

American Museum Novitates

PUBLISHED BY THE AMERICAN MUSEUM OF NATURAL HISTORY
CENTRAL PARK WEST AT 79TH STREET, NEW YORK, N. Y. 10024

NUMBER 2411

MARCH 25, 1970

A New Genus of Aenictopecheine Bugs from the Holarctic (Enicocephalidae, Hemiptera)

BY PEDRO WYGODZINSKY¹ AND PAVEL ŠTYS²

The bugs of the subfamily Aenictopecheinae Usinger are distinguished from all other members of the family Enicocephalidae mainly by their indistinctly subdivided pronotum and the presence, to a variable degree, of well-developed external genital appendages in both males and females; these appendages are highly reduced or have been completely lost in the great majority of the Enicocephalidae. A precise redefinition of the subfamily must await the critical re-examination of most of the named genera placed in the group, and a study of several genera as yet undescribed. The subfamily Aenictopecheinae, as previously known, has been restricted to subtropical, cool temperate and cold temperate areas of the Southern Hemisphere, and extended into the tropics of the Oriental Region. The unnamed genera before us follow this rule, except for the genus described in the present paper, which is holarctic.

The authors of the present paper discovered the new genus independently among material received for study from various sources. The new genus, *Boreostolus*, has two species, one found in northwestern North America, the other in the Ussuri region of the Far East. The two species are similar in morphology and color, but easily separable by meristic characters of a rank equivalent to those separating closely related species

¹ Curator, Department of Entomology, the American Museum of Natural History.

² Senior Lecturer, Department of Systematic Zoology, Charles University, Prague.

in other genera of the family.

Our thanks are due to the colleagues who allowed us to study the material in their care, and for providing, in some cases, ecological data and other information on localities: Dr. I. Kerzhner, Zoological Institute, Academy of Sciences, Leningrad; Dr. J. Lattin, Department of Entomology, Oregon State University, Corvallis; Dr. C. D. MacNeill, the California Academy of Sciences, San Francisco; and Dr. J. Popov, Paleontological Institute, Academy of Science, Moscow. Mrs. Celeste Green executed the two habitus drawings; we are much obliged to her, and also wish to thank the authorities of the Division of Entomology, University of California, Berkeley, for their permission to use these drawings.

BOREOSTOLUS, NEW GENUS

Aenictopecheinae. Medium-sized species (3.3–5.3 mm.). Head, abdomen and appendages polished, thorax dull. Setiferous tubercles lacking. All setae simple, slender. Macropterous or micropterous.

MACROPTEROUS FORM: Head with postocular impression deep. Eyes of males larger than those of females, but not closely approximated on lower surface of head. Ocelli closer to margin of head than to each other. Antennal segments narrowly cylindrical, II–IV subequal in length. Rostrum short and stout, extended downward in preserved specimens. Pronotum unarmed, strongly flattened above, only middle of disc slightly elevated. Transversal impressions separating the three lobes faint, obsolescent in middle. Posterior impression conspicuously carried forward at sides. Median lobe with shallow longitudinal furrow at middle. Proepisternum delimited from pronotum by a lateral ridge. Pleural sulcus situated strikingly dorsally, its short ventral sector vertical, situated on lateral side of prothorax, its longer dorsal sector directed obliquely posteriorly, situated on dorsal surface of prothorax. Dorsally, pleural sulcus continuous with oblique depression delimiting apparent posterolateral portions of pronotum, being, in fact, dorsally situated; portions of proepimera fused with pronotum. A rounded portion of proepisternum visible in dorsal view; lateral outline of pronotum notched at level of pleural sulcus. Dorsal portion of prothorax with dense, short hairs, anteriorly directed on anterior, and posteriorly on posterior portion of sclerite. Anterior coxal cavities open behind.

Scutellum subsemicircular. Mesosternum slightly convex, only very slightly shorter than wide, delimited from mesepisternum by delicate ridge.

Front legs stout, thicker in female than in male. Coxae and ventral surface of femora with minute scalelike structures. Projection of inner

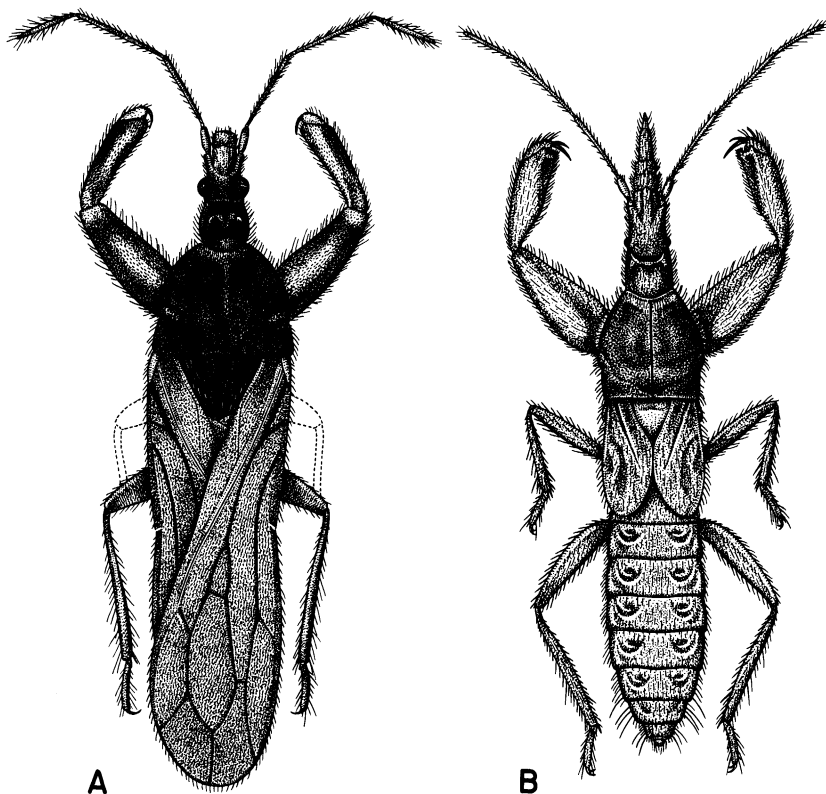


FIG. 1. *Boreostolus americanus*. A. Male holotype. B. Brachypterous female.

