INTRODUCTION

GEOGRAPHIC AND BIOTOPIC DISTRIBUTION

Studies on the species composition and geographic and biotopic distribution of long-horned beetles (Cerambycidae) of northern Asia were initiated by K.G. Lakshman, P.S. Pallas, K.F. Ledebur, A.G. Shrenk, V.I. Mochul'skii, F. Gebler, and other naturalists during the eighteenth and nineteenth centuries. The collections of these researchers during the course of their expeditions served as primary material in the publication of lists of species of cerambycids in different regions.

Research on long-horned beetles has been more intensive since the 1930's and a large number of papers have appeared in the Far East. Among the most important of these publications are those by Samoilov (1936), Kurentsov (1950), Shablinskii (1956, 1958), Krivolutskaya (1961, 1962, 1965, 1966, 1973), Ivliev (1966), Ivliev and Kononov (1963, 1966), and Plavil'shchikov (1954). Among the publications for eastern Siberia, mention should be made of these: Florov (1938), Tal'man (1940), and A.I. Cherepanov (1946, 1952a). For western Siberia these are significant: Kiseleva (1926), Tal'man and Yatsenkovskii (1938), A.I. Cherepanov (1952a–b, 1956), Prozorov (1958), Krivolutskaya (1965), and A.I. Cherepanov and N.E. Cherepanova (1971–1978). Work on the beetles of Kazakhstan includes a monograph by Kostin (1973). The monographs by Plavil'shchikov (1932, 1936, 1940, 1958) on Cerambycidae of the USSR, including northern Asia, are of great importance. Publications by some researchers abroad are likewise important: Kojima (1959, 1960), Kojima and Okabe (1960), Hayashi (1968–1976), Kojima and Hayashi (1969), Gressit (1951), and Namkhaidorzh (1972). The works of Linsley (1959, 1961–1964) and Linsley and Chemsak (1972, 1976) on North American fauna have led to a more accurate understanding of the extensive Cerambycidae fauna of northern Asia and North America. A bibliography of the major publications on the Cerambycidae of northern Asia is given at the end of this book.

The long-horned beetle fauna (Cerambycidae) of each region differs in species composition, origin, and biotopological distribution. These differences are primarily due to plant associations. Most of the species are ecologically associated with wood and shrub vegetation and only a few with herbaceous plants (*Brachyta*, *Dorcadion*, *Eodorcadion*, *Phytoecia*, *Agapanthia*, and several others).

or 5.0 mm × 4.0 mm) on trunk surface and escape from wood through them. Life cycle completed in two years. Weight of larvae before pupation 38.4 to 158.2 mg (83.8 ± 5.7), pupae 34.0 to 103.2 mg (71.9 ± 3.9), and young beetles before emerging from wood 23 to 83 mg (52.6 ± 3.3).

Asemum punctulatum Bless. lives in decaying maple together with *Asemum striatum amurense* Kr. The former is seen on trunks and the latter on exposed roots and basal zone of trunk.

5. Genus *Tetropium* Kirby

Kirby, 1837, *Fauna Bor. Amer.*, p. 174; Plavil'shchikov, 1940, *Fauna SSSR*, 22, 2, 27–28; Linsley, 1962, *Cerambycidae of North America*, 11, 19, 85–86.

Adult: Body elongate. Head short, eyes finely faceted, highly emarginate, divided into upper and lower lobes with narrow septum between them. Apices of antennae barely extend beyond middle of elytra or short of this level; 1st segment thick and short. Pronotum laterally rounded, transverse apically, with very fine punctation. Legs short; distal half of femora highly dilated.

Egg: Elongate, rounded at poles and here with thin rough or flat cellular sculpture.

Larva: Distinguished from larvae of other genera by white band laterally on head and piliform sclerotized tubercles, or reddish-rust pubescent sclerotized speckles in anterior half on whitish background.
442 Abdominal tergite IX on posterior end with pair of small spinules set on common tubercular protuberance.

Pupa: Characterized by moderately elongate body. Antennae arcuate, outer side with acute spinules. Pronotum laterally rounded, disk flat, and with or without lateral longitudinal grooves. Abdominal tergites with acute spinules forming tuft or transversely elongate, laterally narrowing band along sides of longitudinal groove. Tip of abdomen with pair of widely separated urogomphi that terminate in long subulate spinule bent under and inward.

Seven species inhabit the Palearctic. Of these, two species are widely distributed in northern Asia and two species have reached from Europe into western Siberia. In North America six species are presently known. All species of the genus *Tetropium* live on coniferous wood species. They generally colonize highly weakened and recently dead trees, and damage drying bast.

Type species: *Tetropium cinnamopterum* Kirby, 1837.

KEY TO SPECIES

Adult Insects

1 (4). Pronotum and elytra with short, not very dense hairs, that do not form compact cover.
2 (3). Head between antennae with deep longitudial suture, as though longitudinally impressed. Antennae thick, with apical segments distinctly thickened, nodose. Pronotum with very sparse dispersed punctation on disk. . . . . 1. **T. castaneum** (L.).
3 (2). Head between antennae even, not impressed, only sometimes with faint longitudinal suture. Antennae thin, with segments gradually thickening insignificantly toward apex. Pronotum with dense punctation on disk; spaces between punctures marginally larger than punctures per se. . . . . 2. **T. gracilicorne** Reitt.
4 (1). Pronotum and elytra with long dense hairs forming (in some specimens) compact cover.
5 (6). Elytra straw-yellow, with broad, transverse, light-colored, pubescent band at base. . . . . 3. **T. fuscum** (F.).
6 (5). Elytra dark brown or reddish-brown, monochromatic, without broad transverse light-colored band at base. . . . . 4. **T. aquilonium** Plav.

