

A key to genera and species of the tribe Hylesinini Erichson, 1836  
(Coleoptera: Curculionidae: Scolytinae)  
from Russia and adjacent countries

Определительные таблицы видов трибы Hylesinini Erichson, 1836  
(Coleoptera: Curculionidae: Scolytinae)  
России и сопредельных стран

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КЛЮЧЕВЫЕ СЛОВА: Coleoptera, Curculionidae, Scolytinae, короеды, систематика, новые синонимы, Россия.

ABSTRACT. Species of the tribe Hylesinini Erichson, 1836 from Russia and adjacent countries are reviewed and a key to species is provided. New synonymy is proposed: *Hylesinus wachtli* Reitter, 1887 = *Hylesinus orni* Fuchs, 1906, **syn.n.**, *Hylesinus laticollis* Blandford 1894 = *Hylesinus pravdini* Stark, 1936, **syn.n.**, *Hylesinus tristis* Blandford 1894 = *Hylesinus lubarskyi* Stark, 1936, **syn.n.**

РЕЗЮМЕ. Дан обзор видов трибы Hylesinini Erichson, 1836 России и сопредельных стран, составлены ключи для определения родов и видов. Предложена новая синонимия: *Hylesinus wachtli* Reitter, 1887 = *Hylesinus orni* Fuchs, 1906, **syn.n.**, *Hylesinus laticollis* Blandford 1894 = *Hylesinus pravdini* Stark, 1936, **syn.n.**, *Hylesinus tristis* Blandford 1894 = *Hylesinus lubarskyi* Stark, 1936, **syn.n.**

Tribe Hylesinini Erichson, 1836 unites 14 genera of Scolytinae: *Alniphagus* Swaine, 1918, *Cryptocurus* Schedl, 1957, *Dactylipalpus* Chapuis, 1869, *Ficicis* Lea, 1910, *Hapalogenius* Hagedorn 1912, *Hylastinus* Bedel 1888, *Hylesinopsis* Eggers, 1920, *Hylesinus* Fabricius, 1801, *Kissophagus* Chapuis, 1869, *Longulus* Krivolutskaya, 1968, *Neopteleobius* Nobuchi, 1971, *Phloeoborus* Erichson, 1836, *Pteleobius* Bedel, 1888, *Rhopalopselion* Hagedorn, 1909 [Kurentsov, 1941; Balachowsky, 1949; Stark, 1952; Krivolutskaya, 1996; Wood, 1986; Wood, Bright, 1992; Petrov, Mandelsh-

tam, 2002; Alonso-Zarazaga, Lyal, 2009; Beaver, 2010; Knížek, 2011]; six of them are known in Russia.

The present paper puts on review of tribe Hylesinini of Russia, with a key provided to six genera.

### Material and methods

The material studied are kept in the collections of the Naturhistorisches Museum, Vienna, Austria (NHMW), the Hungarian National Museum, Budapest, Hungary (HNMB), the Zoological Institute of Russian Academy of Science, St.-Petersburg, Russia (ZISP), the Zoological Museum of Moscow State University, Moscow, Russia (ZMMU).

### Results

#### Tribe Hylesinini Erichson, 1836

Total length 1.5–16 mm, body 1.6–2.2 times as long as wide.

Head sexually dimorphic or not (frons convex in both sexes); eye entire to weakly sinuate anteriorly; antennal funicle 6- or 7-segmented, club conical, subconical or moderately flattened; pronotal surface with asperities or tubercles in anterolateral area (except *Hylastinus* and *Longulus*); scutellum visible, small; elytral bases armed by a single row of crenulations (except *Dactylipalpus* and *Phloeoborus*). Mandibles are prominent, triangular; each with an apical tooth, without subapical and median teeth. Maxillae have typical

form for the tribe. The form of the cardo, stipes, palpifer, galea, subgalea and lacinia is constant within the tribe. Maxillary palpi 3-jointed, the first joint is equal to or longer than the second, and equal to or shorter than the two other segments together. Lacinial teeth are long; first, second and third teeth in apical portion of lacinia are narrow and short, teeth 4–16 are lanceolate and longer, basal teeth 17–19 are narrow and long (Fig. 7). Labial form is conserved within the tribe. The mentum is wide, and as long as wide. Labial palpi as long as mentum. Ligula short, with abundant long setae (Fig. 6).

Thoracic sclerites: Metascutellar area is separated from postnotum by a distinct suture, and a long sutural groove; metendosternite V-shaped, with long furcal arms, lateral arms well developed; stalk middle length, with developed lateral flaps expanded and rounded off at top (Fig. 8).

Legs: Procoxae are contiguous to narrowly separated; third tarsal segment bilobed.

Proventriculus is changed in form and size in different genera, from cylindrical in *Hylesinus* and *Phloeoborus* to conoid in *Alniphagus*. Anterior plate strongly sclerotized on



Figs 1–4. Habitus of bark beetles of the tribe Hylesinini: 1 — *Hylesinus crenatus*; 2 — *H. varius*; 3 — *H. verae*; 4 — *Longulus elatus*.  
Рис. 1–4. Габитус жуков короедов трибы Hylesinini: 1 — *Hylesinus crenatus*; 2 — *H. varius*; 3 — *H. verae*; 4 — *Longulus elatus*.

lateral sides, with many transverse sutures, which are replaced by blunt tubercles on anterior triangular area, posterior ones of the sutures strongly curved and retuse in middle, without distinct tubercles laterally; middle triangular area of anterior plate weakly sclerotized, median longitudinal suture and lateral teeth of serration absent. Posterior plate 1.1–2.1 times as long as anterior plate; closing teeth not reaching to middle of masticatory brush, each not serrated in lateral sides; each masticatory tooth with about six femoral teeth, of which median ones are larger. Crop closely covered with sharply pointed tubercles (*Hylesinus*) or without tubercles (*Phloeoborus*). Anterior plate indistinctly bordered on crop (Figs 9–11)

Median lobe of the aedeagus variable: elongated with long apophyses in *Alniphagus*, *Ficicis*, *Hylastinus*, *Hylesinus*, and *Longulus*, elongated with short apophyses in *Pteleobius*. or short with short apophyses in *Kissophagus*. In the base there is a basal sclerotized structure (internal sac). Lateral folds thick and uniformly arcuate, apex round; lateral and apical margins with more sclerotization. Tegmen circular, ventral side weakly thickened proximally. Spicule nearly as long as aedeagus, sickle-shaped (Figs 20–38).