apical angle of fore tibia very prominent, with an apical ridge bearing six spines, divided into two groups of three by a small incision. Outer group composed of three conical spines of unequal length, the outermost one inserted on a level basad of that of the two adjacent ones. Inner group consisting of one outer conical and two inner large subsemicircular spines. Tarsus with only two spines, the more distal one half-moon or hook-shaped, closely adpressed to tarsus; the more proximal one erect, elongate conical. Fore tarsi with two claws; inner one about twice as long as outer one. Mid and hind tibia with two large apical spinelike setae, but without bristle combs; one or two preapical spine-like setae on under surface of tibia of mid and hind; tarsi two-segmented.

Forewings with fracture at center of costal margin. Basal cell present, discal cell closed, the former from one-half to more than one-half as long as the latter. Stigmal cell extending beyond stigma, not sub-

divided. An_1 and An_2 well separated on basal half of clavus. Setae on basal half of forewing medium in length, arranged in two series on veins, although more numerous on costal margin. Setae on veins of distal half of forewing slightly shorter than the others, sparse. Cells lacking setae; a few bristles scattered on membranous area of anal lobe; area between costal margin and R + M lacking setae. Hind wing without setae.

Abdomen with dorsum weakly but rather uniformly sclerotized, more strongly so on terga VII–IX. Laterotergite discernible only for first tergum, not differentiated from mediotergites on remaining segments; connexivum not differentiated. Opening of dorsal abdominal gland situated on anterior margin of tergum IV, transversally slitlike. Terga III–VIII with paired, bare, posterolateral transverse depressions. Terga covered by short and medium-sized hairs and by serially arranged macrochaetae, normally 3 + 3 on each segment. Spiracles situated on anterior fifth of ventrolaterotergal regions of segments I–VIII. Abdominal sterna separated from ventrolaterotergal area by wide membranous zone.

Eighth abdominal segment of male with complete separated tergum and sternum. Pygophore large, almost completely free, only its extreme base invaginated into eighth segment. Anterior dorsal bridge of pygophore present, short, in shape of a narrow transversal band. Inner structure of pygophore simple, lacking distinctive sclerotized structures. Parameres and aedeagus inserted close to posterior portion of pygophore, forming independent, permanently extruded unit.

Parameres horizontal in position, subrectangular, trough-shaped, laterally convex, medially deeply concave; dorsal wall much wider than ventral wall. Dorsal free edge subapically with broad, rounded projection, the apical part of paramere formed by rounded tubercle closing trough. Ventral free edge below tubercle with curved, hooklike projection with serrated anterior margin. Base of paramere with platelike extension formed by both dorsal and lateral walls of paramere and extending from dorsal free edge in an approximately right angle; this extension freely produced into lumen of pygophore. Free ventral edge of paramere proximally with condylar tubercle articulating directly with end of basal plate of phallus, without intervening sclerites. Almost entire ventral and lateral walls and laterodistal part of dorsal wall of paramere with long slender setae. Medial concave surface glabrous, except for group of short setae distally.

Phallus simple, anchor-shaped, sclerotized, permanently erected, lacking evaginable portion. Proximal part, homologous to basal plates, in shape of simple transversal sclerite. Medial portion of phallus tubular, curved,

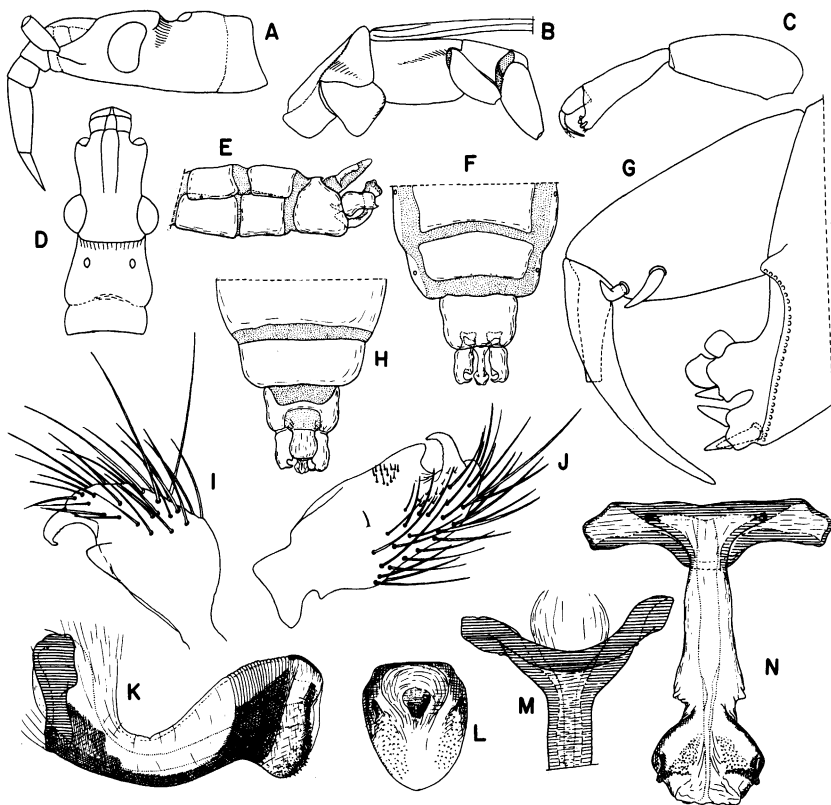


FIG. 2. *Boreostolus americanus*, male. A. Head, lateral view. B. Thorax, side view. C. Femur, tibia, and tarsus of foreleg. D. Head, dorsal aspect. E. Apex of abdomen, expanded, side view. F. Apex of abdomen, ventral aspect. G. Apex of fore tibia, with tarsus and claws. H. Apex of abdomen, expanded, dorsal view. I, J. Paramere. K. Phallus, side view. L. Apex of phallus, seen from behind. M. Phallus, base, dorsal aspect. N. Phallus, seen from below.

simple; distal portion widened into a "capitulum." Basal plates and convex portion of central section of phallus heavily sclerotized, sclerotization continuing onto lateral and posterior surfaces of capitulum; lateral surfaces of capitulum striated. Capitulum with projections and minute cuticular processes. Ejaculatory duct wide, without observable reservoir; secondary gonopore situated at apex of capitulum.