Larvae

1 (2). Spinules at posterior end of abdominal tergite IX high and elongate, slightly longer than width at base, and pressed against each other. . . . . 1. **T. castaneum** (L.).
2 (1). Spinules at posterior end of abdominal tergite IX not high, usually shorter than width at base, and not pressed against each other; separated by interception almost equal to diameter of spinule.
3 (4). Hairs with sclerotized base on parietals in anterior half form compact dense tufts (20 to 25 hairs per tuft). Spinules at posterior end of abdominal tergite IX specklike, without even an indistinct sclerotization at base. . . . . 2. **T. gracilicorne** Reitt.
4 (3). Hairs with sclerotized base on parietals in anterior half form sparse tufts (usually 10 to 14 hairs per tuft). Spinules at posterior end of abdominal tergite IX look like spots, with indistinct sclerotization at base, and cover significant part of tubercle on which
443 they are set. . . . . 3. **T. fuscum** (F.).

Pupae

1 (2). Mesonotum markedly raised tubercularly at apex and here with large spinules visible under low magnification. . . . . 1. **T. castaneum** (L.).

2 (1). Mesonotum not raised at apex, bulges insignificantly, and here without large spinules.

3 (4). Longitudinally grooved folds on pronotal disk distinctly diverge anteriorly. . . . . 2. **T. gracilicorne** Reitt.

4 (3). Longitudinally grooved folds on pronotal disk do not diverge anteriorly, parallel. . . . . 3. **T. fuscum** (F.).

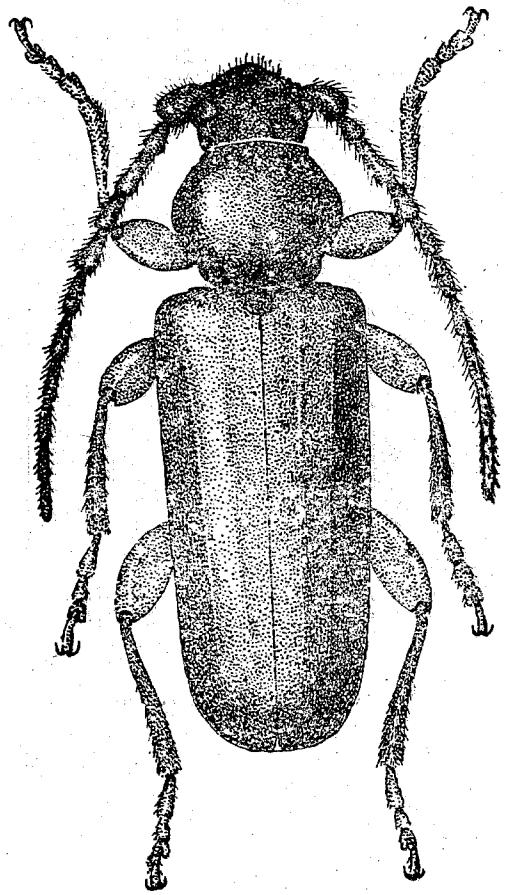
1. **Tetropium castaneum** (L.)

Linnaeus, 1758, *Syst. Nat.*, 10th ed., p. 396 (*Cerambyx*); Plavil'shchikov. 1940, *Fauna SSSR*, 22, 2, 29–32; Kojima and Hayashi, 1969, *Insect Life in Japan*, vol. 1, p. 44.

Adult (Figure 286): Distinguished from other species of genus by very thick antennae, markedly dilated (thickened) femora, and sparse pronotal punctation. Head with deep median longitudinal suture, tubercularly produced at base of antennae, with more or less distinct dent on vertex between upper lobes of eyes, and uneven, often obliterated punctation on vertex and especially on occiput. Eyes markedly emarginate on inner side; septum between upper and lower lobes with not more than single row of facets. Antennae thick, setaceous, thicken at base, markedly narrow toward apex, with apices barely extending beyond middle of elytra (male) or even not reaching this level (female). First antennal segment thick, width 0.50 length; 2nd to 7th segments notably thicken apically, nodose.

Pronotum laterally rounded, broadens in anterior third (male) or in middle (female), slightly elongate (male) or transverse (female), with slight transverse groove apically, more distinct transverse groove basally, longitudinal dent in middle, and sometimes rounded dent along sides; with diffuse or very sparse simple punctation on disk, and dense, granulate punctation on sides, and readily abraded thin hairs. Scutellum
444 with parallel side, broadly rounded posteriorly, bulges, sometimes flat with longitudinal broad groove, smooth, with minute punctation at base.

Elytra bulge moderately, parallel, rounded apically, with two longitudinal ridges on disk, dense very fine punctation, and fine hairs. Femora markedly dilated. First segment of hind tarsi slightly shorter or almost as long as successive two together. Body black, elytra light brown with rusty tinge (f. *typica*), or body and elytra black, legs and antennae reddish-rust or reddish-brown (ab. *fulcratum* F.), or body, elytra, legs,



443 Figure 286. *Tetropium castaneum* (L.).

and antennae black (ab. *aulicum* F.), or body, antennae, and legs black, elytra lighter in color, brownish (ab. *luridum* L.). In general, light-colored forms predominate in plains and much darker ones in high altitudes. Length of body 8.0 to 17.0 mm.

Egg: White, broadly rounded at one pole, narrowly at the other, and narrows more toward one end. Chorion with minute, very fine, coarse microsculpture, imparting a silvery tone. Length 1.2 mm, width 0.5 mm.