#### KEY TO THE GENERA OF HYLESININI OF RUSSIA.

1. Surface of pronotum with asperities or small tubercles on anterolateral areas ..... 2  
— Surface of pronotum without asperities or small tubercles ..... 5
2. Antennal funicle 6-segmented (Fig. 18); male frons convex, median area on lower two-thirds weakly impressed with a fine, long carina; pronotum slender (0.9–1.0 times as long as wide); vestiture of uniform color, elytral ground vestiture of abundant, plumose setae; 2.0–2.2 mm ..... *Kissophagus* Chapuis  
— Antennal funicle 7-segmented ..... 3
3. Abdomen distinctly ascending to meet elytral apex, convex; ventrites 1 to 5 forming an obtuse angle with thoracic sternites; apical portion of protibia armed on lateral margin by six or more closely set, socketed teeth; antennal club with 2 or 3 straight, transverse sutures; eye entire, less than 3.0 times as long as wide; 1.7–6.6 mm ..... *Hylesinus* Fabricius  
— Abdomen horizontal, apical portion of protibia armed on lateral margin by five closely set, socketed teeth ..... 4
4. Antennal club subconical, with two transverse sutures and six transverse rings of setae (Fig. 12); frons of male convex, median area on lower two-thirds weakly impressed; elytral interstriae armed by fine crenulations or loosely set pointed tubercles; vestiture of sparse hair-like setae on elytral disc, shorter scale-like setae on declivity, and rows of erect interstitial hair-like setae; 2.0–3.8 mm ..... *Alniphagus* Swaine  
— Antennal club without straight transverse rings of setae; frons of male convex; elytral interstriae without crenulations or sparse pointed tubercles; ground vestiture of abundant scales, forming patterns of light and dark brown color; 1.6–2.2 mm ..... *Pteleobius* Bedel
5. Elytral interstriae with sparse hair-like setae; interstriae 1, 2, 3 not elevated on elytral declivity; 2.0–2.7 mm ..... *Hylastinus* Bedel  
— Elytral interstriae with abundant scale-like setae; interstriae 1 and 3 weakly elevated on elytral declivity; declivital interstriae 3 and 9 connect in an apical part of elytra, interstriae 3 increasing in height from declivital base to junction with interstriae 9; the junction is raised over apical interstriae 2 (Fig. 5); 2.5–3.2 mm ..... *Longulus* Krivolutskaya

#### Genus *Alniphagus* Swaine, 1918

Type species *Hylesinus aspericollis* LeConte, 1876.

= *Hylastinoides* Spessivtsev, 1919.

Length 2.1–4.2 mm, 1.9–2.1 times as long as wide. Color reddish brown to dark brown.

Head sexual dimorphic, frons of male flat, median area on lower two-thirds weakly impressed, frons of female convex with transverse impression just above epistoma, and short median carina; vestiture of sparse, fine, short hairs. Eye elongate, shallowly emarginate. Antennal scape elongate, funicle 7-segmented, club moderately flattened, marked by three sutures in North American species [Wood, 1982, 1986] or of conical form with two sutures in *Alniphagus costatus* (Blandford, 1894). Besides, club of *A. costatus* with six rings of erect setae (Fig. 12). Pronotum wider than long, 0.75–0.80 times as long as wide, anterolateral area armed by asperities; vestiture of hair-like setae. Elytra cylindrical, 1.40–1.60 times as long as wide, basal margins armed by crenulations; striae feebly impressed, interstriae wider than striae, each armed by a uniseriate row of coarse crenulations; declivity convex, steep, alternate interstriae 1, 3, 5, 7 and 9 weakly elevated; vestiture hairlike. Abdomen horizontal. Aedeagus elongate, 3.35–3.40 times as long as wide, apophyses as long as median lobe (for *A. costatus*), aedeagus as in *Hylesinus*, but with longer frontal process of basal internal sac, lateral processes of internal sac reduced (Figs 20–21) Spicule longer than aedeagus, sickle-shaped.

Legs: anterior coxae widely separated; protibia armed in apical part of lateral margin by five closely set socketed denticles; outer apical angle only moderately abrupt.

Genus *Alniphagus* is restricted to the Holarctic. It includes three species, but only one species is known from the Palaearctic region, including Russia.

#### 1. *Alniphagus costatus* (Blandford, 1894)

Figs 12, 20–21.

= *Hylastes alni* Niisima, 1909.

= *Alniphagus alni* var. *imitator* Sokanovsky, 1958.

DISTRIBUTION. Russian Far-East (Southern parts of Khabarovsk Terr., Primorsk Terr.), Sakhalin, Southern Kurils (Iturup Isl. and Kunashir Isl.), Japan (Hokkaido, Honshu), North Korea [Chu, 1964, Mandelshtam et al, 2007], South Korea, China, Taiwan [Knižek, 2011].

HOSTS. *Alnus* spp. Schedl [1958] suggested that *Hylesinus tristis* Blandford, 1894 is a junior synonym of *Hylesinus costatus* Blandford, 1894. Due to this erroneous opinion Wood and Bright [1992] included in the list of host trees for *H. costatus* several tree species which it does not infest, namely *Fraxinus mandschurica* and *F. sieboldiana* (Oleaceae), which are normal hosts of *H. tristis*. Krivolutskaya [1996] repeated this mistake. Wood and Bright [1992] also list as a host plant *Cladrastis shikokiana* (Leguminosae), but this seems unlikely for both *A. costatus* and *H. tristis* [Mandelshtam et al., 2007].

BIOLOGY. *A. costatus* adults overwinter in tunnels in the bark of living or felled trees. They emerge in the summer and attack weakened trees from mid-July to end of August. The first part of the egg gallery is transverse for 15–20 mm, then abruptly changes direction to run longitudinally for 30–50 mm. Eggs are laid singly in niches on both sides of the gallery. Larval mines are straight. There is one generation each year.

#### Genus *Hylastinus* Bedel, 1888

Type species *Ips obscurus* Marsham, 1802.

Length 2.0–2.8 mm, 2.1–2.2 times as long as wide. Color dark-brown.



Head without sexual dimorphism, frons of male and female convex, with transverse impression in epistomal area; surface coarsely reticulate; vestiture hairlike, short; Eye entire, elongate; antennal funicle 7-segmented, club with three sutures, sutures 1 and 2 septate. Pronotum wide, 0.9–0.95 times as long as wide; surface without asperities and small tubercles in anterolateral areas, coarsely, deeply punctured; pronotal vestiture consists of elongate, abundant hair-like setae. Scutellum small, slightly depressed. Elytra 1.4–1.45 times as long as wide; bases of elytra armed by a single row of crenulations; declivity convex, steep, interstriae 1 and 3 not elevated on elytral declivity above interstriae 2, 4, 5; vestiture hair-like. Prothoracic intercoxal piece wide, prothorax in front of coxa with acute ridge extending from coxa to anterior margin of prothorax. Abdomen horizontal.

Male genitalia. We had no opportunity to study the aedeagus of the type species *H. obscurus*. The description provided is for *H. fankhauseri* Reitter, 1894. Aedeagus elongate, 2.13 times as long as wide, apophyses 1.55 times long as median lobe; base of internal sac is considerably above upper rim of median lobe; lateral processes of internal sac base are hypertrophied in length, frontal processes of internal sac base do not form a ring (Figs 22–23) Spicule of similar length to aedeagus, sickle-shaped.

The genus *Hylastinus* is distributed in Europe; *H. obscurus* has been introduced into North America and South America. In Russia there are two species.

#### KEY TO *HYLASTINUS* SPECIES OF RUSSIA

1. Elytral vestiture of abundant fine, adjacent, hair-like setae; interstriae with abundant short hairs and row of sparse longer hair-like setae; 2.0–2.5 mm ..... *obscurus* (Marsham)
- Elytra without fine, adjacent hairs; each interstria with three rows of long hair-like setae; 2.0–2.8 mm ..... *tiliae* Semenov

#### 1. *Hylastinus obscurus* (Marsham, 1802)

- = *Hylesinus crenatulus* Duftschmid, 1825.
- = *Scolytus crenatus* Olivier, 1795.
- = *Hylurgus fuscescens* Stephens, 1830.
- = *Hylastinus pilosus* Eggers, 1944.
- = *Dermestes trifolii* P. W. J. Müller, 1803.

