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NOTES ON THE GENUS LABOPS, BURMEISTER IN NORTH AMERICA, WITH THE DESCRIPTIONS OF THREE NEW SPECIES (HEMIPTERA: MIRIDAE).

By JAMES A. SLATER,[1] Storrs, Conn.

The genus *Labops* is composed of a rather homogeneous group of species that are quite distinctive from any related Nearctic genera within the subfamily Orthotylinae. Reuter (1883) erected the tribe Labopini for *Labops,* and certainly the genus has many features distinctive enough to appear to warrant at least tribal status. For example, the posterior wall of the bursa copulatrix is quite different in composition from any other orthotyline yet investigated (see Slater 1950).

Species of *Labops* may be recognized by the strongly pedunculate eyes that extend laterad far beyond the margins of the pronotum (Plate II, Fig. 3), the vertical head, slender condition of the third and fourth antennal segments and the strongly dimorphic condition of the hemelytral development.

Distribution:

Labops is Holarctic in distribution being found principally in northwestern North America and northeastern Siberia, with single species extending into eastern North America and eastern Europe respectively. The genus ranges through only the northern portions of both hemispheres. Judging from the descriptions and figures the Palearctic species are closely related to the Nearctic and form a rather homogeneous generic unit both morphologically and geographically.

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Host Plants:

Little is known of the biology of these species but it is evident that they feed upon wild grasses particularly those associated with arid conditions. Mills (1939) reports *Labops hesperius* feeding on *Koeleria cristata* (L.), *Poa secunda* Presl., *Stipa comata* Trin. and Rupt., and *Stipa* (?) *williamsi* Scrbn. in Montana. Mills (*ibid.*) also reports *hesperius* attacking *Hordeum* and *Triticum sativum*. Mills (1941) again notes *hesperius* on wheat in Montana. Gillette and Baker (1895) report *hesperius* on pine, but this surely is a "sitting" record. Mills (1938, 1939) notes *Labops hirtus* injuring wheat in Montana.

The male gonostyli (claspers) have previously been used as taxonomic characters in *Labops* by Knight (1922). In general the left gonostylus offers more reliable and easily utilized characters than does the right. However, the latter may be used if care is exercised in orientation.

The female structures have not previously been utilized for taxonomic discrimination although Slater (1950) described and illustrated differences in the posterior wall of the bursa copulatrix of *hirtus* and *hesperius*. The sclerotized rings appear to have limited value for specific separation. In contrast the posterior walls can be used to separate all of the known North American species with the exception of *hesperius* and *brooksi* where intergradation of characters is present. However, the most striking characters are found in a sclerotized area that extends mesally from an origin near the junction of the anterior rami and the connecting pieces (see Kullenberg 1947 and Slater 1950). This sclerotized area may be designated as the *inter-ramal bridge* and usually extends as a solid band with projecting spinous processes near the lateral extremities (Plate III, Figs. 15, 16, 17, 19), although in *chelifer* it is reduced to a pair of pincer-like lateral sclerites with no mesal connection, in *utahensis* it is a simple band of tissue and in *hesperius* and *brooksi* the area is completely membranous. This inter-ramal bridge presents remarkable specific characters and has the additional advantage of being much more easily utilized than the posterior wall (which is often difficult to dissect intact in this genus), and in not requiring extremely high magnification nor a high degree of accuracy in orientation.

Brachyptery:

Differences in the degree of hemelytral development are most interesting in this genus and show considerable variation from species to species. In *Labops verae* Knight only the brachypterous