Eighth and ninth terga of female not modified, the latter posteriorly excised, their ventral laterotergal areas continuous with dorsal tergum. Sternum VIII separated from laterotergal region by wide membrane; sternum not subdivided longitudinally, posteriorly with two pairs of

projections completely fused to sternum at their base. Outer pair of same degree of sclerotization as main body of sternum and with same type of pubescence, probably representing first valvifers fused with sternum. Inner pair representing first valvulae, longer than outer pair, scoop-shaped, forming a trough enclosing second valvulae. First valvulae more strongly sclerotized on apical half, beset ventrally with minute sensory setae; each valvula articulating mediolaterally with condyle of first valvifer. Second valvifers well individualized, strongly sclerotized, closely associated with medial margins of tergum IX. Second valvulae weakly sclerotized, narrowly rod-shaped, tapering toward apex; valvulae with pointed simple or multiple minute cuticular processes apically, these processes transformed into finely serrate transverse striae more proximally. Gonangulum inverse T-shaped, posterior transverse part fused with tergum IX and articulating with second valvifer, anterior rodlike part free.

MICROPTEROUS FORM: General characters much as in macropterous form. Eyes much smaller, ocelli very small or obsolescent. Hind lobe of pronotum not wider than mid-lobe. Scutellum subtriangular. Mesosternum distinctly shorter than wide. Forewings reduced to short pads with indistinct venation, covered with numerous short setae and one conspicuous macrochaeta on basal fourth of wing; costal fracture faintly indicated; both anteroventral and posteroventral margins of wings markedly thickened on basal third. Hind wings absent. Scent gland opening on first sternum, in male and female (examined only in *B. sikhotalinensis*).

TYPE SPECIES: *Boreostolus americanus*, new species.

DISTRIBUTION: Western North America (Oregon, Colorado) and Ussuri region (Eastern Asia).

Among all the described Aenictopecheinae and the undescribed ones before us, *Boreostolus* seems to be most closely related to *Gamostolus* Bergroth, 1927, from southernmost South America, redescribed in detail by Wygodzinsky (1949). The two genera can be distinguished as follows:

Outermost spine of outer group of spines on apical projection of fore tibia inserted basad of level of two adjacent spines (figs. 4E, F; 6C); fore tarsus with only two spines (figs. 4E, F); dorsal bridge of pygophore very short, in shape of narrow transversal band (figs. 2H; 7A, C); parameres of male subrectangular in outline, with a subapical hook-shaped process (figs. 2I, J; 7D, F); phallus simple at base, apically capitate, capitulum with projections and minute spinelike cuticular processes (figs. 2K, N); first valvulae of female completely fused to sternum VIII (fig. 4O), simply rounded apically, forming a trough for reception of second valvulae (figs. 4O; 8D)

. *Boreostolus*

Outermost spine of outer group of spines of fore tibia inserted at same level as adjacent two spines; fore tarsus with four spines; dorsal bridge of pygophore large, occupying most of dorsal surface of pygophore; parameres of male oval, without projection; phallus at base with wide funnel-shaped structure, apically simply tubular and lacking projections or cuticular processes; first valvulae of female not completely fused to sternum VIII, apically with a bifid projection, and not forming trough. *Gamostolus*

Boreostolus seems to be the apomorphic component of the *Gamostolus-Boreostolus* complex, as indicated by the position of the outermost tibial spine out of alignment with the two adjacent ones, the loss of two of the usual four tarsal spines, the very short dorsal bridge of the pygophore, and the trough formed by the first valvulae that are completely fused to the eighth sternum.

The macropterous form is known only from one of the two species of *Boreostolus* here described; the micropterous forms of the two species can be distinguished as follows:

Length about 5 mm.; vertex between eyes flattened in lateral view (fig. 3B); sides of hind lobe of head slightly diverging but not convex (fig. 1B); eyes comparatively larger, about one-fourth as wide as synthlipsis (fig. 1B), with about 40 ommatidia; ocelli distinct, their diameter approximately one-seventh of their distance; antennae comparatively long and slender (fig. 1B); claval suture of forewings conspicuous (fig. 1B); second valvulae pointed apically (fig. 4M). *americanus*

Length not more than 4.1 mm.; vertex of female between eyes distinctly convex, in lateral view (fig. 5C); sides of hind lobe distinctly convex (fig. 5B, E); eyes comparatively smaller, about one-sixth as wide as synthlipsis, with approximately 20 (females) to 30 (males) ommatidia; ocelli obsolescent, their diameter approximately one-twelfth to one-fourteenth of their distance; antennae comparatively short and stout (fig. 3D); claval suture not conspicuous; second valvulae rounded apically (fig. 8C). *sikhotalinensis*

***Boreostolus americanus*, new species**

Figures 1, 2, 3A-C, 3E-I, 4

Macropterous or micropterous.

MACROPTEROUS MALE: Length to apex of forewings, 5.3 mm. General aspect as shown in figure 1A.

Head dark reddish brown; clypeus and rostrum yellowish brown; antennae dark brown. Eyes dark red; ocelli surrounded by reddish circle. Thorax dark reddish brown, with posterior lobe darker than rest. Legs and forewings light brown, veins distinctly darkened. Abdomen dark brown. Head, antennae, rostrum and legs polished, thorax matte, pronotum and scutellum velvety.