DISTRIBUTION. Russia (Crimea, South Dagestan); Latvia, Eastern and Western Europe, North Africa.

HOST. *Trifolium pratense*, *Laburnum* spp., *Lathyrus* spp., *Lembotropis nigricans*, *Medicago* spp., *Melilotus* sp., *Ononis natrix*, *Sarothamnus scoparius*, *Ulex europaeus*, *Vicia* spp. [Pfeffer, 1995; Wood, 1982].

BIOLOGY. Adults and larvae of *H. obscurus* overwinter in roots in the ground. They emerge in the spring and attack unthrifty plants from mid-May to late June. Egg gallery of the biramous type. Eggs in niches along both margins of egg gallery. The larvae mine at random through the root tissues. Pupae and young beetles appear in August or September. There is one generation each year.

#### 2. *Hylastinus tiliae* Semenov, 1902

DISTRIBUTION. Russia (Dagestan, North Ossetia); Abkhazia, Georgia.

HOST. *Tilia cordata*, *T. platyphyllos*.

BIOLOGY. Adults and larvae of *H. tiliae* overwinter in tunnels in the bark of felled trees. The beetles emerge in the spring and fly to the trunks or limbs of felled or dying trees from mid-May to June. There is one generation each year.

#### Genus *Hylesinus* Fabricius 1801

Type species *Bostrichus crenatus* Fabricius, 1787.  
= *Leperisinus* Reitter, 1913.  
= *Adipocephalus* Wickham, 1916.

Length 1.8–6.6 mm, 1.8–2.0 times as long as wide. Color of body reddish brown to dark brown.

Head sexually dimorphic, frons of male flat to weakly convex, frons of female convex, vestiture strongly differs in species from abundant to very sparse. Eye oval, anterior margin weakly sinuate.

Antenna with scape clavate, of equal length to funicle; funicle 7-segmented; setae of funicle segments erect, sparse; club subconical with 3 clear transverse sutures, covered by short setae. Length of funicular setae and form of club are important morphological features for distinguishing species (Figs 13–17).

Pronotum with variable sculpture and vestiture that are of importance in separating species. Pronotum wider than long, 0.60–0.75 times as long as wide in different species of the genus; weakly narrowed and constricted anteriorly; basal margin weakly bisinuate; surface of anterolateral areas in most species armed by several crenulations; disc with deep rounded or irregular punctures. Pronotal vestiture variable: in different species it can be scale-like, hair-like or very short hair-like. Features of elytral sculpture and pubescence divide the genus into two groups: 1) elytra with weakly impressed elytral striae and vestiture of abundant ground scales forming patterns of light and dark brown color; 2) elytra with deeply impressed elytral striae and vestiture of sparse hair-like or scale-like dark setae or scales, some species with elytral vestiture of microscopic hairs only.

Abdomen obliquely ascending from the posterior edge of the first sternite to fifth sternite at an angle of 30–40°. Sternites are covered with hairs or almost glabrous.

Legs: Procoxae narrowly separated, mesocoxae and metacoxae widely separated by length of one coxa. Protibia broad, on outer lateral edge with six or seven small closely set socketed teeth on distal third. Mesotibia and metatibia with 7–9 small, socketed teeth on lateral and distal parts.

Aedeagus elongate, 2.3–2.7 times as long as wide, apophyses as long as median lobe; base of internal sac located below upper rim of median lobe; frontal and lateral processes of internal sac base are developed, form and length of frontal and lateral processes are species-specific (Figs 24–33) Spicule slightly longer than aedeagus, sickle-shaped.

The genus is morphologically similar to *Ficicis* Lea 1910, but the latter can be distinguished by the more gradual elytral declivity with shorter erect setae on elytral interstriae, and eye less than 3.0 times as long as wide [Wood, 1986].

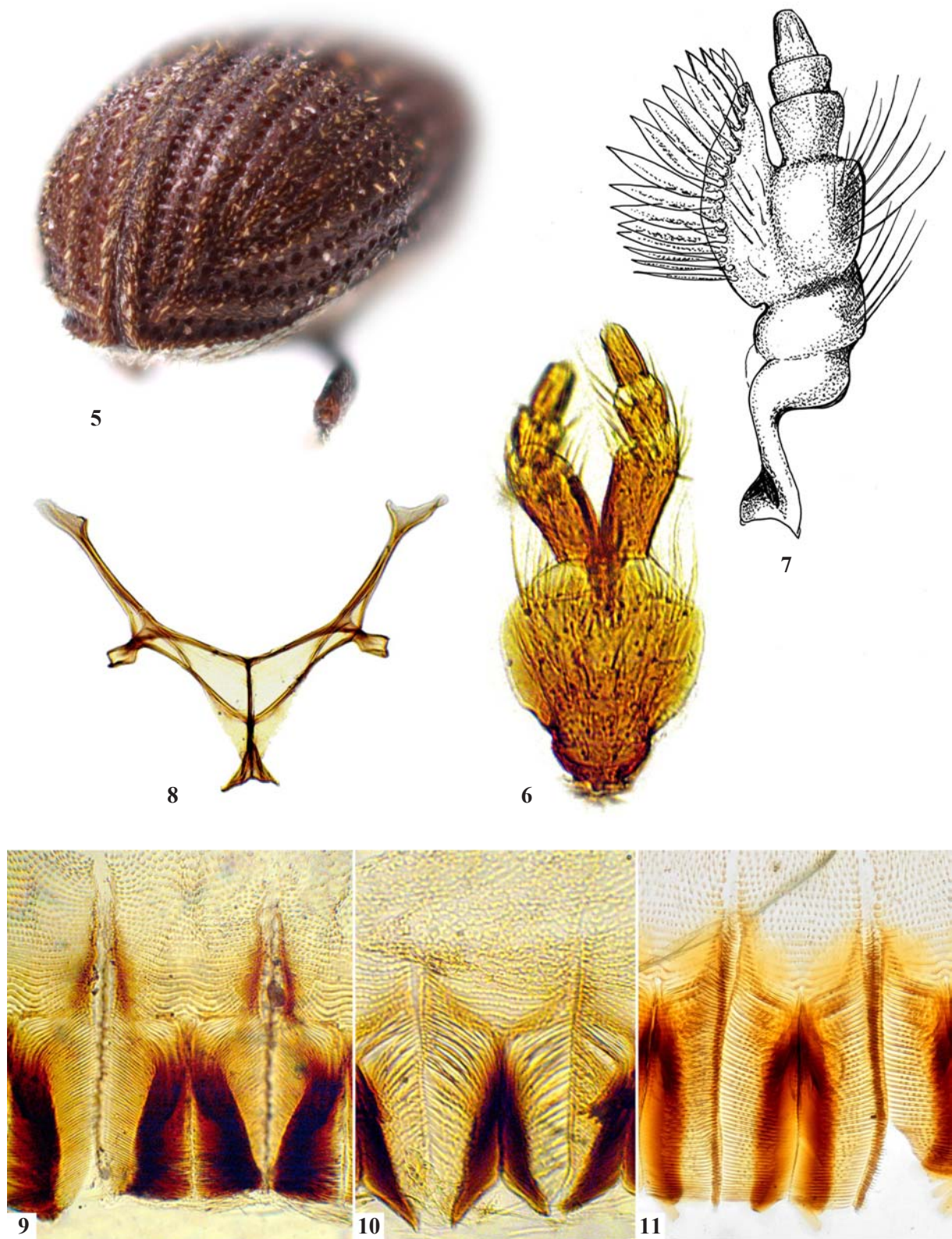
Most species of the genus *Hylesinus* are distributed in the Holarctic realm; in the Palaearctic, they occur from the northern limits of the range of *Fraxinus* to India and northern Africa [Knížek, 2011, Petrov, 2011]. Genus includes 37 recent species, of which at least 12 are known from the Palaearctic. All Palaearctic species breed in the inner bark and sapwood of Oleaceae trees, are mostly restricted to the genera *Fraxinus* and *Olea*, but exceptionally can attack branches of *Fagus*, *Quercus*, *Tilia* and *Syringa*.