condition is known in either sex. The hemelytra in this species are very short leaving several abdominal segments exposed and are truncate at the apex, the cuneus is undifferentiated and the clavus and corium fused into a single pad-like structure. It appears that *verae* has progressed furthest in brachypterous modification of any of the North American species. *Labops hirtus* Knight shows a predominance of brachyptery in both sexes. (Of the material I have examined 60 of 73 males are brachypterous; of 39 females 32 are brachypterous.) The brachypterous condition is quite different however from that of *verae,* in that the cuneus is well differentiated, and sometimes a slight trace of membrane is present and the hemelytra are much longer, covering almost the entire abdomen except for the two terminal segments and having the apices acutely rounded. In *L. hesperius* Uhler, *brooksi* n. sp., *tumidifrons* Knight and *burmeisteri* Stal the brachypterous condition is represented only in the females of the material I have studied. The following number of males have been examined without a single brachypterous specimen appearing: *hesperius* 46, *tumidifrons* 22, *brooksi* 79, *burmeisteri* 24. In the females of the above mentioned species brachyptery is the predominant condition, of material examined 84 females of *hesperius* show 68 brachypterous, of 69 *brooksi* 54 are brachypterous and the only 2 females of *tumidifrons* available are both brachypterous. The condition of the wings in short-winged individuals of these three species is similar to that found in *hirtus,* agreeing in the possession of a cuneus. However, the hemelytra at least in *hesperius* and *brooksi* are much shorter leaving 4–5 abdominal tergites exposed and the species are much more bluntly rounded with no indication of a membrane remnant visible. It is interesting that the species (*hirtus*) that Blatchley (1926) synonymized with *hesperius* is distinguishable in the brachypterous condition by the hemelyera alone in addition to all the other characters that have been utilized to separate the two species.

Immature Stages:

Apparently the immature stages have not previously been described in the literature.

Labops hesperius Uhler
(fifth instar nymph—in alcohol)

General coloration testaceous, marked with brownish as follows: frons on either side of midline and area about eye, this band extending about half way to meson along posterior margin of head,

clypeus, apices of lorae, labium, antennae, patch on lateral pronotal margin near center and extending irregularly mesad in area of calli, comma shaped mark near antero-mesal angle of developing wing pads, irregular longitudinal striping on wing covers, diffused area about dorsal abdominal scent gland opening, apex of abdomen, spotting on thoracic pleuron, coxae and trochanters, femora with a basal and subapical band; tibiae and tarsi entirely dark brown; a series of 5 brown spots along lateral margin of abdomen.

Clothed with prominent, erect dark brown hairs over body and appendages; hairs on hind tibiae not obscuring the true spines.

Eyes pedunculate and head strongly declivent as in adult, width across eyes 1.35 mm., interocular space .92 mm.; length pronotum .50 mm., width pronotum 1.06 mm.; mesothoracic wing pads extending caudad onto third abdominal tergite, narrow and divergent, not explanate at lateral margins, length wing pads 1.10 mm.; scent gland opening present between abdominal tergites 3–4; labium reaching metacoxae; basal segment of hind tarsus much shorter than second; antennae with third and fourth segments slightly thinner than segment two, length antennal segments I .32 mm., II .78 mm., III .53 mm., IV .78 mm. Total length 3.41 mm. Described from three specimens. 30 miles south Valentine, Nebraska, June 9, 1950. (Slater, Hicks, Laffoon.) Author's collection.

All three specimens available appear to be females so that it has been impossible to ascertain whether the inflated jugae, characteristic of males of the species are evident in the nymphs.

Key to North American Species of Labops

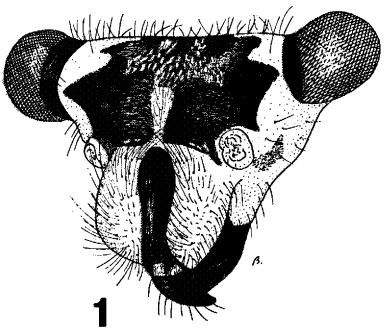
1. Hemelytra lacking upright, slender hairs, clothed only with flattened scale-like silvery hairs; head possessing a prominent transverse basal ridge; always brachyterous with the clavus, corium and cuneus fused into a single pad .. *verae*

   Hemelytra always possessing slender upright hairs, flattened silvery hairs usually present; head lacking a prominent basal ridge; both brachyterous and macropterous forms, but in latter case with corium, clavus and cuneus well differentiated ..... 2.

