Gebler, 1830), wrinkled weevil.

Found in foliage and mixed forests, near water reserves of Novosibirsk Province and Altai Territory. Heyden (1880–1881) reported this species from Salair. A communication of Mitlyuchenko (1951) about finding *Byctiscus betulae* in the environs of Novosibirsk refers to wrinkled weevil. Related to flood-land poplar forests and poplar forest belts. Dendrophil. Prefers poplars of the laurel-leafed group, although leaf-bales also occur on white poplar in mass reproduction. Near forest belts also develops on apple tree and, according to Egorov (1958), on birch.

After hibernation, beetles appear in the first ten-day period of May and feed on young poplars, eating around the leaf plate. In callous leaves they gnaw out the plate parenchyma in the form of tracks. Soon after hibernation, copulation and oviposition into leaf bales are noted. Between 2 and 12 eggs are deposited in one leaf-bale. Eggs of the wrinkled weevil are found in leaf-bales till the middle of June. Larvae occur from the first ten-day period of June till the end of July. They develop equally well in leaf-bales hanging on trees and in those fallen on the ground. Having finished their development, larvae leave the leaf-bales and go into soil to depths of up to 5 cm. There, they produce a soil cradle, in which later pupate. Beginning with the middle of August, beetles of a new generation emerge. They go out to the surface and feed on leaves until the onset of light frosts in September. Beetles hibernate in fallen leaves. Part of beetles do not leave their soil cradles till the spring of the next year. In addition, a large number of nonpupate larvae remain to winter.

Eastern Palaearctic species.

Material. Novosibirsk Prov.: Cherepanovskoe OPKh, 2.VII.1985, 3 specimens (Khitrina), 6.VI.1986, 2 specimens (Belyaev), 12.VI.1989, 5 specimens (Krasilova); Bezmenovo, 12.VI.1986, 4 specimens; Bobrovskoe, 19.VI.1971, 2 specimens; Shurygino, 20.VI.1971, 2 specimens; Shaidurovo, 20.VI.1971, 1 specimen; Michurinskii, 13.VI–29.VIII.1988, 2 specimens; Mochishche, 15.VI.1987, 3 specimens (Legalov); Krasnoobsk, 7.VIII.1986, 1 specimen, 1–25.VI.1987, 11 specimens; Berdsk, 11.VII.1983, 2 specimens, 7.VIII.1986, 1 specimen, 13–14.VI.1988, 2 specimens, 4–30.VII.1988, 12 specimens, 2–29.VIII.1988, 7 specimens; Ogurtsovo, 30.VIII.1972, 3 specimens, 24.VI.1989, 1 specimen (Krasilova); Elitnoe, 9–14.VI.1988, 4 specimens, 30.VIII.1988, 9 specimens, 9.VI.1989, 5 specimens (Krasilova), 24.VIII.1989, 13 specimens (Zharkov); Ob', 3.IX.1956, 1 specimen; Novosibirsk, 17.VIII.1950, 1 specimen, 7.VIII.1951, 2 specimens, 1.VI.1952, 1 specimen (Dyatlova), 24.VII.1952, 2 specimens (Dyatlova), 25.VIII.1952, 1 specimen (Dyatlova), 13.VII.1953, 2 specimens, 11–15.VIII.1953, 3 specimens (Sobesskaya), 9–11.VI.1954, 3 specimens (Cherepanov), 8.VI.1955,

1 specimen, 27.VI.1960, 1 specimen, 7.VI.1970, 7 specimens (Opanasenko), 13.VI.1971, 8 specimens (Opanasenko), 14.V.1972, 20 specimens (Opanasenko), 28.V.1972, 15 specimens (Opanasenko), 10–13.VI.1972, 9 specimens (Opanasenko), 2.IX.1972, 19 specimens (Opanasenko), 13.V.1973, 12 specimens (Opanasenko), 3–10.VI.1973, 17 specimens (Opanasenko), 1.IX.1973, 11 specimens (Opanasenko), 27.IX.1973, 4 specimens (Opanasenko), 1.IX.1987, 16 specimens, 18.VI.1989, 2 specimens (Legalov), 19.VIII.1991, 1 specimen (Legalov); Kalonovka, 1987, 1 specimen; Ordynskaya route, 27.V.1987, 17 specimens; Skala, 23.V.1992, 1 specimen (Legalov); Maslyanikha, 1992, 1 specimen (Isakova); Oktyabr'skoe, VII–VIII.1992, 1 specimen (Ivanova). Altai Territory: Barnaul, 28.VI.1901, 1 specimen (Goretovskii), 12.VII.1986, 1 specimen, 25.VII.1988, 1 specimen, 10.VIII.1988, 1 specimen; Gorno-Altaisk, 22.VIII.1962, 6 specimens; Teletskoe Lake, Katu-Yaryk area, 11.VIII.1962, 1 specimen; Kozlushka, 8.VI.1925, 2 specimens (Lebedev); Aleisk, 26.VIII.1950, 7 specimens.