Larva (Figure 287): Characterized by broadly impressed epistoma, presence of sclerotized pubescent granules laterally on head, and structure of spinules at posterior end of tergite IX. Head transverse, narrowly rounded anteriorly, reddish-rust, whitish around frontal sutures in posterior half and laterally, with pubescent sclerotized dark red granules

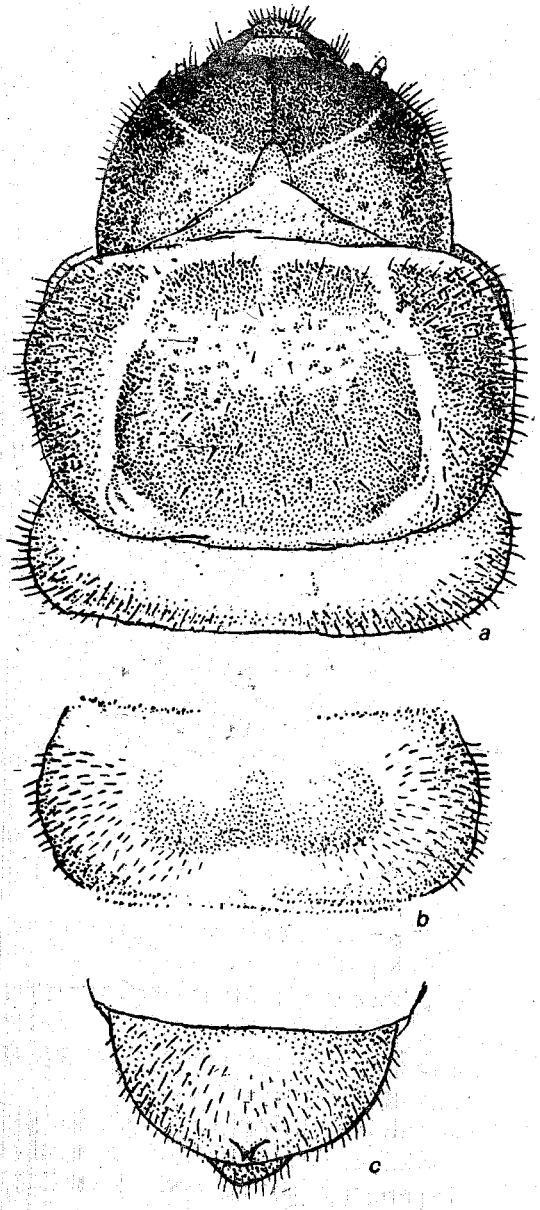


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Figure 287. Larva of *Tetropium castaneum* (L.). a—head and pronotum; b—abdominal tergite with locomotory ampulla; c—tip of abdomen.

forming group on anterior margin closer to antennae. Epistoma dark rust or brownish-red, darker on anterior margin, broadly impressed in middle, with long hairs forming transverse band in anterior half. Frontal sutures white, well developed, slightly concave. Median longitudinal suture continuous, dark brown. Hypostoma along anterior margin, and especially at base, markedly emarginate, slightly rounded laterally, with sharp gula medially, and thin hairs in anterior half; dark border along margins and around gula make hypostoma appear to consist of two distinct disjointed sclerites. Clypeus trapezoidal, white, rusty at base. Labrum rounded anteriorly, with short setae along margin, much longer ones at base along sides. Mandibles obliquely notched apically, with not very elongate lower and fully developed upper denticle; deeply notched on inner side at cultrate edge and here with two oblique carinae, one extending toward apex of lower denticle, the other parallel to first, trailing behind it.

Pronotum laterally with dense rusty hairs forming band bent down angularly along margins (dorsal view), stray hairs on disk in anterior half, brownish specks anterior to shield, broad transverse yellowish bands in anterior third, and glabrous, without hairs; anterior margin in this region with white border. Pronotal shield bulges, sclerotized, yellowish-rust, angularly emarginate or almost straightly truncate laterally on anterior margin, with deep longitudinal fold on sides, laterally sclerotized, with fine, barely perceptible hairs. Presternum brownish-red, with short rusty hairs, sclerotized border on inner margin at eusternum. Propresternum shagreen, glabrous, without hairs. Eusternum sclerotized, without perceptible white punctation, with stray setae.

Abdomen laterally with short rusty hairs. Locomotory ampullae developed on abdominal segments I to VII, bulge, entirely sclerotized and divided by common median longitudinal groove. Posterior end of abdominal tergite IX with pair of long proximate spinules set on com-
445 mon tubercular urogomphi. Length of mature larvae 18 to 22 mm, width of head 3.5 mm.

Pupa (Figure 288): Head short, flat on vertex between upper lobes of eyes, rounded or with two projecting contiguous tubercles on occiput set with one or two spinules. Antennae arcuate, flexed to sides, with acute spinules at apex of segments (especially 1st to 5th).

Pronotum transversely oval, bulges moderately, sometimes on anterior margin (especially in male) with small tubercular protuberance, fine transverse streaks in middle of disk; with distinct spinules, denser in anterior third and sparse elsewhere on surface, and fine light-colored setae laterally. Mesonotum (in region of scutellum) tubercularly elevated at apex, with highly numerous, sometimes large spinules. Metanotum bulges slightly or almost flat in anterior half, raised in middle of

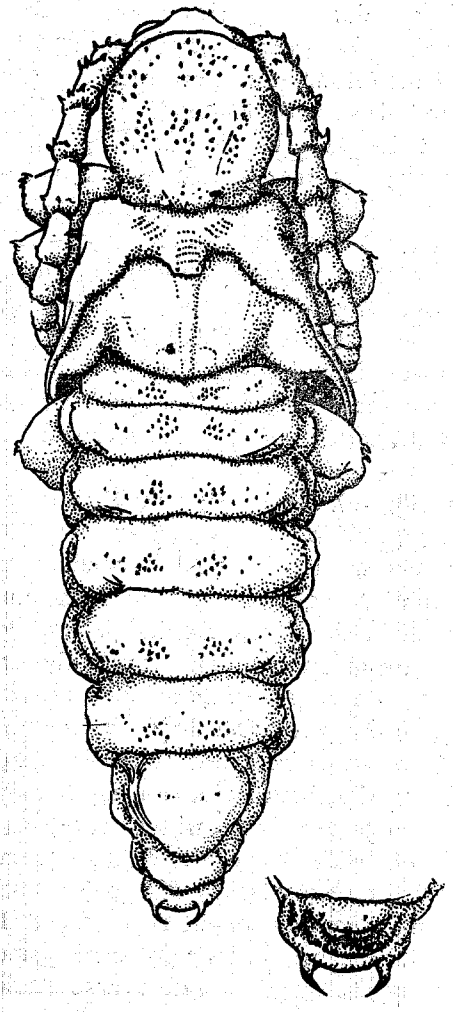


Figure 288. Pupa of *Tetropium castaneum* (L.), male.