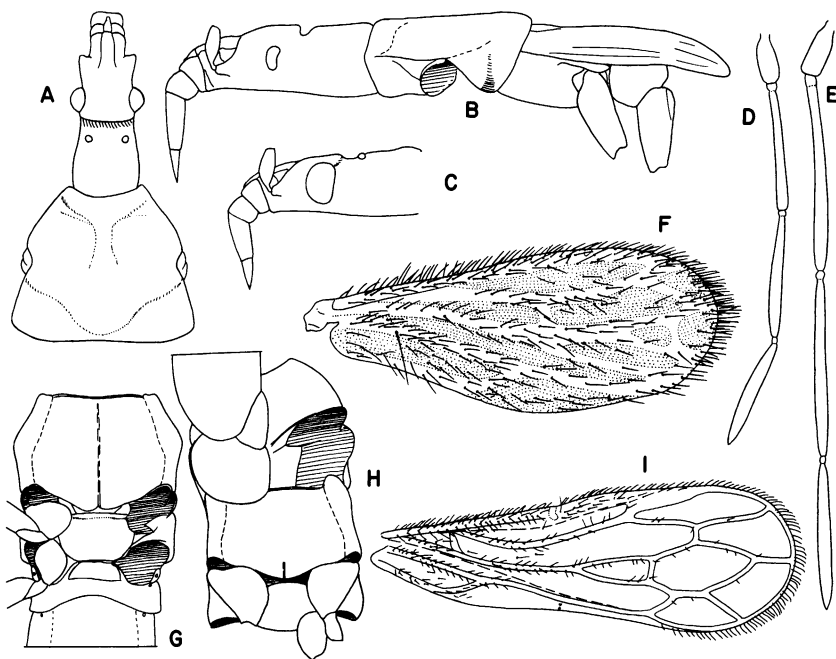


FIG. 3. A-C. *Boreostolus americanus*. A. Macropterous female, head and prothorax, seen from above. B. Micropterous female, head and thorax, side view. C. Macropterous female, head, lateral aspect. D. *Boreostolus sikhotalinensis*, female, antenna. E-I. *Boreostolus americanus*. E. Micropterous female, antenna. F. Micropterous female, forewing (veins white, space between veins dotted). G. Macropterous female, mesosternum, metasternum, and base of abdomen. H. Micropterous female, thorax, ventral aspect. I. Macropterous female, forewing.

Head as shown in figures 1A; 2A, D; hind lobe distinctly wider than long (1.6/1), widest on posterior third. Eyes relatively small, not attaining levels of dorsal and ventral surfaces of head, in lateral view. Eyes only slightly shorter than distance from their anterior border to apex of antenniferous tubercles (0.8/1); synthlipsis slightly over twice as large as width of eyes (2.25/1). Ocelli well developed, their diameter equal to one-fifth of their distance. Length of antennal segment I, 0.25 mm., II, 0.62 mm., III, 0.67 mm., IV, 0.52 mm. Rostrum as shown in figure 2A. Hairs of head forwardly directed.

Pronotum as in generic description and as shown in figure 1A; hind lobe slightly but distinctly wider than apparent width of midlobe. Lateral view of thorax as shown in figure 2B.

Forewings as in generic description and as shown in figure 1A, 2.8 times as long as wide; attaining apex of abdomen; their venation and chaetotaxy as shown for macropterous female (see fig. 3I).

General structure, spines, and chaetotaxy of legs as in generic description and much as illustrated in detail for female (see fig. 4A-G, J, K). Outlines of foreleg and detail of apex of fore tibia with tarsus and claws as shown in figure 2C, G. Fore femur 2.5 times as long as wide; fore tibia approximately four times as long as wide. Midlegs not preserved. Tibia of hind legs with one or two preapical spinelike setae; hind femur four times as long as wide.

General structure of abdomen and genitalia as in generic description and as illustrated (fig. 2E, F, H-N). Parameres as illustrated; their hook-like process simple apically. Phallus as illustrated.

MACROPTEROUS FEMALE: Length to apex of forewing 4.9 mm. General aspect, coloring, and structure like that of macropterous male.

Head as shown in figure 3A, C; hind lobe distinctly wider than long (1.2/1), widest on posterior third. Eyes about as large as those of male, not attaining levels of dorsal and ventral surface of head, in lateral view. Eyes only slightly shorter than distance from their anterior border to apex of antenniferous tubercles (0.9/1); synthlipsis slightly more than twice as large as width of eyes (2.25/1). Distance between ocelli equal to about five times their diameter. Length of antennal segment I, 0.2 mm., II, 0.68 mm., III, 0.65 mm., IV, 0.52 mm. Rostrum and pubescence of head like those in male.

Pronotum (fig. 3A) like that of male. Ventral aspect of thorax as shown in figure 3G.

Forewings 2.8 times as long as wide, attaining apex of abdomen, their venation and chaetotaxy as in generic description and as shown in figure 3I.

General structure, spines, and chaetotaxy of legs as in generic description and as shown in figure 4A, C-G, J, K. Fore femur 2.7 times as long as wide; fore tibia approximately 2.6 times as long as wide. Tibiae of mid and hind legs with one or two preapical spinelike setae. Hind femur four times as long as wide.

General structure of abdomen and morphology of genitalia as in generic description and in micropterous form (see fig. 4H, I, L-O).

MICROPTEROUS FEMALE: Length to apex of abdomen (dry specimen) 5.2 mm. General aspect as shown in figure 1B.