Byctiscus (s. str.) *betulae* (Linnaeus, 1758), polyphagous weevil.

In Western Siberia found from mountain forests in Altai to the northern border of the forest zone (Labytnangi, Polovinka). Also inhabits forest plantations and forest belts of Barabinskaya forest-steppe and Kulundinskaya steppe.

The species is related to tree stock of aspen and poplar, on which beetles and larvae feed. In isolated cases leaf bales have been collected from willow, hawthorn, and birch. Dendrophil. According to Escherich (1923), occurs on all foliage species. In Europe prefers red beech, aspen, birch, lime, alder, nut, willow, and elm, rarely damages grape (Ter-Minasyan, 1955; Brauns, 1964). In Northern Kazakhstan is markedly harmful for birch and poplar, does less harm to aspen, isolated events of damage have been registered for elm (Slivkina, 1958). According to observations made in Novosibirsk Province, beetles start to roll leaf-bales and oviposit in the third ten-day period of May. Females deposit in one leaf-bale between 1 and 9 eggs (3, on the average). Eggs found in rolls till the end of June. Larvae registered from the middle of June till end of July. Pupation occurs in soil, where pupa were found in the third ten-day period of July. Young beetles appear during August and feed on trees till the beginning of October. Part of larvae remain to winter without pupation. In Western Siberia, the polyphagous leaf-rolling weevil heavily damages fruit-berry cultures and forest plantations.

Transpalaearctic species.

Material. Tyumen' Prov.: Labytnangi, 4.VII.1963, 2 specimens; Polovinka, 2.VIII.1964, 1 specimen; Tyumen' Regional Experimental Station, 27.VI.1954, 1 specimen (Cherepanov). Tomsk Prov.: Kopylovka, 2.VI.1961, 1 specimen; Ust'-Chizhapka, 17–21.VII.1965, 1 specimen (Ermolenko); Kolomino, 29.VI.1958, 1 specimen (Knysh); Batalino, 20.VI.1955, 1 specimen; Asino, 8.VIII.1957, 1 specimen (Zolotarenko). Novosibirsk Prov.: Izdrevaya, 17–27.VI.1959, 13 specimens; Novosibirsk, 1.VI.1953, 2 specimens, 11.VIII.1953, 1 specimen, 6.VI.1962, 2 specimens, 7–24.VI.1971, 2 specimens (Opanasenko), 10.VI.1991, 1 specimen (Legalov); Mochishche, 15.VI.1987, 1 specimen (Legalov); Toguchin, V.1955, 1 specimen, 10.V.1987, 2 specimens (Shayanova); L'nikha, 16.VI.1977, 1 specimen; Nov. Sharap, 4.VI.1959, 1 specimen; Aleus, 15.VI.1958, 1 specimen (Kravtsov); Chingisy, 4–29.VI.1960, 7 specimens (Grigor'ev); Malinovka, VII.1990, 1 specimen; Chernovka, 2.VII.1986, 1 specimen; Korolevka, 13–16.VIII.1959, 3 specimens; Erestnaya, 11.VI.1961, 1 specimen; Sergovka, 25.V.1961, 1 specimen (Stebaev); Zonovo, 3.VII.1960, 6 specimens (Stebaev); Maslyanino, 25.VIII.1959, 2 specimens (Zolotarenko); Dubrovka, 21.VI.1956, 1 specimen (Krivolutskaya); Bugotak, 3.VII.1960, 3 specimens (Petrova); Gutovo, 25.VII.1987, 1 specimen; Shadrikha, 31.V.1992, 2 specimens (Dubatolov). Kemerovo Prov.: Samokhino, 4.VII.1957, 1 specimen; Leninsk-Kuznetskii distr., 16.VII.1954, 1 specimen; Salair, 11.VII.1966, 1 specimen (Opanasenko). Altai Territory: Pikhtovskoe, 8–18.VI.1956, 2 specimens (Kortavina); Teletskoe Lake, 20.V.1959, 1 specimen; Gorno-Altaisk, 1.VI.1948, 1 specimen; Barnaul, 4.VIII.1987, 1 specimen; Mikhailovka, 9.IX.1950, 1 specimen (Bykov).

