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# Systematic revision of American Glaresidae (Coleoptera: Scarabaeoidea)

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Systematic revision of American Glaresidae (Coleoptera: Scarabaeoidea)

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## Systematic revision of American Glaresidae (Coleoptera: Scarabaeoidea)

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**Abstract.** Thirty five Western Hemisphere species of Glaresidae (Coleoptera) are recognized. Descriptions of new species, redescrptions of those previously described, keys to groups and species, and illustrations of pertinent morphological characters are presented. Nineteen **newly described** species are *Glaresis australis*, *G. bajaensis*, *G. bautista*, *G. caenulenta*, *G. californica*, *G. costaricensis*, *G. costata*, *G. falli*, *G. dentata*, *G. donaldi*, *G. imitator*, *G. limbata*, *G. montenegro*, *G. paramendica*, *G. sabulosa*, *G. tumida*, *G. warneri*, *G. yanegai*, and *G. zacateca*. *Glaresis cartwrighti* Gordon is recognized as a **junior synonym** of *G. inducta* Horn.

### Introduction

North American *Glaresis* Erichson (Coleoptera) were revised by Gordon (1970). At that time relatively few specimens were available because light trap collected material had not yet found its way into collections. Since then, thousands of *Glaresis* specimens have been collected and deposited in dozens of private and institutional collections, and many specimens have been collected by one of the authors (RDG). Examination of this rich resource has resulted in discovery of new species, newly recognized characters, reassessment of previously known characters, and range extensions for nearly all species.

Members of Glaresidae are present on all major continents except Australia. As would be expected of a primitive group, morphological character evolution has been extremely conservative and specimens from one continent closely resemble those from any other.

Thirty five Western Hemisphere species are recognized. All currently described South American species are treated along with all known taxa from north of South America. Descriptions of Mexican and two Central American species probably do not reflect the actual number of species occurring in those regions. Redescrptions of previously described species, keys to groups and species, and illustrations of pertinent morphological characters are presented. Nomenclatorial changes proposed here are descriptions of 19 new species and relegation of one name to synonymy.

Only the adult stage is dealt with herein, all references to “species” refer to the adult stage.

### Materials and Methods

*Cleaning.* Nearly all specimens of *Glaresis* come equipped with a surface encrustation of sand and other soil particles. In order to study surface sculpture and other external details, it is necessary to remove this layer. We accomplished this by soaking specimens in a water and “409” (commercial cleaner) solution for 24 hours, then scrubbing the specimen with a camel’s hair brush. If an ultrasonic cleaner is available, it does a better cleaning job within 10 to 15 minutes if the specimen is placed in a hot solution of water and “409.” Male genitalia are difficult to obtain because the abdomen is very lightly sclerotized, flexible, and subject to bending far back almost to the metasternal cavity. The abdomen is removed using sharp forceps (Dumont # 5), the genitalia dissected out and placed in a hot KOH solution for approximately 5 minutes. The genitalia are usually lightly sclerotized, therefore structurally weak and subject to warping if left in the KOH solution too long.

*Images.* Imaging of specimens was accomplished with a Canon EOS 60D digital camera mounted to an Olympus SZX16 stereo microscope. Stacks of between 20 and 30 images, depending on magnification requirements, were taken using the Cognisys Inc. Stackshot System and montaged in Helicon Focus.

Genitalia and hind legs were imaged while immersed in glycerine and under a cover glass to prevent movement of the specimen during photo stacking. All images were then processed in Photoshop to highlight morphological characters. Glycerine immersion provided superior results at high magnification compared to open air imaging, and as such, images of holotype specimens that could not have body parts removed for immersion are of lower quality.

Arrows on images are used to point out structures of identification significance such as trochanteral and femoral teeth, metasternal grooves, etc. Images are best observed digitally, but if they are downloaded and printed then a good quality printer must be used to ensure a quality image.

**Data and types.** Locality data and distributions are based entirely on specimens examined. New species have label data listed in full and presented verbatim under the heading "Type material." Additional non-type material studied is listed with abbreviated data. The initial listing of each state is in boldface followed by county, locality, etc. All primary type specimens were reexamined to ensure accuracy of identification. It was not necessary to designate lectotypes because species were either described from a unique specimen, or only one specimen of a type series remains in the collection. Male specimens are nearly always selected as holotypes. However, for *G. parmanendica* and *G. tumida* females were selected because identifying characters are exceptionally distinct and females are as easily recognized as males in both cases. Type depositories were not located for *G. pardolcaidei* and *G. fritzi* because both species are easily recognized, leaving no doubt as to the identity of each.

**Morphology.** Certain body structures are useful in species recognition and repeatedly used in descriptions and diagnostic keys, some of these are discussed below:

**Body.** Shape is a somewhat useful character. For example, the short, stout body form of *G. inducta* (Fig. 17A) is valuable in distinguishing it from similar species; and the nearly parallel-sided elytra of *G. montenegro* (Fig. 5A) and *G. phoenicis* (Fig. 17A) are useful for recognizing those species.

**Head.** An excellent source of diagnostic characters. Examples are shape of clypeal apex which may be truncate, smooth, angled posteriorly (ecostata group) (Fig. 2B), as opposed to a strongly tuberculate, flat structure surface (phoenicis group) (Fig. 5B), or slightly reflexed clypeus of the inducta group (Fig. 17B) and some members of the mendica group. Surface armature of clypeus, frons, and vertex are useful in distinguishing species groups and individual species within a group.

**Pronotum.** Basically uniform throughout, but the ecostata group lacks foveae altogether (Fig. 2C), while the other groups have foveae weakly or strongly defined (Fig. 26C). Surface sculpture often has short, setose ridges that vary from straight to irregularly sinuate in shape, and vary in density between species, but are of limited value for diagnostic purposes.

**Elytra.** Striae may be flat, or slightly raised, with or without distinct carinae (Fig. 2E), or convex to highly convex with striae carinae widely interrupted to nearly complete (Fig. 17C). Intervals seem to provide no useful characters.

**Metasternum.** Surface sculpture may be reduced to scattered, widely spaced, mostly straight elongate ridges restricted to basal 1/2 of sternum (Fig. 2D), base of metasternum lacking strong, supporting ridges posterior to mesocoxae (ecostata group), or with dense, sinuate ridges, often forming reticulate pattern (Fig. 25D), base of metasternum with strongly raised supporting ridges posterior to mesocoxae (mendica group). If a metasternal groove for reception of the mesotarsus is present, it varies from shallow, with one or both margins tapered or rounded (Fig. 15D), to deep with both margins abruptly ridged (Fig. 25D). This oblique metasternal groove on the median metasternum extends partly across a shallow, reversely oblique groove extended across anterior portion of metasternum and anterior portion of metepimeron. This anterior groove receives the mesotibia when the beetle is in a resting or defensive posture.

**Mesotibia.** Number and spacing of spines on the outer margin are often useful characters for group and species diagnosis. These vary from 4 widely spaced spines characteristic of the mendica group (Fig. 19D), to 6 or more narrowly spaced spines in *G. canadensis* and *G. sabulosa* (Fig. 15D). An intermediate character state is that of *G. inducta* with 4 or 5 widely spaced spines (Fig. 17D). Variations in spine number include *G. gordonii* and *G. caenulenta* with 3 spines, *G. clypeata* with 6-9, and *G. limbata* with 5. Spines counted are within the lateral emargination, including any on the the median lateral projection. As noted in species descriptions, the figures do not always depict the correct number of spines because these spines are sometimes broken off, or perhaps not developed.

*Trochanter*. Apical margin may lack teeth entirely, or have 1-3 teeth on margin (Fig. 8G, 2H); 1 to several small tubercles, or appear serrate; posterosuperior trochanteral surface typically has a single large tooth near the femur, but may have 2 teeth of varying sizes and lengths (*G. mendica*, *G. paramendica*).

*Metafemur*. Basal flange may be absent, narrow, or wide (*mendica* group) (Fig. 23G); density of surface ridges or tubercles varies, and angle of ridges varies from straight to obliquely transverse, ridges or tubercles vary from sparse to dense,

*Metatibia*. Presence (Fig. 12F) or absence (Fig. 5F) and degree of development of postmedian lateral projection is an extremely significant character in species separation; number, development and shape of median row of tubercles is useful, for example, the weakly developed, transversely oblique tubercles of *G. inducta* (Fig. 17F) is critical in distinguishing it from *G. canadensis*, which has strongly developed, rounded, raised tubercles.

*Abdomen*. Of little use as a diagnostic character in general because it is uniform for most species, but it is sexually dimorphic in at least some members of all groups except the ecostata and pardalcadei groups. Dimorphism is confined to the apical margin of the 5th abdominal ventrite that is often notched, emarginate, or more strongly rounded (female), or nearly truncate (male).

*Male genitalia*. Shape, width, and length of median lobe, comparative lengths of phallobase and parameres, and shape of parameres are often useful for species diagnosis, but genitalia of *inducta* group members are very uniform and are seemingly of no value for species separation.

**Collections codens.** Hundreds of specimens borrowed from many institutions and private collections were involved in this study, and some of the original private collections are now deposited in institutions, or the present address of an individual may not be available. The following acronyms denote depositories for specimens used herein.

BYUC	—	Brigham Young University, Provo, UT
CASC	—	California Academy of Sciences, San Francisco, CA
CMNC	—	Canadian Museum of Nature, Ottawa, ON
CMNH	—	Carnegie Museum of Natural History, Pittsburgh, PA
CNIC	—	Canadian National Collection, Ottawa, ON, Canada
CICC	—	College of Idaho Collection, Caldwell, ID
CSCA	—	California State Collection of Arthropods, Department of Food and Agriculture, Sacramento, CA
DCCC	—	David Carlson, Fair Oaks, CA
FSCA	—	Florida State Collection of Arthropods, Gainesville, FL
JCIC	—	John Carr, Calgary, AB (now at CNIC)
KSUC	—	Kansas State University, Manhattan, KS
KUNHM	—	University of Kansas, Lawrence, KS
MCZC	—	Museum of Comparative Zoology, Cambridge, MA
MJPC	—	Matt J. Paulsen Collection, Lincoln, NE
OSUC	—	Ohio State University, Columbus, OH
RAAC	—	Robert A. Androw, Gibsonia, PA
RBCM	—	Royal British Columbia Museum, Victoria, BC
RCCC	—	Rich Cunningham, Chino, CA
SMCC	—	Scott McCleve, Douglas, AZ
TAMU	—	Texas A & M University, College Station, TX
UBCV	—	University of British Columbia, Vancouver, BC
UCRC	—	University of California, Riverside, CA
UNSM	—	University of Nebraska Museum, Lincoln, NE
USNM	—	U. S. National Museum of Natural History, Smithsonian Institution, Washington, DC
USUL	—	Utah State University, Logan, UT
WBWC	—	William B. Warner, Chandler, AZ
WSCW	—	Warren Steiner Collection, National Museum of Natural History, Smithsonian Institution, Washington, DC
WSUC	—	Washington State University, Pullman, WA



## Systematics

### Family Glaresidae

Glaresidae Kolbe 1905: 543 (as Glaresini); Semenov-Tian-Shanskii and Medvedev 1932: 22 (as Glaresini: Troginae); Scholtz 1987: 353 (as Glaresidae, *stat. n.*); Jameson 2002: 15; Král and Löbl 2006: 81.

**Description.** Length 2.5-6.0 mm. Color light tan to dark brown. Head deflexed; antenna 10-segmented, club 3-segmented, basal segment largest, usually cupuliform and partially enclosing segment 2; eye divided by large canthus, dorsal portion of eye small, ventral portion large; mandibles heavily sclerotized, molar region varies from having 3 blunt teeth to having a plate-like surface, apex may be asymmetrically dentate with more teeth on one mandible than the other. Elytra with 8-10 costae (all American species have 10 costae). Thorax long, with well developed wings, metasternum may have deep metasternal groove for reception of mesotarsus. Metipemeron with apical projection extended over lateral elytral margin, locking elytron in place. Protibia strongly developed for digging with 3 teeth; meso- and metatibia armed with dentiform processes and various ridges and setae; metatibia broad, spatulate, metatafemora and metatibia enlarged to cover abdomen in retracted position. Abdomen with 5 visible ventrites. Male genitalia simple, symmetrical, trilobed, with parameres and median lobe fused to basal piece which is either shorter or longer than parameres.

**Remarks.** The family description above is modified after Scholtz (1987), who was first to positively place the genus *Glaresis* in a family of its own based on various characters. Scholtz et al. (1994) confirmed that family assignment based on phylogenetic assessment of 72 characters such as eye structure, wing venation, etc.

Most *Glaresis* species, except for the distinctive *G. pardoalcaidei*, are apparently not sexually dimorphic, but *G. phoenicis*, *G. dakotensis*, and *G. medialis* have modified apices of the 5th abdominal ventrite, and some species of the mendica group also have similar modifications. Males may usually be recognized in spite of lack of secondary sexual differences because the abdominal apex is often curled ventrally, or at least straight. In females the abdominal apex is usually curled or angled dorsally. In most Coleoptera species the abdomen is a firm, well sclerotized structure capable of protecting the apical ventral surface. In *Glaresis* this protective function is taken over by the expanded metafemur and metatibia resulting in an abdomen that has a soft, flexible, lightly sclerotized structure.

Species of *Glaresis* are known from all major regions of the world except Australia (also none from Chile). The Afrotropical region has 18 species; Palearctic Region, 23 species (including those from North Africa); Madagascar, 1 species; Nearctic Region, 25 species; and Neotropical Region, 7 species.

### *Glaresis* Erichson

*Glaresis* Erichson 1848: 925; Semenov-Tian-Shanskii and Medvedev 1932: 337; Pardo Alcaide 1958: 161; Gordon 1970: 500; Scholtz 1983: 210; Ratcliffe and Paulsen 2008: 60. **Type-species:** *Glaresis rufa* Erichson 1848, by monotypy.

*Eoglaresis* Semenov-Tian-Shanskii and Medvedev 1932: 337; Gordon 1970: 52 (as subgenus); Scholtz 1982: 17 (synonym of *Glaresis* Erichson); Ratcliffe 1991: 131; Jameson 2002: 15. **Type-species:** *Glaresis oxiana* Semenov-Tian-Shanskii and Medvedev 1932, by subsequent designation.

*Eremoglaresis* Semenov-Tian-Shanskii and Medvedev 1932: 337 (as subgenus of *Eoglaresis*); Martín-Piera and López-Colón 2000: 487 (as synonym of *Glaresis* Erichson). **Type-species:** *Eoglaresis beckeri* (Solsky 1870), by original designation.

*Afroglareis* Petrovitz 1968: 270; Scholtz et al. 1987: 345-354 (as synonym of *Glaresis*); Ratcliffe 1991: 131; Jameson 2002: 15. **Type-species:** *Afroglareis obscura* Petrovitz 1968, by original designation and monotypy.

**Description.** Glaresidae with head usually somewhat tuberculate, sometimes with clypeus punctate; frons and vertex with varying degrees and type of microsculpture. Pronotum usually with shallow to deep foveae except in ecostata group. Elytra with striae flat, slightly convex, or strongly convex, striae

lacking carinae or with variably developed carinae. Mesosternum with sparse, widely scattered, setose ridges in basal 1/2, or with dense ridges sometimes forming reticulate pattern over most of surface, ridges sometimes forming strong, supporting structure at base of mesocoxae. Mesotibia with 3-6 or more spines in posterolateral emargination. Trochanter with apical margin smooth, or with 1 or 2 teeth, or serrate with series of small teeth. Metafemur without apical flange, or with narrow or wide flange. Metatibia nearly smooth, without posteromedian projection, or with projection small, or with posteromedian projection highly developed, prominent; median ridge of tubercles nearly absent to well developed. Abdomen not sexually dimorphic except in some species of the *phoenicis* and *mendica* groups.

**Remarks.** *Glaresis* Erichson has traditionally been classified as a close relative of *Trox* Fabricius, and more recently both genera have been grouped together in the Trogidae. As discussed by Scholtz (1986) and Scholtz et al. (1987), this grouping of *Glaresis* and *Trox* has been the subject of considerable controversy among authors. Scholtz et al. (1987), after examining characters of *Glaresis* and comparing them with those of primitive Scarabaeoidea, concluded that *Glaresis* is near the base of ancestral stock from which scarabaeoids arose, and erected the monobasic family Glaresidae for the genus.

Genera have been split off the original *Glaresis* by authors, and there has been some disagreement in the literature as to whether they are valid genera, subgenera, or should be treated as synonyms. Zidek (2007) stated the situation well, and we quote: "Semenov & Medvedev (1932) restricted *Glaresis* to the type species (*G. rufa* Erichson 1848) and established the genus *Eoglaresis* for all others, moreover introducing also the subgenus *Eremoglaresis* to accommodate *Eoglaresis beckeri* (Solsky 1870). They based the split on absence (*G. rufa*) vs. presence of a lateral prominence near the mandibular base; subemarginate and smooth (*G. rufa*) vs. convex and serrate anterior clypeal margin; presence (*G. rufa*) vs. absence of large, round impressions on the pronotal disc; narrower (*G. rufa*) vs. broader metatibia; longer (*G. rufa*) vs. shorter tarsi; and in the case of *Eremoglaresis* on the presence of a pair of frontal tubercles on the clypeus of *E. beckeri*. In 1932 there were merely 13 species known (seven Nearctic and six Palearctic), of which Semenov and Medvedev had at hand only *G. beckeri*, *G. handlirschi*, *G. oxiana*, *G. rufa* and two species they described as new (*E. porrecta*, *E. zarudniana*). The differences they observed thus appeared more clear-cut and significant than they do today. With the exception of Báguena (1959) and Paulian (1980), later authors regarded *Eoglaresis* as a subgenus or a synonym of *Glaresis*, because with increasing numbers of species the above criteria became untenable."

Herein we consider all species as belonging to *Glaresis*, with *Eoglaresis* and *Eremoglaresis* as junior synonyms. The only other genus ascribed to the family was the African *Afroglaresis* Petrovitz, placed as a junior synonym of *Glaresis* by Scholtz et al. (1987).

Sequences of group and species taxa are based on character polarities as determined by Scholtz et al. (1986) and Zidek (2007). In general, some of the characters they consider primitive are: smooth body surface, smooth clypeal apex, pronotal surface lacking foveae, lateral mesotibial apical projection weak, posteromedian metatibial projection weak or lacking, and male genitalia with basal piece shorter than parameres. We attempt to follow their arrangement by placing the relatively smooth, weakly modified species of the *ecostata* group first, the roughly sculptured, highly modified species of the *mendica* group last, and apparently intermediate groups between. Within groups species are arranged based on observed shared characters. For example, within the *mendica* group 3 subgroups occur based primarily on structure of the metasternal groove. Those subgroups species sharing common characters are further clustered.

Species of *Glaresis* are nearly always collected in arid areas, primarily those with sand deposits. However, some species, usually in the *mendica* group, are found in habitats apparently lacking sand. Most of these sites yielded only a specimen or two, rarely an extensive series, therefore this group is the least well known.

Most known *Glaresis* species have been taken at light where they may be abundant, and several species are occasionally collected together on a given night. For example, J. Carr found 3 species together at a collection site near Hasty, Bent County, Colorado, and R. Gordon found 4 species in a single night of light trapping north of Sedona, Coconino Co., Arizona. Larvae are still unknown in spite of efforts to rear adults under laboratory conditions (Baker 1968). We suspect that larvae are present deep in the substrate, and will be found at or near the interface of dry/wet soil (sand). Scholtz et al. (1987) hypothesized that *Glaresis* feeds on subterranean fungi. We assume that species of *Glaresis* are detritivores,



most of them psammophilus, that use the same resource as psammophilus detritivores of the Aphodiini genus *Flaviellus* Gordon and Skelley, as well as other aphodiine scarabs.

Specimens from Mexico and Central America are rarely found in collections, hence the fauna of those regions is not adequately covered in this study. Certainly that fauna is more extensive than represented here.

*Glaresis* specimens examined are divisible into 5 groups as indicated in the following key.

### Key to species groups of American *Glaresis*

1. Surface of pronotum and elytra with small, widely spaced, round tubercles, each bearing long, semi-erect seta (Fig. 1A); posterolateral pronotal angle produced, flanged (Fig. 1E); South America ..... ***Glaresis* - Pardoalcaidei Group**
- Surface of pronotum and elytra with somewhat elongate tubercles, usually with ridges rather than tubercles; posterolateral pronotal angle not produced; north of Panama ..... **2**
- 2(1). Clypeal apex straight, widely flattened, smooth, angled posteriorly (Fig. 2B); pronotal foveae completely lacking (Fig. 2C); metatibia deeply incised apically on inner and outer margins (Fig. 2G) ..... ***Glaresis* - Ecostata Group**
- Clypeal apex usually medially emarginate or sinuate, not angled posteriorly; pronotal foveae distinctly visible or deeply impressed; metatibia not incised apically on inner and outer margins ..... **3**
- 3(2). Pronotal fovea deeply impressed (Fig. 27C); elytral striae strongly, nearly continuously carinate (Fig. 21A); metasternal groove distinct, shallow or deep (Fig. 21D, 27D); posterolateral emargination of mesotibia with 3 or 4 short, widely spaced spines (Fig. 28D) ..... ***Glaresis* - Mendica Group**
- Pronotal foveae weakly impressed (Fig. 13C) or strongly impressed (inducta group); elytral striae rounded or weakly carinate (except *G. inducta* and *G. canadensis*); metasternal groove indistinct or not discernable (except *G. sabulosa*); posterolateral emargination of mesotibia with more than 4 or more spines, spines usually long ..... **4**
- 4(3). Clypeal apex flat (Fig. 7B); Mesotibial apex strongly produced, apex somewhat acute (except *G. clypeata*) (Fig. 8D); posterior margin of metafemur usually with tooth or angulation next to trochanter (Fig. 7G) ..... ***Glaresis* - Phoenicis Group**
- Clypeal apex narrowly, weakly raised (Fig. 17B); Mesotibial apex weakly produced, apex rounded (Fig. 17D); posterior margin of metafemur without tooth or angulation next to trochanter (Fig. 17G) ..... ***Glaresis* - Inducta Group**

### *Glaresis* - Pardoalcaidei Group

**Description.** Size large, length 4.0 to 5.7 mm. Clypeal apex truncate with small tubercles, medially angled posteriorly (Fig. 1B). Pronotal foveae completely lacking except for small anterolateral depression, surface with round tubercles, each tubercle bearing semi-erect seta; elytral striae flat, with round, seta bearing tubercles (Fig. 1D). Metasternum with surface ridges unmodified, with faint trace of metasternal groove. Mesotibia with posterolateral flange covering setal bases, with 5 spines, apex produced (Fig. 1C). Posterior metatrochanteral margin somewhat serrate or with large tooth at outer angle (Fig. 1G). Metatibia without lateral armature, apical margin not incised. Apex of 5th abdominal ventrite unmodified. Sexually dimorphic; males have large, median tubercles on metasternum (Fig. 1C), outer apical angle of metatrochanter with long, curved tooth, females lack median tubercle on metasternum, outer angle of metatrochanter without tooth.