#### KEY TO *HYLESINUS* SPECIES OF RUSSIA

1. Scales on elytral surface bicoloured, very dense, concealing striae, and forming a rather irregular pattern on surface of pronotum and elytra ..... 2
- Scales less dense, not concealing striae on disk of elytra; scales on pronotum and elytra dark and almost unicoloured, not forming an irregular pattern ..... 7

2. Paler scales form distinct oblique fasciae, contrasting with dark scales, and symmetrical on either side of elytral suture ..... 3  
 — Paler scales not forming distinct oblique symmetrical fasciae on either side of elytral suture, but arranged in a more irregular pattern ..... 4
3. Elytral scales acutely pointed at apex; pale scales form a wide band from postero-lateral part of elytra to scutellum, with a further pale area on elytral declivity; interstriae with rows of small tubercles; base of pronotum with long, pale hairs; 2.5–5.5 mm ..... *H. tupolevi* Stark  
 — Elytral scales rounded, blunt at apex; pale scales form a hardly noticeable narrow band in apical half of elytra, the band interrupted at first interstria in center of elytral disk; base of pronotum with short silvery hairs and narrow scales; 2.3–2.5 mm ..... *H. cingulatus* Blandford
4. First, third and ninth interstriae on declivity raised, second interstriae deepened; 3.0–3.4 mm .....  
 ..... *H. eos* Spessivtsev  
 — Second interstriae not deepened, third and ninth interstriae not raised on declivity ..... 5
5. Each elytral interstria with scales of two types: abundant, short, rounded scales and rare longer, recumbent, hairlike scales. Lateral margins of elytra with poorly visible recumbent hairlike scales. Majority of scales of pale colour; 2.5–3.3 mm ..... *H. wachtili* Reitter  
 — Each elytral interstria with scales of two types: abundant short rounded scales and rare long, erect hairlike scales. Lateral margins of elytra with clearly visible erect, hairlike scales ..... 6
6. Club of subtriangular form, male antennal funiculus with long setae on segments 4–7, these setae extending as far as second suture of club (Fig. 17); interstriae on elytral disk with small pointed tubercles; median lobe of male genitalia falcate (in lateral view) (Figs 32–33); 2.9–3.3 mm ..... *H. verae* Petrov  
 — Club of more elongate, spindle-like form; male antennal funiculus with shorter setae on segments 4–7, these setae extending only up to first suture of club (Fig. 16); interstriae on elytral disk of majority of specimens without small pointed tubercles; median lobe of male genitalia (Figs 30–31) elongate and weakly curved (in lateral view); 3.0–3.4 mm ..... *H. varius* (Fabricius)
7. Anterolateral part of pronotum without tubercles and pointed teeth (or with very minute tubercles) ..... 8  
 — Anterolateral part of pronotum with distinct tubercles and pointed teeth ..... 11
8. Posterior margin at apex of elytral declivity thickened and protruding backwards; surface of pronotum and elytra without scales, and with only minute hairs on interstriae 1 of elytra; 4.5–6.0 mm .....  
 ..... *H. botscharnikovi* Stark  
 — Apex of elytral declivity with simple margin, not thickened, not explanate and not protruding backwards; surface of pronotum and elytra with scales and hairs ..... 9
9. Surface of elytral interstriae with straight longitudinal rows of minute hairs (old beetles sometimes without hairs so that elytral surface appears glabrous); 3.6–6.0 mm ..  
 ..... *H. crenatus* (Fabricius)  
 — Elytral surface (especially declivity) covered with hairs and scales ..... 10
10. Interstriae with numerous transverse, strongly raised asperities; interstriae on apical part of elytra with reddish-brown, brown or black scales, and rare short hairs; interstriae 2, 4, 8 on elytral declivity are impressed; 4.5–5.0 mm ..... *H. cholodkovskiy* Berger  
 — Interstriae with large rounded tubercles, smaller in apical part of elytra; interstriae on elytral declivity with elongate hairlike scales; interstriae 2, 4, 8 on elytral declivity not impressed; 4.7–6.0 mm ..... *H. nobilis* Blandford
11. Interstriae densely covered with semirecumbent, narrow, dark brown scales; interstriae 1 densely covered with longer, erect, hair-like scales, forming a noticeable velvety strip from scutellum to apical margin of elytra; 2.4–3.5 mm ..... *H. toranio* (D'Anthoine)  
 — Interstriae densely covered with short, dark brown, rounded scales; interstriae 1 without longer, erect, hair-like scales ..... 12
12. Interstriae in posterior half of elytra covered with short dark scales; interstriae 1 with short dark scales throughout from scutellum to apex, but not masking interstitial tubercles; body oblong-oval, 1.8 times as long as wide; 3.8–4.1 mm ..... *H. tristis* Blandford  
 — Interstriae 1 covered with short pale scales throughout from the base of elytra to apex, concealing tubercles; hairs or hairlike scales cover surface of other interstriae on their apical part ..... 13
13. Length more than 3.8 mm, body broadly-oval, 1.7 times as long as wide; interstriae 1 covered with short pale scales throughout from the base of elytra to apex; other interstriae are covered with hairs or hairlike scales on most of elytra; male with interstriae 1 raised from base to posterior part of elytra; 4.0–4.8 mm ..... *H. laticollis* Blandford  
 — Length less than 2.5 mm, body oblong-oval, 1.85 times as long as wide; interstriae 1 slightly raised from base to posterior part of elytra; 1.8–2.1 mm .....  
 ..... *H. mandshuricus* Eggers
1. *Hylesinus botscharnikovi* Stark, 1931  
 Fig. 13.  
 DISTRIBUTION. Russia (South Dagestan); Azerbaijan, Iran, Turkmenistan [Petrov, 2011].  
 HOST. *Fraxinus excelsior*.  
 BIOLOGY. Adults and larvae of the *H. botscharnikovi* overwinter in tunnels in the bark of twigs of living trees. They emerge in the spring and attack weakened trees from mid-April to late May (in South Dagestan). There is one generation for year and half or two years.
2. *Hylesinus cholodkovskiy* Berger, 1916  
 DISTRIBUTION. Russia (South Primorsk Terr.); China (Heilongjiang); N. Korea.  
 HOST. *Fraxinus mandshurica*.  
 BIOLOGY. Not investigated.
3. *Hylesinus cingulatus* Blandford, 1894  
 DISTRIBUTION. Russia (Far-East, Southern parts of Khabarovsk Terr., South Primorsk Terr.); China, North and South Korea; Japan  
 HOST. *Fraxinus mandshurica japonica*, *F. lanuginosa serrata*  
 BIOLOGY. Adults and larvae of *H. cingulatus* overwinter in tunnels in the bark of twigs of living trees. Beetles attack stressed and weakened trees from the end of May to June. Larvae develop for 20–30 days. Young beetles leave the parental galleries from the end of July to mid-August [Kurenzov, 1941]. There is one generation each year.
4. *Hylesinus crenatus* (Fabricius, 1787)  
 Figs 1, 9, 14, 24–25.  
 = *Anthribus crenatus* Gravenhorst, 1807.  
 = *Anthribus prutenkyi* Sokanovskiy, 1959.