446 posterior half, and here with fine spinules. Femora markedly dilated; hind femora with stray spinules at apex on outer side.

Abdomen elongate, insignificantly narrows anteriorly and gradually posteriorly. Abdominal tergites with common median longitudinal groove, transverse groove flexed posteriorly in anterior half, minute acute spinules anterior to transverse groove and on sides, very large spinules behind grooves forming two dense tufts in posterior half set on tubercular protuberances along sides of longitudinal groove. Tergite VII transverse, broadly rounded posteriorly, with stray minute spinules on disk sometimes forming transverse row. Tergite VIII glabrous, without spinules. Abdominal sternites laterally with faint minute setae; sternites VI to VII in posterior half sometimes with stray large spinules. Tip of abdomen obtuse (ventral view), bound laterally by coriaceous glabrous carina, dorsally with long urogomphi that terminate in long acute spinule directed upward and bent under inward. Valvifers of female flat, tubercular, with distinct round process at apex on inner side. Length of body 12 to 19 mm, width of abdomen up to 4.0 mm.

Material: From eastern Ural region, Ob' region, Altai, Tuva, Trans-Baikal, Ussuri-Primor'e region, Sakhalin, and Kunashir. Adult insects 1,440, larvae 1,404, pupae 65.

Distribution: From Atlantic to Pacific Ocean coasts in coniferous zone: Europe, western and eastern Siberia, Tuva, Sakhalin, and Kunashir; northern Mongolia, northern China, Korea, and northern Japan,

Biology: Inhabits coniferous species, mainly fir–spruce and maple stands, and rises in mountains to forest zone. I found it in large numbers in Altai at about 2,000 m above sea level. Flight of beetls commences in May and continues up to September. Beetles maximum in June. During systematic surveys in different regions of Siberia, 724 insects were collected: three (0.4%) in May, 541 (74.7%)—June, 164 (22.7%)—July, 11 (1.5%)—August, and five (0.7%)—early September. High in mountains flight commences in last 10 days of June, ceasing end of July. For example, of the 121 insects collected in Altai (Kolyushta) 2,000 m above sea level, 32 were found in last 10 days of June and 89 in July, disappearing in early August.

Beetles creep onto decaying, recently dead standing and freshly felled trees. They are most active in warm weather. Female lays eggs in bark crevices, usually singly (at some distance from each other). Fecundity of beetles comparatively high. Ovaries of females dissected seven to ten days after emerging from wood contained 76 to 142 fully mature eggs. Larvae hatched from eggs two to three weeks after oviposition. In the laboratory 44 eggs were kept under observation at 15.2 to 20.8°C (18.1 $\pm$ 0.5°C); larvae hatched from them 10 to 19 days after oviposition, average 12.6 $\pm$ 0.3 days.

On hatching larvae immediately bore into bark, live underneath it, and damage drying bast. There they make longitudinal or transverse, straight or meandering, sometimes platformlike galleries slightly imprinted or not imprinted on alburnum, and plug them with fine frass. Mature larva bores into wood to a depth of up to 4.5 to 5.0 cm, makes cell there at right angle to trunk, plugs inlet with fibrous frass, and pupates in it with head toward inlet. Length of cell 38 to 40 mm, width 6.0 mm. Length of frass plug sealing pupal cell 10 mm, width of inlet
447 to wood surface 5.0 mm; inlet invariably extends along trunk.

Pupation of larvae commences early May and continues to end of

June. Pupae found in large numbers in early June. Development period of pupae in nature three to four weeks. Pupal transformation into adult occurs from last 10 days of May to first 10 days of July inclusive. Beetles formed break stopper sealing cell inlet, push frass aside, bore toward bark, nibble oval opening on bark surface, and abandon wood through it. Emergence of beetles from wood usually completed early July. Life cycle completed in two years. Data from weighings of 32 insects in different developmental stages: weight of larvae 32 to 269 mg (109.6 ± 10), pupae 26 to 245 mg (99.2 ± 9.1), and beetles 17.5 to 175.0 mg (76.6 ± 6.6).

This species mainly colonizes Siberian stone pine (*Pinus sibiricus*), fir (*Abies sibirica*), spruce (*Picea obovata*), rarely larch (*Larix sibirica*) and Scots pine (*Pinus sylvestris*). I raised 91 beetles from larvae collected in nature, of which 44 were from Siberian stone pine, 18—fir, 15—spruce, 10—larch, and four—Scots pine. *Rhagium inquisitor* (L.), *Acanthocinus carinulatus* Gebl., *Clytus arietoides* Reitt., and others quite often live together with this species on trunks of decaying trees.

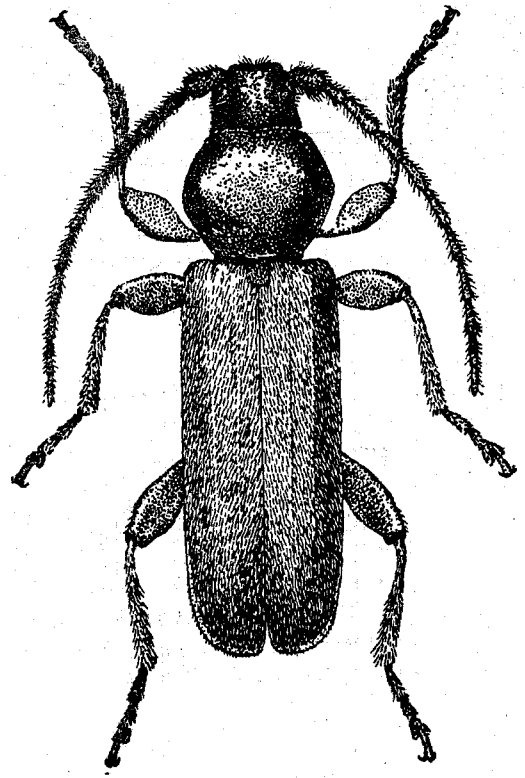
2. **Tetropium gracilicorne** Reitt.