**Remarks.** This monotypic South American group is the only known *Glaresis* taxon to exhibit gross sexual dimorphism and is not closely similar to any other group of American *Glaresis*.

***Glaresis pardoalcaidei* Martinez, Pereira, and Vulcano**

*Glaresis pardoalcaidei* Martinez, Pereira, and Vulcano 1961:69.

**Description. Male.** Length 5.3 mm, width 3.0 mm; body form blocky, robust, slightly widened from elytral base to apical 1/3 (Fig. 1A). Color reddish brown. Head with clypeal surface and frons densely rugose, microtuberculate, with scattered large, round tubercles, setae long, nearly erect (Fig. 1B); vertex with short, pronounced basomedian carina, surface rugose, with small round tubercles. Clypeal apex weakly emarginate, medially thickened, slightly angled posteriorly, with small, evenly spaced, apically acute tubercles, appearing dentate, lateral angles oblique, acute (Fig. 1B). Mandible pair symmetrical; mesal tooth strong; lateral prominence obsolete, outer margin evenly rounded. Pronotum without fovea except for small, anteromedian and posteromedian foveae evident; surface densely rugose, microtuberculate, with small, uniform, round, setae-bearing tubercles, setae slightly decumbent, much longer than tubercle (Fig. 1E); lateral and posterior margins bordered, crenulate, anterior border smooth, not bordered; posterolateral angle produced, flanged. Elytra with surface dull, densely rugose; all striae wide, without carinae, with widely, evenly spaced, small tubercles bearing long, slightly decumbent setae; intervals with small, deep, round punctures (Fig. 1D). Metasternum long, dull, densely microreticulate, median surface not microtuberculate, without larger tubercles, laterally both microtuberculate and with small, round tubercles bearing long, nearly erect setae, median area flat, without median carina (Fig. 1C), metasternal groove strong, deep, both sides abruptly ridged. Lateral protibial teeth short, broadly rounded, unevenly spaced, basal teeth close together (Fig. 1E). Mesotibia with 5 short, closely spaced spines on outer margin, slightly projecting at apex (Fig. 1C). Posterior metatrochanteral margin serrate with several small teeth, lateral angle produced, strongly curved inward, apically acute (Fig. 1G); posterosuperior surface of metatrochanter without teeth. Metafemoral surface with widely scattered, small, round, setae-bearing tubercles, tubercles arranged in horizontal row posteromedially, microreticulate; width to length ratio 1.0:1.6, without flange on anterior margin; posterosuperior margin without teeth. Metatibia narrow, abruptly widened before apex; surface smooth, shiny, without posteromedian lateral projection, lateral margin with row of closely spaced, tooth-like tubercles bearing short, stout setae, medially with very thin tubercles forming slightly irregular row from near base to apex (Fig. 1G, H). Apical margin of 5th abdominal ventrite broadly rounded. Genitalia long, basal piece slightly longer than parameres, proximal end curved; median lobe shorter than parameres, wider at middle than a paramere, curved upward in apical 1/3, apex bifid; parameres weakly curved in lateral view, strongly narrowed in apical 1/3, slightly curved on inner margin, apex bluntly rounded (Fig. 1F).

**Female.** Metasternum without large, median tubercles; metatrochanter slightly angled outward apically, without curved tooth; apex of 5th abdominal ventrite same as in male.

**Variation.** Length 4.3 to 6.3 mm, width 2.4 to 3.4 mm. Clypeal apex with thickened ridge narrow or wide, clypeal surface extremely rugose to moderately so; median area of metasternum varies from convex, flat, or with depression, metasternal surface varies from densely, smoothly rugose medially to densely, roughly rugose, angled outward apically, without curved tooth.

**Type locality.** South America, Argentina, “ciudad de San Miguel del Tucumán, Puente del río. Sah.”

**Type depository.** Unknown.

**Temporal distribution.** November-January.

**Geographical distribution.** Martinez et al. (1961) had a large number of specimens at hand when he described this species. He listed the holotype and 118 paratypes from localities in Argentina, Bolivia, Brasil, and Paraguay. Specimens available to us fall within the range of the Martinez paratypes with the

following exceptions. **ARGENTINA. Cordoba:** "Obispo Tre?" **La Pampa:** Santa Rosa; **Santiago del Estero:** Santiago del Estero. **BOLIVIA: Santa Cruz:** Buena Vista, F & F Hotel. **BRASIL: Sao Paulo:** Piracicaba. (FSCA) (OSUC) (USNM).

**Remarks.** This is the largest known species of Glaresidae further distinguished by the blocky, robust body form; flanged posterolateral pronotal angle; sexual dimorphism; and narrow metatibia with smooth, shiny surface and lack of armature on lateral margin.

### ***Glaresis* - Ecostata Group**

**Description.** Size large, length 3.0 to 5.0 mm. Clypeal apex straight, smooth, angled posteriorly (Fig. 2B). Pronotal fovea completely lacking (Fig. 2C). Elytral striae flat or weakly convex. Metasternum with surface ridges unmodified (Fig. 2D). Metatasternal surface with ridges unmodified. Metasternal groove absent. Mesotibia with about 5 spines on outer margin, mesotibial apex not produced; posterior metatrochanteral margin tridentate (Fig. 3F). Metatibia deeply incised apically on inner and outer margins (Fig. 2G). Apex of 5th abdominal ventrite truncate in both sexes.

**Remarks.** The ecostata group contains 3 species and is the most easily recognized group within the genus.

### **Key to species of *Glaresis* - Ecostata Group**

1. Elytral striae convex (Fig. 4E), setae distinctly visible; length 3.0 to 3.75 mm; pronotal surface with elongate ridges bearing setae slightly shorter than tubercles; Colorado, New Mexico, Texas, Utah ..... ***G. costata*, n. sp.**
- Elytra striae flat (Fig. 2E), setae short; length 3.24 to 5.0 mm; pronotal surface with short, widely spaced seta-bearing ridges; not known from New Mexico, Texas, Utah ..... **2**
- 2(1). Clypeal surface and apical 1/2 of frons with large, closely spaced punctures (Fig. 2B); frons densely rugulose; clypeal apex with smooth area wide, posterior margin thickened (Fig. 2B); pronotal surface with small, slightly elongate ridges bearing short, nearly invisible setae (Fig. 2C); southwestern Arizona, southern California, Mexico ..... ***G. ecostata* Fall**
- Clypeal surface and frons with small, dense punctures (Fig. 3B); frons densely microreticulate; clypeal apex with smooth area narrow, posterior margin not thickened (Fig. 3B); pronotal surface with closely spaced, long ridges bearing short setae (Fig. 3C); Baja California ..... ***G. bajaensis*, n. sp.**

### ***Glaresis ecostata* Fall**

*Glaresis ecostata* Fall 1907: 23; Gordon 1970: 502.

**Description. Male.** Length 3.2 mm, width 1.9 mm; body form elongate, slightly widened from elytral base to apical 1/3 (Fig. 2A). Color yellowish brown. Head with clypeus and frons smooth, shiny, finely micropunctate between large, deep punctures, large punctures separated by less than a diameter, setae short, barely emergent from punctures; frons densely microreticulate, dull, with small, round, widely spaced tubercles, apparently not setose; vertex with short, median basal carina, surface densely microreticulate, dull, without tubercles or punctures. Clypeal apex truncate, smooth, wide, angled posteriorly, posterior margin of angled apex raised, thickened (Fig. 2B), lateral angles feebly toothed. Mandible pair symmetrical; mesal tooth strong; lateral prominence strong, pronounced; outer margin angular. Pronotum with feeble central furrow extended from base nearly to apex, surface dull, finely, densely microreticulate, with short, vertical, widely spaced seta-bearing tubercles, setae short, barely noticeable

(Fig. 2C). Anterior and lateral pronotal margins not bordered, anterior margin smooth medially, crenulate in lateral 1/4, lateral and basal margins entirely crenulate. Elytron with flat striae lacking carinae, surface feebly shiny, distinctly, densely microreticulate; each stria with small, widely spaced, nearly round, seta-bearing tubercles, setae short, slightly shorter than diameter of an interval puncture; interval with large, round punctures somewhat obscured by microreticulate surface (Fig. 2E). Metasternum long, feebly shiny, finely, densely microreticulate, surface not tuberculate medially, laterally with some very long, oblique, seta-bearing tubercles (ridges); without trace of metasternal groove. Lateral protibial teeth unevenly spaced, basal tooth reduced. Mesotibia with 5 spines laterally, spinal bases close together, outer apex of tibia not strongly projecting (Fig. 2D). Posterior margin of metatrochanter with 2 large teeth, 1 small tooth (Fig. 2H); posterosuperior surface without teeth. Metafemoral surface with widely scattered, elongate, setae-bearing tubercles, finely microreticulate, shiny in apical 2/3, posterior 1/3 densely microreticulate, dull, slightly elongate; width to length ratio 1.0:1.4, without flange on anterior margin; posterosuperior margin with single large tooth, sometimes with additional small tooth. Metatibial surface finely microreticulate except extreme apex and apex of lateral expansion shiny (probably from wear); lateral metatibial margin serrate with row of small, seta-bearing teeth, posteromedian lateral projection large, shelf-like, apical margin uneven; row of more or less 3 tubercles anterior to lateral expansion; median surface and apex without tubercles; inner margin with row of small, seta-bearing tubercles, emarginate in apical 1/3, small tooth present at base of emargination (Fig. 2G). Apex of 5th abdominal ventrite truncate. Genitalia long, dorso-ventrally flattened; basal piece shorter than parameres, proximal end curved; parameres straight in lateral view; median lobe much longer than parameres, slightly wider at middle than a paramere, strongly curved upward in apical 1/3, apex narrowly rounded in ventral and lateral views (Fig. 2F).

**Female.** Apex of 5th abdominal ventrite same as in male.

**Variation.** Length 3.2 to 5. mm, width 1.9 to 2.6 mm. Angled clypeal apex varies from narrow to wide; mesotibia with 5 or 6 lateral spines.

**Type locality.** California, Pilot Knob.

**Type depository.** MCZ.

**Temporal distribution.** April-June, September-October.

**Geographical distribution.** **MEXICO. Baja California Norte:** Campo Jemenez; **Baja California Sur:** San Felipe. **Sonora:** 6 mi N. El Golfo; vicinity of La Salina Ba. San Jorge, coastal sand dunes; Bahia Cholla; 6 mi. N. El Golfo. **UNITED STATES. Arizona:** Coconino Co., 1 mi. S Moenkopi; La Paz Co., Parker; La Paz Co., Cactus Plain Wilderness; La Paz Co., Route 95, 14 mi. SSE Parker; Mohave Co., Beaverdam; Navajo, 4 mi. N. Chilchinbito; Navajo Co., 1 mi. N Kayenta; Yuma Co., Ehrenberg; Co., San Luis; Yuma Co., Mohawk dunes. **California:** Imperial Co., 3 mi. N Glamis; 23 mi. W Winterhaven; Inyo Co., Saline Valley dunes; Algodones Dunes, 9.5 mi. NW Glamis; Algodones Dunes, Glamis, Osbourne Overlook; Holtville; Carrizo; Kern Co., Boron; Mojave Co., Beaverdam; Riverside Co., Chuckwalla Valley Dunes; Riverside Co., 2.8 km S. Hidden Palms; Riverside Co., Mecca; Riverside Co., Hopkins Well; Riverside Co., Indio; LaQuinta; Palm Desert; San Bernardino Co., SE Amboy; San Bernardino Co., Amboy lava flow; Riverside Co., 18 mi. W Blythe; Riverside Co., Thousand Palms; San Bernardino Co., Baker; Death Valley, 4.3 mi. NE Saratoga; Kelso Dunes; 0 mi. E. 29 Palms; San Diego Co., Borrego; 1.1 mi. S Henderson Canyon Rd. on on Pegleg Rd.. **Nevada:** Nye Co., sand dunes in Amargosa Desert; Big Dune; Pershing Co., Woolsey. **Utah:** Washington Co., 2 mi. E Washington. (BYUC) (CASC) (CICC) (CMNC) (CMNH) (CNIC) (CSCA) (FSCA) (KUNHM) (MJPC) (RAAC) (RCCC) (SMCC) (TAMU) (UCRC) (USNM) (WSCW).

**Remarks.** *Glaresis ecostata* is a large, smooth *Glaresis* readily distinguished from all other species by the key characters.

This species occurs primarily in Arizona and neighboring California, with its range extending south into Mexico and north to Nye Co., Nevada, and southern Utah. Its little sister species, *G. costata*, has a more extensive allopatric distribution to the east and north.

***Glaresis bajaensis* Gordon and Hanley, new species**

**Description. Female.** Length 4.2 mm, width 2.2 mm; body form elongate, slightly widened from elytral base to apical 1/3 (Fig. 3A). Color yellowish brown. Head with clypeal surface smooth, shiny, frons and vertex densely, coarsely microreticulate, clypeus and frons with dense, small punctures separated by a diameter or less, setae short, barely emergent from punctures; vertex without median basal carina. Clypeal apex truncate, smooth, narrow, angled posteriorly, posterior margin of angled apex not thickened (Fig. 3B), lateral angles obtusely angled. Mandible pair symmetrical; mesal tooth strong; lateral prominence strong, pronounced; outer margin angular. Pronotum with feeble central furrow extended from base nearly to apex, surface shiny, densely microreticulate, with dense, elongate, vertical ridges, setae short, barely noticeable (Fig. 3C). Anterior and lateral pronotal margins not bordered, anterior margin smooth medially, crenulate in lateral 1/4, lateral and basal margins entirely crenulate. Elytron with flat striae lacking carinae, surface feebly shiny, distinctly, densely microreticulate; each stria with small, widely spaced, nearly round, seta-bearing tubercles, setae short, slightly shorter than diameter of an interval puncture; interval with small, round punctures (Fig. 3E). Metasternum long, feebly shiny, finely, densely microreticulate, surface not tuberculate medially, laterally with some closely spaced, long, oblique, seta-bearing ridges; without trace of metasternal groove (Fig. 3D). Lateral protibial teeth evenly spaced, basal tooth reduced. Mesotibia with 5 spines laterally, spinal bases widely separated, outer apex of tibia not strongly projecting. Posterior margin of metatrochanter with 2 large teeth, 1 small tooth, small tooth barely visible (Fig. 3G); posterosuperior surface without tubercles. Metafemoral surface with narrowly spaced, elongate, setae-bearing tubercles, finely microreticulate, shiny in apical 2/3, posterior 1/3 densely microreticulate, dull, slightly elongate; width to length ratio 1.4:2.0, without flange on anterior margin; posterosuperior margin with single large tooth, sometimes with additional small tooth. Metatibial surface finely microreticulate except extreme apex and apex of lateral expansion shiny (probably from wear). Outer lateral metatibial margin serrate with row of small, seta-bearing teeth, postero-median lateral projection large, shelf-like, apical margin uneven; row of more or less 3 tubercles anterior to lateral expansion; median surface and apex without tubercles; inner lateral margin with row of small, seta-bearing tubercles, emarginate in apical 1/3, small tooth present at base of emargination (Fig. 3F). Apex of 5th abdominal ventrite truncate.

**Male.** Unknown.

**Variation.** Length 4.0 to 4.3 mm, width 2.1 to 2.4 mm. Clypeal apex with smooth area slightly varying in width; mesotibia with 4 or 5 lateral spines.

**Type material.** Holotype female: Mexico. **Baja California:** MEX: Baja Calif. Sur, 5.7 mi. SE Mulege BL, VI-28-/30-77, Sand dunes, Joselyn K. Aalbue col. (CASC). Paratypes, 4: (2) same data as holotype; (1) MEX: Baja California Norte, 6 mi. N Guerrero Negro, VII-4-1979, Hardy, Andrews & Guilian; (1) MEX: Baja Calif. Norte, 6 mi. N Guerrero Negro, VII-4-1979, Hardy, Andrews & Giuliani, Walking on dunes at night. (CASC) (CSCA (USNM)).

**Remarks.** This species is similar to *G. ecostata* but is distinguished from that species by head with punctures small; smooth anterior area of clypeus narrow, posterior border not thickened; pronotum with carinae closely spaced; metafemoral surface with ridges narrowly spaced; and posterolateral mesotibial emargination with 4 spines, spinal bases close together.

Males of this Mexican species were not present in material examined.

**Etymology.** The specific name refers to Baja California where the type specimens were collected.

***Glaresis costata* Gordon and Hanley, new species**

**Description. Male.** Length 3.7 mm, width 1.9 mm; body form elongate, slightly widened from elytral base to apical 1/3 (Fig. 4A). Color yellowish brown. Head with clypeus and frons densely microreticulate, dull, with large, deep punctures, setae short, barely emergent from punctures; frons coarsely, densely



microreticulate, feebly shiny, with few small, round tubercles, not setose; vertex with short, median basal carina, surface coarsely, densely microreticulate, feebly shiny, without tubercles or punctures. Clypeal apex truncate, smooth, narrow, angled posteriorly, lateral angles abruptly angulate (Fig. 4B). Mandible pair symmetrical; mesal tooth strong; lateral prominence strong, pronounced; outer margin angular. Pronotum with distinct central furrow extended from base nearly to apex, surface dull, coarsely, densely microreticulate, with elongate, setae-bearing ridges arranged in various directions, setae distinct, slightly shorter than ridge (Fig. 4C). Anterior and lateral pronotal margins not bordered, anterior margin smooth medially, crenulate in lateral 1/4, lateral and basal margins entirely crenulate, basal margin bordered. Elytron with convex, somewhat carinate striae, surface feebly shiny, coarsely, densely microreticulate; each stria with small, closely spaced, nearly round, seta-bearing tubercle (presenting slightly carinate appearance), setae long, slightly longer than diameter of an interval puncture; interval with large, distinctly visible, rectangular punctures (Fig. 4E). Metasternum long, feebly shiny, coarsely, densely microreticulate throughout; entire surface with short, oblique, seta-bearing ridges; without trace of metasternal groove. Lateral protibial teeth unevenly spaced, basal tooth reduced. Mesotibia with 5 spines laterally, spinal bases widely spaced, outer apex of tibia not strongly projecting (Fig. 4D). Posterior margin of metatrochanter with 2 large teeth (usually an additional small tooth present) (Fig. 4H); posterosuperior surface without teeth. Metafemoral surface with widely scattered, elongate, setae-bearing ridges, finely microreticulate, dull throughout; shape slightly elongate; width to length ratio 1.0:1.6, without flange on anterior margin; posterosuperior margin with single tooth (Fig. 4H). Metatibial surface finely microreticulate except extreme apex, and apex of lateral expansion shiny (probably from wear). Outer lateral metatibial margin serrate with row of small, setae-bearing teeth, posteromedian lateral projection large, shelf-like, apical margin uneven; row of more or less 3 tubercles anterior to lateral expansion; median surface and apex without tubercles; inner lateral margin with row of small, seta-bearing tubercles, emarginate in apical 1/3, small tooth present at base of emargination (Fig. 4G). Apex of 5th abdominal ventrite truncate. Genitalia long, dorso-ventrally flattened; basal piece shorter than parameres, proximal end curved; parameres straight in lateral view; median lobe longer than parameres, slightly wider at middle than a paramere, strongly curved upward in apical 1/3, apex rounded in ventral and lateral views (Fig. 4F).

**Female.** Apex of 5th abdominal ventrite same as in male.

**Variation.** Length 3.0 to 3.7 mm, width 1.7 to 2.0 mm. Carina on vertex may be absent; pronotal ridges vary somewhat in degree of spacing; surface sculpture varies slightly, clypeus and anterior portion of frons often shiny, probably because of wear; posterior trochanteral margin with 2 or 3 teeth, inner most tooth small, often not detectable.

**Type material.** Holotype male; **Colorado:** Hasty (Bent County), Colorado, 14.VI.82, Lot 11, BG&JL Carr (JCIC). Paratypes, 113: (46) same data as holotype except date 9.VI.83. **Colorado:** (1) Nunn, Pawnee Grassland, 6-VI-1977, J.W. Leetham; (24) **New Mexico:** Chaves Co., 35.5 mi. E. Roswell, VII-31-1978; (2) Otero Co.; Three Rivers Petroglyphs, 7-VI-1987, Robert Gordon. **Texas:** (34) Hudspeth Co., 2 mi N Fort Hancock, V-29-1982, V-30-1982, N. Rulien; (4) 10 mi. N. Andrews (Andrews Co.), 13.VI.83, Lot 2, BF&JL Carr; (1) Monahans (Ward Co.), 20.IV.87, BF&JL Carr. (CNIC) (JCIC) (FSCA) (MJPC) (USNM).