Figs 5–11. Details of bark beetles of the tribe Hylesinini: 5 — *Longulus elatus*; 6–8, 10 — *Hylesinus varius*; 9 — *H. crenatus*; 11 — *Hylastinus fankhauseri*; 5 — elytral declivity; 6 — labium; 7 — maxilla; 8 — metepisternum; 9–11 — proventriculus.

Рис. 5–11. Детали строения жуков короедов трибы Hylesinini: 5 — *Longulus elatus*; 6–8, 10 — *Hylesinus varius*; 9 — *H. crenatus*; 11 — *Hylastinus fankhauseri*; 5 — скат надкрылий; 6 — нижняя губа; 7 — нижняя челюсть; 8 — эпистернум заднегруди; 9–11 — проверттрикулос.

DISTRIBUTION. Russia (broadleaved forests north to St.-Petersburg southern forest-steppe areas, North Caucasus, Crimea); Europe; Asia (Turkey); North Africa (Algeria, Morocco).

HOST. *Fraxinus excelsior*, *F. pennsylvanica*, *F. angustifolia*, rarely on *F. americana*, *Juglans* sp., *Syringa* sp., *Quercus* sp., *Tilia* sp.

BIOLOGY. Adults and larvae of *H. crenatus* overwinter in tunnels in the bark of stems of living or felled trees. The beetles attack trees from mid-May to the middle of August. Egg gallery transverse. Eggs are laid individually in niches on both sides of the gallery. The larval galleries are perpendicular to the egg gallery, engraving phloem and wood. Pupation takes place in pupal cells in the bark. A generation takes one year and a half or two years.

#### 5. *Hylesinus eos* Spessivtsev, 1919

DISTRIBUTION. in Russia (Far-East: South Primorsk Terr.); China (Heilongjiang), North Korea, Japan.

HOST. *Fraxinus mandshurica*.

BIOLOGY. Adults and larvae of *H. eos* overwinter in tunnels in the bark of twigs of living trees. Adults attack stressed and weakened trees from the end of May to mid-June. Larvae develop for 20–25 days. Young beetles leave the parental galleries from mid-July to mid-August [Kurenzov, 1941]. There is one generation each year.

#### 6. *Hylesinus laticollis* Blandford, 1894

= *Hylesinus pravdini* Stark, 1936 **syn.n.**

= *Hylesinus striatus* Eggers, 1933.

DISTRIBUTION. Russia (Far-East: Southern parts of Khabarovsk Terr., Primorsk Terr.); China (Heilongjiang); Japan.

HOST. *Fraxinus mandshurica*.

BIOLOGY. Adults of *H. eos* overwinter in tunnels in the bark of twigs of dying trees. There is one generation each year.

TAXONOMIC NOTES. The species has strongly variable proportions of length to width. Study of type material of *H. pravdini* (ZISP) has confirmed its similarity with *H. laticollis* in the structure of the head, pronotum, elytra and male genitalia. The longer body and the distribution of the vestiture on the elytral disc of *H. pravdini* are within the range of variation of *H. laticollis*. The structure of the male genitalia of *H. pravdini* is identical to *H. laticollis* (Figs 28–29).

#### 7. *Hylesinus mandshuricus* Eggers, 1922

DISTRIBUTION. North China: "Manchuria".

HOST. *Fraxinus* sp.

BIOLOGY. Not investigated.

NOTES. The diagnosis was based on two specimens originating from Manchuria (China). There have been no new records of this species in China or in adjacent states since its description. The record of the species in the USSR [Wood, Bright, 1992] is erroneous. It is possible that *H. mandshuricus* is only a rare aberration of *H. laticollis*.

#### 8. *Hylesinus nobilis* Blandford, 1894

= *Hylesinus shabliovskiyi* Kurenzov, 1941.

DISTRIBUTION. Russia (Far-East: South Primorsk Terr.); China (Heilongjiang), Japan.

HOST. *Fraxinus mandshurica*.

BIOLOGY. Not investigated.

#### 9. *Hylesinus toranio* (Danthoine, 1788)

= *Hylesinus antipodes* Schedl, 1952.

= *Hylesinus bicolor* Brullé, 1832.

= *Hylesinus esau* Gredler, 1866.

= *Bostrichus oleiperda* Fabricius, 1792.

= *Ips scaber* Marsham, 1802.

= *Hylesinus suturalis*, Redtenbacher, 1842.

= *Hylesinus suturalis* W. Redtenbacher, 1842.

HOST. *Fraxinus excelsior*, *Olea europaea*, rare on *F. pennsylvanica*, *Fagus* sp.

DISTRIBUTION. in southern forest-steppe areas of Russia, North Caucasus, Crimea; Europe, North Africa, Asia (Turkey).

BIOLOGY. Adults and larvae of *H. toranio* overwinter in tunnels in the bark of felled trees. There is one generation each year (possibly two generations in Southern regions of Russia, Caucasus).

#### 10. *Hylesinus tristis* Blandford, 1894

= *Hylesinus lubarskii* Stark, 1936 **syn.n.**

DISTRIBUTION. Russia (Far-East: South Primorsk Terr.); South Korea, Japan.

HOST. *Fraxinus mandshurica*.

BIOLOGY. Adults and larvae of *H. varius* overwinter in tunnels in the bark of living or felled trees. The beetles attack trees at the end of May and up to the middle of July. Egg galleries are transverse. Eggs are laid individually in niches on both sides of the gallery. The larval galleries are longitudinal f, following the grain of the wood and deeply engraving it. There is one generation each year.

TAXONOMIC NOTES. The species has strongly variable body proportions, especially the ratio of length to width. Studies of *H. lubarskii* type material (ZISP) has confirmed its identity in structure of the head, pronotum, elytra and male genitalia with *H. tristis*. The length of body and distribution of vestiture on elytral disc in these beetles are within the range of variation of *H. tristis* (Figs 26–27).

#### 11. *Hylesinus tupolevi* Stark, 1936

Fig. 15.

= *Hylesinus tupolevi* Eggers, 1942.

= *Hylesinus tupolevi denticulosus* Sokanovskii, 1956.

DISTRIBUTION. Kyrgyzstan, Tadjikistan, China (Yunnan).

HOST. *Fraxinus sogdiana*.

BIOLOGY. Adults and larvae of *H. tupolevi* overwinter in tunnels in the bark of living or felled trees. The beetles attack trees from mid-May to the middle of June. Egg galleries are biramous and transverse. The larval galleries are longitudinal-, following the grain of the wood and deeply engraving it. Larvae develop for 20–30 days. There is one generation each year.

#### 12. *Hylesinus varius* (Fabricius, 1775)

Figs 2, 6–8, 10, 30–31.

= *Ips griseus* Marsham, 1802.

= *Hylesinus fraxini* Panzer 1799.

= *Ips haemorrhoidalis* Marsham 1802.

= *Hylesinus henscheli* Knotek, 1892.

= *Bostrichus melanocephalus* Fabricius 1792.

= *Hylesinus minutus* Fabricius, 1777.

= *Hylesinus picipennis* Stephens 1830.