Reitter, 1889, *Deutsch. Entom. Z.*, p. 287; Plavil'shchikov, 1940, *Fauna SSSR*, 22, 2, 34–35; Krivolutskaya, 1973, *Entomofauna Kuril'skikh ostrovov*, p. 104.

Adult (Figure 289): Close to *Tetropium castaneum* (L.). Differs in thin antennae, dense punctation on pronotal disk, absence of deep longitudinal suture between antennae, and other features. Head short, more rounded between antennae, with or without faint longitudinal suture, without tubercular protuberances on inner sides at antennal base, with moderately large close punctation and fine yellowish hairs. Antennae thin; 6th (male) or 8th (female) segment reaches beyond pronotal base. First antennal segment thick, 1.5 to 2.0 times longer than maximum thickness; rest of segments comparatively thin, thicken slightly at apex, not perceptibly nodose.

Pronotum not longer (female) or only slightly longer (male) than wide, rounded laterally, narrows more posteriorly, less so anteriorly, bulges on disk, with more or less perceptible median longitudinal groove,
448 with close deep punctation (spaces between punctures larger or not larger than punctures per se), and fine light-colored, easily abraded hairs. Scutellum with parallel sides or narrows slightly posteriorly, broadly rounded apically, with coarse or obliterated sparse punctation, and smooth median longitudinal band.

Elytra elongate, parallel, rounded apically, with slightly projecting longitudinal ridges on disk, very fine punctation imparting matte tone, and minute, barely visible hairs. Hind tarsi shorter than tibiae, with



447 Figure 289. *Tetropium gracilicorne* Reitt.

1st segment not longer than subsequent ones. Body black, elytra light brown, antennae and legs reddish-rust (f. *typica*), sometimes body, elytra, antennae, and legs black (ab. *subaulicum* Plav.), or body, antennae, and legs black, elytra light brown (ab. *subluridum* Plav.), or body and elytra black, antennae and legs rusty or reddish (ab. *rubripes* Pic). Length of body 9.0 to 16.0 mm.

Egg: Elongate, broadly rounded at one pole, with distinct thin flat cellular sculpture, narrowly rounded at the other end, with less distinct, obliterated, very fine sculpture; usually smooth in middle. Length 1.4 mm, width 0.4 mm.

Larva (Figure 290): Close to larva of *Tetropium castaneum* (L.) in structure of head, but readily distinguished from it in specklike, not elongate spinules at tip of abdomen. Head narrowly rounded anteriorly, rusty, with large whitish spot laterally in anterior half and here with long thick setaceous hairs set on sclerotized flat specklike bases [in *Tetropium castaneum* (L.) base of hairs sclerotized, tubercular]. Epistoma dark rust, broadly darkened on anterior margin, notably impressed in

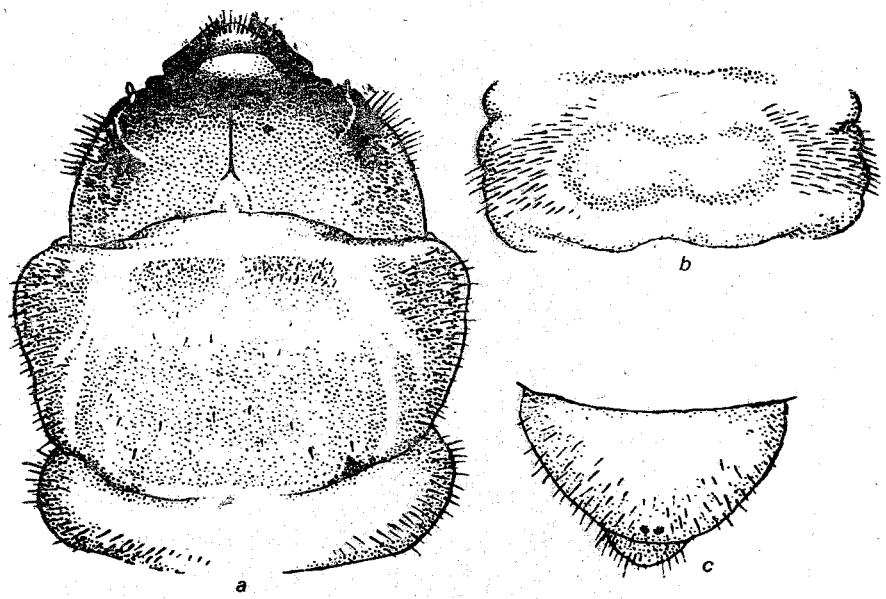


Figure 290. Larva of *Tetropium gracilicorne* Reitt.
a—head and pronotum; b—abdominal tergite with locomotory ampulla; c—tip of abdomen.

posterior half, slightly rounded laterally; frontal sutures white, sharp, slightly convex, longitudinal suture entirely dark brown. Hypostoma more than 2.0 times longer laterally than medially, divided longitudinally into two bordered sclerites bearing up to 10 or more small pubescent pores on inner half. Clypeus narrows markedly toward apex, white, with rusty base and apex; sometimes entirely dull yellowish-rust. Labrum transversely oval, broadly rounded, bulges on anterior margin, with
449 dense setae, white, at base glabrous and brown. Mandibles obliquely notched apically on inner side, with long carinae extending from upper margin toward apex of lower denticle and shortened second carina disposed obliquely and receding from lower denticle toward base.

Pronotum transverse, with moderately dense hairs laterally encircled at base by sclerotized rusty ringlet, and numerous short hairs on anterior margin. Pronotal shield sclerotized, with long lateral longitudinal fold, sclerotized on outer side, with stray white pubescent punctation. Presternum with dense short hairs encircled by rusty ringlet, and sclerotized on inner margin at base. Propresternum glabrous, without hairs, shagreen. Eusternum bulges, sclerotized, with stray faint hairs.