**Other specimens.** 18: (1) **New Mexico:** Eddy Co., 32° 24.8'N, 103° 41.5'W; Eddy Co., 26 mi. N Carlsbad. (1) **South Dakota:** Angostura Dam, S. of Hot Springs, VII 6-10, 1968, H.F. Howden. (1) **Texas:** El Paso Co., 12 mi. NE Fabans, IV-23-1996, UV light, Coll. E. G. Riley-628; (2) **Utah:** (1) UTAH, Emery Co., Goblin Valley Rd.; Utah, Emery Co. 5100', 4airMiN GilsonBt, VII-20/23-81, Viers, Parker, Griswold; Emery Co., Goblin Valley, 4-VIII-1986, Robert Gordon; (1) Utah, Emery Co., Little Gilson Butte, 29-VIII-1986, A. S. Menke; (4) Utah, Hanksville, VIII 7-9, 1968, H.F. Howden; (1) Utah, 14 mi. S. Hanksville, 25-VII-1968, J.E. Martin; (1) Fairview Ranch, 5000', 13 mi. S. Hanksville, 6.VIII.1968; (1) Utah, 26 mi. S. Hanksville (Garfield Co.), Hwy. 95, 16-VI-84, Robert Gordon; Grand Co., 3 mi north of Moab, Hwy 123. (BYUC) (CMNC) (CNIC) (MJPC) (TAMU) (USNM) (USUL).

**Remarks.** In addition to key characters, *G. costata* differs from *G. ecostata* by the more roughly microsculptured body surface, distinct median pronotal furrow, bordered basal pronotal margin, and long metasternal setae.

**Etymology.** The name *ecostata* refers to a lack of elytral costae. Therefore, this species is named *G. costata* in reference to the slightly carinate appearance of the elytral striae, and in recognition of its close relationship to *G. ecostata*.

### ***Glaresis* - *Phoenicis* Group**

**Description.** Size moderate to large, length 2.7 to 5.3 mm. Clypeal apex flat, truncate or emarginate, surface tuberculate (Fig. 5B, 6B). Pronotal fovea absent or weakly impressed. Elytral striae not to weakly carinate. Metasternum with surface ridges unmodified, metasternal groove not visible or difficult to detect. Mesotibia with strong apical projection, posterolateral emargination with 4-9 spines (*G. clypeata* may have more than 5 spines). Posterior metatrochanteral margin without teeth, or lateral angle with single tooth. Lateral metatibial margin not apically incised, with small, more or less even teeth, lacking a major posteromedian lateral projection (except *G. clypeata*). Apex of 5th female abdominal ventrite notched or weakly emarginate medially (except *G. clypeata*), male ventrite apically truncate or slightly arcuate.

**Remarks.** This group contains 6 species, all except *G. clypeata* superficially very similar in appearance. *Glaresis clypeata* is atypical of this group, but is placed here because it is more similar to *G. phoenicis* and allies than to any other group of *Glaresis*.

### **Key to species of *Glaresis* - *Phoenicis* group**

1. Apical metatrochanteral border with 3 or 4 small teeth; posterior margin of metafemur with long, strong tooth next to trochanter (Fig. 11G) ..... ***G. clypeata* Van Dyke**
- Metatrochanteral border without teeth, sometimes appearing serrate; posterior margin of metafemur without strong tooth, may have blunt angulation ..... **2**
- 2(1). Head surface punctate from clypeal apex to posterior eye margin; anterior clypeal margin with low tubercle or swelling on each side of median emargination (Fig. 8B) ..... ***G. dakotensis* Gordon**
- Head surface tuberculate, tubercles moderate to strong; anterior clypeal margin lacking tubercle or swelling on each side of middle (except *G. imitator*) ..... **3**
- 3(1). Posterosuperior margin of metafemur with a single tooth (Fig. 10G); tubercles on head large, dense; apical clypeal tubercles large, pronounced (Fig. 10B); lateral metatibial margin with teeth mostly equal in length except single median tooth pronounced (Fig. ) ..... ***G. medialis* Gordon**
- Teeth absent on posterosuperior margin of metatafemur; tubercles on head small, sparse, or large, dense; apical clypeal tubercles small or large; lateral metatibial margin without pronounced median tooth (Fig. 10F) ..... **4**
- 4(3). Posterior metafemoral margin with blunt, angulate tooth next to trochanter (Fig. 7F) ..... **6**
- Posterior metafemoral margin without angulate tooth (Fig. 5F) ..... **5**
- 5(4). Metatrochanteral border without teeth; median lobe of male genitalia narrowed medially, appearing “pinched” (Fig. 5E); in California known from Imperial and San Bernardino Counties ..... ***G. montenegro*, n. sp.**
- Metatrochanteral border with 3 small, blunt teeth; (Fig. 6G); median lobe of male genitalia with sides straight in basal 2/3, evenly curved to apex in apical 1/3 (Fig. 6F); known only from type locality, Riverside Co., California ..... ***G. yanegai*, n. sp.**
- 6(4). Clypeal apex with large, strong tubercle on each side of median emargination (Fig. 9B); Mexico, Sonora ..... ***G. imitator*, n. sp.**

- Clypeal apex without tubercle on each side of median emargination (Fig. 7B); Arizona, California  
..... *G. phoenicis* Fall

***Glaresis montenegro* Gordon and Hanley, new species**

**Description. Male.** Length 2.8 mm, width 1.6 mm; body form elongate, nearly parallel-sided, slightly widened in apical 1/2 (Fig. 5A). Color yellowish brown. Head with clypeus and triangular median area on frons shiny, coarsely, densely tuberculate, remainder of frons and vertex dull, densely, finely rugose, setae on frons short, barely visible. Clypeal apex truncate, with small, dense, evenly spaced tubercles, appearing serrate, lateral angles oblique, pronounced, outwardly toothed (Fig. 5B). Mandible pair symmetrical; mesal tooth strong; lateral prominence strong, pronounced; outer margin abruptly rounded. Pronotum with all foveae weakly impressed except fovea on each side medially near lateral margin strongly impressed; surface densely rugose, with sparse, setae-bearing carinae, carinae elongate, straight (Fig. 5C). Elytra with surface dull, densely microreticulate; striae convex, strongly carinate, carinal segments briefly interrupted, each with short seta; intervals with small, shallow, mostly round punctures. Metasternum long, feebly shiny, finely, densely microreticulate, surface medially concave without median carina, lateral surface with short ridges in basal 2/3 (Fig. 5D); metasternal groove broadly, shallowly impressed. Lateral protibial teeth unevenly spaced, basal 2 teeth close together. Mesotibia with 4 or 5 spines laterally, tibia strongly projecting at apex (Fig. 5C). Posterior metatrochanteral margin without teeth, outer angle lacking tooth; posterosuperior surface of metatrochanter with single large tooth often visible directly in ventral view (Fig. 5G). Metafemoral surface with widely scattered, small, obliquely transverse, setae-bearing tubercles, microreticulate; width to length ratio 1.0:1.6, with narrow flange on anterior margin, posterior margin without tooth; posterosuperior margin without tooth (Fig. 5G). Metatibia broadly triangular, surface entirely microreticulate, outer margin without posteromedian projection, with series of small, subequal teeth from base nearly to apex, inner margin smooth, pubescent (Fig. 5F). Apex of 5th abdominal ventrite slightly arcuate. Genitalia long, basal piece 1/2 as long as parameres, proximal end curved; median lobe shorter than parameres, nearly parallel-sided except narrowed medially, appearing “pinched”, apex rounded, wide, twice as wide as paramere at middle, curved upward before apex; parameres feebly curved in lateral view, apex bluntly rounded (Fig. 5E).

**Female.** Apex of 5th abdominal ventrite truncate.

**Variation.** Length 2.7 to 3.2 mm, width 1.6 to 1.7 mm. Size of head tubercles slightly variable; clypeal apex occasionally with slight median emargination; mesotibia with 4 or 5 lateral spines.

**Type material.** Holotype: **California:** CALIF: Imperial Co., Black Mountain, IV-14-1991, Andrews & Eichlin, Blacklight (CSCA). Paratypes, 76: (62) same data as holotype except additional date IV-16-1991; (2); USA: CA: S. Bernardino Co., Amboy Rd., 11-15 miles E. 29 Palms, Wonder Valley, town lights, 2000 ft., 1-May-1992, R. Cunningham, B. Streit, collrs.; (9) **Arizona:** (1) (Yuma Co.) Palm Canyon, 13.V.88 UV trap, I. Dworakowska; (1) AZ: (Yuma Co.) Kofa Natl. Wildlife Refuge, 12.V.88 UV trap, I. Dworakowska; (1) **Nevada:** Clark Co., Colo. R. (Colorado River) Canyon, 4/22/30, Blackwelder Collection. (CSCA) (CMNC) (RCCC) (USNM).

**Remarks.** This is a small sister species of *G. phoenicis* which it closely resembles. *Glaresis montenegro* differs from *G. phoenicis* by the smaller size, length 2.70 to 3.20 mm; truncate or nearly truncate clypeal apex; more strongly carinate elytral striae; lack of angulate tooth on posterior metafemoral margin near trochanter; apex of 5th female abdominal ventrite truncate; and male genitalia with basal piece wide, much shorter than parameres. See Remarks under *G. yanegai*, new species.

The actual distribution of this species is unknown, but is probably severely restricted because the general geographic area has been heavily light trapped over the past 30 years.

**Etymology.** This species is named for the holotype locality which translates to “montenegro.”

***Glaresis yanegai* Gordon and Hanley, new species**

**Description. Male.** Length 3.3 mm, width 1.7 mm; body form elongate, distinctly widened in apical 1/2 (Fig. 6A). Color yellowish brown. Head with clypeus and triangular median area on frons shiny, coarsely, rather sparsely tuberculate, some tubercles joined to form a rugosity, remainder of frons and vertex dull, densely, finely rugose with scattered tubercles, setae on frons short, barely visible. Clypeal apex truncate, broadly, weakly reflexed, with small, evenly spaced tubercles at apex, basal margin of reflexed area narrowly raised, lateral angles oblique, pronounced, outwardly toothed (Fig. 6B). Mandible pair symmetrical; mesal tooth strong; lateral prominence strong, pronounced; outer margin abruptly rounded. Pronotum with all foveae weakly impressed except fovea on each side medially near lateral margin strongly impressed; surface densely rugose, with sparse, setae-bearing carinae, carinae elongate, straight (Fig. 6C). Elytra with surface dull, densely microreticulate; striae convex, appearing carinate, carinal segments narrowly interrupted, each with short seta; intervals with small, shallow, mostly round punctures (Fig. 6E). Metasternum long, feebly shiny, finely, densely microreticulate, surface medially concave without median carina, lateral surface with short ridges in basal 2/3 (Fig. 6D); metasternal groove broad, distinctly impressed, lateral margins broadly rounded. Lateral protibial teeth unevenly spaced, basal 2 teeth close together. Mesotibia with 5 spines laterally, tibia strongly projecting at apex (Fig. 6D). Posterior metatrochanteral margin with 3 small, blunt teeth, outer angle acute; posterosuperior surface of metatrochanter with single large tooth (Fig. 6H). Metafemoral surface with widely scattered, small, round, setae-bearing tubercles, microreticulate; width to length ratio 1.0:1.5, with narrow flange on anterior margin, posterior margin without tooth; posterosuperior margin without tooth (Fig. 6H). Metatibia broadly triangular, surface entirely microreticulate, outer margin without posteromedian projection, with series of small teeth from near base nearly to apex, middle 4 teeth distinctly larger than remainder, inner margin smooth, pubescent (Fig. 6G). Apex of 5th abdominal ventrite broadly rounded. Genitalia slightly elongate, basal piece 1/3 as long as parameres, proximal end curved; median lobe wide, shorter than parameres, lateral margins broadly, weakly curved to rounded apex, curved upward before apex; parameres feebly curved in lateral view, apex bluntly rounded (Fig. 6F).

**Female.** Apex of 5th abdominal ventrite truncate.

**Variation.** Length 3.0 to 3.4 mm, width 1.6 to 1.7 mm; mesotibia with 4 or 5 lateral spines.

**Type material.** Holotype: **California:** USA: CA: Riverside Co., Painted Cyn Rd, 4.3 mi NNW jct Box Cyn Rd., 33°36'55" N 115°59'54" W, 21.iii.2010 D. Yanega MV, Univ. Calif. Riverside Ent. Res. Museum, UCRC ENT 260292 (UCRC). Paratypes, 7: same data as holotype. (UCRC) (USNM).

**Remarks.** This is another species most similar to *G. phoenicis* and *G. montenegro*. It is particularly similar to *G. montenegro* from which it is reliably distinguished only by form of median lobe of the male genitalia. This lobe is narrowed medially in *G. montenegro*, in *G. yanegai* the lateral margin is straight in basal 2/3, then smoothly rounded to apex. In addition, the metatrochanter has 3 small, blunt teeth on outer margin; average size smaller; and California specimens are all from Riverside Co., while all California specimens of *G. montenegro* are from Imperial or San Bernardino counties. See Remarks under *G. montenegro*.

As under *G. montenegro*, the actual distribution of this species is unknown, but may be restricted to the type locality because the general geographic area has been heavily light trapped over the past 30 years.

**Etymology.** This species is named for Douglas Yanega, University of California, Riverside, collector of the type series.

***Glaresis phoenicis* Fall**

*Glaresis phoenicis* Fall 1907: 24; Gordon 1970: 502.



**Description. Male.** Length 3.2 mm, width 1.6 mm; body form elongate, nearly parallel-sided, slightly widened from elytral base to apical 1/3 (Fig. 7A). Color yellowish brown. Entire head surface densely microreticulate, dull, clypeus and frons with small tubercles separated by less than to twice diameter of a tubercle, setae short, barely visible. Clypeal apex weakly emarginate medially, somewhat sinuate, with small, dense, evenly spaced tubercles, appearing serrate, without large tubercle on each side of middle, lateral angles oblique, pronounced, outwardly toothed (Fig. 7B). Mandible pair symmetrical; mesal tooth strong; lateral prominence strong, pronounced; outer margin abruptly rounded. Pronotum with all foveae weakly impressed except fovea on each side medially near lateral margin strongly impressed; surface densely rugose, with sparse, setae-bearing carinae, carinae elongate, straight (Fig. 7C). Elytra with surface dull, densely microreticulate; striae convex, feebly carinate, carinal segments widely separated, each with short seta; intervals with shallow, slightly rectangular punctures. Metasternum long, feebly shiny, finely, densely microreticulate, surface medially flat without median carina, lateral surface with short ridges in basal 3/4 (Fig. 7D); metasternal groove nearly invisible. Lateral protibial teeth unevenly spaced, basal 2 teeth close together. Mesotibia with 4 spines laterally, 1 spine near apex of posterolateral emargination, 3 spines closely grouped on or near median projection, tibia strongly projecting at apex (Fig. 7D). Posterior metatrochanteral margin without teeth, outer angle lacking tooth; posterosuperior surface of metatrochanter with single large tooth often visible directly in ventral view (Fig. 7G). Metafemoral surface with widely scattered, elongate, setae-bearing tubercles, microreticulate; width to length ratio 1.0:1.6, with narrow flange on anterior margin, large, blunt tooth at angle near trochanter; posterosuperior margin without tooth (Fig. 7G). Metatibia broadly triangular, surface entirely microreticulate, outer margin without large teeth, with series of small, subequal teeth from base nearly to apex, inner margin smooth, pubescent (Fig. 7F). Apex of 5th abdominal ventrite truncate. Genitalia long, basal piece about as longer as parameres, proximal end curved; median lobe shorter than parameres, slightly tapered from base to acute apex, narrow, about width of paramere at middle, curved upward before apex; parameres feebly curved in lateral view, apex bluntly rounded (Fig. 7E).

**Female.** Abdominal apex with triangular notch.

**Variation.** Length 3.2 mm to 4.3 mm, width 1.6 to 2.2 mm.

**Type locality.** Arizona, Phoenix.

**Type depository.** MCZ.

**Temporal distribution.** March-August.

**Geographical distribution. UNITED STATES. Arizona:** Phoenix; La Paz Co., Parker; 9.5 mi. SE AZ-CA state line at Parker; Maricopa Co., Jct. Airport Rd. & Gila R., S. of Liberty; Mohave Co., Kingman; Mohave Co., Virgin River Rec. Area; Pima Co., Tucson; Pima Co., Verde River; Yuma Co., Dateland; Yuma Co., Ehrenberg; Mohawk Dunes; Yuma. **California:** Imperial Co., Algodones Dunes, 7.4 mi S Glamis; Inyo Co., Eureka Valley; Riverside Co., Bradshaw Trail Rd. 4 mi. W. Graham Pass Rd; San Bernardino Co., Needles; Kelso sand dunes. **Nevada:** Clark Co., Mesquite; Mercury. (BYUC) (CASC) (CMNC) (CNIC) (CSCA) (FSCA) (SMCC) (RCCC) (TAMU) (UCRC) (USNM).

**Remarks.** *Glaresis phoenicis*, *G. montenegro*, *G. dakotensis* and *G. imitator* differ from *G. medialis* by the outer metatibial margin serrate with small teeth, without a larger posteromedian lateral tooth. *Glaresis phoenicis* and *G. montenegro* are distinguished from *G. dakotensis* by a distinctly tuberculate head, absence of small tubercle or swelling on each side of apical clypeal emargination, teeth on outer margin of metatibia equal from base to apex; width to length ratio of metafemur 1.0:1.6; and median lobe of male genitalia distinctly shorter than paramere, narrow, about width of paramere. The mesotibial figure for *G. phoenicis* is not accurate in the number of lateral spines seen. Two of these spines have been broken off because there should be 4 visible. See Remarks under *G. montenegro*.



***Glaresis dakotensis* Gordon**

*Glaresis dakotensis* Gordon 1970:503; Ratcliffe 1991: 131; Ratcliffe and Paulsen 2008: 64.

**Description. Male.** Length 3.4 mm, width 2.0; body form robust, slightly widened from elytral base to apical 1/3 (Fig. 8A). Color dark yellowish brown. Head shiny, surface punctate from clypeal apex to posterior margin of eye, posterior portion of head finely tuberculate, setae short, barely visible. Clypeal apex sinuate, with narrow median emargination. lateral angles of emargination with low tubercle or slight swelling, entire apex with small, dense, evenly spaced tubercles, appearing serrate, lateral angles oblique, pronounced, outwardly toothed (Fig. 8B). Mandible pair symmetrical; mesal tooth strong; lateral prominence strong, pronounced; outer margin abruptly rounded. Pronotum with all foveae weakly impressed except fovea laterally on anterior margin and on each side medially near lateral margin strongly impressed; surface densely rugose, with sparse, seta-bearing carinae, carinae elongate, straight (Fig. 8C). Elytra with surface dull, densely microreticulate; striae convex, feebly carinate, carinal segments widely separated, each with short seta; intervals with shallow, slightly rectangular punctures. Metasternum long, feebly shiny, finely, densely microreticulate, surface medially flat without median carina, lateral surface with short ridges in basal 1/2 (Fig. 8D); without metasternal groove. Lateral protibial teeth unevenly spaced, basal 2 teeth close together. Mesotibia with 5 spines laterally, 4 spines closely grouped median projection, 1 spine spaced posterior to grouping, tibia strongly projecting at apex (Fig. 8D). Posterior metatrochanteral margin without teeth, apical angle without tooth; posterosuperior surface of metatrochanter with single large tooth not visible directly in ventral view (Fig. 8G). Metafemoral surface with widely spaced, elongate, seta-bearing tubercles, microreticulate; width to length ratio 1.0:1.4, with narrow flange on anterior margin, large, blunt tooth at angle near trochanter; posterosuperior margin without tooth (Fig. 8G). Metatibia broadly triangular, surface entirely microreticulate, outer margin without posteromedian projection, with series of small teeth from base to slightly beyond middle, teeth increasing in size from base with last 3 median teeth largest, apical tooth larger than all others, inner margin smooth, pubescent (Fig. 8F). Apex of 5th abdominal ventrite truncate. Genitalia with basal piece slightly longer than parameres, proximal end curved; median lobe nearly as long as paramere, slightly tapered from base to acute apex, wider than paramere at middle, curved upward apically before acute apex; parameres feebly curved in lateral view, apex bluntly rounded (Fig. 8E).

**Female.** Apex of 5th abdominal ventrite feebly emarginate.

**Variation.** Length 3.4 mm to 4.4 mm, width 2.0 to 2.4 mm. Lateral tubercles on apical clypeal margin often reduced or not apparent, specimens from southern localities tend to have tubercles larger, more distinct than specimens from northern localities; mesotibial spines in posterolateral emargination vary 4-5 in number, and spacing.

**Type locality.** South Dakota, Hot Springs, Angostura Dam.

**Type depository.** CNIC.

**Temporal distribution.** April-August.

**Geographical distribution. UNITED STATES. Arizona:** Navajo Co., Joseph City; **Colorado:** Bent Co., Hasty; Fremont Co., 4 mi. NE Canon City. **Idaho:** Power Co., Massacre Rocks State Park. **New Mexico:** Chaves Co., Bottomless Lake St. Pk; Eddy Co., 32° 19.8'N, 103° 47.3'W; Eddy Co., Carlsbad; 26 mi. E. Carlsbad; McKinley Co., Dalton Pass; mi. N. Tohatchi; Otero Co., Three Rivers Peroglyphs; Otero Co., 24 km SW Alamogordo; Otero Co., White Sands; San Juan Co., Cuaco Canyon; Union Co., Clayton Lake State Park; Valencia Co., T7N, R3W Sect.30, SE corner. **Nebraska:** Sioux Co., 17 mi. N. Henry. **North Dakota:** Slope Co. **South Dakota:** Fall River Co., Hot Springs, Angostura Dam. **Texas:** Andrews Co., Andrews; Brewster Co., Big Bend National Park, Chihuahuan desert nr. Nugent Mt.; Big Bend National Park, Rosillos Lodge; Big Bend National Park, Tornillo Flat; El Paso Co., red dunes, 14 mi. NE Fabens; Presidio Co., Saucedo, Big Bend State Natural Area. **Wyoming:** Platte Co., Wheatland. (CMNC) (CMNH) (CNIC) (JCIC) (MJPC) (RAAC) (TAMU) (UNSM) (USNM).