General color yellowish brown, hind lobe of head somewhat darker; pronotum light reddish brown; abdomen whitish, except for darker distal segments. Head with appendages, legs, and abdomen polished;

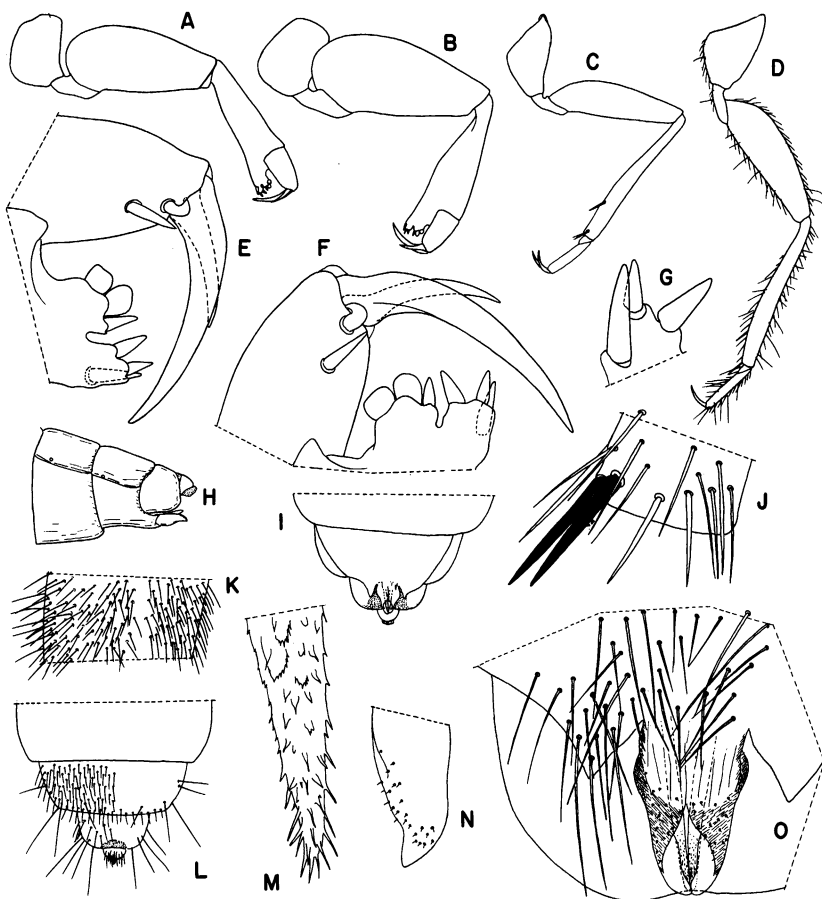


FIG. 4. *Boreostolus americanus*, females. A. Macropterous, foreleg. B. Micropterous, foreleg. C. Macropterous, hind leg. D. Micropterous, hind leg. E. Macropterous, apex of fore tibia with tarsus. F. Micropterous, apex of fore tibia with tarsus. G. Micropterous, outer group of tibial spines, different view. H. Micropterous, apex of abdomen, side view. I. Micropterous, apex of abdomen, ventral aspect. J. Macropterous, apex of hind tibia. K. Macropterous, detail of chaetotaxy of fore femur. L. Micropterous, apex of abdomen, dorsal view, with setae. M. Micropterous, apex of second valvulae. N. Micropterous, apex of first valvulae. O. Micropterous, genital appendages, as seen in cleared abdomen.

thorax and wings matte.

Head as shown in figures 1B and 3B; hind lobe wider than long (1.2/1), practically parallel-sided. Vertex between eyes flattened in

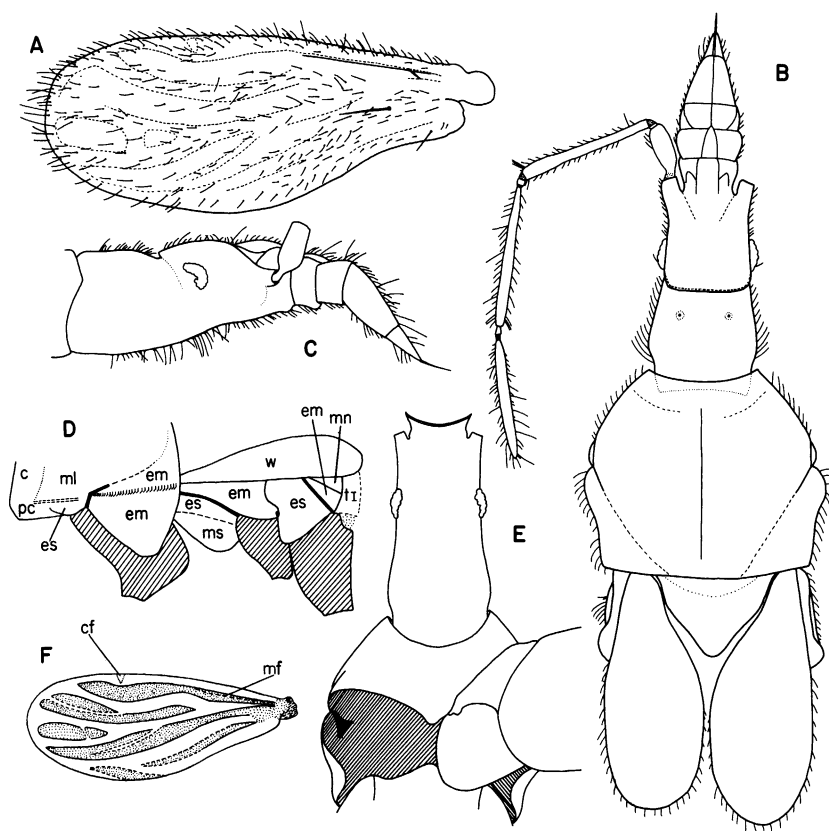


FIG. 5. *Boreostolus sikhotalinensis*, female. A. Forewing. B. Anterior portion of body, dorsal view. C. Head, lateral aspect. D. Scheme of thoracic pleura; coxae hatched, pleural sulci indicated by thick lines. E. Head and prothorax, ventral view, rostrum removed. F. Forewing, scheme of venation.