= *Antribus pubescens* Fabricius, 1798.

= *Ips rufescens* Marsham, 1802.

DISTRIBUTION. Russia (European part, Crimea, Caucasus), widely distributed in Europe, occurs up to the northern limits of *Fraxinus* range; Asia (Turkey); North Africa (Algeria, Morocco, Tunis).

HOST. *Fraxinus excelsior*, *F. pennsylvanica*, *F. angustifolia*, rarely on *F. americana*, *Juglans* sp., *Syringa* sp., *Quercus* sp., *Tilia* sp.



**BIOLOGY.** Adults and larvae of *H. varius* overwinter in tunnels in the bark of stems of living or felled trees. The beetles attack trees in late April (or early May) to the middle of July. Egg galleries are biramous and transverse. The larval galleries are longitudinal, following the grain of the wood and deeply engraving it. Larvae develop for 20–35 days. There is one generation each year.

13. *Hylesinus verae* Petrov, 2002

Figs 3, 17, 32–33.

**DISTRIBUTION.** Turkmenistan (Kopetdag Mts.), Iran.

**HOST.** *Fraxinus syriaca*.

**BIOLOGY.** Adults and larvae overwinter in tunnels in the bark of stems of living trees or felled trees. *H. verae* attacks stressed and weakened trees from April to mid-May.

Larvae develop for 20–30 days. Young beetles leave the parental galleries from mid-July to August. There is one generation each year.

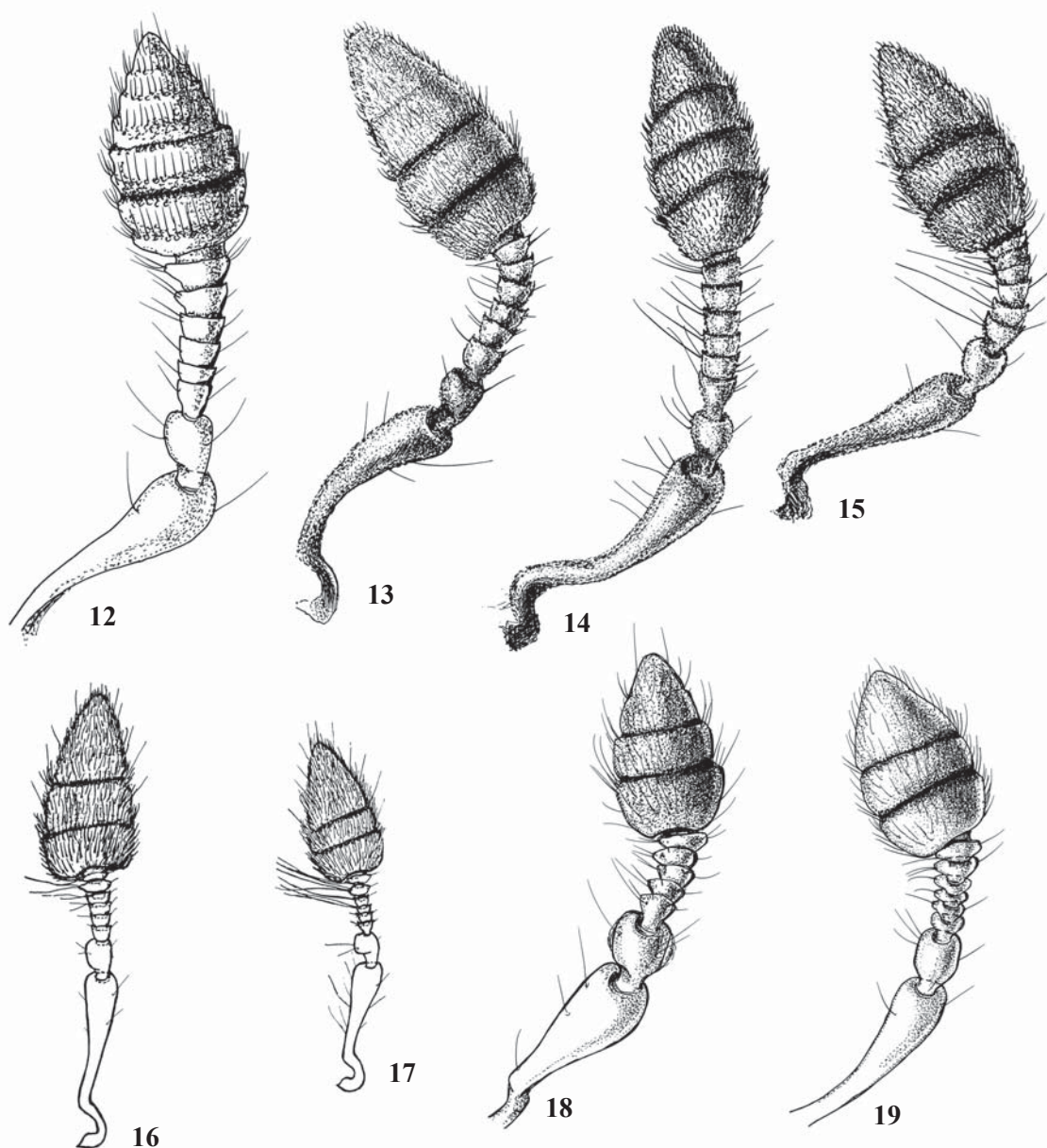
14. *Hylesinus wachtli* Reitter, 1887

= *Hylesinus orni* Fuchs, 1906 **syn.n.**

**DISTRIBUTION.** Central and South Europe.

**HOST.** *Fraxinus excelsior*, *F. ornus*.

**BIOLOGY.** Adults and larvae overwinter in tunnels in the bark of stems of living or felled trees. The beetles attack trees from end of May and up to middle of July. Egg galleries are biramous and transverse. The larval galleries are longitudinal, following the grain of the wood and deeply engraving it. There is one generation each year.



Figs 12–19. Antennae of bark beetles of the tribe Hylesinini: 12 — *Alniphagus costatus*; 13 — *Hylesinus botscharnikovi*; 14 — *H. crenatus*; 15 — *H. tupolevi*; 16 — *H. varius*; 17 — *H. verae*; 18 — *Kissophagus vicinus*; 19 — *Pteleobius vittatus*.

Рис. 12–19. Антенны короедов трибы Hylesinini: 12 — *Alniphagus costatus*; 13 — *Hylesinus botscharnikovi*; 14 — *H. crenatus*; 15 — *H. tupolevi*; 16 — *H. varius*; 17 — *H. verae*; 18 — *Kissophagus vicinus*; 19 — *Pteleobius vittatus*.