Byctiscus (s. str.) *populi* (Linnaeus, 1758), aspen weevil.

In Western Siberia found in all forest formations that include aspen and poplar, from Gornyi Altai on the south to forest-tundra (Oktyabr'skoe and Labytnangi) on the north. Occurs in steppe groves, forest belts, on glades in pine forests, in slashes, and river flood-lands.

Dendrophil. We have found beetles of the species on aspen, poplar, birch, and willow. On the south-west of Western Siberia develops in one generation. Females

roll a leaf-bale using one leaf and deposit there one egg. Oviposition continues till the middle of July. We found larvae in rolls during the whole July. Last-instar larvae leave the leaf-bale and go into soil, where they pupate in soil cradles. Part of larvae remain to winter. Pupae were found in August. Emergence of beetles to the surface begins in the end of August. During September they feed additionally on aspen and poplar leaves.

In Western Siberia aspen weevil may damage aspen and poplar plantations.

Transpalaearctic species.

Material. Tyumen' Prov.: Labytnangi, 4.VII.1963, 1 specimen; Oktyabr'skoe, 25.VI.1963, 3 specimens; Tyumen' Regional Experimental Station, 27.VI.1954, 1 specimen. Tomsk Prov.: Tika, 11–28.VIII.1957, 2 specimens (Kovalev); Chichka-Yul, 6.VII.1959, 2 specimens; Ust'-Chizhapka, 17–24.VII.1965, 9 specimens (Ermolenko). Novosibirsk Prov.: Zonovo, 11.VI.1961, 1 specimen (Stebaev); Novosibirsk, 30.VII.1951, 1 specimen, 7.VIII.1951, 2 specimens, 9–11.VI.1954, 1 specimen; Kudryashovskii pine forest, 8.VI.1962, 1 specimen; Kolomino, 31.VII.1958, 1 specimen (Korshunov); Chingisy, 13–27.VI.1960, 5 specimens (Grigor'ev, Stroganova); Novyi Sharap, 8.VI.1958, 1 specimen, 28.VI.1959, 1 specimen, 21.VIII.1959, 1 specimen; Malaya Krutishka, 23.VI.1960, 2 specimens; Korolevka, 4.VII.1959, 1 specimen (Korshunov, Knysh), 13–18.VIII.1959, 6 specimens (Khnysh, Korshunov); Kupino, 24.VI.1952, 2 specimens (Cherepanov), 28.VII.1950, 1 specimen; Karasuk, 28.VII.1950, 1 specimen (Cherepanov). Kurgan Prov.: Petukhovo, 8.VII.1962, 1 specimen (Tibatina). Omsk Prov.: Omon, 11.VI.1926, 1 specimen. Kemerovo Prov.: Salair, 11.VII.1966, 1 specimen (Opanasenko). Altai Territory: Barnaul, 24–30.V.1899, 3 specimens (Goretovskii), 23–28.V.1901, 4 specimens (Goretovskii), 13.VI.1901, 1 specimen (Goretovskii), 8.VI.1902, 1 specimen (Goretovskii); Teletskoe Lake, Samysh, 14.VII.1965, 1 specimen; Komsomol'skii, 9.VI.1962, 1 specimen; Maslyanikha, 26.VIII.1952, 2 specimens; Artybash, 30.VI.1987, 1 specimen (Domnikova); Gorno-Altaisk, 1.VI.1948, 1 specimen; Kamenskii distr., 13.VI.1929, 1 specimen (Mafinin).

Tribe DEPORAINI Voss, 1938

Deporaus (Hypodeporaus) mannerheimi (Hummel, 1823).

One beetle found in August in a relict lime forest in the southern part of Kemerovo Province and in July in the environs of Novosibirsk. Krivets (1984) reported this species from the northern part of Kuznetsk Ala Tau.

Dendrophil. Develops on willow and birch. According to Roginskaya (1966), 95% of beetles collected in Moscow Province are related to the latter. In Primorskye Territory damages Amur lime (Azarova, 1974). Females lay eggs into the plate of a leaf and gnaws its petiole. Larvae develop inside fallen leaves, feeding on decomposing parenchyma. For pupation, larvae go into soil (Ter-Minasyan, 1950).

Transpalaearctic species.

Material. Novosibirsk Prov.: Novosibirsk, 9.VII.1974, 1 specimen (Opanasenko). Kemerovo Prov.: Kuzdeevo, 16.VIII.1968, 1 specimen; Tyazhinskii district forestry, 29.VIII.1958, 1 specimen (Stroganova).