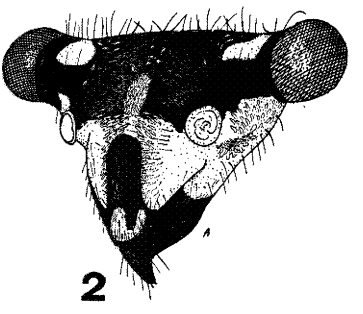
Plate II

Fig. 1. Antero-lateral view of head of *Labops hesperius*. Fig. 2. Antero-lateral view of head of *Labops brooksi*. Fig. 3. Dorsal view of *Labops hirtus*.

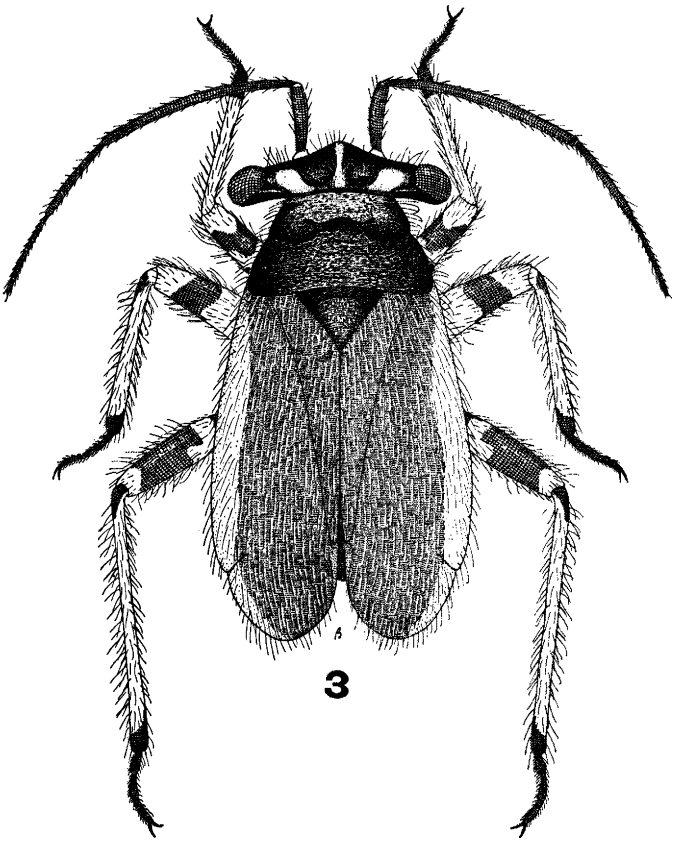
BULL. B.E.S. VOL. XLIX PLATE II



1



2



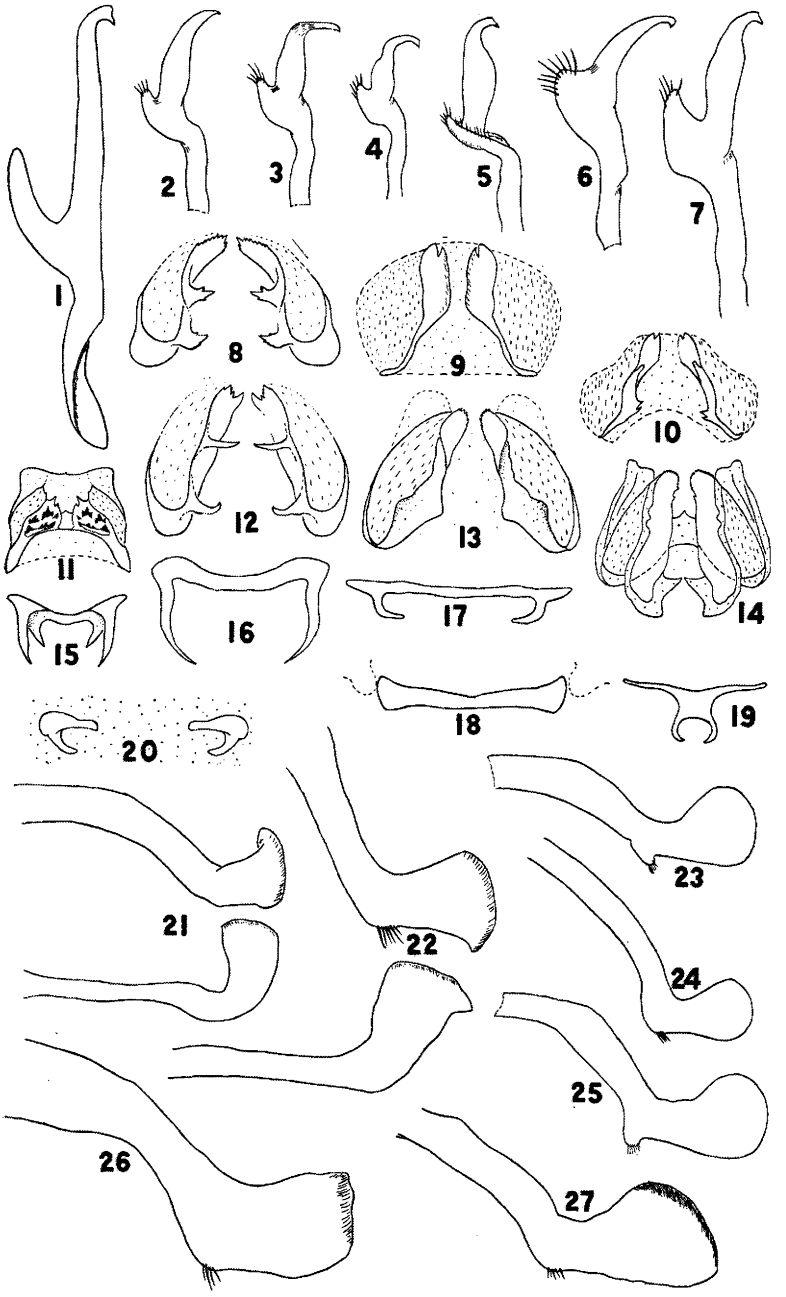
3

2. Hind tibiae completely black or extremely dark fuscous ... 3.
   Hind tibiae never completely black, sometimes extensively darkened, but in this case partially reddish-brown or orange ..... 5.
3. Jugae of males greatly swollen (Plate II, Fig. 1), with clypeus not visible between jugae from lateral view, of females less so, but still evidently tumid; left gonostylus evenly curving to apex (Plate III, Fig. 2) not strongly angled or straight for greater portion of length ..... *hesperius*
   Jugae of males not strongly swollen (Plate II, Fig. 2), clypeus visible between jugae from lateral view; left gonostylus sharply angled (Plate III, Fig. 3) before apex or straight for greater portion of length ..... 4.
4. Length of first antennal segment as long as or longer than length of pronotum; labium reaching apex of hind coxae; third antennal segment one-fourth longer than segment four; large species over 4.7 mm.; female genitalia with inter-ramal bridge sclerotized and consisting of a simple mesally narrowed bar (Plate III, Fig. 18) left gonostylus of male very elongate, the shaft nearly straight throughout greater portion of length (Plate III, Fig. 1) ... *utahensis*