TAXONOMIC NOTES: Balachowsky [1949] treated the species as *Hylesinus orni wachtl* Reitter 1887. Schedl [1958] suggested that *Hylesinus orni* Fuchs, 1906 was a junior synonym of *H. varius*, on the base of comparison of scales color variations and similar habitus of the species. Wood and Bright [1992] recognize three independent species *Hylesinus varius*, *H. orni*, *H. wachtl*. Pfeffer [1995] treated these species as *Leperisus orni orni*, *L. orni wachtl* and *L. fraxini*. Diagnosis of taxa was based on the prevalence of dark brown, pink and pale scales. Stark [1952] pointed out the considerable inaccuracy of such a diagnosis. The color of the scales can change in one individual depending on its age. Knížek [2011] preserved three names *Hylesinus wachtl* Reitter 1887, *H. wachtl orni* Fuchs, 1906 and *H. varius* (Fabricius, 1775). Knížek separates the taxa on two characters: the presence or absence of longer interstitial setae on the elytral sides, and the colour of the scales on the pronotum and elytral disk [M. Knížek, personal communication]. In order to stabilize nomenclature, we studied the form and features of the antenna, proventriculus and male genitalia of these taxa. Long series of beetles from Austria, the Czech Republic, and France (Aix-en-Provence, Parc Jourdan) were investigated. Despite variations in colour, all beetles had similar habitus, and identical structure of the antennae, proventriculi and male genitalia. The presence of erect and recumbent long scales on elytral interstria remained constant in long series of beetles (375 specimens). Syntypes of *H. wachtl* (HNMB) have recumbent long scales on the elytral interstriae. Therefore, *Hylesinus orni* Fuchs, 1906 is a junior synonym of *H. wachtl* Reitter 1887.

#### Genus *Kissophagus* Chapuis, 1869

Type species *Hylesinus hederae* Schmitt, 1843 (= *Hylesinus vicinus* Comolli, 1837).

Length 2.0–2.4 mm, 1.9–2.1 times as long as wide. Color brown to reddish brown.

Head with poorly expressed sexual dimorphism, frons of male weakly convex, with fine, long median line; female frons convex with short median line; vestiture of sparse fine short hairs. Eye elongate, shallowly emarginate. Antennal scape elongate, funicle 6-segmented, club moderately flattened, conical, marked by two sutures (Fig. 18). Pronotum as long as wide, anterolateral area armed by small asperities; vestiture of pale hairlike recumbent setae. Elytra 1.50–1.56 times as long as wide, basal margins armed by crenulations, sides almost straight and subparallel on basal two-thirds to declivital base, broadly rounded behind; striae feebly impressed, interstriae wider than striae, each armed on declivity by row of small crenulations; declivity convex, steep, vestiture of pale hairlike setae. Abdomen horizontal.

Legs: anterior coxae widely separated; protibia armed in apical part of lateral margin by five socketed teeth; third tarsal segments broadly emarginate.

Aedeagus stout and short with short apophyses, 2.6 times as long as wide, apophyses 0.15–0.18 times as long as median lobe. Spicule longer than aedeagus, sickle-shaped (Figs 34–35).

The genus *Kissophagus* is distributed in the Palaearctic region. The genus includes 3 species in Europe and North Africa. In Russia only one species is recorded.

1. Pronotum wider, 0.75 times as long as wide; pronotum vestiture of hairlike scales set similarly in all parts of disk, apices of setae directed towards center of disk; frons with weakly indicated median line; 2.0–2.4 mm ..... *K. vicinus* (Comolli)

- Pronotum longer, 1.0–1.1 times as long as wide; setal orientation on pronotum differs in different parts; in central area of disc setal apices are directed towards center of pronotum, in posterior part setae are transversely oriented; frons with clearly indicated median longitudinal carina; 2.0–2.4 mm ..... *K. novaki* Reitter

#### 1. *Kissophagus vicinus* (Comolli, 1837)

= *Hylesinus hederae* Schmitt, 1843.

= *Kissophagus nuesslini* Reitter, 1913.

DISTRIBUTION. Russia (North Caucasus, Dagestan, Crimea); Caucasus (Azerbaijan, Armenia, Georgia); Europe; Asia (Turkey); North Africa (Algeria)

HOST. *Hedera* spp.

BIOLOGY. Adults and larvae of *H. vicinus* overwinter in tunnels in the bark of ivy lianas. The beetles attack plants from the end of May to the middle of July. Egg galleries are biramous and transverse. The larvae galleries are longitudinal, following the grain of the wood and deeply engraving it. There is one generation each year.

#### 2. *Kissophagus novaki* Reitter, 1894

= *Kissophagus binodus* Reitter, 1913

DISTRIBUTION. Central and South Europe; North Africa (Algeria). Highly likely of detection of this species on Western Caucasus.

HOST. *Hedera* spp.

BIOLOGY. Not investigated.

#### Genus *Longulus* Krivolutskaya, 1968

Type species *Hylesinus elatus* Niisima, 1913.

= *Ulmiphagus* Krivolutskaya, 1965.

Length 2.3–2.7 mm, 2.3–2.4 times as long as wide. The characters of *Longulus* indicate that the genus clearly belongs in the tribe Hylesinini [Mandelstam et al, 2007]. Head not sexually dimorphic, frons convex with transverse impression just above epistoma; vestiture of sparse fine very short hairs. Eye elongate, shallowly emarginate. Antennal funicle 7-segmented (Fig. 18). Pronotum dark brown, 0.65–0.70 times as long as wide, surface without asperities in anterolateral areas. Elytra 1.40–1.41 times as long as wide, basal margins armed by small crenulations, sides almost straight and parallel on basal two-thirds to declivital base, broadly rounded behind; striae feebly impressed, interstriae wider than striae; declivity convex, interstriae 1 and 3 weakly elevated on elytral declivity; interstriae 3 increasing in height from declivital base to junction with interstriae 9; junction raised above apical interstriae 2; interstriae 9 with row of pointed teeth; each declivital interstria with numerous small scalelike setae and a row of longer hairlike setae. Abdomen horizontal. Prothorax has an elevated costal ridge extending from the procoxa to the anterior margin. Protibia is of typical hylesinine form, the lateral margin armed with a series of socketed teeth. Aedeagus similar to *Hylesinus*, except for circular frontal process of basal internal sac. Aedeagus elongate, 2.0 times as long as wide, apophyses as long as median lobe; base of internal sac located below the base of median lobe; frontal processes of base of internal sac are joined to form a ring (Fig. 36) Spicule nearly longer than aedeagus, sickle-shaped.

#### 1. *Longulus elatus* (Niisima, 1913)

Fig. 4.

DISTRIBUTION. Russia: (Southern Kurils: Kunashir Isl.); Japan.

HOST. *Alnus* sp., *Ulmus* spp.

**BIOLOGY.** Adults overwinter in tunnels in the bark of dying or seriously weakened trees. Beetles attack trees at the end of June and up to the end of July. There is one generation each year.

**Genus *Pteleobius* Bedel, 1888**

Type species *Bostrichus vittatus* Fabricius, 1792.