**Remarks.** This species is most similar to *G. phoenicis*, see Remarks under that species. *Glaresis dakotensis* is the eastern version of *G. phoenicis*, with a distributional range not known to extend farther west than Navajo Co., northern Arizona, and McKinley and Otero counties, New Mexico, then extending north from Texas to North Dakota.

***Glaresis imitator* Gordon and Hanely, new species**

**Description. Male.** Length 4.4 mm, width 2.4; body form robust, slightly widened from elytral base to apical 1/3 (Fig. 9A). Color yellowish brown. Head shiny, clypeus and anterior 1/2 of frons with large surface tubercles, posterior 1/2 of frons and vertex finely densely microreticulate, setae short, barely visible. Clypeal apex slightly sinuate, with narrow median emargination, very large, apically bifid tubercle present at each side of emargination, tubercles narrowly separated, apex lateral to large tubercles with small, dense, evenly spaced tubercles, appearing serrate, lateral angles rounded, outwardly toothed (Fig. 9B). Mandible pair symmetrical; mesal tooth strong; lateral prominence strong, pronounced; outer margin abruptly rounded. Pronotum with all foveae weakly impressed except fovea laterally on anterior margin and on each side medially near lateral margin strongly impressed; surface finely microreticulate, somewhat shiny, with small, sparse, setae-bearing carinae, carinae short, straight. Elytra with surface somewhat shiny, densely, strongly microreticulate; striae convex, feebly carinate, carinal segments separated by width of carinal segment, each with seta nearly as long as segment; intervals with deep, round punctures (Fig. 9C). Metasternum long, feebly shiny, finely, densely microreticulate, surface medially flat without median carina, lateral surface with sparse, short ridges laterally (Fig. 9D); without metasternal groove. Lateral protibial teeth unevenly spaced, basal 2 teeth close together. Mesotibia with 5 spines laterally, tibia strongly projecting at apex (Fig. 9D). Posterior metatrochanteral margin without teeth, apical angle without tooth; posterosuperior surface of metatrochanter with single large tooth not visible directly in ventral view (Fig. 9G). Metafemoral surface with widely spaced, elongate, seta-bearing tubercles, strongly microreticulate; width to length ratio 1.0:1.4, with narrow flange on anterior margin, with large, blunt tooth at angle near trochanter; posterosuperior margin without tooth (Fig. 9G). Metatibia broadly triangular, surface entirely microreticulate, outer margin without posteromedian projection, with series of small teeth from base to slightly beyond middle, teeth increasing in size from base with last 3 median teeth largest, usually penultimate tooth larger than all others, inner margin smooth, pubescent (Fig. 9F). Apex of 5th abdominal ventrite truncate. Genitalia long, basal piece about as long as parameres, proximal end curved; median lobe slightly shorter than paramere, tapered from base to acute apex, wider than paramere at middle, curved upward apically before acute apex; parameres feebly curved in lateral view, apex bluntly rounded (Fig. 9E).

**Female.** Apex of 5th abdominal ventrite feebly emarginate.

**Variation.** Length 4.3 mm to 4.4 mm.

**Type material.** Holotype male: Mexico. **Sonora:** Mexico, Sonora, Puerto Libertad, 4/29/68, A. Kumlin (USNM). Paratype, 1: same data as holotype. (USNM).

**Remarks.** This species is a macho version of *G. dakotensis*, but has the tuberculate clypeus and frons of *G. phoenicis*. It is distinguished from either species by the extremely large tubercle on each side of apical clypeal emargination; very large tubercles on surface of clypeus and frons; reduced pronotal ridges; somewhat shiny pronotal surface; and shiny, strongly microreticulate elytral surface. The mesotibia figured has all of the lateral spines broken off, but there should be 5 visible.

One male and a female were the only specimens available for study.

**Etymology.** The specific name is the Latin *imitator*, meaning mimic, in reference to the strong resemblance to *G. dakotensis*.

***Glaresis medialis* Gordon**

*Glaresis medialis* Gordon 1969: 508; Gordon 1970:508; Gordon 1974: 91.

**Description. Male.** Length 3.2 mm, width 1.7 mm; body form elongate, slightly widened from elytral base to apical 1/3 (Fig. 10A). Color dark yellowish brown. Entire head surface densely microreticulate, dull, clypeus and frons with large tubercles (tubercles small in Idaho specimens) separated by diameter of a tubercle or less, setae short, barely visible. Clypeal apex weakly emarginate medially, somewhat sinuate, with large, evenly spaced tubercles, appearing dentate, lateral angles oblique, pronounced, outwardly toothed (Fig. 10B). Mandible pair symmetrical; mesal tooth strong; lateral prominence strong, pronounced; outer margin abruptly rounded. Pronotum with all foveae weakly impressed except fovea on each side medially near lateral margin strongly impressed; surface densely rugose, with sparse, setae-bearing carinae, carinae short, straight. Elytra with surface feebly shiny, densely microreticulate; all striae slightly convex, not carinate, with row of short setae; interval with shallow, round punctures (Fig. 10C). Metasternum long, feebly shiny, finely, densely microreticulate, surface medially flat with faint carina extended from apical keel anteriorly 1/2 distance to mesocoxae, lateral surface without tubercles or ridges (Fig. 10D); metasternal groove nearly invisible. Lateral protibial teeth unevenly spaced, basal 2 teeth close together. Mesotibia with 4 short spines laterally, 2 widely spaced spines in lateral emargination, 2 closely spaced spines on median projection, tibia strongly projecting at apex (Fig. 10D). Posterior metatrochanteral margin without teeth, apical angle acutely toothed; posterosuperior surface of metatrochanter with single large tooth not visible directly in ventral view (Fig. 10G). Metafemoral surface with widely scattered, elongate, setae-bearing tubercles, microreticulate; width to length ratio 1.0:1.6, with narrow flange on anterior margin; posterosuperior margin with single tooth. Metatibia broadly triangular, surface entirely microreticulate, with series of small teeth on outer margin, penultimate tooth largest, a row of sparse, small tubercles extended from base nearly to apex medially, inner margin smooth, pubescent (Fig. 10F). Apex of 5th abdominal ventrite truncate. Genitalia long, basal piece shorter than parameres, proximal end curved; median lobe shorter than parameres, tapered from base to broadly rounded apex, very wide, more than twice width of paramere at middle, slightly curved upward before apex; parameres feebly sinuate in lateral view, apex bluntly rounded (Fig. 10E).

**Female.** Apex of 5th abdominal ventrite weakly emarginate medially.

**Variation.** Length 3.2 mm to 3.6 mm, width 1.7 to 2.2 mm. Size and density of head tubercles varies from moderate sized, relatively sparse, to large, densely distributed; posterolateral mesotibial spines vary from 3 to 4, spacing also varies; mesotibia with 3 or 4 lateral spines; metatibial apex occasionally reduced, apically blunt.

**Type locality.** Utah, Logan.

**Type depository.** USNM.

**Temporal distribution.** June-July.

**Geographical distribution.** **CANADA. British Columbia:** Osoyoos; Penticton. **UNITED STATES. California:** Mono Co., Benton. **Idaho:** Owyhee Co., Bruneau Dunes; Owyhee Co., Bruneau State Park; Washington Co., Weiser Dunes. **Nevada:** Pershing Co., Humboldt River, above Rye Patch Reservoir; Pershing Co., Woolsey; White Pine Co., 15 mi. W. Ely. **Oregon:** Harney Co., Harney Lake dunes; Wasco Co., 8 mi. E. Hwy 26 on 216. **Utah:** Cache Co., Logan; Millard Co., Confusion Range-Fossil Mt.; Juab Co., 3 mi. S, 22 mi. E Callao; Sevier Lake, 22 mi. S, 33 mi. W Delta; Sevier Co., Richfield; Salt Lake Co., Salt Lake City; Toole Co., E. Dugway Dunes, Dugway Proving Ground; Utah Co., Goshen Warm Springs. **Washington:** Benton Co., Hanford Site; Franklin Co., Beverly Dunes; Benton Co., McNary Dam; Yakima Co., Toppenish; Winchester. **Wyoming:** Big Horn Co., Big Horn Canyon Rec. Area; Lincoln Co., Kemmerer; Sweetwater Co., Flaming Gorge, Blacks Fork River. (BYUC) (CASC) (CSCA) (CICC) (JCIC) (MJPC) (RAAC) (RBCM) (UBCV) (USNM) (USUL) (WSUC)

**Remarks.** *Glaresis medialis* is most similar to *G. phoenicis* but differs from that species by its heavily tuberculate clypeus and frons; apical clypeal tubercles large; elytral striae rounded, without trace of carinae; and outer metatibial margin with large, posteromedian tooth. This is primarily a northwest United States species with a range overlapping that of *G. clypeata*, another member of the *phoenicis* Group.

### *Glaresis clypeata* Van Dyke

*Glaresis clypeata* Van Dyke 1928: 162; Gordon 1970: 507.

**Description. Male.** Length 3.5 mm, width 1.8 mm; body form robust, slightly widened from elytral base to apical 1/3 (Fig. 11A). Color dark yellowish brown. Entire head surface densely microreticulate, dull, clypeus and frons with large tubercles separated by less than to twice diameter of a tubercle, setae short, barely visible. Clypeal apex broadly, weakly emarginate medially, not sinuate, with large, evenly spaced tubercles, appearing dentate, lateral angles oblique, pronounced, outwardly acute (Fig. 11B). Mandible pair symmetrical; mesal tooth strong; lateral prominence strong, pronounced; outer margin abruptly rounded. Pronotum with all foveae weakly impressed except fovea on each side medially near lateral margin strongly impressed; surface densely rugose, with sparse, setae-bearing carinae, carinae short, straight. Elytra with surface dull, densely microreticulate; striae convex, feebly carinate, carinal segments widely separated, each with short seta; intervals with shallow, slightly rectangular punctures (Fig. 11E) Metasternum long, dull, finely, densely microreticulate, surface medially flat without median carina, lateral surface with sparse, short ridges each bearing seta twice as long as ridge (Fig. 11D); metasternal groove nearly invisible. Lateral protibial teeth unevenly spaced, basal 2 teeth close together. Mesotibia with 6 spines laterally, tibia weakly projecting at apex (Fig. 11D). Posterior metatrochanteral margin with 3 small, blunt teeth (Fig. 11D); posterosuperior surface of metatrochanter with 2 teeth, outer tooth large, inner tooth small (Fig. 11H). Metafemoral surface microreticulate with widely scattered, elongate, setae-bearing ridges, ridges often becoming tuberculate in large specimens, projecting above metafemoral surface along posterior metafemoral margin; width to length ratio 1.0:1.6, with narrow flange on anterior margin; posterior margin with single large tooth at angle near metatrochanter (Fig. 11H), posterosuperior margin with 2 teeth. Metatibia broadly triangular, surface entirely microreticulate, with small, equal teeth from base to large, bifid, posteromedian lateral projection (Fig. 11G), row of sparse, small tubercles extended from base nearly to apex medially, inner margin smooth, pubescent. Apex of 5th abdominal ventrite evenly rounded. Genitalia very long, basal piece short, 1/3 length of parameres, proximal end curved; median lobe slightly longer than parameres, not tapered from base to apex, slightly constricted medially, wider than paramere, apex broadly rounded, not curved upward before apex; parameres slightly curved in lateral view, apex narrow, somewhat acute (Fig. 11F).

**Female.** Apex of 5th abdominal ventrite same as in male.

**Variation.** Length 3.5 mm to 5.3 mm, width 1.8 to 3.8 mm. Apical clypeal teeth and surface tubercles on head extremely variable between populations, clypeal teeth may be small, relatively indistinct to very robust, and surface tubercles on head vary correspondingly; largest specimens tend to have exaggerated head sculpture and are usually from southern California or southern Arizona; posterolateral mesotibial spines vary from 5 to 9, spacing also varies.

**Type locality.** California, Trinity Co., Carrville.

**Type depository.** CASC.

**Temporal distribution.** April-October.

**Geographical distribution.** MEXICO. Baja California Norte: 5.5 mi. E El Arco. UNITED STATES. Arizona: Cochise Co., 5 mi. SW McNeal; Coconino Co., 2 mi. N. Sedona; 1 mi. E. Tuba City; Navajo Ind. Res., 1.2 mi. S. Moenkopi; Maricopa Co., Tempe; Mohave Co., Virgin River Rec. Area; Yavapai Co., Ash



Fork; 3 mi. SW Sedona; Yuma Co., Fort Yuma; Ehrenberg; Yuma Co., Parker. **California:** Imperial Co., Algodones Dunes, 2.5 mi. NE Coachella Bridge #1; Inyo Co., Independence; Lassen Co., Hat Creek, Lasen NF; Mono Co., Benton; Benton Sta.; Riverside Co., Indian Wells; Trinity Co., Carrville. **Colorado:** Nunn Co., Pawnee Grassland. **Idaho:** Ada Co., T1N R4E S29. **Nevada:** Lincoln Co., Alamo; Ormsby Co., Carson City; Nye Co., Amargosa Desert, Big Dune; 2 mi. N 24 mi. E Warm Springs, Black Rock Smt, 6350'; Grapevine Mts., Phinney Canyon; Pershing Co., Woolsey; Washoe Co., 9 mi. S. Reno. **New Mexico:** McKinley Co., Dalton Pass; Otero Co., Three Rivers Petroglyphs; San Juan Co., Cuaco Canyon. **Oregon:** Deschutes Co., 13 mi. E. Sisters; Morrow Co., 3 mi. S Boardman. **Utah:** Emery Co., Goblin Valley; Garfield Co., Calf Creek, 7 mi S Boulder; Grand Co., 3 mi N of Moab; Juab Co., Little Sahara, White Sands Camp; Kane Co., Coral Pink sand dunes; 50 mi. E. Kanab, Catstairs Canyon; Sevier Co., Fish Lake, Dog Spring; Toole Co., Dugway Proving Ground; Washington Co., Leeds Canyon; Wayne Co., 14 mi. S. Hanksville; Wayne Co., base of Henry Mts; Weber Co., Ogden. **Washington:** Yakima Co., Toppenish. **Wyoming:** Sweetwater Co., Flaming Gorge, Blacks Fork River; Sweetwater Co., Flaming Gorge Res. (BYUC) (CASC) (CICC) (CMNC) (CMNH) (CNIC) (CSCA) (JHCIC) (MJPC) (RCCC) (SMCC) (USNM) (USUL)

**Remarks.** *Glaresis clypeata* is one of the most easily recognized species of North American *Glaresis*. The combination of large average size; strongly tuberculate head and clypeal apex; large, usually acute tooth on posterior femoral margin adjoining trochanter; and lateral metasternal ridges bearing setae twice as long as ridge diagnose this species.

Specimens available for examination indicate an extremely broad range from Mexico and Arizona north to Washington state. Additional field work should expand this range considerably.

### *Glaresis* - Inducta Group

**Description.** Size moderate, length 2.6 to 4.3 mm. Clypeal apex slightly raised, weakly sinuate, medially emarginate (Fig. 12B), clypeal surface and at least anterior portion of frons tuberculate. Pronotal fovea present but less pronounced than in mendica group. Elytral striae often not strongly carinate. Metasternal surface with ridges unmodified, metasternal groove not visible or difficult to detect (except *G. canadensis*, *G. inducta* and *G. sabulosa*). Mesotibia with weak, blunt apical projection, posterolateral emargination with 4-6 or more spines. Mosterior metatrochanteral margin unarmed. Outer metatibial margin not apically incised, with major posteromedian lateral protuberance. Apex of 5th male and female abdominal ventrites sexually dimorphic, males with apex weakly rounded, nearly truncate, females with apex strongly rounded (except *G. fritzi* with apex slightly emarginate in both sexes).

**Remarks.** This group contains 6 similar appearing species, some of which are distinguished with difficulty. Unrecognized cryptic species may be present here because some widely disjunct distributions occur, as illustrated by *G. canadensis* and *G. sabulosa*. The one South American species is a reasonably typical member of the inducta group, although the armature of the posterior metatrochanteral and metafeomarginal margins is unusual.

### Key to species of *Glaresis* - Inducta Group

1. Elytral striae raised, distinctly carinate, carinae nearly continuous (Fig. 17A, C) ..... **2**
- Elytral striae convex or nearly flat, not distinctly carinate, carinae reduced to short segments, or very short, serving only as setal bases (Fig. 12A, 16E) ..... **3**
- 2(1). Posterolateral mesotibia with 4-5 spines on lateral margin, spinal bases widely separated (Fig. 17D); metatibial surface with small, mostly oblique transverse ridges or carinae (Fig. 17F); size small, length 2.60 to 3.20 mm; body form short, stout, lateral margins of elytra slightly rounded medially (Fig. 17A) ..... ***G. inducta* Horn**



- Posterolateral metatibia with 6 or more spines on lateral margin, spinal bases close together (Fig. 18D); metatibial surface with coarse, dense armature composed of tubercles and ridges (Fig. 18F); size large, length 3.30 to 4.30 mm; body form comparatively more elongate, lateral margins of elytra not rounded medially (Fig. 18A) ..... ***G. canadensis* Brown**
- 3(1). Metasternal groove present, distinct (Fig. 15D); southern Utah, Wyoming ..... ***G. sabulosa*, n. sp.**
- Metasternal groove not visible or only slightly so (Fig. 13D); Arizona, southern California, South America ..... **4**
- 4(1). Elytral striae flat, or nearly so, striae carinae reduced to setal bases (Fig. 12C); Arizona, southern California, South America ..... **5**
- Elytral striae raised, striae carina composed of widely separated carinal segments (Fig. 16E); El Paso Co., Texas ..... ***G. warneri*, n. sp.**
- 5(4). Posterior metatrochanteral margin serrate, with large tooth near metafemur (Fig. 14H); posterior metafemoral margin with tooth (Fig. 14H); South America ..... ***G. fritzi* Martinez et al.**
- Posterior metatrochanteral margin not serrate, without large tooth; posterior metafemoral margin without tooth; not known from South America ..... **6**
- 6(5). Outer margin of metatibia with pronounced, continuous, wide shelf-like projection extended about 1/2 width of metatibia (Fig. 12F); mesotibia with 4 or 5 spines on external margin (Fig. 12D); spines on posterosuperior metatrochanteral surface widely separated; Kelso Dunes, San Bernardino Co., California ..... ***G. arenata* Gordon**
- Outer margin of metatibia with posteromedian projection not shelf-like, usually not extended more than 1/3 width of metatibia (Fig. 13G); mesotibia with 6 or more spines on external margin; spines on posterosuperior metatrochanteral surface narrowly spaced (Fig. 13H); Arizona ..... ***G. zvirgzdinsi* Warner**

### ***Glaresis arenata* Gordon**

*Glaresis arenata* Gordon 1974: 93.

**Description. Male.** Length 3.8 mm, width 2.0 mm; body form elongate, somewhat slender, feebly widened from elytral base to apical 1/3 (Fig. 12A). Color pale brownish yellow. Head with clypeal surface finely rugose with fine, sparse tubercles extended onto frons, frons densely rugose, vertex finely reticulate without basal carina, setae short, indistinct. Clypeal apex slightly raised, weakly sinuate with median emargination, lateral angles oblique, angulate (Fig. 12B). Mandible pair symmetrical; mesal tooth strong; lateral prominence weak, outer margin rounded. Pronotum with distinct, long, transverse fovea in anterior 1/4 extended completely across pronotum, small slightly transverse fovea on each side of middle in anterior 1/2, wide, deep fovea on each side medially near lateral margin, distinct central furrow extended from base to transverse furrow; surface finely rugose, with sparse, straight setae-bearing carinae, setae decumbent, about 1/2 length of carina; anterior and lateral pronotal margins not bordered, all margins crenulate (Fig. 12C). Elytra with surface dull, finely microreticulate; all striae slightly convex, nearly flat, not carinate, remnants of carinae reduced to setal bases, seta much longer than base; intervals with large, shallow, slightly rectangular punctures (Fig. 12C). Metasternum long, dull, finely, densely microreticulate, median surface without ridges, laterally with scattered, straight ridges in basal 2/3, median area flat, with median carina extended anteriorly from apical keel 1/2 or more distance to mesocoxae (Fig. 12D); metasternal groove not visible. Lateral protibial teeth unevenly spaced, basal 2 teeth closer together. Mesotibia with 4 spines laterally, spinal bases widely separated, tibia slightly projecting at apex (Fig. 12D). Posterior metatrochanteral margin without small teeth; posterosuperior surface of metatrochanter with single large tooth near femur (Fig. 12G). Metafemoral surface with widely, evenly spaced, strong setae-bearing tubercles, microreticulate; width to length ratio 1.0:1.5, without noticeable

flange on anterior margin; posterior metafemoral margin angulate next to trochanter; posterosuperior margin with 2 small teeth (Fig. 12G). Metatibia broadly triangular, surface entirely microreticulate, with large, shelflike ridge about as wide as 1/2 metatibial width on outer margin postmedially, small teeth present on outer margin from near base to lateral ridge, single tooth present anterior to ridge, an irregular row of coarse tubercles extended from base nearly to apex medially, inner margin smooth, pubescent (Fig. 12F). Apical margin of 5th abdominal ventrite weakly rounded. Genitalia long, basal piece longer than parameres, proximal end curved; median lobe shorter than parameres, tapered from base nearly to rounded apex, narrower at middle than a paramere, slightly curved upward in apical 1/3, parameres slightly curved before apex in lateral view, margin straight, apex narrowly rounded (Fig. 12E).