   Length of pronotum greater than that of first antennal segment; labium reaching apex of mesocoxae; antennal segments three and four subequal in length; smaller species under 4.5 mm. in length; female genitalia with inter-ramal bridge entirely membranous; left gonostylus sharply angled near apex (Plate III, Fig. 3) ..... *brooksi*
5. Lateral margin of corium black, unicolorous with remainder of hemelytron ..... *burmeisteri*
   Lateral margin of corium whitish or yellowish, always strongly contrasting with darkened median portion of hemelytron 6.
6. Hairs of hind tibiae very long, as long as or longer than the true spines and tending to obscure them; larger species over 4.0 mm. in length ..... *hirtus*

Plate III

Figs. 1–7. Left gonostyli of *Labops utahensis, hesperius, brooksi, tumidifrons, burmeisteri, verae, hirtus* respectively. Figs. 8–14. Posterior walls of bursa copulatrix *Labops brooksi, burmeisteri, chelifer, tumidifrons, hesperius, utahensis, verae* respectively. Figs. 15–20. Inter-ramal bridges of *Labops tumidifrons, hirtus, burmeisteri, utahensis, verae, chelifer* respectively. Figs. 21–27. Right gonostyli of *Labops burmeisteri, hirtus, brooksi, tumidifrons, hesperius, verae, utahensis* respectively.