Abdomen laterally with moderately dense short tender hairs. Dorsal

locomotory ampullae on abdominal tergites I to VII bulge, entirely sclerotized, with common broad median longitudinal groove, and convex faint longitudinal fold laterally. Abdominal tergite IX glabrous on disk, with dense rusty elongate hairs laterally, and two proximate speck-like (hemispherical) spinules at apex set on common small tubercular coriaceous protuberance [in *Tetropium castaneum* (L.) these spinules are elongate, considerably longer than width at base]. Body length of mature larvae 15 to 19 mm, width of head 2.8 to 3.0 mm.

Pupa (Figure 291): Readily recognized by structure of mesonotum and absence of large spinules on it. Head usually bulges transversely

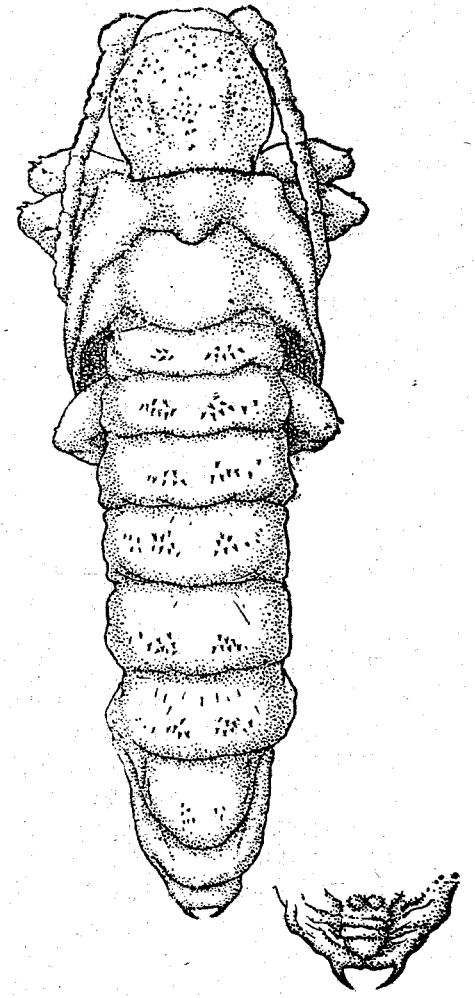


Figure 291. Pupa of *Tetropium gracilicorne* Reitt., male

between antennae, broadly impressed on vertex, rounded or with insignificant proximate tubercles on occiput and here with or without stray spinules. Antennae flexed to sides, arcuate, with one to two acute spinules on segments on outer side.

Pronotum broadly rounded in middle or in anterior half, usually narrows more posteriorly, less so anteriorly, bulges on disk, with grooved longitudinal folds in posterior half along sides diverging anteriorly, and faint transverse streaks between folds [in *Tetropium fuscum* (F.) longitudinal folds parallel, do not diverge]; with spinescent, unevenly distributed setae mainly in anterior half set on protuberant coriaceous base that is slightly sclerotized, and with or without setae in posterior half (especially along posterior margin). Mesonotum slightly raised apically,
450 with very minute faint spinules visible only under high magnification [in *Tetropium castaneum* (L.) spinules larger, seen well even under low magnification]. Metanotum bulges slightly, and with or without very minute spinules. Femora apically with acicular or setaceous spinules on outer side forming transverse row.

Abdomen broadens in region of segments III to IV, gradually narrows posteriorly. Abdominal tergites along sides of longitudinal, comparatively broad, common groove in posterior half bulge tubercularly and here with acute setaceous spinules forming two tufts on each tergite. Sides of abdominal sternites with tender faint hairs; sternites VI to VII with pair of widely separated large spinules. Tip of abdomen (ventral view) bound laterally by horseshoe-shaped coriaceous glabrous carina, dorsally with pair of long urogomphi at end which terminate in subulate sclerotized spinule bent under and inward. Length of body 11 to 17 mm, width of abdomen 3.0 to 5.0 mm.

Material: From Ob' region, Altai, Tuva, Yakutia, Trans-Baikal, and Ussuri-Primor'e region. Adult insects 175, Larvae 411, pupae—38 males and females; 117 beetles were raised in the laboratory.

Distribution: From Ob' River basin, Altai to Pacific Ocean coast, including Siberia, Tuva, Sakhalin, and Kunashir; northern Mongolia, northern China, Korea, and northern Japan (Hokkaido and Honshu).

Biology: Lives in deciduous vegetation and mainly found in forests of foothills and mountains. Flight of beetles observed in June and July, maximum in middle 10 days of July, with stray specimens up to early September. Beetles lead a cryptic mode of life, not seen on flowers; they creep only onto trunks of recently dead trees, those damaged by fire and Siberian silkworm (*Dendrolimus sibiricus* Tschetv.) or wind-felled, and so forth. Female lays eggs in bark crevices. From eggs laid in a forest on June 27 to July 2 (19 eggs under observation), larvae hatched on July 17. Mean daily atmospheric temperature during this period was 19.7 ± 0.2°C.

On hatching larvae tunnel into bark, live underneath it, make galleries in decaying bast, and plug them usually with fine fibrous frass. Galleries longitudinal, rarely transverse, straight or meandering, slightly impressed or, more often, not impressed on sapwood, and quite often extend into cork layer. Width of gallery 10 mm. Mature larva makes cell in bark along trunk, lines it with frass, nibbles an exit to bark surface, and pupates in cell with head toward exit. Length of cell 16 to 22 mm, width 7.0 mm.