**Female.** Apex of 5th abdominal ventrite strongly rounded.

**Variation.** Length 3.2 to 3.8 mm, width 1.7 to 2.2 mm. Lateral mesotibial spine number varies from 4 to 5; posterosuperior margin of trochanter may have 2nd tiny tooth; and surface of metatibia varies slightly in degree of sculpture.

**Type locality.** California, San Bernardino Co., 7 mi. SW Kelso, sand dunes.

**Type depository.** (USNM).

**Temporal distribution.** April-May.

**Geographical distribution. UNITED STATES. California:** Imperial Co., Hwy 78, 1.3 miles SW Glamis; San Bernardino Co., Amboy R., 11-15 miles E 29 Palms, Wonder Valley, 2000 ft.; 7 mi. SW Kelso, sand dunes; Kelso sand dunes, 3.7 mi W Kelbaker Rd.; Kelso sand dunes. (CMNC) (CSCA) (RCCC) (USNM).

**Remarks.** *Glaresis arenata* shares some *G. canadensis* characters, especially the strongly tuberculate metatibial surface, and has 4 to 5 spines on outer mesotibial margin as does *G. inducta*, but elytral stria without carinae distinguish *G. arenata* from both species. In addition the posteromedian metatibial ridge is more well developed and transversely elongate in *G. arenata*, and geographical distributions are widely disjunct..

*Glaresis zvirgzdinsi* is similar in appearance and range, see Remarks under that species.

### ***Glaresis zvirgzdinsi* Warner**

*Glaresis zvirgzdinsi* Warner 1995: 267.

**Description. Male.** Length 3.7 mm, width 2.0 mm; body form compact, widened from elytral base to apical 1/3 (Fig. 13A). Color pale brownish yellow. Head with clypeal surface smooth, shiny, with distinct, coarse, sparse tubercles extended onto frons, frons densely rugose, vertex finely reticulate without basal carina, setae short, indistinct. Clypeal apex slightly raised, weakly sinuate with median emargination, lateral angles oblique, angulate (Fig. 13B). Mandible pair symmetrical; mesal tooth strong; lateral prominence weak, outer margin rounded. Pronotum with distinct, long, transverse fovea in anterior 1/4 extended completely across pronotum, small slightly transverse fovea on each side of middle in anterior 1/2, wide, deep fovea on each side medially near lateral margin, distinct central furrow extended from base to transverse furrow; surface finely rugose, with sparse, straight setae-bearing carinae, setae decumbent, about 1/2 length of carina; anterior and lateral pronotal margins not bordered, lateral and basal margins crenulate (Fig. 13C). Elytra with surface dull, finely microreticulate; all striae slightly convex, nearly flat, not carinate, remnants of carinae reduced to setal bases, seta twice as long as base; intervals with large, shallow, slightly rectangular punctures (Fig. 13E). Metasternum long, dull, finely, densely microreticulate, median surface without ridges, laterally with numerous, obliquely straight ridges throughout, median area flat, with median carina extended anteriorly from apical keel 1/2 or more distance to mesocoxae (Fig. 13D); metasternal groove nearly invisible. Lateral protibial teeth unevenly spaced, basal

2 teeth closer together. Mesotibia with 6 spines laterally, spinal bases close together, tibia slightly projecting at apex (Fig. 13D). Posterior metatrochanteral margin without teeth; posterosuperior surface of metatrochanter with single large tooth near femur (Fig. 13H). Metafemoral surface with widely, evenly spaced setae-bearing tubercles, microreticulate; width to length ratio 1.0:1.5, with narrow flange on anterior margin; posterior metafemoral margin angulate next to trochanter; posterosuperior margin with 2 small teeth very close together (Fig. 13H). Metatibia broadly triangular, surface entirely microreticulate, with large, shelflike ridge about as wide as 1/2 metatibial width on outer margin postmedially, with large teeth on outer margin from near base to postmedian projection, an irregular row of 5 coarse tubercles extended from base nearly to apex medially, inner margin smooth, pubescent (Fig. 13G). Apical margin of 5th abdominal ventrite weakly rounded. Genitalia long, wide, basal piece longer than parameres, proximal end curved; median lobe shorter than parameres, tapered from base to apex, slightly narrower at middle than a paramere, curved upward in apical 1/3, apex rounded in ventral view; parameres slightly curved before apex in lateral view, margin straight, apex narrowly rounded (Fig. 13F).

**Female.** Apex of 5th abdominal ventrite strongly rounded.

**Variation.** Length 3.0 to 4.4 mm, width 1.7 to 2.3 mm. Lateral mesotibial spine number varies from 5 to 7.

**Type locality.** Arizona, Yuma Co., north end of Mohawk dunes west of Mohawk Mountains, ca. 1 mi. S of I-8.

**Type depository.** (FSCA).

**Temporal distribution.** April-May.

**Geographical distribution.** UNITED STATES. **Arizona:** Yuma Co., north end of Mohawk dunes west of Mohawk Mountains, ca. 1 mi. S of I-8; Yuma; Yuma Co., 6-8 mi. E. of Tacna dunes. **Baja California:** 36 mi. S. La Puerta. (CMNC) (FSCA) (RCCC) (USNM) (WBWC).

**Remarks.** *Glaresis zvirgzdinsi* and *G. arenata* are similar species with similar ranges. *Glaresis zvirgzdinsi* differs from *G. arenata* by larger size; smooth, shiny clypeal surface; and posterosuperior metafemoral margin with 2 closely spaced teeth (*G. arenata* has these teeth widely separated). In addition, the lateral mesotibial margin usually has 4 spines, sometimes 5 in *G. arenata*, *G. zvirgzdinsi* usually has 6 spines.

### ***Glaresis fritzi* Martinez, Pereira, and Vulcano**

*Glaresis fritzi* Martinez, Pereira, and Vulcano 1961: 77.

**Description. Male.** Length 3.2 mm, width 2.7 mm; body form slightly elongate, strongly widened from elytral base to apical 1/3 (Fig. 14A). Color pale yellowish brown. Head with surface of clypeus, frons, and anterior portion of vertex slightly shiny, finely microreticulate, posterior portion of vertex more coarsely reticulate, clypeus and frons with small, sparse tubercles. Clypeal apex feebly sinuate, with small, evenly spaced tubercles, medially raised and angled posteriorly, lateral angles rounded then angulate at apex (Fig. 14B). Mandible pair symmetrical; mesal tooth strong; lateral prominence weak, outer margin rounded. Pronotum with distinct, long, transverse fovea in anterior 1/4 extended completely across pronotum, small slightly transverse fovea on each side of middle in anterior 1/2, wide, deep fovea on each side medially near lateral margin, distinct central furrow extended from base to transverse furrow; surface finely rugose, with dense, T-shaped, setae-bearing carinae, setae decumbent, about 1/2 length of carina (Fig. 14C); anterior and lateral pronotal margins not bordered, all margins crenulate. Elytra with surface dull, finely microreticulate; all striae strongly raised, convex, not carinate, remnants of carinae reduced to setal bases, seta much longer than base; intervals with large, shallow, slightly rectangular punctures (Fig. 14E). Metasternum long, dull, finely, densely microreticulate, median surface without

ridges, laterally with scattered, straight ridges in basal 2/3, median area slightly convex, without median carina (Fig. 14D); metasternal groove not visible. Lateral protibial teeth unevenly spaced, basal 2 teeth closer together. Mesotibia with 6 spines laterally, spinal bases narrowly separated, tibia slightly projecting at apex (Fig. 14D). Posterior metatrochanteral margin serrate, with large tooth near metafemur (Fig. 14H); posterosuperior surface of metatrochanter without teeth. Metafemoral surface with widely, evenly spaced, strong setae-bearing tubercles, microreticulate; width to length ratio 1.0:1.5, without noticeable flange on anterior margin; posterior metafemoral margin with large tooth near trochanter (Fig. 14H); posterosuperior margin without teeth. Metatibia broadly triangular, surface entirely microreticulate, with large, irregular, posteromedian lateral projection, row of rounded teeth on lateral margin from base to posteromedian projection, short row of small, obliquely transverse tubercles extended from base nearly to posteromedian projection medially, inner margin smooth, pubescent (Fig. 14G). Apical margin of 5th abdominal ventrite barely perceptibly emarginate medially. Genitalia elongate, basal piece much shorter than parameres, basal lobe weakly narrowed from base to apex, apex imarginate medially (Fig. 14F).

**Female.** Apex of female 5th abdominal ventrite distinctly emarginate.

**Variation.** Length 3.0 to 3.7 mm, width 1.7 to 2.0 mm. Clypeal apex with posteriorly angled margin simply widened, or narrowly triangular (outer ends not extending to lateral angle) or widely triangular (outer ends reach lateral angle), occasionally smooth completely lacking tubercles; lateral mesotibial spine number varies from 5 to 6; posterosuperior margin of trochanter may have 2nd tiny tooth; and surface of metatibia varies slightly in degree of sculpture.

**Type locality.** Argentina, Rio Negro, Lamarque.

**Type depository.** Unknown.

**Temporal distribution.** November-February.

**Geographical distribution.** **ARGENTINA. Catamarca:** Andalgala; Londres, 15 km SW of Belen; La Ciénaga, Belen; Rio Potrero, 65 km NE of Andalgala. **Rio Negro:** Lamarque.

**Remarks.** *Glaresis fritzi* is distinguished from any other member of the inducta group by the pronounced metatrochanteral and metafemoral armature. In general appearance it is most similar to *G. arenata* and *G. zvirgzdinsi*.

Some specimens of *G. fritzi* are labeled as “Pitfall trap, dry desert,.” or “Pitfall trap, creosote bush desert.”

### ***Glaresis sabulosa* Gordon and Hanley, new species**

**Description. Male.** Length 4.0 mm, width 2.3 mm body form elongate, robust, widened from elytral base to apical 1/3 (Fig. 15A). Color yellowish brown. Head with clypeal surface finely rugose with small, sparse tubercles extended onto frons, frons finely rugose, vertex finely rugose without basal carina, setae short, indistinct. Clypeal apex slightly raised, weakly sinuate with median emargination, lateral angles angulate (Fig. 15B). Mandible pair symmetrical; mesal tooth strong; lateral prominence weak, outer margin abruptly rounded. Pronotum with distinct, long, transverse fovea in anterior 1/4 extended completely across pronotum, small slightly transverse fovea on each side of middle in anterior 1/2, wide, deep fovea on each side medially near lateral margin, distinct central furrow extended from base to transverse furrow; surface finely rugose, with sparse, straight setae-bearing carinae, setae decumbent, about 1/2 length of carina; anterior and lateral pronotal margins not bordered, all margins crenulate. Elytra with surface dull, finely microreticulate; all striae convex, weakly carinate, carinal segments small, widely separated, not much more than setal bases, seta much longer than base; intervals with large, shallow, slightly rectangular punctures (Fig. 15C). Metasternum long, dull, finely, densely microreticulate, median surface without ridges, laterally with scattered, straight ridges in basal 2/3, median area flat, with



trace of median carina extended anteriorly from apical keel 1/2 distance to mesocoxae (Fig. 15D); metasternal groove shallow, clearly demarked. Lateral protibial teeth unevenly spaced, basal 2 teeth closer together. Mesotibia with 6 spines laterally, spinal bases close together, tibia slightly projecting at apex (Fig. 15D). Posterior metatrochanteral margin without small teeth; posterosuperior surface of metatrochanter with single tooth (Fig. 15G). Metafemoral surface with widely, evenly spaced, setae-bearing tubercles, microreticulate; width to length ratio 1.0:1.5, without noticeable flange on anterior margin; posterior metafemoral margin angulate next to trochanter; posterosuperior margin with 2 widely spaced teeth, outer tooth small (Fig. 15G). Metatibia broadly triangular, surface entirely microreticulate, outer margin with series of small teeth from base to posteromedian lateral projection, projection small, oblique, surface smooth, median row of tubercles nearly lacking, inner margin smooth, pubescent (Fig. 15F). Apical margin of male 5th abdominal ventrite feebly rounded. Genitalia long, basal piece about as long as parameres, proximal end curved; median lobe shorter than parameres, tapered from base to apex, narrower at middle than a paramere, slightly curved upward in apical 1/3, apex rounded in ventral view; parameres slightly curved before apex in lateral view, margin straight, apex narrowly rounded (Fig. 15E).

**Female.** Apex of 5th abdominal ventrite strongly rounded.

**Variation.** Length 3.3 to 4.0 mm, width 1.8 to 2.3 mm. Number of lateral mesotibial spines varies from 6-8; number of tubercles and form of lateral projection on metatibia vary slightly, number of teeth on posterosuperior metafemoral surface varies from 1 to 2; posterosuperior teeth on metatrochanter vary from 1 to 2 closely spaced teeth.

**Type material.** Holotype male: **Utah:** UTAH: (Garfield Co.) 26 mi. S. Hanksville, Hwy. 95, 16-VI-84, Robert Gordon (USNM). Paratypes, 34: (15), same data as holotype; (1) Utah, Emery Co., Little Gilson Butte, 29-VIII-1986, A. S. Menke; (1) Wayne Co., Hanksville, 28-V-1974; (1) 14 mi. S. Hanksville, Fairview Rch., 14-VI-82, Robert Gordon; (6) Emery Co., Goblin Valley, 1-VI-82; (3) Utah, Emery Co., Goblin Valley Rd. at Hwy 24; UV trap; M. Raschko; 16-17.V.2007; (1) Utah, Emery Co., Wildhorse Cr N of Goblin Vly 4900', 27-28 May 1985, F.D. Parker Collector, D.K. Broemeling Collector; (9) Emery Co., 17 mi. N. Hanksville, "dunes" nr. Gilson Butte well, VII-27-78, Andrews & Hardy; (1) Utah, Garfield Co., 42 km SSE Hanksville, 15 June 1982, W. Steiner, R. Gordon & D. Whitehead, colls.; (CASC) (CSCA) (MJPC) (USNM) (USUL).

**Other specimens.** 276: **Arizona:** Navajo Co., Betatakin Ruins. **Colorado:** Maybell. **Utah:** (71) Kane Co., Coral Pink Dunes, 10-VII-1980, Robert Gordon; same data except collection date 18-VI-1993; (3) Kane Co., Coral Pink Dunes, 16 km W Kanab, 2045m, 26 Aug.-7 Sep. 1991, J. M. Hill, C. B. & R. Knisley, W. E. Steiner collectors; (21) Kane Co., Coral Pink Sand Dunes, BLM land NW Kanab, 37° 05'14". 112° 40'11", P. Skelley and family; (22) Kane Co., Coral Pink Sand Dunes State Pk, 14-VII-1998, Baumann, et al.; (35) Kane Co., Coral Pink sand dunes, June 4, 1981, Baumann; (5) Kane Co., Coral Pink Sand Dunes St. Pk., VIII-2/3-85, Rolf L. Aalbu col. BL; (3) Kane Co., Coral Pink Sand Dunes, 1.8 mi. S. Hancock Rd, on Sand Dunes Rd.; (7) Kane Co., Ponderosa Cmpgd, Coral Pink Sand Dunes; (4) Kanab Co., 8 mi. N. Kanab, 29 Aug 1962, G. F. Knowlton; (43) Garfield Co., 7.9 mi. SE Boulder, Sand Dunes, 37° 52'18" 111° 20'14"W, 25-VII-2001, RD Gordon; (1) Garfield Co., Grand Staircase-Escalante Natl. Mon., Sand Creek Boulder Mail Trail, 31 July-1 August 2001; (1) Garfield Co., Burr Trail between Deer Creek and Sleep Creek, 23-VII-2001, R.W. Baumann; (1) Washington Co., Sand Hollow Rd., E. entr. St. Pk., UV light, W.B. Warner; (2) Utah, Washington Co., Zion Nat'l Park, 8 Aug 1966, R. Peckenpaugh; Washington Co., 6 mi. SW Hurricane sand dunes. **Wyoming:** (28) Sweetwater Co., Flaming Gorge, Blacks Fork River, 14-VI-1993, Col: R. Gordon, UV light; (6) Sweetwater Co., Flaming Gorge Res., BF. & J. Carr, pitfall trap, ant mound; (42) Sweetwater Co., Red Desert, sand dunes, 23-VI-1977, Gordon & Ashworth; (1) Sweetwater Co., Hwy 191, 7 mi. S I-80, 14-VI-84, Robert Gordon. (BYUC) (CMNH) (FSCA) (JCIC) (MJPC) (RCCC) (USNM) (USUL).

**Remarks.** *Glaresis sabulosa* is known from several southern Utah localities, but specimens from each locality vary slightly from the typical and from each other. Therefore the type series is restricted to sand deposits in the vicinity of Hanksville in Emery, eastern Garfield, and Wayne Counties. Specimens from Kane Co., Coral Pink dunes, differ from the typical by somewhat larger tubercles on clypeus and frons,



and by distinctly more tubercles and more robust posteromedian projection of the metatibia. Specimens from dunes southeast of Boulder also have more prominent head tubercles, and the metatibial sculpture in some (not all) specimens is more pronounced than in Coral Pink specimens. However, all specimens examined have the shallow but distinctly defined metasternal groove that helps define *G. sabulosa*. Southern Wyoming specimens are distinctly larger and differ by having more prominent head tubercles, darker color, and slightly different metatibial posteromedian projection. The Wyoming specimens are perhaps another species, but we are unable to satisfactorily distinguish them from Utah *G. sabulosa* on morphological characters.

*Glaresis inducta* is the most similar species, but has 4 or 5 metatibial spines; lacks a definable metasternal groove; body short, robust; and elytral carinae nearly continuous.

All type specimens have been taken at light, and specimens collected by one of us (RDG) in the Hanksville area were at ultra violet light in blow sand deposits such as dunes and sand fields, etc. Nontype specimens were also taken in areas of sand deposits, all Wyoming specimens were collected at UV light (R. Gordon, pers. obs.)

**Etymology.** The specific epithet is the Latin *sabulosus*, meaning sandy, referring to the extremely sandy habitat of this species.

### ***Glaresis warneri* Gordon and Hanley, new species**

**Description. Male.** Length 3.7 mm, width 2.0 mm; body form elongate, gradually widened from elytral base to apical 1/3 (Fig. 16A). Color yellowish brown. Head with clypeal surface and apical 1/2 of frons shiny, posterior 1/2 of frons and vertex densely rugose, dull, clypeus and frons with large, scattered tubercles, vertex without basal carina, setae short, indistinct. Clypeal apex slightly raised, weakly sinuate, with median emargination, lateral angles oblique, angulate (Fig. 16B). Mandible pair symmetrical; mesal tooth strong; lateral prominence strong, outer margin rounded. Pronotum with distinct, long, transverse fovea in anterior 1/4 extended completely across pronotum, small, slightly transverse fovea on each side of middle in anterior 1/2, wide, deep fovea on each side medially near lateral margin, distinct central furrow extended from base to transverse furrow; surface finely rugose, with slightly curved, seta-bearing carinae, setae decumbent, about 1/2 length of carina; anterior and lateral pronotal margins not bordered, all margins crenulate (Fig. 16C). Elytra with surface dull, finely microreticulate; all striae raised, convex, carinate, carinae widely interrupted, space between carinal segments as long as carinal segment, intervals with large, shallow, slightly rectangular punctures (Fig. 16E). Metasternum long, dull, finely, densely microreticulate, median surface without ridges, laterally with scattered, straight ridges in basal 2/3, median area flat, with median carina extended anteriorly from apical keel 1/2 or more distance to mesocoxae (Fig. 16D); metasternal groove not visible or indistinctly so. Lateral protibial teeth unevenly spaced, basal 2 teeth closer together. Mesotibia with 6 spines in posterolateral emargination, spinal bases close together, tibia slightly projecting at apex (Fig. 16D). Posterior metatrochanteral margin without teeth; posterosuperior surface of metatrochanter with single large tooth near femur (Fig. 16H). Metafemoral surface rugose, with widely, evenly spaced, obliquely transverse, small seta-bearing tubercles, width to length ratio 1.0:1.5, without noticeable flange on anterior margin; posterior metafemoral margin angulate next to trochanter; posterosuperior margin with 1 large tooth (Fig. 16H). Metatibia broadly triangular, surface entirely microreticulate, with large, irregular, transversely oblique posteromedian lateral projection, an irregular row of small, obliquely transverse tubercles extended from base nearly to apex medially, inner margin smooth, pubescent (Fig. 16G). Apical margin of 5th abdominal ventrite weakly rounded. Genitalia long, basal piece longer than parameres, proximal end curved; median lobe slightly shorter than parameres, tapered from base to apex, 1/2 width of paramere at middle, slightly curved upward in apical 1/3, apex nearly acute in ventral view; parameres slightly curved before apex in lateral view, margin straight, apex narrowly rounded (Fig. 16F).

**Female.** Apex of 5th abdominal ventrite strongly rounded.

**Variation.** Length 2.8 to 3.7 mm, width 1.7 to 2.0 mm. Metasternal groove may be more apparent on some specimens; lateral mesotibial spine number usually 6, but often with only 5; number of teeth on posterosuperior metafemoral surface varies from 1 to 2.

**Type material.** Holotype: **Texas:** TEXAS: El Paso Co., 12 mi. NNE Fabens, 31°40'31"N; 106° 02' 30"W, IV-23-1998, UV light, Coll. E. G. Riley (TAMU). Paratypes, 104: (83) same data as holotype; (18) El Paso Co., red dunes, 24 N of Fabens, VI-23-97, C. Wolfe; (3) El Paso Co., red dunes, 14 N of Fabens, C. Wolfe & D. Marqua. (TAMU) (USNM).

**Remarks.** *Glaresis warneri* is similar to *G. inducta*, but is distinguished from that species by elytral striae with widely interrupted carinae; more elongate body form; larger average size; and presence of 5 or 6 lateral mesotibial spines, with the usual number 6.