BULL. B.E.S. VOL. XLIX PLATE III



Hairs of hind tibiae relatively much shorter, the true spines considerably longer and not obscured by the hairs; smaller species usually under 3.5 mm. ..... 7.

7. Labium reaching, or nearly reaching apex of hind coxae; apex of scutellum light; female genitalia with inter-ramal bridge consisting of a pair of laterally placed, non-contiguous pincer-like sclerites (Plate III, Fig. 20) ..... *chelifer*

Labium extending caudad only to mesocoxae; scutellum dark throughout; female inter-ramal bridge developed as a continuous band of sclerotized tissue with two pairs of caudally directed spines near lateral margins (Plate III, Fig. 15) ..... *tumidifrons*

Labops brooksi n. sp.

Male—macropterous: Coloration bluish-black, marked with whitish as follows: explanate margins of hemelytra, area adjacent to eyes except for a narrow black lateral extension that reaches or nearly reaches the eyes above the antennal bases, jugae, short median area just above base of clypeus, bucculae, markings on coxae and sometimes incomplete striping on femora; antennae and tibiae completely black.

Clothed above and below with semi-erect yellow hairs, interspersed abundantly with decumbent scale-like flattened, silvery pubescence; first antennal segment and tibiae bearing prominent blackish spines, those on the tibiae distinctly longer than and not obscured by the hairs.

Head broad with typically pedunculate eyes, frons more tumid and less sloping than in *hesperius,* jugae not swollen, clypeus visible between them when viewed from side, width across eyes 1.35 mm., interocular space .93 mm.; pronotum rugulose, often with depressed area in region of calli, length pronotum .71 mm. (.64–.76), width pronotum 1.34 mm. (1.29–1.42), scutellum rugulose, convex at base, length .64 mm. (.57–.71); membrane exceeding apex of abdomen by distance caudad of tip of cuneus, maximum width across hemelytra 1.67 mm. (1.63–1.70); labium slightly exceeding apex of mesocoxae; length antennal segments I .57 mm., II 1.28 mm., III .64 mm., IV .64 mm. Total length 4.06 mm. (3.91–4.26).

Female—brachypterous. Similar to male in shape and color, often more strongly marked with whitish-yellow on femora; hemelytra strongly arcuate and rounded at apices, membrane entirely absent, leaving 3–4 abdominal tergites exposed; width across eyes

1.45 mm. (1.42–1.49), interocular space .99 mm.; maximum width across hemelytra 1.95 mm. (1.85–2.13); length scutellum .50 mm.; total length 3.65 mm. (3.55–3.76). Macropterous female—total length 4.37 mm. (4.12–4.83).

Holotype: Male: Manyberries, Alta. 4-VI-1952. (L. A. Konotopetz)—In Canadian National Museum Collection.

Paratypes: 79 males and 69 females. Alberta: Elkwater, Irvine, Spring Rt., Lethbridge, Manyberries, Cowley, Elkwater Park, Coults, Frank, Milk River, Conrad, Cardston, Morrin, Cochrane. Saskatchewan: Saskatoon, Beaver Creek, Glidden, Harris, Cypress Hills. Manitoba: Aweme. British Columbia: Rolla. Collected by C. P. Alexander, R. D. Bird, A. R. Brooks, H. E. Gray, L. A. Kelton (= Konotopetz), G. F. Manson, J. H. Pepper, H. L. Seamans, P. N. Vroom, R. M. White. Specimens deposited in Canadian National Museum, United States National Museum, British Museum, California Academy of Sciences, University of Connecticut, University of Massachusetts, H. H. Knight and author's collections.

This new species is very closely related to *hesperius,* the size, form and coloration are nearly identical in the two species. The males may readily be separated by the greatly swollen jugae of *hesperius* (Plate II, Fig. 1), in contrast the jugae of *brooksi* (Plate II, Fig. 2) are non-swollen and of the same type as found in the females of both species. The left gonostylus is also distinctive in the species, being much more sharply angled in *brooksi* (Plate II, Fig. 3), the right gonostylus while showing constant points of difference is more difficult to utilize due to the necessity of very accurate orientation to ascertain the small differences present.