Pupation of larvae commences end of May or early June and ends in early July. In Tuva in 1976 a large number of pupae were found in middle 10 days of June. Pupae develop in about three weeks. For example, from pupae appearing on June 11, beetles began emerging on July 2nd, and from pupae formed on June 18, beetles emerged on July 11. Atmospheric temperature during this period was 11.7 to 32.0°C (19.5 ± 0.7°C). Developed beetles nibble oval openings on bark surface and escape. They are found in pupal cells in June and July, and their emergence ceases mid-July. Weight indexes of 31 insects revealed: weight of larvae before pupation 38 to 138 mg (average 69.0 ± 4.1), pupae 34 to 108 mg (61.2 ± 3.5), and beetles before emerging from pupal cells 23 to 87 mg (49.2 ± 3.1).

451 *Acanthocinus carinulatus* Gebl., *Callidium chlorisans* (Sols.), and *Rhagium inquisitor* (L.) colonize together with this species under bark of the same trees. I found this species only on larch in 1939 to 1941, in large numbers in deciduous forests of Trans-Baikal damaged by Altai larch woodborer [*Xylotrechus altaicus* (Gebl.)]. There *Tetropium gracilicorne* Reitt. is the first to attack, followed by the aforementioned pest.

3. **Tetropium fuscum** (F.)

Fabricius, 1787, *Mant. Ins.*, vol. 1, p. 154 (*Callidium*); Plavil'shchikov, 1940, *Fauna SSSR*, 22, 2, 39–40.

Adult (Figure 292): Differs from adult of preceding species in broad whitish pubescent transverse band at base of elytra, and much lighter color (straw-yellow) of latter. Head between antennae with short deep longitudinal suture, dense punctation, and long light-colored hairs. Apices of antennae reach beyond middle of elytra (male) or do not reach this level (female), and covered with long dense hairs. Second to 5th antennal segments apically thickened, nodose; others slightly produced anteriorly, appear serrate; 11th segment short and oval, pointed apically (female) or long, considerably longer than 10th, with distinct constriction behind middle, and usually not pointed but rounded at apex (male).

Pronotum broadens anterior to middle, narrows more toward base, not longer than wide (female) or slightly longer (male), bulges notably with more or less distinct longitudinal impression medially, narrow

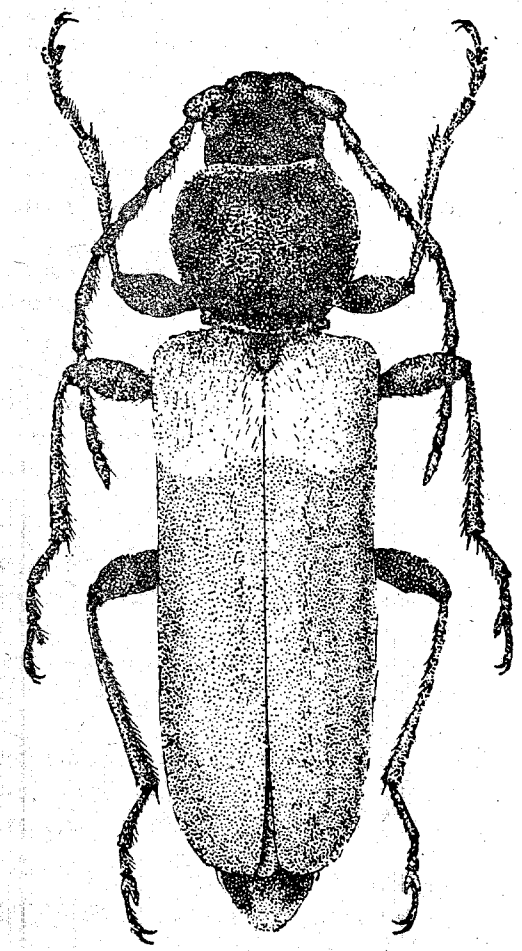


Figure 292. *Tetropium fuscum* (F.).

flange at base, and bent posterior margin; striate, with dense, sometimes deep, fused punctation [only in some specimens is punctation on pronotal disk smoothened, dispersed, as in *Tetropium castaneum* (L.)], with easily abraded yellowish hairs. Scutellum narrows slightly toward apex or with parallel sides, broadly rounded apically, with coarse dense or sparse punctation.

Elytra elongate, parallel, with two longitudinal ridges on disk extending from base almost up to hind clivus, broadly rounded at apex, with very small close punctation, short black or dark brown hairs, and invariably light-colored close hairs basally. Hind tarsi distinctly shorter than tibiae, with 1st segment equal to two successive ones together. Body black, elytra straw-yellow, with broad velvety light-colored trans-

452 verse band at base, and antennae rusty or rusty-brown. Pronotum with rusty border at base and apex, legs brownish-yellow, femora usually very darkened (f. *typica*); sometimes pronotum entirely black, without rusty border (ab. *obscuratum* Pic), or head dark yellowish-rust and pronotum black on disk (ab. *ferruginipes* Pic). Sometimes head, pronotum, and underside of thorax black, abdomen rusty-red. Length of body 9.0 to 13.0 mm.

Larva: Very similar to larva of *Tetropium castaneum* (L.). Differs in sparse hairs on sides of head and structure of spinules on posterior margin of abdominal tergite IX. Head rusty or reddish-rust, with narrow white band laterally and here sparse long setaceous hairs in anterior half with flat sclerotized base [in *Tetropium castaneum* (L.) hairs on sides very numerous, with sclerotized tubercular base]. Anterior margin of epistoma along sides of longitudinal suture with deep alveolar dent, broadly impressed medially. Posterior margin of abdominal tergite IX with pair of small sclerotized spinules intercepted by space not less than diameter of spinule per se [in *Tetropium castaneum* (L.) interception absent or less than diameter of spinule); spinules set on tubercular base with extensive indistinct sclerotization (without sclerotization in *Tetropium gracilicorne* Reitt.). In other features larva of this species similar to larva of preceding species. Body length 18 mm, width of head 0.8 mm.