All specimens examined were taken from sand dunes in the vicinity of Fabens, El Paso County, Texas. Surprisingly, no examples of *G. inducta* were mixed with these specimens because that species is very commonly collected in other dune systems of west Texas and New Mexico.

**Etymology.** This species is named for Bill Warner who has long had an interest in this genus and has generously given us the benefit of his group knowledge, as well as many valuable specimens.

### *Glaresis inducta* Horn

*Glaresis inducta* Horn 1885: 117; Gordon 1970: 510; Ratcliffe 1991: 133; Warner 1995: 268; Ratcliffe and Paulsen 2008: 65.

*Glaresis knausi* Brown 1928: 73; Gordon 1970: 510.

*Glaresis cartwrighti* Gordon 1970: 508. **New synonym.**

**Description. Male.** Length 3.0 mm, width 1.8 mm; body form short, stout, strongly widened from elytral base to apical 1/3 (Fig. 17A). Color yellowish brown. Head with clypeal surface and apical 1/2 of frons shiny, posterior 1/2 of frons and vertex densely rugose, dull, clypeus and frons with large, scattered tubercles, vertex without basal carina, setae short, indistinct. Clypeal apex slightly raised, weakly sinuate, with median emargination, lateral angles oblique, angulate (Fig. 17B). Mandible pair symmetrical; mesal tooth strong; lateral prominence strong, outer margin rounded. Pronotum with distinct, long, transverse fovea in anterior 1/4 extended completely across pronotum, small slightly transverse fovea on each side of middle in anterior 1/2, wide, deep fovea on each side medially near lateral margin, distinct central furrow extended from base to transverse furrow; surface finely rugose, with slightly curved, seta-bearing carinae, setae decumbent, about 1/2 length of carina; anterior and lateral pronotal margins not bordered, all margins crenulate. Elytra with surface dull, finely microreticulate; all striae strongly raised, convex, carinate, carinae nearly continuous, briefly interrupted adjacent to space between interval punctures; intervals with large, shallow, slightly rectangular punctures (Fig. 17C). Metasternum long, dull, finely, densely microreticulate, median surface without ridges, laterally with scattered, straight ridges in basal 2/3, median area flat, with median carina extended anteriorly from apical keel 1/2 or more distance to mesocoxae (Fig. 17D); metasternal groove not visible or indistinctly so. Lateral protibial teeth unevenly spaced, basal 2 teeth closer together. Mesotibia with 4 spines laterally, spinal bases widely separated, tibia slightly projecting at apex (Fig. 17D). Posterior metatrochanteral margin without small teeth; posterosuperior surface of metatrochanter with single large tooth near femur (Fig. 17E). Metafemoral surface rugose, with widely, evenly spaced, obliquely transverse, small setae-bearing tubercles, width to length ratio 1.0:1.5, without noticeable flange on anterior margin; posterior metafemoral margin angulate next to trochanter; posterosuperior margin with 2 small, widely spaced teeth (Fig. 17G). Metatibia broadly triangular, surface entirely microreticulate, with large, irregular, transversely oblique posteromedian lateral projection, an irregular row of small, obliquely transverse tubercles extended from base to posteromedian projection, inner margin smooth, pubescent (Fig. 17F). Apical margin of 5th abdominal ventrite weakly rounded. Genitalia long, basal piece about as long as parameres, proximal end curved; median lobe slightly shorter than parameres, tapered from base to apex, narrower at middle than at

paramere, slightly curved upward in apical 1/3, apex angulate in ventral view; parameres slightly curved before apex in lateral view, margin straight, apex narrowly rounded (Fig. 17E).

**Female.** Apical margin of 5th ventrite strongly rounded.

**Variation.** Length 2.6 to 3.2 mm, width 1.6 to 1.8 mm. Metasternal groove may be more apparent on some specimens; lateral mesotibial spine number varies from 4 to 5, with occasional specimens having 6 spines; number of teeth on posterosuperior metafemoral surface varies from 1 to 2, occasionally a specimen has a third tiny tooth; number of median, obliquely transverse tubercles on metatibia is variable, both shape and size of posteromedian lateral projection vary considerably.

**Type locality.** of *inducta*, southwestern Texas; of *knausi*, Kansas, Medora; of *cartwrighti*, New Mexico, White Sands.

**Type depository.** of *inducta*, MCZ; of *knausi*, CNIC; of *cartwrighti*, USNM.

**Temporal distribution.** May-July.

**Geographical distribution.** **MEXICO. Sonora:** vicinity of La Salina Ba. San Jorge; 24 mi. S. Sonoita. **UNITED STATES. Arizona:** Cochise Co., 4 mi. S. Wilcox; Wilcox Playa; 5.8 km E Willcox, Blue Sky Road. **Colorado:** Bent Co., Hasty. **Kansas:** Reno Co., Medora. **Indiana:** Porter Co., Dunes Beach. **Illinois:** Mason Co., Sand Ridge State Forest. **Michigan:** Warren Dunes St. Pk. **Nebraska:** Greeley Co., 10 mi. N. Greeley, sandhills, Jct. hwy 281 & 91; Thomas Co., Halsey, Dismal River. **New Mexico:** Chaves Co., Mescalero Sands; 15.5 mi. E. Roswell; 9.5 mi W Caprock; Dona Ana Co., Las Cruces; Eddy Co., Carlsbad; Eddy Co., 26 mi. N Carlsbad; Lea Co., 5 mi. E Loco Hills; Hidalgo Co., 6 mi. E. Cloverdale; Lea Co., 4 mi. S Jal; Otero Co., 24 km S. Alamogordo; White Sands; Torrance Co., Town of Gran Quivira, 6500'. **Oklahoma:** Jackson Co., Jct. Hwy. 6 & Red River; Marshall Co., Lake Texoma. **South Dakota:** Bennett Co., Martin; Fall River Co., Angostura Dam, S. Hot Springs; Hyde Co., Highmore. **Texas:** Anderson Co., Tennessee Colony; Salmon; Andrews Co., Dunes, 1.3 E of Jct. Tx. 115 & FR 181; 10 mi. N. Andrews; Bexar Co., S. of San Antonio, Applewhite Rd; Jct. I-37 & hwy. 1604, Waterwood estates; Brazos Co., College Station; Brooks Co., 8 mi. S. Falfurrias; Caldwell Co., 5.5 mi. E Luling; Cameron Co., Boca Chica Beach; Crane Co., Jct. 1053 & 1233; Culberson Co., Guadalupe Mts. National Park; El Paso Co., Anthony; Horizon City; Johnson Co., Cleburne St. Park; Lamb Co., Littlefield; Lee Co., Fedor; Leon Co., 5 mi. N Flynn; 9 km N. Flynn; Martin Co., Stanton; Milam Co., 5.6 km NE Gause; Ward Co., Monahans Dunes; Winkler Co., 10 mi. NE Kermit; Winkler Co., 20 mi. NE Kermit; .5 mi. NE VIC, Jct. Hwy 115 & Fm. Rd. 874. **Wisconsin:** Wood Co., Griffith State Nursery. **Wyoming:** Niobrara Co., Lusk (BYUC) (CASC) (CMNC) (CMNH) (CNIC) (CSCA) (DCCC) (FSCA) (JCIC) (KUNHM) (RAAC) (RCCC) (TAMU) (UCRC) (USNM).

**Remarks.** A diagnosis for *G. inducta* would be: average size small, length 2.60 to 3.20 mm; head with vertex and posterior portion of frons dull, densely, finely rugose; body short, stout, lateral elytral margins rounded medially; elytral striae raised, strongly carinate, carinae nearly continuous, metatibial surface with armature reduced, median row of tubercles weak, obliquely transverse; posterolateral mesotibial emargination with 4 or 5 spines, spinal bases widely separated.

The most critical character listed above is number of mesotibial spines that nearly always number 4 or 5, but number 6 or more about 2% of the time. If the mesotibial spination and densely rugose vertex characters are applied rigorously, *G. inducta* can be accurately defined. The metatibial surface armature is useful only in distinguishing *G. inducta* from *G. sabulosa* and *G. canadensis*, not from most other similar species. Of the other species, *G. warneri* has the same mesotibial spination as *G. inducta*, but is distinguished by elytral striae weakly raised, and striae carinae broken into distinct segments.

*Glaresis canadensis* and *G. inducta* are similar, but *G. canadensis* is nearly always distinguished by larger average size, length 3.30 to 4.30 mm; posterior portion of frons with pronounced, elongate reticulation; strong metatibial surface armature composed of more or less vertical tubercles; and 6 or more posterolateral mesotibial spines. However, very small *G. canadensis* specimens occasionally occur, and these small specimens usually have less pronounced metatibial armature. In these instances, if the large

*G. inducta* specimens have 6 or more posterolateral mesotibial spines, identification becomes difficult. Fortunately these instances are rarely encountered.

A series of *G. inducta*-like specimens collected in Texas, "Bexar Co., Jct. I-37 & Hwy. 1604," mostly agree with the above diagnosis, but the head sculpture is different enough to create doubt as to correct identification. Because we find no other differences, this series is placed as probably *G. inducta*. A series of *G. inducta* was collected at a widely disjunct locality at Wilcox, Arizona, in company with supposed *G. canadensis*, and again we can find little difference between the Arizona specimens and typical *G. inducta*. See Remarks under *G. canadensis*.

*Glaresis knausi* Brown was synonymized with *G. inducta* by Gordon (1970); in the same publication Gordon described *G. cartwrighti* based on two worn specimens from White Sands, New Mexico. With considerably more knowledge of *G. inducta* distribution and character variation, it is apparent that *G. cartwrighti* must also be considered a junior synonym of *G. inducta*.

### ***Glaresis canadensis* Brown**

*Glaresis canadensis* Brown 1928: 74; Gordon 1970: 509; Ratcliffe 1991: 133; Ratcliffe and Paulsen 2008: 62.

**Description. Male.** Length 4.0 mm, width 1.2 mm; body form slightly elongate, lateral elytral margins not rounded, robust, widened from elytral base to apical 1/3 (Fig. 18A). Color yellowish brown. Head with clypeal surface shiny, tuberculate, apical 2/3 of frons rugose, basal 1/3 of frons with coarse, reticulate sculpture, vertex finely reticulate, without basal carina, setae short, indistinct. Clypeal apex slightly raised, weakly sinuate with feeble median emargination, lateral angles oblique, angulate (Fig. 18B). Mandible pair symmetrical; mesal tooth strong; lateral prominence strong, outer margin rounded. Pronotum with distinct, long, transverse fovea in anterior 1/4 extended completely across pronotum, small, slightly transverse fovea on each side of middle in anterior 1/2, wide, deep fovea on each side medially near lateral margin, distinct central furrow extended from base to transverse furrow; surface finely rugose, with slightly curved or sinuate setae-bearing carinae, setae decumbent, about 1/2 length of carina; anterior and lateral pronotal margins not bordered, all margins crenulate. Elytra with surface dull, finely microreticulate; all striae strongly raised, convex, carinate, carinae nearly continuous, briefly interrupted adjacent to space between interval punctures; intervals with small, shallow, slightly rectangular punctures (Fig. 18C). Metasternum long, dull, finely, densely microreticulate, with dense ridges throughout except smooth posteromedian area, median area flat, with median carina extended anteriorly from apical keel 1/2 distance to mesocoxae (Fig. 18D); metasternal groove feeble, indistinct. Lateral protibial teeth unevenly spaced, basal 2 teeth closer together. Mesotibia with 6 spines laterally, tibia slightly projecting at apex (Fig. 18D). Posterior metatrochanteral margin without small teeth; posterosuperior surface of metatrochanter with single large tooth near femur (Fig. 18G). Metafemoral surface rugose, with widely, evenly spaced, obliquely transverse, setae-bearing tubercles, width to length ratio 1.0:1.5, with weak flange on anterior margin; posterior metafemoral margin angulate next to trochanter; posterosuperior margin with 2 large, widely spaced teeth. Metatibia broadly triangular, surface entirely microreticulate, with large, transverse posteromedian projection on outer margin, small teeth present on outer margin from near base to posteromedian projection, an irregular row of large, raised, nearly vertical tubercles extended from base nearly to apex medially, inner margin smooth, pubescent (Fig. 18F). Apical margin of 5th abdominal ventrite weakly rounded. Genitalia long, basal piece longer than parameres, proximal end curved; median lobe slightly shorter than parameres, tapered from base to apex, narrower at middle than a paramere, slightly curved upward in apical 1/3, apex angulate in ventral view; parameres slightly curved before apex in lateral view, margin straight, apex narrowly rounded (Fig. 18E).

**Female.** Apical margin of 5th abdominal ventrite strongly rounded.

**Variation.** Length 3.3 to 4.3 mm, width 1.8 to 2.5 mm. Posterolateral mesotibial spine number varies from 6 to 7; teeth on posterosuperior metafemoral surface vary from 1 to 2, occasionally a specimen has a third tiny tooth; number of median tubercles on metatibia is highly variable, both in shape and size,



and are sometimes slightly obliquely transverse in apical 1/2, shape and size of lateral posteromedian projection are also extremely variable.

**Type locality.** Manitoba, Aweme.

**Type depository.** CNIC.

**Temporal distribution.** April-July.

**Geographical distribution.** **CANADA. Alberta:** 7 mi. S Empress, Alta.-Sask. border; Tp. 5 Rge. 7, W. 4 Mer.; Tp. 20 Rge. 1, W. 4 Mer. (15 mi. SW Empress); Tp. 22 Rge. 1, W. 4 Mer. (5 mi. S. Empress); 11 km S Empress, sand dunes. **Manitoba:** Aweme. **UNITED STATES. Arizona:** Cochise Co., 5.8 km SE Willcox, Blue Sky road. **Idaho:** St. Anthony Co., sand dunes. **Nebraska:** Greeley Co., 10 mi. N Greeley, sandhills, Jct. hwy 218 & 91; Thomas Co., Halsey; Lake Mconaughey Rec. Area. **New Mexico:** Chaves Co., 24 km W Caprock off Rt. 380, Mescalero Sands Rec. Area. **North Dakota:** Bottineau Co.; Mercer Co., Stanton dunes, 7 mi. E. Hazen. **South Dakota:** Bennett Co., Martin; Fall River Co., Angostura Dam, S. of Hot Springs. **Texas:** Andrews Co., 1.3 mi. E of Jct Tx 115 & FR 181; Ward Co., Monahans, sand dunes; Winkler Co., 20 mi. NE Kermit. (CASC) (CICC) (CMNC) (CNIC) (CSCA) (DCCC) (FSCA) (JCIC) (RAAC) (TAMU) (USNM).

**Remarks.** See comparative Remarks under *G. inducta*. This species was described from southern Manitoba, but northern specimens are rarely collected, probably because cold temperatures limit light trapping possibilities. True *G. canadensis* specimens were examined from Alberta, Manitoba, Idaho, North and South Dakota, and Nebraska. Large numbers of west Texas specimens are present in collections because many collectors have visited those dunes fields. However, we have recognized no *G. canadensis* specimens from any locality between Nebraska and west Texas, an extremely unusual distribution, if in fact it is real. In addition we have widely disjunct populations of putative *G. canadensis* in Arizona and New Mexico. Specimens from these localities appear morphologically identical to typical *G. canadensis*, therefore we record them as that species. The Arizona specimens were collected along with putative specimens of *G. inducta*, a situation also found in western Texas. There are probably two or more species here that we cannot distinguish on external morphology. Perhaps molecular analysis will solve this question.

### ***Glaresis* - Mendica Group**

**Description.** Size small, length 2.7 to 3.5 mm. Clypeal apex straight or curved, not or weakly reflexed, tuberculate (Fig. 19B). Pronotal fovea deep, distinct (Fig. 27C). Elytral striae strongly convex, strongly carinate (except *G. californica*, *G. howdeni*, *texana*, and *confusa*) (Fig. 25C). Metasternal surface with ridges strong, raised behind mesocoxae, forming a supporting structure; metasternal groove distinct, shallow or deep. Mesotibial apex noticeably produced, apically rounded except large, long, apically acute in *G. confusa* and subgroup C, posterolateral emargination of mesotibia with 3 or 4 short, widely spaced spines (Fig. 19D). Posterior margin of metatrochanter unarmed, or serrate with series of tubercles, or with some small tubercles. Lateral metatibial, posteromedian projection, or series of small teeth. Apex of 5th abdominal ventrite emarginate in some species, smoothly rounded in others, sexually dimorphic in some but not others.

Three subgroups can be defined, subgroup C is thus far known from Mexico south to Costa Rica, and defined by the metatibial apex strongly projecting, apically acute (as in *G. phoenicis*), metatibia narrow basally, abruptly widened before apex, strongly microreticulate ventral surface, and modified apex of female 5th abdominal ventrite. Species in this group are; *G. costaricensis*, *G. dentata*, *G. donaldi*, *G. limbata*, and *G. zacateca*.

The other two subgroups have the mesotibial apex not strongly projecting, apically rounded (except *G. confusa*, *G. falli* and *G. texana* with apex as in Group C), metatibia wide, evenly widened from base to apex, ventral surface not strongly microreticulate, and apex of female 5th abdominal ventrite unmodified. They are known from northern Mexico, Baja California, Canada and United States, and distin-



guished from each other by type of metasternal groove which is weakly impressed with tapered sides in subgroup A., containing *G. texana*, *G. howdeni*, *G. californica*, *G. confusa*, and *G. falli*, and deeply, distinctly impressed with sides abruptly defined in subgroup B which contains *G. australis*, *G. gordonii*, *G. caenulenta*, *G. mendica*, *G. paramendica*, and *G. tumida*.

**Remarks.** This group contains 16 small, roughly sculptured species, many of which are found in habitats atypical of other groups and species of *Glaresis*. Some such as *G. confusa* are often attracted to light in areas with no known sand deposits, although often in arid regions. Metasternal ridges in this group are strongly raised behind the mesocoxal bases, seeming to form a supporting structure.

### Key to species of *Glaresis* - Mendica Group

1. Mesotibial apex strongly projecting laterally, projection apically acute (Fig. 34C); metatibia abruptly widened before apex; Mexico, Central America; subgroup C ..... **12**
- Mesotibial apex weakly projecting laterally, projection rounded (Fig. 29D) (except *G. confusa*, *G. falli*, and *G. texana* with apex strongly projecting, apically acute); metatibia gradually widened from base to apex (Fig. 19G); Mexico, Canada, United States; subgroups A, B ..... **2**
- 2(1). Metasternal groove shallow, at least inner border of groove tapered (Fig. 19D); subgroup A.. **3**
- Metasternal groove deep, distinct, sides abrupt, ridged (Fig. 27D); subgroup B ..... **7**
- 3(2). Outer margin of metatibia with series of small, regular teeth from base to apex, without large posteromedian lateral projection (Fig. 21F); Texas ..... ***G. texana* Gordon**
- Outer margin of metatibia with distinct posteromedian lateral projection (Fig. 20F); not known from Texas ..... **4**
- 4(3). Clypeal apex with large, widely spaced tubercles medially (Fig. 23B); metatibial posteromedian lateral projection large, apically bifid (Fig. 23F) ..... ***G. falli*, n. sp.**
- Clypeal apex with small, evenly spaced tubercles throughout (Fig. 22B); metatibial posteromedian lateral projection small, tooth-like (Fig. 22F) ..... **5**
- 5(4). Tubercles on head surface small, sparse (Fig. 22B); apex of mesotibia strongly projecting, apically acute; Alberta, Colorado, Utah ..... ***G. confusa* Brown**
- Tubercles on head large, dense (Fig. 19B); apex of mesotibia not strongly projecting, apically rounded ..... **6**
- 6(5). Posterosuperior metatrochanteral surface with 2 teeth (Fig. 19C); median lobe of male genitalia wide, apex broadly rounded (Fig. 19E) ..... ***G. californica*, n. sp.**
- Posterosuperior metatrochanteral surface with single tooth (Fig. 20C); median lobe of male genitalia slender, apically acute (Fig. 20E) ..... ***G. howdeni* Gordon**
- 7(2). Posterosuperior metatrochanteral surface with 2 teeth (Fig. 24G) ..... **8**
- Posterosuperior metatrochanteral surface with single tooth (Fig. 27G) ..... **10**
- 8(7). Metasternal sculpture with carinae straight, not irregular, pronotal carinae distinctly spaced, not dense; male genitalia with basal lobe slender, narrowed in basal 1/3, apex rounded (Fig. 26F); southern California ..... ***G. bautista*, n. sp.**
- Metasternal sculpture with carinae irregular, dense; pronotal carinae closely spaced; male genitalia not as described for *G. bautista*; not known from southern California ..... **9**
- 9(8). Metasternal sculpture irregular, forming reticulate pattern extended from apex to metacoxal cavity of metasternum (Fig. 24D); apical trochanteral margin with small teeth, teeth often not visible; male genitalia with basal lobe broad, apically rounded (Fig. 24E); Arizona, California, Mexico ..... ***G. mendica* Horn**