Thus far I have been unable to satisfactorily separate the females of these two species other than by the slightly more swollen jugae in *hesperius.* The posterior wall of the bursa copulatrix while very distinct from other species of *Labops* (Plate III, Figs. 8 & 12) shows all degrees of intergradation in the two species and is unreliable for specific separation. The area of the inter-ramal bridge is entirely membranous in both *hesperius* and *brooksi* and is therefore not suitable for use in taxonomic discrimination.

I take pleasure in dedicating this new species to Mr. A. R. Brooks who has collected the greatest part of the type series and who first noted the jugal differences in the males of *hesperius* and *brooksi.*

(To be concluded in the October issue)

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NOTES ON THE GENUS LABOPS, BURMEISTER IN NORTH AMERICA, WITH THE DESCRIPTIONS OF THREE NEW SPECIES (HEMIPTERA: MIRIDAE).

By JAMES A. SLATER,[1] Storrs, Conn.

(Continued from the June issue)

Labops utahensis n. sp.

General coloration bluish-black, marked with ivory white to yellowish as follows: irregular spot mesad of eyes that narrows and curves mesad near base of head, but does not reach midline, lateral margins of hemelytra, scattered areas on coxae, extreme apices of femora, jugae and genae; hind tibiae almost black, sometimes possessing a fuscous cast; clothed above and below with intermixed upright hairs and decumbent, sericeous scale-like pubescence, hairs on hind tibiae not obscuring the true spines.

Eyes strongly stalked and tilted slightly upward to apex, jugae nearly flat, not markedly tumid in either sex, width across eyes 1.45 mm. (1.35–1.49), interocular space .88 mm. (.85–.92); pronotum rugose on posterior lobe, calli strongly convex, length pronotum .71 mm. (.64–.78), width pronotum 1.24 mm. (1.21–1.35), length scutellum .64 mm. (.57–.71); hemelytra moderately expanded, strongly tapering caudad, posterior margin bluntly rounded, length 2.87 mm. (2.70–2.98); labium extending caudad to, or nearly to, apex of hind coxae; length antennal segments I, .81 mm. (.71–.99); II, 2.06 mm. (1.78–2.27); III, 1.35 mm. (1.28–1.42); IV, .96 mm. (.92–.99). Total length 4.97 mm. (4.76–5.18).

Brachyptery: Present in all females examined; clavus and cuneus

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well differentiated, apex of hemelytron bluntly rounded, vestige of membrane usually visible.

Genitalia: Males with left gonostylus very elongate and slender the terminal shaft straight for the greater portion of the length, the sensory lobe strongly produced (Plate III, Fig. 1). Females with inter-ramal bridge connected mesally, simple, and consisting of a simple mesally narrowed bar (Plate III, Fig. 18). Posterior wall lacking a mesally directed spine near caudal angle (Plate III, Fig. 13).

Holotype: Female, Utah: Laketown, July 18, 1945. (G. F. Knowlton.) In H. H. Knight collection.

Paratypes: 14 females, 1 male, some data as holotype: 1 male, *Colorado* No. 4389. Specimens in United States National Museum, Canadian National Museum, British Museum, H. H. Knight, University of Connecticut and author's collections.

This is a large, elongate species, averaging somewhat larger than any other North American species. The male and female genitalia as noted above are distinctive. *Utahensis* belongs to the group containing *brooksi* and *hesperius,* by reason of the black hind tibiae, simple nature of the inter-ramal bridge and general habitus. However, the male gonostyli are very different and the posterior wall of the bursa copulatrix is somewhat more suggestive of *burmeisteri* and *hirtus.*

Labops chelifer n. sp.

General coloration black, prominently marked with yellowish-white as follows: stripe along inner margin of eyes and extending mesad along base of head nearly to meson, jugae and genae, apical one-third of scutellum, outer one-half of clavus, corium and cuneus with exception of an extensive darkened area covering central portion of disc, area adjacent to coxae, legs with exception of tarsi and apices of tibiae.