Pupa: Differs from pupa of *Tetropium castaneum* (L.) in slightly raised (bulging) apex of mesonotum devoid of large spinules. Pronotum bulges, rounded laterally, narrows more anteriorly, with short longitudinal grooved fold along sides of disk, and minute uneven spinules. Apex of mesonotum (in region of scutellum) slightly raised and spinules here minute, barely visible under high magnification (in this regard similar to pupa of *Tetropium gracilicorne* Reitt.). Abdominal tergites bulge in posterior half, with acute spinules along sides of common longitudinal groove forming transversely elongate band that narrows laterally. Tergite VII behind middle with minute spinules forming indistinct transverse row. In other features pupa of this species similar to pupa of other species of the genus *Tetropium*. Length of body 17 mm, width of abdomen 3.8 mm.

Material: From the Urals. Adult insects two, larvae three, pupa—one female.

Distribution: Inhabits Europe, rarely found in western Siberia. I did not find it there. Known in temperate zones of the Urals. Ecologically associated with spruce and pine (Plavil'shchikov, 1940).

4. **Tetropium aquilonium** Plav.

Plavil'shchikov, 1940, *Fauna SSSR*, 22, 2, 37–38.

Adult (Figure 293): Differs from all other species of the genus *Tetropium* in densely pubescent head, pronotum, and elytra. Head between antennae with short longitudinal suture, flat on vertex between upper lobes of eyes, rounded on occiput, with close punctation, and long dense yellow hairs in form of two vortexes on occiput. Eyes completely separated into lower and upper lobes; septum between them smooth, without facets. Antennae comparatively short, barely reach beyond middle of elytra (male) or considerably short of this level (female). First antennal segment short, rounded at apex; 2nd to 5th segments thicken apically, nodose; 2nd one short, others almost equal in length.

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Pronotum bulges, broadly rounded in middle, narrows more posteriorly, less so anteriorly, not longer than wide (male) or even shorter (female); with narrow transverse groove at anterior and posterior margins, margins slightly curved, with median longitudinal, sometimes faint groove on disk, small alveolar lateral impression anterior to middle,

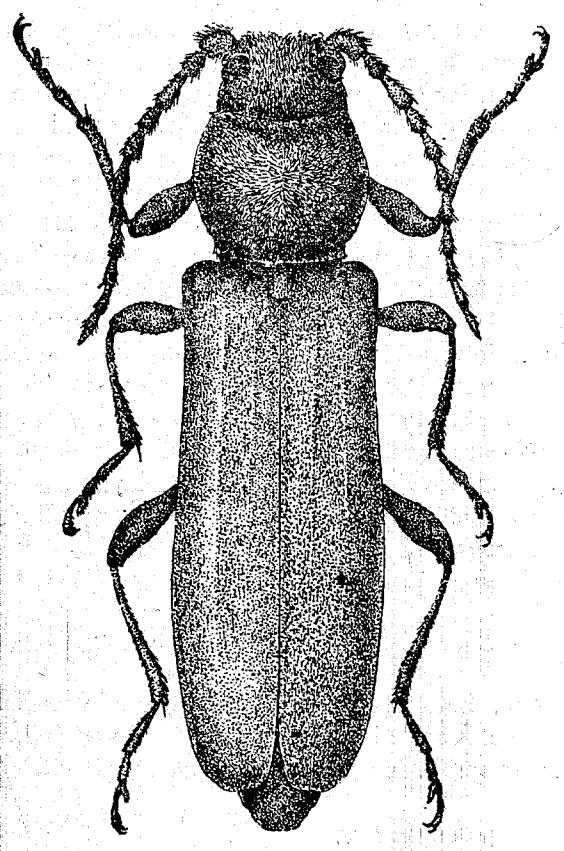

Figure 293. *Tetropium aquilonium* Plav.

very small close punctation, and dense light-colored adherent hairs in form of two vortexes on disk. Scutellum with parallel sides, broadly rounded posteriorly, with fine punctation.

Elytra elongate, bulge, with parallel sides, broadly rounded apically and slightly flattened there, with two more or less distinct longitudinal ridges on disk, close very fine punctation imparting matte oily tone, and dense, short, light-colored, adherent hairs forming almost compact cover. Head black, with rusty frontal tubercles at antennal bases; pronotum blackish-brown, with reddish-rust border on anterior and posterior margins; scutellum rusty-brown or chestnut; elytra dark brown with rusty tinge at base or reddish-brown. Body ventrally reddish-rust or brownish-chestnut. Length of body 9.5 to 13.0 mm.

Material: From Pechora River and Lower Ob' region (collection of Moscow State University and the Zoological Institute); known from northern region of Kola Peninsula up to northern Ob' region. Flight of beetles in July.

Biology: Not studied.

11. Tribe ATIMINI

Adult insects differ from beetles of other tribes in highly pubescent body, broad flat prosternal process, and widely separated hemispherical forecoxae.

Larvae characterized by presence of pigmented ocellus on parietals at base of antennae, markedly bulging locomotory ampullae on abdominal segments IV to VI, and long spinules bent under and somewhat forward on posterior margin of tergite IX.

Pupae distinguished from pupae of other tribes of Aseminae by presence of piliform setae on abdominal tergites, urogomphi turned upward and slightly forward, not bent down and inward.

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This tribe includes two genera. Species of the genus *Atimia* inhabit eastern Asia and those of both *Atimia* and *Paratimia*, North America.

1. Genus *Atimia* Hald.

Haldeman, 1847, *Trans. Amer. Philos. Soc.*, 10, 2, 56; *Myctus*, Semenov-Tian-Shanskij and Plavilstshikov [Semenov-Tian-Shanski and Plavil'shchikov], 1937, *Bull. Soc. Entom. France*, 42, 17, 252; Gressit, 1951, *Longicorn Beetles of China*, vol. 2, pp. 42–43; Linsley, 1962, *Cerambycidae of North America*, 11, 19, 92–93; Kojima and Hayashi, 1969, *Insect Life in Japan*, p. 169; Cherepanov and Cherepanova, 1973, *Nov. i maloizv. vidy fauny Sibiri*, vol. 7, p. 79.

Adult: Characterized by moderately elongate, comparatively dilated