Abbreviations: c, collum; cf, costal fracture; em, epimeron; es, episternum; mf, medial furrow; ml, medial lobe of pronotum; mn, metanotum; ms, mesosternum; pc, precoxale of prothorax; tI, first abdominal tergum; w, forewing.

lateral view (fig. 3B). Eyes small, kidney-shaped, composed of about 40 ommatidia. Eyes remote from levels of dorsal and ventral surface of head, their distance from ventral surface of head slightly less than their height. In dorsal view, eyes half as long as distance from their anterior border to apex of antenniferous tubercles. Synthlipsis slightly more than four times as large as width of eye (4.3/1). Ocelli much smaller than in macropterous form, their diameter equal to about one-seventh

of their distance. Antennae comparatively long and slender (fig. 3E), slightly longer than imaginary line from apex of antenniferous tubercle to apex of scutellum, and their second segment 1.65 times as long as width of postocular portion of head. Length of antennal segment I, 0.25 mm., II, 0.7 mm., III, 0.73 mm., IV, 0.55 mm. Rostrum and pubescence of head as in macropterous form.

Pronotum as in generic description and as shown in figures 1B and 3B; length of pronotum very slightly less than its width. Under surface of thorax as shown in figure 3H.

Forewings attaining level of posterior border of abdominal segment II. Structure and chaetotaxy of forewings as in generic description and figures 1B and 3F. Claval suture pronounced.

General structure of legs as in macropterous form, but femora somewhat stouter. Outline of fore and hind legs as shown in figure 4B, D. Fore femur 2.3 times as long as wide, fore tibia 2.75 times as long as wide. Mid and hind tibiae with one subapical spinelike seta; hind femur 3.5 times as long as wide.

General structure of abdomen and morphology of genitalia like those in generic description and as illustrated (fig. 4H, I, L-O); second valvulae pointed apically.

MATERIAL EXAMINED: U.S.A.: Colorado: [Routt Co.:] Clark, 7000 feet, June 18, 1943 (O. Bryant; California Academy of Science), one male, holotype. Oregon: Jackson Co.: 8 miles southeast of Lakecreek South Fork, Little Butte Creek, 2300 feet, May 21, 1964, under rock at edge of creek (R. Hansell; the American Museum of Natural History), one macropterous female, allotype; Dead Indian Soda Springs, 23 miles east southeast of Eagle Point, 2650 feet, May 21 and June 17, 1960, under rock along Dead Indian Creek, just below Springs (K. M. Fender, L. G. Gentner, the American Museum of Natural History; Department of Entomology, Oregon State University, Corvallis) two brachypterous females, paratypes.

***Boreostolus sikhotalinensis*, new species**

Figures 3D, 5-8

Micropterous. General aspect and morphology very similar to that of micropterous form of foregoing species. Length to apex of abdomen, males, 3.3-3.7 mm., females, 3.4-4.1 mm.

General color yellowish brown, with pronotum, especially hind lobe, somewhat darker brown. Head with appendages, legs and abdomen, polished; thorax and fore wings, matte.

Head as shown in figure 5B, C; hind lobe wider than long (1.2/1),

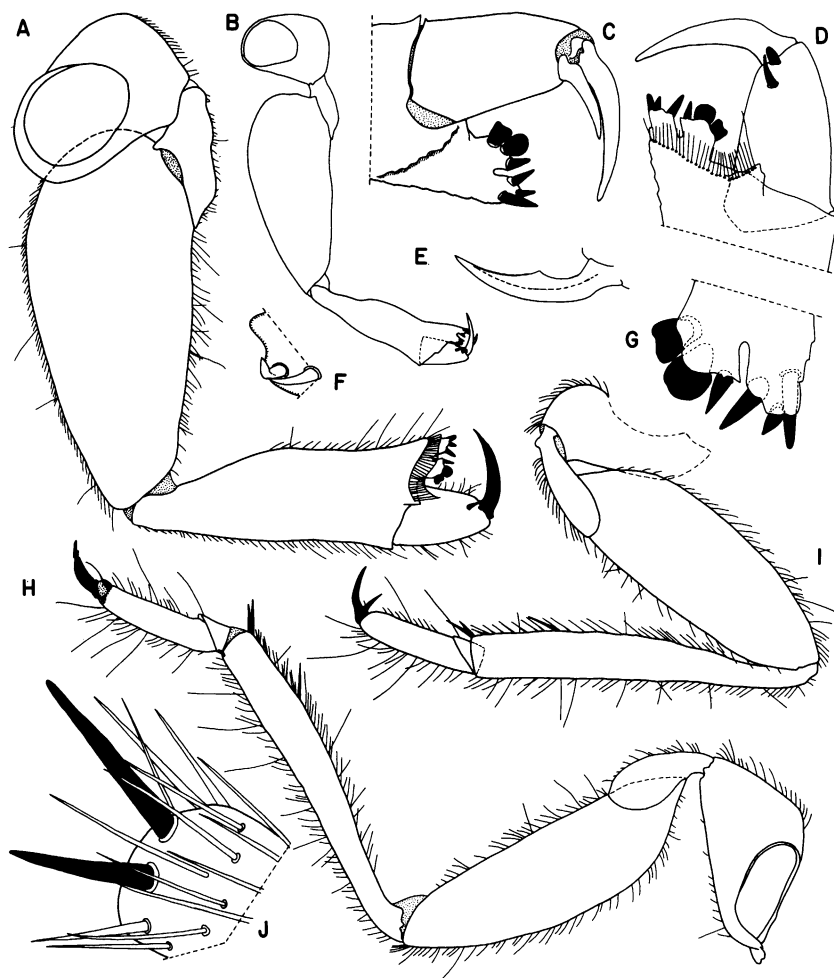


FIG. 6. *Boreostolus sikhotalinensis*. A. Female, foreleg. B. Male, foreleg. C. Female, right foreleg, apex of tibia with tarsus, outer view. D. Female, right foreleg, apex of tibia with tarsus, anterior view. E. Foreleg, damaged inner claw. F. Male, armature of fore tarsus, anterior view. G. Female, right foreleg, process of tibia, anterior view. H. Female, right hind leg. I. Female, right midleg. J. Female, apex of left posterior tibia, ventral view.

with sides distinctly convex. Vertex of female between eyes distinctly convex, in lateral view (fig. 5C), in male almost flat. Eyes small, kidney-shaped, composed of about 20 ommatidia in female and about 30 in male. Eyes remote from levels of dorsal and ventral surfaces of head;