- Metasternal sculpture irregular, not forming reticulate pattern, not extended to metacoxal cavity (Fig. 25D); apical trochanteral margin with several distinct teeth; male genitalia with basal lobe narrow, apically acute (Fig. 25E); California, Idaho, Nevada, Wyoming ..... ***G. paramendica*, n. sp.**
- 10(7). Posteromedian lateral projection of metatibia large, pronounced (Fig. 29F); surface sculpture of frons and vertex composed of dense raised, irregular ridges coalesced into a reticulate pattern (Fig. 29B); Baja California Sur ..... ***G. australis*, n. sp.**
- Posteromedian lateral projection of metatibia small, not pronounced (Fig. 20F); surface sculpture of frons and vertex reduced, if ridges present then not forming a reticulate pattern; United States ..... **11**
- 11(10). Metasternum tumid, protuberant, with heavy, somewhat reticulate surface sculpture laterally (Fig. 30D); southeast Texas ..... ***G. tumida*, n. sp.**
- Metasternum flat or medially concave, surface sculpture comparatively light, not forming reticulate pattern; not known from southeast Texas ..... **12**
- 12(11). Posterosuperior metafemoral margin with single small tooth (Fig. 28H); posterior metatrochanteral margin serrate with several small teeth; median lobe of male genitalia wide, not “pinched” medially (Fig. 28F); New Mexico, west Texas ..... ***G. caenulenta*, n. sp.**
- Posterosuperior metafemoral margin without tooth, or occasionally with single, tiny, indistinct tooth; posterior metatrochanteral margin with 3 small teeth (Fig. 27G); median lobe of male genitalia slender, “pinched” medially (Fig. 17E); Arizona ..... ***G. gordonii* Warner**
- 13(1). Tubercles in median emargination of clypeal apex large, pronounced, tooth—like (Fig. 34B); metasternal groove widened from base to apex, apex extremely wide, nearly reaching metepimeron (Fig. 34D); Costa Rica ..... ***G. costaricensis*, n. sp.**
- Tubercles in median emargination of clypeal apex small, tubercles irregular but more or less equal in size across apical margin (Fig. 33B); metasternal groove not extremely widened, apex not approaching metepimeron ..... **14**
- 14(13). Metatibia with posterolateral projection (Fig. 33H); southern Mexico ..... **15**
- Metatibia without posterolateral projection, lateral flange usually serrate with small teeth (Fig. 35F); not known from southern Mexico ..... **16**
- 15(14). Metasternal surface lacking pronounced carinae arranged in reticulate pattern; surface of metafemur finely rugose, appearing smooth (Fig. 33G); Zacateca, Mexico ..... ***G. zacateca*, n. sp.**
- Metasternal surface with pronounced carinae arranged in reticulate pattern (Fig. 32D); surface of metafemur coarsely microreticulate; Puebla, Mexico ..... ***G. donaldi*, n. sp.**
- 16(14). Posterior margin of metatrochanter with series of large tubercles, second tubercle to trochanteral margin pronounced, tooth—like (Fig. 31F); surface of clypeus, apical portion of frons with large, dense tubercles (Fig. 31B); Guatemala ..... ***G. dentata*, n. sp.**
- Posterior margin of metatrochanter smooth, without tubercles (Fig. 35F); surface of clypeus and anteromedian portion of frons densely, finely rugose, with small, sparse tubercles (Fig. 35B); Mexico, Coahuila ..... ***G. limbata*, n. sp.**

### ***Glaresis californica* Gordon and Hanley, new species**

**Description. Male.** Length 2.7, width 1.3 mm; body form elongate, nearly parallel-sided, slightly widened from elytral base to apical 1/3 (Fig. 19A). Color yellowish brown. Head with clypeal surface and frons densely rugose, impunctate, with large, dense, irregular tubercles, setae short, barely evident;

vertex sparsely tuberculate, with faint trace of basal carina, surface rugose. Clypeal apex weakly emarginate, with large, irregular tubercles, appearing dentate, lateral angles feebly oblique, acute (Fig. 19B). Mandible pair symmetrical; mesal tooth strong; lateral prominence strong, pronounced; outer margin rounded. Pronotum with deep, long, transverse fovea in anterior 1/4 extended completely across pronotum, small slightly transverse fovea on each side of middle in anterior 1/2, wide, deep fovea on each side medially near lateral margin, deep central furrow extended from base to transverse furrow; surface densely rugose, with irregular, mostly vertical, dense setae-bearing carinae, setae decumbent, about 1/2 length of carina. Anterior and lateral pronotal margins not bordered, all margins crenulate. Elytra with surface feebly shiny, densely microreticulate; all striae distinctly, weakly carinate, carinae widely interrupted adjacent to space between interval punctures, each carinal segment bearing an apical seta about 2/3 length of segment; intervals with deep round punctures. Metasternum long, feebly shiny, finely, densely microreticulate, surface not tuberculate medially, laterally with some elongate, oblique, seta-bearing ridges, median area slightly depressed, with faint trace of carina extended anteriorly from apical keel; metasternal groove weak, distinct, inner margin not ridged, outer margin not ridged (Fig. 19D). Lateral protibial teeth unevenly spaced, basal two teeth close together. Mesotibia with 4 short, widely spaced spines laterally, tibia slightly projecting at apex (Fig. 19D). Posterior metatrochanteral margin lacking teeth, feebly serrate, posterosuperior metatrochanteral surface with 2 large teeth (Fig. 19C). Metafemoral surface with widely scattered, elongate, setae-bearing tubercles, microreticulate, shiny throughout; width to length ratio 1.0:1.5, with narrow flange on anterior margin; posterosuperior margin without teeth (Fig. 19G). Metatibia broadly triangular, surface entirely microreticulate, with large, bifid, posteromedian lateral projection, medially with irregular row of coarse tubercles extended from base nearly to apex, inner margin smooth, pubescent (Fig. 19F). Apical margin of 5th ventrite broadly, weakly emarginate. Genitalia long, basal piece longer than parameres, proximal end curved; median lobe shorter than parameres, wider at middle than a paramere, slightly curved upward in apical 1/3, apex somewhat acute in ventral view; paramere straight in lateral view, slightly sinuate on inner margin, apex bluntly rounded (Fig. 19E).

**Female.** Apex of 5th abdominal ventrite with wide, shallow emargination.

**Variation.** Length 3.0 to 3.4 mm, width 1.7 to 1.9 mm. Size and spacing of apical clypeal tubercles varies slightly from the typical; tubercles on surface of clypeus and frons vary from large, dense, to smaller, more widely spaced; number of tubercles in median row of metatibia vary from 4 to 5.

**Type material.** Holotype male: **California:** CALIF: Inyo Co, 2.5 mi. NNE Big Pine, VIII-27-81/XIXI-22-81, D. Giuliani 3940' (USNM). Paratypes, 3: (1) CALIF: Calaveras Co., 2.7 mi. N. Camp Connell, VI-22-1975, Fred G. Andrews; (1) CALIF: Mono Co, Mono Lake, Sulfur Pond, VIII-2 to VII-25-1981, J. Harris coll; (1) CALIF: Mono Co., Tom's Place, VI-14 to VII-7-1979, D. Giuliani, antifreeze trap. (CASC) (USNM).

**Remarks.** This species differs from other subgroup A members by the presence of 2 teeth on the posterosuperior metatrochanteral margin. It and *G. howdeni* are also the least roughly sculptured members of the subgroup. *Glaresis californica* has a distinctive, densely, strongly tuberculate head surface; apex of mesotibia apically rounded, not strongly projecting; and unique male genitalia.

**Etymology.** The species is named for the state in which it occurs, name used as a noun in apposition.

### ***Glaresis howdeni* Gordon**

*Glaresis howdeni* Gordon 1970: 504.

**Description. Male.** Length 3.1, width 1.8 mm; body form elongate, slightly widened from elytral base to apical 1/3 (Fig. 20A). Color yellowish brown. Head with clypeal surface and frons densely rugose, impunctate, with large, dense, irregular tubercles, setae short, barely evident; vertex not tuberculate, without trace of basal carina, surface rugose. Clypeal apex weakly emarginate, with small, irregular

tubercles, appearing dentate, lateral angles feebly oblique, acute (Fig. 20B). Mandible pair symmetrical; mesal tooth strong; lateral prominence strong, pronounced; outer margin rounded. Pronotum with deep, long, transverse fovea in anterior 1/4 extended completely across pronotum, small slightly transverse fovea on each side of middle in anterior 1/2, wide, deep fovea on each side medially near lateral margin, deep central furrow extended from base to transverse furrow; surface densely rugose, with irregular, mostly vertical setae-bearing carinae, setae semidecumbent, about 1/2 length of carina. Anterior and lateral pronotal margins not bordered, all margins except anterior crenulate. Elytra with surface feebly shiny, densely microreticulate; all striae distinctly, weakly carinate, carinae widely interrupted adjacent to space between interval punctures, each carinal segment bearing an apical seta about 2/3 length of segment; intervals with deep round punctures. Metasternum long, dull, finely, densely microreticulate, surface not tuberculate medially, laterally with some elongate, oblique, seta-bearing ridges, median area slightly depressed, with faint trace of carina extended anteriorly from apical keel; metasternal groove weak, distinct, inner margin not ridged, outer margin not ridged (Fig. 20D). Lateral protibial teeth unevenly spaced, basal two teeth close together. Mesotibia with 3 short, widely spaced spines in postero-lateral emargination, tibia slightly projecting at apex, apically rounded (Fig. 20D). Posterior metatrochanteral margin lacking teeth, very slightly serrate, posterosuperior metatrochanteral surface with 1 large tooth (Fig. 20C). Metafemoral surface with small, widely scattered, slightly elongate, setae-bearing tubercles, microreticulate, slightly shiny throughout; width to length ratio 1.0:1.6, with narrow flange on anterior margin; posterosuperior margin without teeth (Fig. 20G). Metatibia broadly triangular, surface entirely microreticulate, with large, bifid, posteromedian lateral projection, row of small teeth anterior to lateral projection, medially with irregular row of coarse tubercles extended from base nearly to apex, inner margin smooth, pubescent (Fig. 20F). Apical margin of 5th ventrite broadly, weakly emarginate. Genitalia long, basal piece slightly longer than parameres, proximal end curved; median lobe longer than parameres, gradually narrowed from near base to acute apex, as wide at middle as a paramere, slightly curved upward in apical 1/3, apex acute in ventral view; paramere straight in lateral view, apex bluntly rounded (Fig. 20E).

**Female.** Apex of 5th abdominal ventrite same as in male.

**Variation.** Some specimens have a second, extremely small, barely visible trochanteral tooth.

**Type locality.** California, Kern Co., Alta Sierra, 5800'.

**Type depository.** CNIC.

**Temporal distribution.** June.

**Geographical distribution. UNITED STATES. California:** Inyo Co., 12 mi. E. Big Pine, Inyo Mts., 7700'; Kern Co., Alta Sierra, 5800; Mono Co., Benton Sta.; Mono Co., Larkin Lake; L. Big Rock Cr. P. C.; Siskiyou Co., Horn Ranch. (CASC) (USNM)

**Remarks.** This species is in subgroup A because of the weakly impressed metasternal groove. It is distinguished from other subgroup members by a combination of small, closely spaced tubercles on clypeal apex; large, dense tubercles on clypeus and frons; posterosuperior metatrochanteral surface with single large tooth; unique male genitalia; and montane type locality. It is very similar to *G. californica*, but the distinctive male genitalia and differing number of posterosuperior metatrochanteral teeth characterize each. See Remarks under *G. californica*.

Gordon (1970) stated that *G. howdeni* had 2 teeth on the posterosuperior surface of the metatrochanter, but reexamination of the type specimen shows that it has only a single tooth.

### ***Glaresis texana* Gordon**

*Glaresis texana* Gordon 1970: 506

**Description. Male.** Length 2.8 mm, width 1.6 mm; body form short, robust, widened from elytral base to apical 1/3 (Fig. 21A). Color yellowish brown. Head with clypeal surface and frons densely rugose, impunctate, with small, irregular, dense tubercles, setae short, barely evident; vertex without basal carina, surface rugose, with scattered tubercles. Clypeal apex weakly emarginate, with small tubercles, appearing dentate, lateral angles feebly oblique, acute (Fig. 21B). Mandible pair symmetrical; mesal tooth strong; lateral prominence strong, pronounced; outer margin abruptly rounded. Pronotum with deep, long, transverse fovea in anterior 1/4 extended completely across pronotum, small, slightly transverse fovea on each side of middle in anterior 1/2, wide, deep fovea on each side medially near lateral margin, deep central furrow extended from base to transverse furrow; surface densely rugose, with irregular, mostly vertical, dense seta-bearing carinae, setae decumbent, nearly as long as carinae (Fig. 21C). Anterior and lateral pronotal margins not bordered, all margins crenulate. Elytra with surface feebly shiny, densely microreticulate; all striae distinctly, weakly carinate, carinae widely interrupted adjacent to space between interval punctures, each carinal segment bearing an apical seta about 2/3 length of segment; intervals with deep, slightly rectangular punctures. Metasternum long, surface dull, finely, densely microreticulate, not tuberculate medially, laterally with some elongate, oblique, setae-bearing ridges, median area slightly depressed, with faint trace of carina extended anteriorly from apical keel; metasternal groove weak, distinct, inner margin rounded, outer margin ridged (Fig. 21D). Lateral protibial teeth unevenly spaced, basal two teeth close together. Mesotibia with 4 short, widely spaced spines laterally, tibial apex projecting and apically acute (Fig. 21D). Posterior metatrochanteral margin lacking teeth, feebly serrate, posterosuperior metatrochanteral surface with 1 tooth. Metafemoral surface with widely scattered, elongate, setae-bearing tubercles, microreticulate, dull throughout; width to length ratio 1.0:1.5, with broad flange on anterior margin; posterosuperior margin without teeth (Fig. 21G). Metatibia broadly triangular, surface entirely microreticulate, without large posteromedian lateral projection, lateral margin with series of small, regular teeth from base to apex, an irregular row of coarse tubercles extended from base nearly to apex medially, inner margin smooth, pubescent (Fig. 21F). Apical margin of male 5th abdominal ventrite truncate. Genitalia long, basal piece longer than parameres, proximal end curved; median lobe shorter than parameres, twice as wide at middle as paramere, slightly curved upward in apical 1/3, apex somewhat acute in ventral view; paramere straight in lateral view, narrow, flattened, straight, tapered from base to bluntly rounded apex (Fig. 21E).

**Female.** Apical margin of 5th abdominal ventrite broadly emarginate medially.

**Variation.** Length 2.8 to 3.3 mm, width 1.6 to 1.9 mm. Color pale yellowish brown to dark yellowish brown. Clypeal apex weakly to strongly emarginate medially.

**Type locality.** Texas, Del Rio.

**Type depository.** CNIC

**Temporal distribution.** April-August.

**Geographical distribution. UNITED STATES. Kansas:** Meade Co., Meade. **Texas:** Brewster Co., Big Bend National Park, Oak Spring; Culberson Co., Pine Springs; Menard Co., Menard; Randall Co., Palo Duro State Park; Val Verde Co., Langtry; Val Verde Co., Del Rio; Val Verde Co., Seminole Canyon SP. (CAS) (FSCA) (MJPC) (RCCC) (TAMU) (USNM).

**Remarks.** This species is distinguished from other members of the group by lack of metatibial postero-medial lateral projection; lack of apical metatrochanteral teeth; and small, flat male genitalia. The mesotibial figure shows only 3 lateral spines because 1 has been broken off.

All specimens except those from Culberson Co., Menard Co. and Randall Co. were taken in the Rio Grande valley. The Palo Duro Canyon, Texas, and Meade Co., Kansas, localities are particularly disjunct, an indication that *G. texana* may occur in other specialized habitats far north of the type locality.



***Glaresis confusa* Brown**

*Glaresis confusa* Brown 1928: 75; Gordon 1970: 507; Ratcliffe and Paulsen 2008: 63.

**Description. Male.** Length 2.7 mm, width 1.6 mm; body form short, robust, widened from elytral base to apical 1/3 (Fig. 22A). Color pale yellowish brown. Head with clypeal surface and frons densely rugose, impunctate, with small, irregular tubercles, setae short, barely evident; vertex without basal carina, surface rugose, without tubercles. Clypeal apex truncate or weakly emarginate, with small tubercles, appearing dentate, lateral angles feebly oblique, acute (Fig. 22B). Mandible pair symmetrical; mesal tooth strong; lateral prominence strong, pronounced; outer margin angulate. Pronotum with deep, long, transverse fovea in anterior 1/4 extended completely across pronotum, small, slightly transverse fovea on each side of middle in anterior 1/2, wide, deep fovea on each side medially near lateral margin, deep central furrow extended from base to transverse furrow; surface densely rugose, with irregular, mostly vertical, dense setae-bearing carinae, setae decumbent, 1/2 length of carinae. Anterior and lateral pronotal margins not bordered, all margins crenulate. Elytra with surface feebly shiny, densely microreticulate; all striae distinctly, strongly carinate, carinae narrowly interrupted adjacent to space between interval punctures, each carinal segment bearing an apical seta about 1/2 length of segment; intervals with deep, slightly rectangular punctures (Fig. 22C). Metasternum long, surface dull, finely, densely microreticulate, not tuberculate medially, laterally with some elongate, oblique, setae-bearing ridges, median area depressed, without carinae; metasternal groove weak, distinct, inner margin tapered, outer margin weakly ridged (Fig. 22D). Lateral protibial teeth unevenly spaced, basal two teeth close together. Mesotibia with 4 short, widely spaced spines laterally, distinctly projecting at apex, tibial projection apically acute (Fig. 22D). Posterior metatrochanteral margin lacking teeth, smooth, posterosuperior metatrochanteral surface with single tooth. Metafemoral surface with widely scattered, elongate, setae-bearing tubercles, microreticulate, dull throughout; width to length ratio 1.0:1.6, with broad flange on anterior margin; posterosuperior margin without teeth (Fig. 22G). Metatibia broadly triangular, surface entirely microreticulate, outer margin with small tooth at apical 2/3, and series of small, regular teeth from base to apex, an irregular row of coarse tubercles extended from base nearly to apex medially, inner margin smooth, pubescent (Fig. 22F). Apical margin of 5th abdominal ventrite slightly acute medially. Genitalia short, basal piece slightly shorter than parameres, proximal end straight; median lobe slightly shorter than parameres, twice as wide at middle as paramere, slightly curved upward in apical 1/3, apex broadly rounded in ventral view; paramere tapered in lateral view, not flattened, tapered from base to nearly truncate apex (Fig. 21E).

**Female.** Apex of 5th abdominal ventrite weakly rounded.

**Variation.** Length 2.7 to 2.9 mm, width 1.6 to 1.7 mm.

**Type locality.** Utah, Iron Co., Cedar City, Coal Creek Canyon, 5700'.

**Type depository.** KSUC.

**Temporal distribution.** June-July.

**Geographical distribution.** **CANADA. Alberta:** Tp. 1, Rge. 5, W. 4 (Pinhorn Ranch 15 km south of Onefour). **UNITED STATES. Colorado:** Fremont Co., 4mi. NE Canon City; Nunn Co., Pawnee Grassland. **Nebraska:** Dawes Co., Chadron, Chadron State Park. **New Mexico:** Bernalillo Co., Tijeras, 6600'. **South Dakota:** Fall River Co., Angostura Dam, S of Hot Springs. **Utah:** Iron Co., Cedar City, Coal Creek Canyon, 5700; Wayne Co., Bull Creek, 5000', 15 mi. S. Hanksville. (CMNC) (CMNH) (CNIC) (USNM).

**Remarks.** Most similar to *G. howdeni*, *G. confusa* is distinguished from that species by the small, sparse head tubercles, projecting, apically acuminate apex of mesotibia, form of male genitalia, and more eastern distribution. The mesotibial figure shows only 3 lateral spines because 1 has been broken off.

***Glaresis falli* Gordon and Hanley, new species**

**Description. Male.** Length 3.4 mm, width 1.8 mm; body form short, slightly elongate, nearly parallel-sided, slightly widened from elytral base to apical 1/3 (Fig. 23A). Color dark yellowish brown. Head with clypeal surface smooth, dull, frons finely microreticulate, clypeus and frons with pronounced, dense, transversely ovate tubercles, setae short, barely evident; vertex without basal carina, surface coarsely, densely reticulate. Clypeal apex medially emarginate, with large, widely spaced tubercles medially, lateral tubercles small, dense, lateral angles feebly oblique, angulate (Fig. 23B). Mandible pair symmetrical; mesal tooth strong; lateral prominence strong, pronounced; outer margin angulate. Pronotum with deep, long, transverse fovea in anterior 1/4 extended completely across pronotum, small slightly transverse fovea on each side of middle in anterior 1/2, wide, deep fovea on each side medially near lateral margin, central furrow deep in basal 1/3, shallow and barely evident in apical 2/3; surface densely rugose, with irregular, mostly vertical, dense, setae-bearing carinae, small, irregularly transverse carinae present in foveae on each side of middle, setae decumbent, about 1/2 length of carinae. Anterior and lateral pronotal margins not bordered, apical and basal margins crenulate. Elytra with surface feebly shiny, densely microreticulate; all striae distinctly, strongly carinate, carinae narrowly interrupted adjacent to space between interval punctures, each carinal segment bearing an apical seta about 1/2 length of segment; intervals with deep, slightly rectangular punctures (Fig. 23C). Metasternum long, surface dull, finely, densely microreticulate, not tuberculate medially, laterally with dense, strong, elongate, oblique, setae-bearing ridges, median area flat, with weak carina extended from apical keel 2/3 distance to mesocoxae; metasternal groove weak, distinct, inner margin tapered, outer margin weakly ridged (Fig. 23D). Lateral protibial teeth almost evenly spaced, basal two teeth not noticeably close together. Mesotibia with 4 short, widely spaced spines laterally, distinctly projecting at apex, tibial projection apically rounded (Fig. 23D). Posterior metatrochanteral margin lacking teeth, posterosuperior metatrochanteral surface with 1 tooth. Metafemoral surface with widely scattered, elongate, setae-bearing tubercles, microreticulate, dull throughout; width to length ratio 1.0:1.6, with narrow flange on anterior margin; posterosuperior margin with 1 very small tooth (Fig. 23G). Metatibia broadly triangular, surface entirely microreticulate, outer margin with large, bifid, posteromedian lateral projection, and series of small, regular teeth on lateral margin from base to posteromedian projection, regular row of 5 coarse tubercles extended from base nearly to apex medially, inner margin smooth, pubescent (Fig. 23F). Apical margin of 5th abdominal ventrite broadly rounded, barely, almost imperceptibly emarginate medially. Genitalia short, basal piece slightly shorter than parameres, proximal end curved; median lobe slightly shorter than parameres, as wide at middle as paramere, curved upward in apical 1/3, apex acute in ventral view; paramere tapered in lateral view, not flattened, tapered from base to nearly rounded apex (Fig. 23E).