Deporaus (s. str.) *betulae* (Linnaeus, 1761), birch weevil.

In Western Siberia occurs in any place where birch, on which larvae develop, grows. On the shores of Teletskoe Lake a leaf-bale of beetles of this species was also been found on alder. In addition to species noted, larva can develop in leaf-bales of beech, hornbeam, hazel, oak, bird cherry, poplar, lime, and chestnut leaves (Escherich, 1923; Ter-Minasyan, 1955; Brauns, 1964).

For oviposition, females prepare a funnel-like leaf-bale from the cut-off upper part of leaf. Preference is given to young birches and lower branches of older birches, which has been reported previously from Germany (Brauns, 1964). Occasionally several beetles work on one leaf-bale, with male taking no part in this work, according to Brauns (1964). About one hour is necessary for a leaf-bale to be prepared. Eggs are lain by females under the epidermis. One leaf-bale contains between 1 and 7 eggs. They are found from the beginning of June till the middle of July. First larvae appear in the middle of June. First-instar larvae mine the leaf plate. Later, they completely gnaw away the leaf plate, making tunnels in the leaf-bale. Approximately in a month larvae leave the leaf-bale and go into soil to pupate there in a soil cavity. In September, there are beetles in the soil, which hibernate without going out to the surface.

Western Palaearctic species.

Material. Tymen' Prov.: Labytnangi, 16.VII.1963, 1 specimen; bank of Sera River, 1.VII.1964, 2 specimens; Oktyabr'skoe, 5.VII.1964, 1 specimen, 25.VI.1963, 2 specimens; Kormuzhikhanka, 4–

16.VII.1964, 4 specimens: Levaya Kormuzhikhanka, 27.VI.1964, 9 specimens: Salekhard, 2.VII.1954, 1 specimen (Cherepanov). Tomsk Prov.: Kopylovka, 2.VI.1961, 4 specimens: Balagachevo, 29.VI.1957, 11 specimens. Novosibirsk Prov.: Kupino, 7.VI.1953, 1 specimen (Cherepanov); Novyi Sharap, 13.VI.1958, 1 specimen (Cherepanov), 5.VI.1959, 1 specimen, 3–4.VII.1959, 4 specimens; Chingisy, 16.VI.1960, 2 specimens; Krasnyi Yar, 4.VI.1961, 1 specimen; Moshkovskii, 4–6.VI.1965, 1 specimen; Sergovka, 2.VI.1961, 1 specimen; Pashino, 30.VI.1954, 1 specimen, 1.VII.1954, 1 specimen; Berdsk, 16.VI.1986, 7 specimens (Opanasenko), 23.V.1988, 3 specimens; L'nikha, 16.VI.1972, 1 specimen; Novosibirsk, 17.VI.1971, 2 specimens (Opanasenko), 14.VI.1989, 1 specimen (Legalov); Mochishche, 15.VI.1987, 1 specimen (Legalov); Yarkovo, VII.1963, 2 specimens; Kirza, 10–17.VII.1991, 1 specimen (Legalov). Altai Territory, valley of Chiri River, 20.VI.1963, 4 specimens (Opanasenko). Klyuchi, 24.V.1952, 1 specimen (Zolotarenko); Teletskoe Lake, 20.V.1959, 1 specimen; Samysh, 27–31.V.1965, 7 specimens, 11–14.VI.1965, 3 specimens; Yailyu, 6–16.VII.1963, 1 specimen (Opanasenko); Barnaul, 24.V.1901, 1 specimen (Goretovskii).

Subfamily APODERINAE Voss, 1926

Tribe APODERINI Voss, 1926

Apoderus (s. str.) *coryli* (Linnaeus, 1758), nut weevil.

Found in Western Siberia anyplace birch grows. Found in the undergrowth of pine forests, in fir and mixed forests, on slashes, river flood-lands, and meadows in Tomsk, Novosibirsk, and Kemerovo Provinces and in Altai Territory. Registered from the environs of Omsk (Lavrov, 1927) and foothills of the Sayany mountains (Lavrov, 1926). Occurrence of nut weevil reported by Krivets (1984) from the northern part of Kuznetsk Ala Tau.