Head strongly declivent, jugae moderately swollen, labium reaching apices of hind coxae, width across eyes 1.32 mm., interocular space .89 mm.; pronotum with posterior lobe rugulose, calli prominent, clothed with mixture of upright hairs and sericeous decumbent scale-like hairs, length pronotum .53 mm., width pronotum 1.12 mm., length scutellum .56 mm.; brachypterous, cuneus differentiated, vestige of membrane present, clothed with upright hairs, but decumbent, scale-like hairs absent, length hemelytron 2.18 mm.; length antennal segments I, .43 mm.; II, 1.25 mm.; III, .66 mm.; IV, .73 mm.; total length 3.14 mm.

Genitalia: Inter-ramal bridge of female appearing as a pair of pincer-like sclerites widely separated from one another (Plate III, Fig. 20).

Holotype: Female, Canada: Reindeer Depot, Mackenzie Delta, July 16, 1948. (J. R. Vockeroth.) In Canadian National Museum collection.

This interesting new species appears to be most closely related to *tumidifrons,* but the female genital structures are very different than those found in any other member of the genus. Externally *chelifer* may be distinguished by the coloration of the corium, the light apex of the scutellum and of the tibiae and femora and the lack of decumbent scale-like hairs on the corium.

Labops verae Knight

This is one of the most distinctive and easily recognized members of the genus by reason of the ridged base of the head, the lack of upright slender hairs on the hemelytra and above all by the extreme degree of brachyptery as discussed above. Both the female and male genitalia are distinctive (Plate III, Figs. 6, 14, 19, 26).

L. verae is somewhat suggestive of the genus *Scirtetellus* Reuter. The distribution appears to be limited to extreme northwestern United States and western Canada.

Specimens examined: 3 males, 1 female: Washington: Mt. Rainier. British Columbia: Hope Mts. 6,500 ft. N.W. Territory: Cameron Bay, Great Bear Lake. In Canadian National Museum and H. H. Knight collections.

Labops tumidifrons Knight

This small species superficially resembles small specimens of *hesperius* and *brooksi* rather closely. The lateral margins of the corium and cuneus are light, the remainder of the dorsal surface black; hind tibiae dark, but suffused with deep reddish-brown at least in the central portion. The inter-ramal bridge with its four posteriorly projecting spines (Plate III, Fig. 15) is quite distinctive as is the peculiarly developed spinous posterior wall (Plate III, Fig. 11).

The distribution while poorly known is northwestern United States and western Canada.

Specimens examined: 23 males, 2 females: Alberta: Manyberries, Irvine, Silkwater. South Dakota: 15 mi. So. Mission, Todd Co. Specimens in Canadian National Museum and author's collection.

Labops hirtus Knight

This species is quite distinct from other members of the genus in North America. The long hairs on the hind tibiae which obscure the true spines, light coloration of hind tibiae and numerous very long slender upright hairs on the hemelytra together with good specific characters in both male and female genitalia (Plate III, Figs. 7, 16, 22) make this a readily recognizable species. The subapical projection on the right gonostylus is readily recognizable even in undissected specimens.

There is considerable size variation in specimens of *hirtus* from different localities. I have examined a series in the Knight collection from Mt. Adams, Washington that are all extremely small and very densely setose. However the male and female genitalia of these specimens are typically *hirtus*. *Hirtus* appears to be rather closely related to *setosus* Reuter described from Siberia insofar as one may judge by the description of the latter species.

This appears to be the only species of *Labops* that ranges across the northeastern United States, however it occurs together with *hesperius* and other species in the Western United States and Canada.

Specimens examined: 77 males, 43 females: Washington: Mt. Adams. Michigan: Mackinaw Co. Ontario: Fisher Glen; Bell's Corner; Delhi; Algonquin Park; Norway Point, Lake of Bays; Strathroy; Ottawa. Quebec: Knowlton, Queen's Park, Aylmer; Meach Lake; Covey Hill; Kazubazua; Fairy Lake; Abitibi Region. British Columbia: Clinton, Rolla, Cranbrook. Alberta: Cardston; Edmonton. Nebraska: Valentine. New Hampshire: Mt. Washington 6000 ft.; White Mts., Hermit Lake. Colorado: Gothic 9500 ft.; Glacier Basin, Rocky Mt. Nat. Park. Specimens in Canadian National Museum, H. H. Knight, University of Connecticut, University of Massachusetts and author's collection.