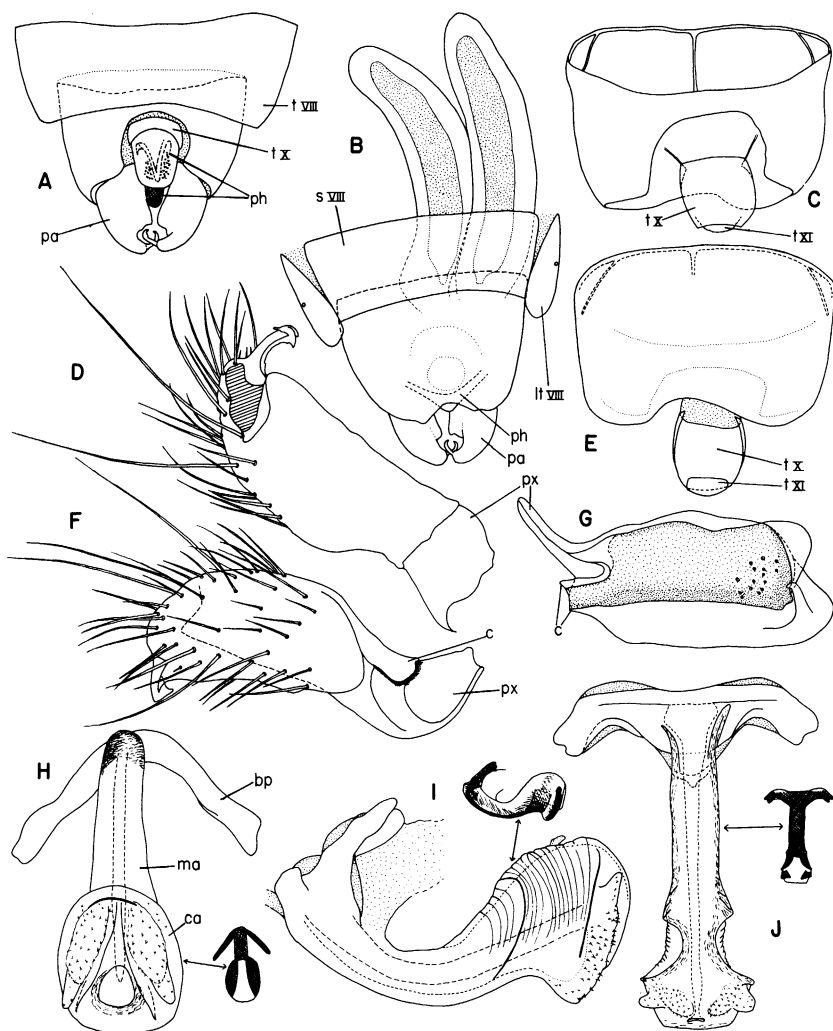


FIG. 7. *Boreostolus sikhotalinensis*, male. A. Apex of abdomen, dorsal view, setae omitted. B. Apex of abdomen, ventral aspect. C. Pygophore and proctiger, dorsal view. D. Right paramere, dorsal aspect. E. Pygophore and proctiger, ventral view. F. Right paramere, ventral aspect. G. Right paramere, medial view, setae of external surface omitted. H. Phallus, dorsoposterior aspect. I. Phallus, lateral view. J. Phallus, ventroposterior aspect. H-J are each accompanied by small scheme showing phallic sclerotization.

Abbreviations: bp, basal plate of phallus; c, condyle of paramere; ca, capitulum of phallus; lt, laterotergite, laterotergal region; ma, medial arch of phallus; pa, paramere; ph, phallus; px, platelike extension of paramere; s, sternum; t, tergum.

in female, distance from eye to ventral surface of head slightly larger than height of eye, in male 0.66 times as large as height of eye. Synthlipsis in both sexes from six to seven times as large as width of eye. Ocelli obsolescent, only from about one-twelfth to one-fourteenth as large as distance between ocelli. Antennae comparatively short and stout; antennae of female (fig. 3D) slightly shorter than imaginary line from apex of antenniferous tubercle to apex of scutellum, and their second segment 1.4 times as long as width of postocular portion of head. Length of antennal segments of female (allotype), I, 0.16 mm., II, 0.45 mm., III, 0.48 mm., IV, 0.39 mm.; of male holotype, I, 0.18 mm., II, 0.45 mm., III, 0.46 mm., IV, 0.39 mm. Rostrum and pubescence of head as shown in figure 5B, C.

Thorax as in generic description and as shown in figure 5B, D, E. Pronotum of male and female slightly shorter than wide.

Forewings of male reaching slightly beyond apical margin of second abdominal tergum, those of female attaining or very slightly surpassing same tergum. Structure and chaetotaxy of forewings as in generic description and figure 5A, F. Claval suture not conspicuous.

Structure of legs as in generic description and as illustrated (fig. 6). Fore femur of male 2.4 times as long as wide, fore tibia 3.0 times as long as wide. Fore femur of female 2.4 times as long as wide, fore tibia 2.6 times as long as wide. Mid and hind tibiae in both sexes with one or two subapical spinelike setae. Hind femur of male 3.3 times as long as wide, of female 3.4 times as long as wide.

Structure of abdomen and genitalia of male (fig. 7) much like that in *B. americanus*, but parameral hooks possibly bifid apically.

Abdomen and genitalia of female (fig. 8) much like those in *B. americanus*, but second valvulae rounded apically.

MATERIAL EXAMINED: U.S.S.R.: Ussuri region, southern part of Sikhota Alin range, Suputinskij zapovednik [Suputinskij Nature Reserve], latitude 43° 58' N., longitude 133° 9' E., inundation zone of Malaja Kamenka River, May 23, 1957 (Tichomirova; Zoological Institute, Academy of Science, Leningrad), one male, holotype; *idem* (Tichomirova; collection Popov, Paleontological Institute, Academy of Science, Moscow), one female, allotype; *idem* (Tichomirova; collection Popov and collection Štys), one male, five females, paratypes. Ussuri region, zapovednik Kedrovaja [Kedrovaja Nature Reserve], approximately latitude 43° 8' N., longitude 131° 33' E., shore of Kedrovka River, May 15, 1962, and August 22, 1963 (L. Borisova and I. Kerzhner; Zoological Institute, Academy of Science, Leningrad).