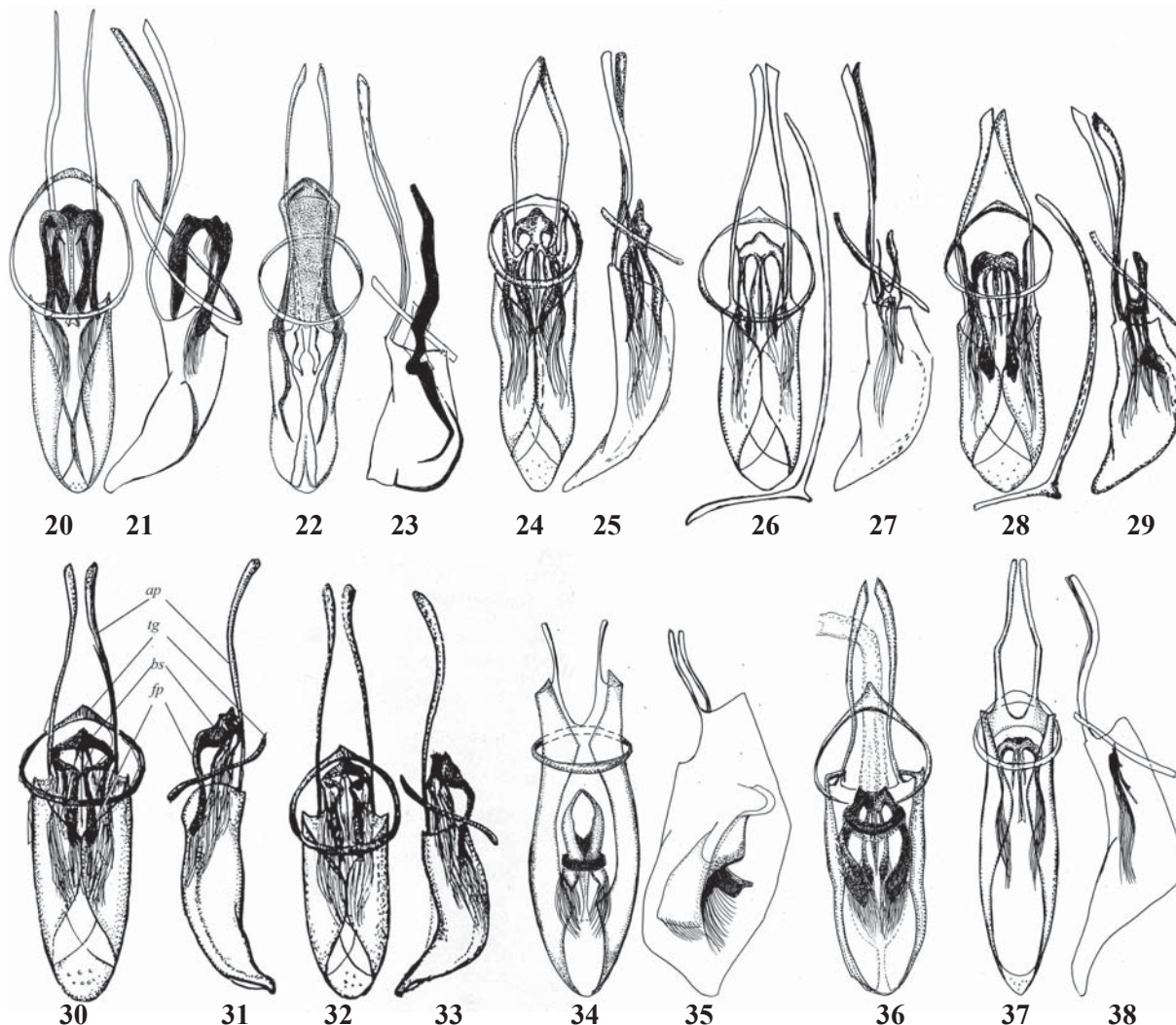
Length 1.8–2.6 mm, 1.9–2.1 times as long as wide. Color brown to reddish brown.

Head not sexually dimorphic, frons convex; vestiture of sparse fine short pale hairs. Eye elongate, entire. Antennal scape elongate, funicle 7-segmented, club moderately flattened, subconical, marked by two sutures (Fig. 19). Pronotum as long as wide, anterolateral area and disc armed by small asperities; vestiture of short scale-like erect setae. Elytra 1.45–1.50 times as long as wide, basal margins armed by small crenulations, sides almost straight

and parallel on basal two-thirds to declivital base, broadly rounded behind; striae feebly impressed, interstriae 1.5 times wider than striae; declivity convex, interstriae 3 increasing in height from declivital base to junction with interstriae 9; each interstriae with abundant bicolored ground scales and a row of longer hairlike scales. Abdomen horizontal. Aedeagus elongate, 3.35–3.40 times as long as wide, apophyses 0.50–0.52 times as long as median lobe, lateral margins of subtriangular form (in lateral view) (Figs 37 and 38).

**KEY TO *PTELEBIUS* SPECIES OF RUSSIA**

1. Interstriae 2 strongly narrowed in posterior half of elytra, disappearing on declivity, clearly shorter, than interstriae 1 and 3; elytral ground vestiture of larger scales set in three irregular rows on interstriae; 1.8–2.2 mm ..... *P. kraatzii* Eichhoff



Figs 20–38. Male genitals of the tribe Hylesinini: 20–21 — *Alniphagus costatus*; 22–23 — *Hylastinus fankhauseri*; 24–25 — *Hylesinus crenatus*; 26–27 — *H. lubarskii*; 28–29 — *H. pravdini*; 30–31 — *H. varius*; 32–33 — *H. verae*; 34–35 — *Kissophagus vicinus*; 36 — *Longulus elatus*; 37–38 — *Pteleobius vittatus*; 26–29 — holotypes; 20, 22, 24, 26, 28, 30, 32, 34, 36, 37 — dorsal view, 21, 23, 25, 27, 29, 31, 33, 35, 38 — lateral view; *ap* — apophyses; *bs* — internal basal sac; *fp* — frontal processes of internal basal sac; *tg* — tegmen.

Рис. 20–38. Гениталии самок короедов трибы Hylesinini: 20–21 — *Alniphagus costatus*; 22–23 — *Hylastinus fankhauseri*; 24–25 — *Hylesinus crenatus*; 26–27 — *H. lubarskii*; 28–29 — *H. pravdini*; 30–31 — *H. varius*; 32–33 — *H. verae*; 34–35 — *Kissophagus vicinus*; 36 — *Longulus elatus*; 37–38 — *Pteleobius vittatus*; 26–29 — голотипы; 20, 22, 24, 26, 28, 30, 32, 34, 36, 37 — сверху; 21, 23, 25, 27, 29, 31, 33, 35, 38 — сбоку; *ap* — апофизы; *bs* — внутренний базальный мешок; *fp* — передние отростки внутреннего базального мешка; *tg* — тегмен.

— Length of interstriae 2 equal to interstriae 1 and 3, interstriae 2 of normal width in posterior half of elytra and continuous up to declivital apex; elytral ground vestiture of smaller scales set in five irregular rows on interstriae; 1.8–2.2 mm ..... *P. vittatus* (Fabricius)

1. *Pteleobius kraatzii* Eichhoff, 1864

= *Hylesinus putonii* Eichhoff, 1868.

DISTRIBUTION. Russia (Southern regions of European part: Astrakhan, Belgorod, Volgograd, Voronezh Provinces, North Caucasus, Crimea); Caucasus, Europe, Asia (Turkey, Turkmenistan)

HOSTS. *Ulmus glabra*, *U. laevis*, *U. minor*.

BIOLOGY. Adults and larvae of *H. kraatzii* overwinter in tunnels in the bark of dying and felled trees. Egg galleries are biramous and transverse. The larval galleries are longitudinal in the bark and deeply engraving it. There is one generation each year.

2. *Pteleobius vittatus* (Fabricius, 1792)

= *Ips coadunatus* Marsham, 1802.

= *Ips furcatus* Marsham, 1802.

= *Ips sericeus* Marsham, 1802.

DISTRIBUTION. Russia: forest-steppe areas, North Caucasus, Crimea); Europe, Asia (Turkey, Turkmenistan).

HOSTS. *Ulmus glabra*, *U. laevis*, *U. minor*.

BIOLOGY. Adults and larvae of *H. vittatus* overwinter in tunnels in the bark of dying trees. The larvae feed away from the gallery, following the bark and deeply engraving it. Larvae develop for 20–25 days. There is one generation each year.

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