Dendrophil. Development commonly occurs on birch. In addition to birch, can develop on aspen, hazel, alder, oak, hornbeam, lime, and willow (Ter-Minasyan, 1955, 1974). In Germany more frequently occurs on hazel and rarely on birch (Brauns, 1964). According to observations made in Moscow Province, this species is distributed in approximately equal shares between alder and hazel (Roginskaya, 1966). In Western Siberia, only 2 of two hundred collected beetles were taken from aspen and 2 from willow. Others were found on birch. Larvae develop on birch in a leaf-bale rolled by the weevil from one leaf. Females deposit into each leaf-bale 1–7 eggs (more often 2). Characteristically, eggs are deposited by females in pairs, with eggs placed near one another. One more egg or other pairs lie at a considerable distance. Eggs can be found in nature from the first ten-day period of June till the beginning of July. Larvae in leaf-bales were found from the first ten-day period of June till beginning of August. Last instars were found in amount of 1, rarely 2, per tube. Having finished their development, larvae pupate in leaf-bale. Young beetles gnaw a hole and go out. Emerged beetles feed additionally and winter in litter.

Transpalaearctic species.

Material. Tomsk Prov.: Batalino, 20.VI.1955, 2 specimens (Kolomiets); Balagachevo, 16.VIII.1957, 2 specimens; Chichka-Yul, 14.VII.1959, 1 specimen; Kaily, 1–4.VI.1962, 1 specimen; Kopylovka, 2.VI.1961, 1 specimen (Patrusheva), 20.VI.1961, 1 specimen; Tomsk, 1947, 1 specimen. Omsk Prov.: Lyubino, 1.VI.1989, 3 specimens (Barkalov). Novosibirsk Prov.: Kirza, 12.VII.1950, 2 specimens (Cherepanov), 9–14.VII.1991, 2 specimens (Legalov); Orekhov Log, 15.VII.1950, 1 specimen; Morozovka, 18.VII.1950, 3 specimens (Cherepanov); Aleus, 3.IX.1950, 1 specimen; Novosibirsk, 15.VII.1950, 1 specimen (Dyatlova), 23.VI.1951, 1 specimen, 2–22.VII.1965, 3 specimens, 8–27.VI.1974, 7 specimens (Opanasenko), 13–29.VII.1974, 2 specimens (Opanasenko); Berdsk, 6.VIII.1988, 1 specimen; Kupino, 24.VI.1952, 1 specimen (Cherepanov), VII.1952, 1 specimen, 7.VI.1953, 3 specimens (Cherepanov); Mitrofanovka, 11.VI.1953, 2 specimens; Karasuk, 25.VI.1953, 1 specimen; Krasnozerskoe, 25.VI.1953, 2 specimens; Pashino, 30.VI.1954, 2 specimens; Dubrovka, 21.VI.1956, 1 specimen (Kortavina); Novyi Sharap, 30.VI.1957, 2 specimens, 16.VII.1957, 1 specimen, 8–10.VI.1958, 3 specimens, 13–27.VII.1958, 3 specimens, 3.V.1959, 1 specimen, 4–29.VI.1959, 13 specimens, 4–26.VI.1959, 6 specimens, 12–22.VIII.1959, 3 specimens; Zonovo, 20.VI.1961, 1 specimen (Stebaev); Korolevka, 16.VII–22.VIII.1959, 5 specimens (Knysh, Korshunov); Izdrevaya, 14–27.VI.1959, 2 specimens (Shevtsov); Chingisy, 10–30.VI.1960, 7 specimens (Stroganova, Grogor'ev, Opanasenko); Krasnyi Yar, 4.VI.1961, 1 specimen; Kainskaya, 29.VI.1964, 3 specimens, 3.VIII.1964, 2 specimens; Erestnaya, 13.VI.1961, 1 specimen; Borovoe, 9.VI.1970, 1 specimen; Rovenskoe, 6.VII.1972, 1 specimen (Zolotarenko); Nauka, 24.VII.1976, 1 specimen; Malaya Krutishka, 27.VI.1960, 1 specimen (Chernyshova). Kemerovo Prov.: Kuzedeevo, VI.1967, 1 specimen. Altai Territory: Zalesovo, 3.VI.1956, 1 specimen (Korzhavina), 13.VIII.1960, 1 specimen; Yailyu, 18.VI.1963, 2 specimens, 4.VII.1963, 2 specimens, 6–16.VII.1969, 2 specimens, 15.IX.1963,

2 specimens: Samysh, 6.VI.1965, 1 specimen; Troitskoe, 3.VII.1987, 1 specimen (Kolomiets); Barnaul, 24.V.1911, 1 specimen (Goretovskii); Artybash, 6.VI.1968, 1 specimen (Novikova).

Apoderus (Comapoderus) erythropterus (Gmelin, 1790).

Beetles found in damp meadows and forest herbs. Appear in the end of May, being caught in sweeping till the end of July. Beetles of new generation registered from the end of July till September.