All the above specimens were collected on moist sand under stones

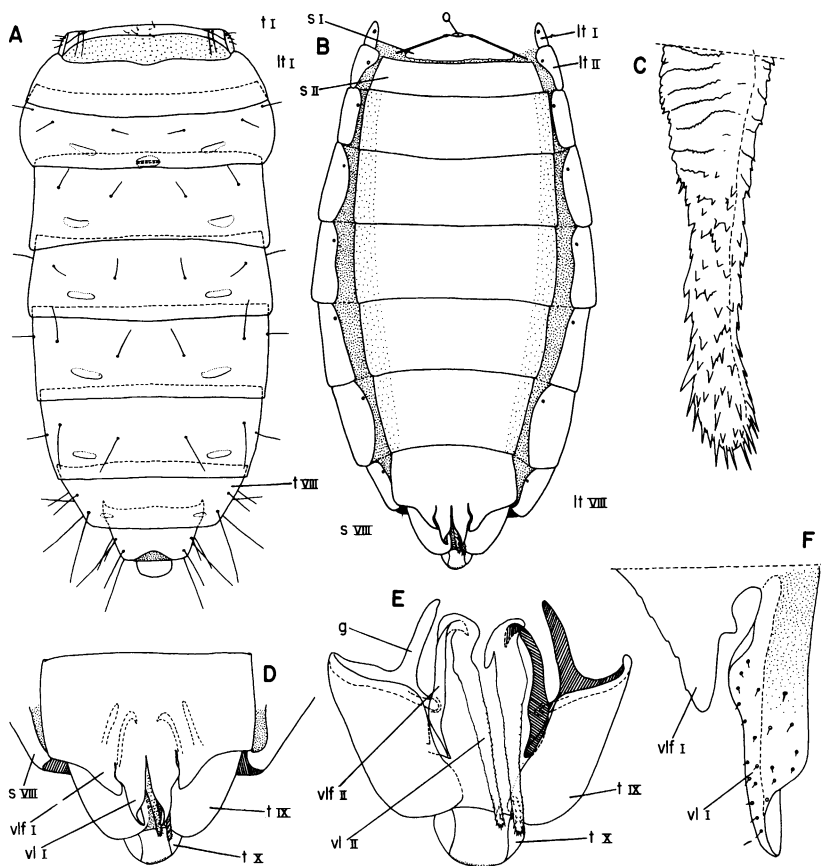


FIG. 8. *Boreostolus sikhotalinensis*, female. A. Abdomen, dorsal aspect. B. Abdomen, ventral view, setae omitted. C. Apical portion of left second valvula. D. Terminalia, seen from below, setae omitted. E. Genital region after removal of eighth segment, ventral view, cleared, setae omitted. F. Right first valvifer and valvulae, ventral view, setae of valvifer omitted.

Abbreviations: g, gonangulum; lt, laterotergite, laterotergal region; o, orifice of scent gland; s, sternum; t, tergum; vl, valvula; vlf, valvifer.

on banks of small rivers.

OBSERVATIONS: In microscopical preparations of this and other species of enicocephalids, one claw of the forelegs may occasionally appear as shown in figure 6E; this appearance is due to damage sustained during preparation of the slide. Normally, the claws will appear as shown in figure 6C, D.

The distal spine of the fore tarsus is normally hook-shaped, as shown in figure 6F and like that in *B. americanus* (fig. 4E, F). In some specimens, the apex of the hook has apparently worn off, and the spine is rounded distally (fig. 6D).

GEOGRAPHICAL DISTRIBUTION: This genus of the Aenictopecheinae, the first discovered in the Holarctic, shows a remarkable disjunctive range, roughly comparable to that of the order Grylloblattodea, or to certain of the Cerambycidae occurring in the Vancouverian subfauna of western North America and in the Japano-Manchurian area (Linsley, 1958).

Both Ussurian localities of *Boreostolus* lie in a zone of broad-leaved and mixed woods of the Far East; the American localities are in zones of coniferous forest. These localities are situated in well-established glacial refuges of the Holarctic arboreal: in the East-Asiatic Pacific and American Pacific refuges according to Reinig (1937), or, following a more detailed classification by Lattin (1967), in an Ussuri secondary center of the Manchurian center, an Oregon center, and a Colorado center. The modern east Asiatic and northwest American disjunction of the range of *Boreostolus* has probably been caused by the Pleistocene glaciations, the genus surviving in the above-mentioned refuges only. The very slight differences between the Asiatic and American populations suggest that the present disjunction is of a relatively recent origin; Reinig (1937) concluded that Eurasiatic-American disjunctive patterns of post-Tertiary age are characterized by differences on a specific but not on a generic or higher level.

The real significance of the presence of a relatively plesiomorphic enicocephalid in the Northern Hemisphere cannot be judged before the relationships of the various genera of the Aenictopecheinae among themselves, and the relationships between this subfamily and the remaining members of the family, have been more clearly established.

BIBLIOGRAPHY

- LATTIN, G.
1967. Grundriss der Zoogeographie. Stuttgart, G. Fischer, 602 pp.
- LINSLEY, E. G.
1958. Geographical origins and phylogenetic affinities of the cerambycid beetle fauna of western North America. Zoogeography, publ. 51, American Assoc., Adv. Sci., x + 509 pp.
- REINIG, W. F.
1937. Die Holarktis. Jena, G. Fischer, 124 pp.
- WYGODZINSKY, P.
1949. Redescription of *Gamostolus subantarcticus* (Berg, 1883) (Enicocephalidae, Hemiptera). Rev. Brasileira Biol., vol. 9, pp. 353-358.