Labops burmeisteri Stal

This species may readily be separated from other Nearctic *Labops* by the lack of light coloration along the lateral margin of the corium, giving the entire dorsal surface a uniformly black coloration with the exception of the basal portion of the head. One specimen from Dawson, Yukon has the posterior lobe of the pronotum white. The antennae, femora and tarsi are black, tibiae dull reddish-brown to yellowish on distal two-thirds with exception of extreme apex; corium and pronotum densely clothed with upright hairs, decumbent scale-like hairs present on pronotum and

along clavus, but usually sparsely represented on corium, particularly in the males.

Male gonostyli distinctive, the right gonostylus curved at nearly a right angle apically (Plate III, Fig. 21), more strongly so than in any other member of the genus. Left gonostylus with sensory lobe produced somewhat trough-like (Plate III, Fig. 5). Female genitalia with inter-ramal bridge bearing two posteriorly directed spines that arise mesad of the lateral end of the main shaft which is contiguous mesally (Plate III, Fig. 17).

Burmeisteri is probably most closely related to *hirtus*. The dense upright pubescence and reduced amount of scale-like hairs on the hemelytra, the composition of the inter-ramal bridge and of the posterior wall of the bursa (Plate III, Fig. 9) are all suggestive of the latter species.

This is a Holarctic species that appears to be essentially Hudsonian in distribution in North America.

Specimens examined: 24 males, 14 females: Canada: Dawson; Yukon; Reindeer Depot; MacKenzie Delta; Mt. Lyall, Quebec, 1500 ft.; Abitibi Region. (W. W. Judd, W. J. Brown, Cook.) Alaska: Steese Highway; Kantishna; Mt. McKinley Park. In Canadian National Museum and University of Massachusetts collections.

Labops hesperius Uhler

This is the only North American species of the genus in which the male jugae are enormously inflated. *Hesperius* is very closely related to *brooksi* and the two are obviously derived from a common stock. Indeed between these two species occurs the only place where the usually good specific characters found in the female inter-ramal bridge and posterior wall of the bursa are of no value.

The distribution is typically western, ranging eastward into South Dakota and Nebraska and in the north possibly into Ontario and Quebec. The older literature records are somewhat unreliable and eastern records should probably be referred to *hirtus*.

I have examined the two male specimens noted by Knight (1922) as having an abnormal development of the right gonostylus and agree that otherwise they are typical *hesperius*, furthermore a third male and three females taken at the same locality and time possess all of the diagnostic features of the species.

Mills (1939 and 1941) refers to this species as the "Grass Plant Bug" a common name which has not yet found its way into the "approved" list of common names.

Specimens examined: 47 males, 86 females: Alberta: Maligne Lake; Nordegg; Banff. British Columbia: "Paul L. Komloops." Montana: Big Horn Co. Wyoming: Shoshone National Forest. Oregon: Aneroid Lake 7500 ft. Colorado: Mesa; Gothic; Rabbit Ear Pass. Nebraska: Valentine; S.W. Corner, Brown Co. S. Dakota: 15 mi. So. Mission, Todd Co. Yukon: Dawson. Specimens in Canadian National Museum, H. H. Knight, University of Connecticut, University of Massachusetts and author's collection.

The author wishes to express his deep appreciation to Mr. A. R. Brooks of the Canadian Dept. of Agriculture, Saskatoon, Saskatchewan for calling attention to the presence of a new species from his area, making the illustrations of the heads of *hesperius* and *brooksi* and the dorsal view of *hirtus* and for the loan of material; and to Dr. Newell Smith of the Canadian National Museum, Dr. H. H. Knight of Iowa State College and Dr. Marion Smith of the University of Massachusetts for the loan of material. Appreciation for the collection of material is extended to the Northern Insect Survey, a joint project of the Canadian Division of Entomology and the Defence Research Board.

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