Herbophil. We have found beetles feeding on burnet. On the same plant occurs the development of larvae. Once, leaf-bales of these beetles were found near Teletskoe Lake on brier bushes. In the environs of Novosibirsk larvae develop in leaf-bales rolled from a leaflet of a compound burnet leaf. Into each leaf-bale female deposits one, rarely two eggs. In nature, leaf-bales with eggs were found in the second half of July; with larvae, from the end of June till the end of July; emergence of young beetles was registered beginning with the end of July. According to observations made in rearing cages, the development continues 40–40 days, proceeding wholly in leaf bales.

Transpalaearctic species.

Material. Tyumen' Prov.: Lugovoe, 1985, 1 specimen. Tomsk Prov.: Tika, 11–28.VIII.1957, 1 specimen (Kovalev). Novosibirsk Prov.: Erestnaya, 11.VI.1961, 1 specimen; Morozovka, 18.VII.1950, 1 specimen (Zolotarenko); Aleus, 15.VI.1958, 1 specimen (Cherepanov); Novyi Sharap, 28.V.1959, 1 specimen; Chingisy, 1.IX.1960, 2 specimens; valley of Matrenka River, 5.VI.1959, 1 specimen; Nizhnyaya Matrenka, 9.VII.1958, 2 specimens, 23.VI.1956, 1 specimen; Ubinskoe, 20.VII.1962, 1 specimen (Tibatina); Korolevka, 24–30.VI.1959, 3 specimens (Korshunov), 1–8.VIII.1959 1 specimen (Knysh); Zonovo, 10.VI.1961, 1 specimen (Stebaev), 6.VII.1961, 1 specimen (Stebaev); Revunka, 19.VI.1961, 1 specimen; Kaily, 14.VI.1962, 1 specimen, 23.VI.1962, 2 specimens, 8–12.VII.1962, 2 specimens; Novosibirsk, 9.VII.1955, 3 specimens (Litvenchuk); Berdsk, 2.VIII.1930, 1 specimen (Petrova); Petlevskoe, 23.VI.1956, 1 specimen; Uburmanka, 25.VI.1962, 3 specimens. Kemerovo Prov.: Kuzedeevskii distr., 16.VIII.1967, 1 specimen (Morozova). Altai Territory: Mariinsk, 25.VII.1952, 1 specimen; Abai, 6–18.VII.1954, 1 specimen (Malinovskaya); Zav'yalovo, 22.VI.1958, 1 specimen; Teletskoe Lake, Samysh, 8.IX.1965, 1 specimen; Yailyu, 14.VI.1963, 1 specimen; Iolgo Range, 12–13.VIII.1974, 2 specimens; Barnaul, 16.V.1901, 1 specimen (Goretovskii); Kozlushka, 30.VI.1925, 2 specimens (Lebedev); Malyi Krasnoyarsk, 24.VI.1925, 1 specimen (Lebedev).

In all, 19 leaf-rolling weevil species have been revealed in the territory of Western Siberia. Wrinkled, polyphagous, nut, and birch weevils are mass species. Species belonging to the Transpalaearctic (57.9%) and Western Palaearctic (31.6%) complexes predominate in the fauna. Wrinkled weevil and *Auletobius irkutensis* have an Eastern Palaearctic type of area. Only one endemic species *Rhynchites chamaecerasi* is known from Western Siberia. In most part of the region we studied, polyphagous (aspen) and birch weevils are widespread. Remaining 16 species occur only in the southern part of Western Siberia.

Of practical importance are five species. Poplar field-protecting belts are heavily damaged by wrinkled weevil. Plum-tree, cherry-tree, wrinkled, birch and polyphagous weevils are harmful to garden cultures.

REFERENCES

1. Azarova, N. N., Leaf-Rolling Weevils (Coleoptera, Attelabidae) of Kurile Islands. *Entomol. Obozr.*, 1974, vol. 53, no. 4, pp. 783–790.
2. Babenko, Z. S., *Nasekomye-fitofagi plodovykh i yagodnykh rastenii lesnoi zony Priob'ya* (Insects Feeding on Fruit and Berry Plants in the Forest Zone of Ob' Region), Tomsk: Tomsk Univ., 1982.
3. Babenko, Z. S. and Krivets, S. A., Weevils and Leaf-Rolling Weevils (Coleoptera: Curculionidae, Attelabidae) as Pests of Fruit and Berry Cultures in the Forest Zone of the Ob' Region. *Fauna i ekologiya nazemnykh chlenistonogikh Sibiri* (Fauna and Ecology of Terraneous Anthropoda in Siberia), Irkutsk, 1981, pp. 44–53.
4. Baitenov, M. S., *Zhuki-dolgonosiki (Coleoptera: Attelabidae, Curculionidae) Srednei Azii i Kazakhstana* [Weevils (Coleoptera: Attelabidae, Curculionidae) in Middle Asia and Kazakhstan], Alma-Ata: Nauka, 1974, pp. 5–27.
5. Bassel', D. G., List of Insects—Garden Pests for Barnaul, *Izv. Sib. Kr. STAZRa*, Tomsk, 1929, no. 3(6), pp. 147–150.
6. Brauns, A., Taschenbuch der Waldinsekten, Jena, 1964, pp. 221–223.
7. Cherepanov, A. I. and Opanasenko, F. I., The Weevil Fauna of the Coastal Region of the Novosibirsk Water Reserve. *Fauna, sistematika i ekologiya nasekomykh i kleshchei* (Fauna, Systematics, and Ecology of Insects and Mites), Novosibirsk: Sib. Otd. Akad. Nauk SSSR, 1963, pp. 7–23.
8. Egorov, N. N., Insects—Pests of Strip Pine Forests in Western Siberia. *Zool. Zh.*, 1958, vol. 38, no. 10, pp. 1488–1499.
9. Escherich, K., Forstinsekten Mitteleuropas, Berlin, pp. 336–349.
10. Gebler, F., Nota et addidamenta ad Catalogum Coleopterorum Sibiriae occidentales et confinis Tatariae Op-

eris. *Ledebour's Reise in das Altai-Gebirge und die soongorische Kirgisen-Steppe*. Berlin. 1830. pp. 292–293.
11. Heyden, L., *Catalog der Coleopteren von Sibirien*. Berlin. 1880–1881. pp. 157–181.
12. Khamushev, E. K., Materials on the Biology and Harmfulness of Cherry Weevil (*Rhynchites auratus* Scop.). *Materialy 3-i respubl. naucho-proizvodstvennoi konferentsii po zashchite rastenii v Kazakhstane* (Proc. of 3rd Republ. Scientific-Industrial Conf. on Plant Protection in Kazakhstan). Alma-Ata. 1974. pp. 68–69.
13. Kobets, N. V. and Opanasenko, F. I., Coleoptera in Willow Groves of the Central Siberian Botanical Garden. *Okhrana sredy i ratsional'noe ispol'zovanie rastitel'nykh resursov* (Environment Protection and Rational Use of Plant Resources). Moscow: Nauka. 1976. pp. 278–279.
14. Korshunov, Yu. P., Remarks on the Entomofauna of the Northern Part of Middle Taiga in Western Siberia. *Priroda taigi zapadnoi Sibiri* (Nature of Taiga in Western Siberia). Novosibirsk: Nauka. 1973. pp. 136–152.
15. Korshunov, Yu. P. and Opanasenko, F. I., Remarks on the Fauna of Coleoptera in the Nature Reserve "Stolby". Pt. 2. *Tr. Gos. Zap. "Stolby"* (Collection of Scientific Works of the Nature Reserve "Stolby"). Krasnoyarsk: Krasnoyarsk Kn., 1971. issue 8. pp. 115–127.
16. Krivets, S. A., Specific Features of the Fauna of Leaf-Rolling Weevils (Coleoptera: Attelabidae, Curculionidae) in the Northern Part of Kuznetsk Ala Tau. *Nasekomye v ekosistemakh lesnoi zony Sibiri* (Insects in Ecological Systems of the Forest Zone in Siberia). Tomsk. 1984. pp. 52–61.
17. Kulik, A. A. and Shbetsova, A. N., *Vrediteli sel'skokhozyaistvennykh rastenii v Omskoi oblasti i bor'ba s nimi* (Pests of Agricultural Plants in Omsk Province and Pest Control). Omsk: Omsk Obl. Gos., 1948.
18. Lavrov, S. D., Remarks on the Entomofauna of the Foothills of the Sayan Mountains. *Tr. Sib. S.-Kh. Akad.* (Collection of Scientific Works of the Siberian Agricultural Academy). Omsk. 1926. vol. 6. issue 7. pp. 1–17.
19. Lavrov, S. D., Materials to Investigation of the Entomofauna of the Environs of Omsk. *Tr. Sib. In-ta S.-Kh. i lesovodstva* (Collection of Scientific Works of the Siberian Institute of Agriculture and Forestry). Omsk. 1927. vol. 8. issue 8. pp. 51–100.
20. Matesova, G. N., Mityaev, I. D., and Yukhnevich, L. A., *Nasekomye i kleshchi-vrediteli plodovo-yagodnykh kul'tur Kazakhstana* (Insects and Pest Mites of Fruit-Berry Cultures in Kazakhstan). Alma-Ata: Akad. Nauk Kaz. SSR. 1962.
21. Mitlyuchenko, K. Z., Materials to Investigation of the Harmful Etnofauna of Tree and Shrub Plantations in Novosibirsk. *Tr. Novosib. S.-Kh. In-ta* (Collection of Scientific Works of Novosibirsk Agricultural Institute). Novosibirsk. 1946. issue 6. pp. 225–235.
22. Mitlyuchenko, K. Z., Entomofauna of Tree and Shrub Plantations in Novosibirsk). *Tr. Novosib. S.-Kh. In-ta* (Collection of Scientific Works of Novosibirsk Agricultural Institute). Novosibirsk. 1951. issue 8. pp. 159–166.
23. Opanasenko, F. I., Experience of Controlling the Wrinkled Weevil. *Inf. listok* (Information Leaflet) no. 464–73. Novosibirsk. 1973.
24. Opanasenko, F. I., Dendrophilous Weevils of upper Ob' Region. *Cand. Sci. (Biol.) Dissertation*. Moscow. 1978.
25. Opanasenko, F. I., Landscape-Biotopic Distribution and Biocenotic Relationships of Dendrophilous Weevils in upper Ob' Region. *Bolezni i vrediteli kul'turnykh rastenii v Novosibirskoi oblasti* (Diseases and Pests of Cultured Plants in Novosibirsk Province). Novosibirsk. 1984. pp. 48–66.
26. Opanasenko, F. I., Carpophagous Insects Feeding on Stone Fruit Trees in Novosibirsk Province. *Ekologiya i geografiya chlenistonogikh v Sibiri* (Ecology and Geography of Anthropods in Siberia). Novosibirsk: Nauka. 1987. pp. 181–183.
27. Prokof'ev, M. A., *Vrediteli i bolezni sadov Sibiri* (Pests and Diseases in Gardens of Siberia). Barnaul: Altai Knizhn., 1966.
28. Roginskaya, E. Ya., Materials on Food Specialization of Dendrophilous Leaf-Rolling and Short-Proboscis Weevils (Coleoptera, Attelabidae, Curculionidae) in Moscow Province. *Entomol. Obozr.*, 1966. vol. 45. nos. 1–2. pp. 36–50.
29. Savkovskii, P. P., *Atlas vreditelei plodovykh i yagodnykh kul'tur* (Atlas of Fruit and Berry Cultures). Kiev: Urozhai. 1983.
30. Slivkina, K. A., Pests of Trees and Shrub of Forest Plantations in Steppe and Forest-Steppe Regions of Kazakhstan. *Tr. NII zashchity rastenii* (Collection of Scientific Works of the Scientific Research Institute of Plant Protection). Ural'sk. 1958. vol. 4. pp. 160–171.
31. Ter-Minasyan, M. E., Leaf-Rolling Weevils (Attelabidae). *Fauna SSSR: nasekomye zhestkokrylye* (The Fauna of the USSR: Coleoptera). Moscow: Akad. Nauk SSSR. 1950. vol. 27. issue 2.
32. Ter-Minasyan, M. E., Leaf-Rolling Weevils of Fam. Attelabidae. *Vrediteli lesa* (Forest Pests). Moscow: Akad. Nauk SSSR. 1955. vol. 2. pp. 581–592.
33. Ter-Minasyan, M. E., Leaf-Rolling Weevils of Fam. Attelabidae. *Opredelitel' nasekomykh Evropeiskoi chasti SSSR* (Key to Insects of the European Part of the USSR). Moscow: Nauka. 1965. vol. 2. pp. 481–485.
34. Ter-Minasyan, M. E., New Beetle Species of the Genus *Rhynchites* Schneid. (Coleoptera, Attelabidae) in the Fauna of the USSR. *Entomol. Obozr.*, 1966. vols. 4–5. no. 4. pp. 854–856.
35. Ter-Minasyan, M. E., Leaf-Rolling Weevils of Fam. Attelabidae. *Nasekomye i kleshchi vrediteli sel'skokhozyaistvennykh kul'tur* (Insects and Mites—Agricultural Pests). Leningrad: Nauka. 1974. vol. 2. pp. 209–218.
36. Winkler, A., *Catalogus Coleopterrorum Regionis Palaearcticae*. Wien. 1930. Pars 11. pp. 1370–1392.