**Female.** Apex of 5th abdominal ventrite with wide, shallow emargination.

**Variation.** Length 3.0 to 3.4 mm, width 1.7 to 1.9 mm. Size and spacing of apical clypeal tubercles varies slightly from the typical; tubercles on surface of clypeus and frons vary from large, dense, to smaller, more widely spaced; number of tubercles in median row of metatibia vary from 4 to 5.

**Type material.** Holotype male: **California:** USA: CALIFORNIA: San Bernardino Co., 0.5mi.E.jct. Riverside Dr.&Stover St., Fontana Delhi dune, light, 34°03'59"N - 117°21'38"W, P.E. Skelley & R. Cunningham (FSCA). Paratypes, 74: 8) same data as holotype; (1) USA: CA: San Bernardino Co., Colton Dunes, 34°04'N 117°18'W, 29 May 2003, A.B.T. Smith; (6) USA:CA: San Berndo, nr. Colton, 34 03'55"N, 117 21'33"W; sand dunes, May 15. 2010:UV:WBWarner; (35) USA: CA: Riverside Co., Colton Dunes, 312 m, 34°03.944'N 117°21.957'W, 26 April 2004, Hawks, Ocampo, Paulsen, Smith. (29) USA:CA: San Bernardino Col, Colton Dunes, UV/MV, 26, 29 APR 2004; coll. Hawks, Paulsen, Smith, Ocampo; (3) CALIFORNIA: San Bdo. Co., Colton, dunes Stover Ave, 24 Apr. 2001, D. C. Hawks. (CMNC) (FSCA) (MJPC) (RCCC) (USNM) (WBWC) (WSCW)

**Remarks.** This species differs from other group members by a clypeal apex with median tubercles large, widely separated, lateral tubercles small, closely spaced; pronotum with central furrow deep in basal 1/3, weakly impressed in apical 2/3; and metatibial posteromedian lateral projection large, apically bifid. *Glaresis falli* is present in large numbers at the Colton dunes site which is an unprotected and somewhat

damaged set of dunes (R. Cunningham, pers. com.). The Delhi Sand Dunes were the subject of an article by Longcore (1997), in which he states that they are remnants of the only inland sand dune system in the Los Angeles basin, and that the dunes originally extended from Lytle Creek and other small creeks to the Santa Ana River and Jurupa Hills to the south and across the Ontario plain into Loma Linda. Now heavily damaged and reduced in size, the dunes future survival is in doubt.

**Etymology.** The species is named for H. C. Fall, once a resident of Pasadena, California, who had a single undetermined specimen of this species in his collection (W. Warner, pers. com.). Fall described two species of *Glaresis*, and was one of the dominant figures in early American coleopterology along with J. LeConte and G. Horn.

### ***Glaresis mendica* Horn**

*Glaresis mendica* Horn, 1885:117; Warner, 1995:267.

**Distribution. Male.** Length 3.0 to 3.5 mm, width 1.7 to 3.0 mm; body form short, robust, slightly widened from elytral base to apical 1/3 (Fig. 24A). Color dark brown. Head with clypeal surface and frons densely rugose, reticulate with irregular ridges, with scattered large, irregular tubercles, setae short, indistinct; vertex without basal carina, surface rugose, reticulate with very irregular ridges, without tubercles or setae. Clypeal apex weakly truncate, with large, evenly spaced tubercles, appearing dentate, lateral angles oblique, acute (Fig. 24B). Mandible pair symmetrical; mesal tooth strong; lateral prominence strong, pronounced; outer margin rounded. Pronotum with deep, long, transverse fovea in anterior 1/4 extended completely across pronotum, small, slightly transverse fovea on each side of middle in anterior 1/2, wide, deep fovea on each side medially near lateral margin, deep central furrow extended from base to transverse furrow; surface densely rugose, with dense setae-bearing carinae, carinae mostly straight in anterior 1/2, very irregular and mostly irregularly T-shaped in basal 1/2, setae decumbent, about 1/2 length of carina; anterior and lateral pronotal margins not bordered, all margins crenulate. Elytra with surface feebly shiny, densely microreticulate; all striae strongly carinate, carinae appearing continuous but narrowly interrupted adjacent to space between interval punctures, each carinal segment bearing an apical seta about 2/3 length of segment; intervals with deep round punctures (Fig. 24C). Metasternum long, feebly shiny, finely, densely microreticulate, median surface not tuberculate medially, laterally with irregular ridges forming reticulate pattern extended from mesocoxal cavity to metasternal apex, median area slightly depressed, with distinct median carina extended anteriorly from apical keel to, or nearly to, mesocoxae; metasternal groove strong, deep, inner margin abruptly tapered, outer margin ridged (Fig. 24D). Lateral protibial teeth evenly spaced. Mesotibia with 4 short, widely spaced spines laterally, tibia slightly projecting at apex (Fig. 24D). Posterior metatrochanteral margin with 3 small teeth; posterosuperior surface of metatrochanter with 2 large teeth, or bifid single tooth, outer tooth visible directly in ventral view (Fig. 24G), often both teeth visible in ventral view. Metafemoral surface with widely scattered, elongate, setae-bearing tubercles, microreticulate; width to length ratio 1.0:1.6, with wide flange on anterior margin; posterosuperior margin without teeth or with faint suggestion of single tooth. Metatibia broadly triangular, surface entirely microreticulate, with small, bifid tooth on outer margin postmedially, small teeth on outer margin extended from near base to bifid tooth, an irregular row of coarse tubercles extended from base nearly to apex medially, inner margin smooth, pubescent (Fig. 24F). Apical margin of 5th abdominal ventrite with broad, weak, barely visible emargination. Genitalia long, basal piece longer than parameres, proximal end curved; median lobe shorter than parameres, wider at middle than a paramere, slightly curved upward in apical 1/3, apex rounded in ventral view; parameres straight in lateral view, slightly sinuate on inner margin, apex bluntly rounded (Fig. 24E).

**Female.** Apex of 5th abdominal ventrite same as in male.

**Variation.** Length 3.0 to 3.5 mm, width 1.7 to 3.0 mm. Head sculpture varies from quite pronounced to somewhat reduced; metasternal ridges vary slightly in extent and degree of development.

**Type locality.** Arizona.

**Type depository.** MCZ.

**Temporal distribution.** May-July.

**Geographical distribution.** UNITED STATES. **Arizona:** Cochise Co., Chiricahua Mts., Tex Canyon, 5300'; Coconino Co., Sedona, 2 mi. north. **New Mexico:** Hidalgo Co., 37 mi. S. Animas, Douglas Road. (CMNC) (SMCC) (USNM).

**Remarks.** See Remarks under *G. paramendica*. This is a rarely collected species discussed by Warner (1995). Gordon (1970) described the common Arizona species, *G. gordonii* Warner, as *G. mendica*, an error discovered and corrected by Warner (1995).

### ***Glaresis paramendica* Gordon and Hanley, new species**

**Description. Male.** Length 3.4 mm, width 1.8 mm; body form short, robust, slightly widened from elytral base to apical 1/3 (Fig. 25A). Color yellowish brown. Head with clypeal surface and frons densely rugose, reticulate with irregular ridges, with large, irregular tubercles throughout except small, round area at middle between eyes lacking tubercles, setae short, indistinct; vertex without basal carina, surface rugose, reticulate with very irregular ridges, without tubercles or setae. Clypeal apex weakly emarginate, with small, evenly spaced tubercles, appearing somewhat serrate, lateral angles oblique, acute (Fig. 25B). Mandible pair symmetrical; mesal tooth strong; lateral prominence strong, pronounced; outer margin slightly angulate. Pronotum with deep, long, transverse fovea in anterior 1/4 extended completely across pronotum, small slightly transverse fovea on each side of middle in anterior 1/2, wide, deep fovea on each side medially near lateral margin, deep central furrow extended from base to transverse furrow; surface densely rugose, with dense setae-bearing carinae, carinae mostly straight in anterior 1/2, mostly irregularly straight in basal 1/2, setae decumbent, about 1/2 length of carina; anterior and lateral pronotal margins not bordered, all margins crenulate. Elytra with surface dull, densely microreticulate; all striae strongly carinate, carinae appearing continuous but narrowly interrupted adjacent to space between interval punctures, each carinal segment bearing an apical seta about 2/3 length of segment; intervals with deep round punctures (Fig. 25C). Metasternum long, dull, finely, densely microreticulate, median surface not tuberculate medially, laterally with short, irregular ridges not forming reticulate pattern, median area slightly depressed, with distinct median carina extended anteriorly from apical keel to, or nearly to, mesocoxae; metasternal groove wide, deep, both sides abruptly ridged (Fig. 25D). Lateral protibial teeth not evenly spaced, 2nd and 3rd teeth close together. Mesotibia with 4 short, widely spaced spines laterally, tibia slightly projecting at apex. Posterior metatrochanteral margin serrate with several teeth; outer trochanteral angle with large apical tooth; posterosuperior surface of metatrochanter with 2 large teeth, 1 large tooth visible directly in ventral view (Fig. 25G), usually both teeth visible. Metafemoral surface with widely scattered, elongate, setae-bearing tubercles, microreticulate; width to length ratio 1.0:1.6, with narrow flange on anterior margin; posterosuperior margin with single tooth. Metatibia broadly triangular, surface entirely microreticulate, with large, bifid posteromedian lateral projection, a row of small teeth on outer margin from near base to lateral projection, an irregular row of coarse tubercles extended from base nearly to apex medially, inner margin smooth, pubescent (Fig. 25F). Apical margin of 5th abdominal ventrite broadly, weakly emarginate, emargination barely visible. Male genitalia long, basal piece longer than parameres, strongly curved, proximal end curved; median lobe shorter than parameres, narrower at middle than a paramere, slightly curved upward in apical 1/3, tapered from base to apex, apex angled to middle, middle acute in ventral view; parameres curved in lateral view, slightly sinuate on inner margin, apex bluntly rounded (Fig. 25E).

**Female.** Apex of 5th abdominal ventrite truncate.

**Variation.** Length 3.2 to 3.4 mm, width 1.7 to 1.8 mm. One specimen was observed with 5 lateral mesotibial teeth. Teeth on posterosuperior margins of trochanter and metatibia usually easily visible in



direct view, but occasionally reduced in size, not visible in direct view.

**Type material.** Holotype female: **Nevada:** Carson City NV, Ash Cyn (Canyon) Burn, VI-10-1981, J. B. Knight, Reseeded burn (CSCA). Paratypes, 27: (2) same data as holotype; (2) same data as holotype, except "Unburned area;" (1) NV: Hwy. 844 and Toiyabe Nat. For., 5.VII.93, Lot 2 BF&JL Carr; (1) Nye Co., 5mi N 10mi E Carrant, 7000' Current (sic) Summit, III-28 to X-1-1982, GBY, Derham Giuliani, Collected in Ethylene glycol pit trap; (2) Nye Co., Toquima Range, Charnock Pass, 6 mi. N, 15 mi. E Carvers, 8300', IX-1986-IX-1987, D. Giuliani, pit trap; (1) **California:** (1) Mono Co., east side Big Alkali Lk., sand dunes, VI-16 to VIII-17-79, Guiliani, antifreeze pit trap; (1) Mono Co., 6900', Long Valley, Big Alkali Lake, sand dunes, X-24-1982 to X-18-1983, Antifreeze pit trap, sand dunes, D. Giuliani; (1) **Idaho:** Butte Co., 6 mi. S. Howe, Vi-II-1981; (1) 19 Km. N. of Parker, 7.vi.06, Lot 2, BF&JL Carr; (1) Owyhee Co., Bruneau Dunes, 3 km NE Bruneau, 21 June, 1982, Steiner, Gordon & Whitehead collrs. Canada. (4) **British Columbia:** (1) BC. Green Mtn., Old Apex Mtn Rd, 18.VI. 1932, and 23.VII.1932, H Kirk, fall trap open south slope, 3000' el.; (8) BC. Keremeos Creek, 2000' El., 16.VII.1932, 18.VI.1932, and 23.VII.1932, H. Kirk, fall trap sage brush flat. (BGDC) (CASC) (CNIC) (CSCA) (JCIC) (UBCV) (USNM).

**Other specimens.** 6: (2) **California:** Calaveras Co., 2.7 mi. N Camp Connell, Vi-22-1975, Fred G. Andrews; Inyo Co., 12 mi. E. Big Pine, Inyo Mts., 7700', I-30 to VIII-21-82, D. Giuliani, Antifreeze Pitfall Trap. (1) **Colorado:** Fremont Co., 4 mi. NE Canon City. (1) **Nevada:** Clark Co., Newberry Mountains, Grapevine Canyon, 35° 14' N, 114° 42' W, elev. 2360 ft., 20-IX-2005, S. M. Clark; (2) **Wyoming:** (Lincoln Co.) Kemmerer, June 1963, R. Parmenter. (BYUC) (RAAC) (USNM) (WBWC).

**Remarks.** *Glaresis paramendica* has a distinctly more northern distribution than does *G. mendica* and is more frequently collected. This species has a roughly sculptured surface most resembling that of *G. mendica*. It is distinguished from that species primarily by outer angle of metatrochanter bearing a large tooth; surface ridges on vertex of head irregularly straight, not T-shaped; color yellowish brown; and basal lobe of male genitalia apically acute. The ventral surface of *G. mendica* as a whole is noticeably more heavily rugose than that of *G. paramendica*. Both of these species are distinguished by the presence of 2 large teeth on the superior metatrochanteral surface, a character that distinguishes them from all other members of subgroup B, mendica group, except *G. bautista*. See Remarks under that species.

The 2 California paratypes are from the same Mono Co. area as several specimens of *G. californica*. The specimens from Kemmerer, Lincoln Co., Wyoming, are apparently this species, but not included as paratypes.

**Etymology.** The species is named for its similarity to *G. mendica*.

### ***Glaresis bautista* Gordon and Hanley, new species**

**Description. Male.** Length 2.8 mm, width 1.5 mm; body form short, robust, slightly widened from elytral base to apical 1/3 (Fig. 26A). Color yellowish brown. Head with clypeal surface and frons densely rugose, with large, irregular tubercles scattered throughout, setae short, indistinct; vertex without basal carina, surface rugose, reticulate with large, irregular tubercles. Clypeal apex essentially truncate, with large, evenly spaced tubercles, lateral angles oblique, acute (Fig. 26B). Mandible pair symmetrical; mesal tooth strong; lateral prominence strong, pronounced; outer margin slightly angulate. Pronotum with deep, long, transverse fovea in anterior 1/4 extended completely across pronotum, small slightly transverse fovea on each side of middle in anterior 1/2, wide, deep fovea on each side medially near lateral margin, deep central furrow extended from base to transverse furrow; surface densely rugose, with distinctly separated, setae-bearing carinae, carinae straight, setae decumbent, about 1/2 length of carina (Fig. 26C); anterior and lateral pronotal margins not bordered, basal and lateral margins margins crenulate. Elytra with surface dull, densely microreticulate; all striae strongly carinate, carinae appearing continuous but narrowly interrupted adjacent to space between interval punctures, each carinal segment bearing an apical seta about 2/3 length of segment; intervals with deep round punctures. Metasternum long, dull, finely, densely microreticulate, median surface not tuberculate medially, with short, straight ridges not forming reticulate pattern, median area slightly depressed, with distinct median carina ex-



tended anteriorly from apical keel 1/3 distance to mesocoxae; metasternal groove wide, deep, both sides ridged (Fig. 26D). Lateral protibial teeth not evenly spaced, 2nd and 3rd teeth close together. Mesotibia with 4 short, widely spaced spines laterally, tibia slightly projecting at apex (Fig. 26D). Posterior metatrochanteral margin serrate with 4 teeth; outer trochanteral angle acute; posterosuperior surface of metatrochanter with 2 large teeth, 1 large tooth slightly visible directly in ventral view, teeth close together (Fig. 26G). Metafemoral surface with widely scattered, elongate, setae-bearing tubercles, microreticulate; width to length ratio 1.0:1.6, with wide flange on anterior margin; posterosuperior margin with single tooth. Metatibia triangular, surface entirely microreticulate, with small posteromedian lateral projection on lateral margin preceded by row of small, even teeth, an irregular row of sparse, coarse tubercles extended from base nearly to apex medially, inner margin smooth, pubescent (Fig. 26F). Apical margin of 5th abdominal ventrite broadly, weakly emarginate, emargination barely visible. Male genitalia long, basal piece shorter than parameres, strongly curved, proximal end curved; median lobe shorter than parameres, narrower at middle than a paramere, slightly curved upward in apical 1/3, tapered from base to apex, apex rounded in ventral view; parameres curved in lateral view, slightly sinuate on inner margin, apex bluntly rounded (Fig. 26E).

**Female.** Apex of 5th abdominal ventrite truncate.

**Variation.** Length 3.2 to 3.4 mm, width 1.7 to 1.8 mm. Teeth on posterosuperior margins of trochanter and metatibia usually easily visible in direct view, but occasionally reduced in size, not visible in direct view.

**Type material.** Holotype male: **California:** CALIF: Riverside Co., SE of Hemet, Bautista Cny. Site 2, blacklight 3-V-2004, Paulsen, Smith, & Hawks (CASC). Paratypes, 3; (1) same data as holotype; (2): USA: CA: Riverside Co., Hemet, Bautista Canyon, 33°41.776N 116°51.191'W, 657 m, 3 MAY 2004, Bruyea, Hawks, Paulsen, Smith, Ocampo. (CASC) (CMNC) (MJPC).

**Other specimen:** Riverside Co., Menifee Vly (hills on west end). (UCRC)

**Remarks.** *Glaresis bautista* is the 3rd species of subgroup C with 2 large teeth on the posterosuperior metatrochanteral margin. It is distinguished from the other 2 species by its relatively sparse pronotal and metasternal carinae; form of male genitalia; and geographical distribution.

**Etymology.** This species is named for the type locality, name used as a noun in apposition.

### *Glaresis gordonii* Warner

*Glaresis gordonii* Warner 1995: 268; Gordon 1970: 505 (as *G. mendica*).

**Description. Male.** Length 2.7, width 1.4 mm; body form short, robust, slightly widened from elytral base to apical 1/3 (Fig. 27A). Color yellowish brown. Head with clypeal surface and frons densely rugose, reticulate with small, irregular ridges, with scattered large, irregular tubercles, setae short, indistinct; vertex without basal carina, surface rugose, reticulate with small, very irregular ridges, without tubercles or setae. Clypeal apex weakly emarginate, with small, evenly spaced tubercles, appearing dentate, lateral angles oblique, acute (Fig. 27B). Mandible pair symmetrical; mesal tooth strong; lateral prominence strong, pronounced; outer margin abruptly rounded. Pronotum with deep, long, transverse fovea in anterior 1/4 extended completely across pronotum, small, slightly transverse fovea on each side of middle in anterior 1/2, wide, deep fovea on each side medially near lateral margin, deep central furrow extended from base to transverse furrow; surface densely rugose, with sparse setae-bearing carinae, carinae mostly slightly irregular throughout, setae decumbent, about 1/2 length of carina (Fig. 27C); anterior and lateral pronotal margins not bordered, all margins crenulate. Elytra with surface feebly shiny, densely microreticulate; all striae with low carinae, carinae appearing continuous but narrowly interrupted adjacent to space between interval punctures, each carinal segment bearing an apical seta about 2/3 length of segment; intervals with deep round punctures. Metasternum long, feebly shiny, finely, densely microreticulate, median surface not tuberculate medially, laterally with irregular ridges in basal

1/2, median area slightly depressed, with feeble median carina extended anteriorly from apical keel nearly to middle; metasternal groove strong, deep, both sides abruptly ridged (Fig. 27D). Lateral protibial teeth unevenly spaced, basal teeth close together. Mesotibia with 3 short, widely spaced spines laterally, tibia slightly projecting at apex. Posterior metatrochanteral margin with 3 small teeth; posterosuperior surface of metatrochanter with 1 tooth, tooth not visible directly in ventral view (Fig. 27G). Metafemoral surface with widely scattered, elongate, setae-bearing tubercles, microreticulate; width to length ratio 1.0:1.5, with wide flange on anterior margin; posterosuperior margin without teeth or with faint suggestion of single tooth (Fig. 27G). Metatibia broadly triangular, surface entirely microreticulate, with posteromedian lateral projection, with row of small teeth on outer margin from near base to lateral projection, medially with irregular row of coarse tubercles extended from base nearly to projection, inner margin smooth, pubescent (Fig. 27F). Apical margin of 5th abdominal ventrite broadly rounded. Genitalia long, basal piece shorter than parameres, proximal end curved; median lobe shorter than parameres, as wide at middle as a paramere, slightly "pinched" medially, curved upward in apical 1/3, apex rounded in ventral view; parameres weakly curved in lateral view, slightly curved on inner margin, apex bluntly rounded (Fig. 27E).

**Female.** Apex of 5th abdominal ventrite same as in male.

**Variation.** Length 2.7 to 3.1 mm, width 1.4 to 1.6 mm. Head tubercles vary from small to pronounced; metasternal sculpture usually confined to basal 1/2 but occasionally present from base to apical 2/3; lateral margin of mesotibia occasionally with 4 teeth; posterosuperior surface of metafemur occasionally with small, indistinct tooth.

**Type locality.** Arizona, Yavapai Co., wash at NW side of Lake Pleasant.

**Type depository.** FSCA.

**Temporal distribution.** June-October.

**Geographical distribution.** **MEXICO. Baja California Norte:** 5.4 mi. NW Catavina; 49 mi. S Catavina; 12 km. NE El Arco; El Berrendo palm oasis; 12.7 km. east El Rosario; 14.7 km. east El Rosario; 30-35 mi. SE of El Rosario; 2.1 mi. SW Rosarito; La Zapopita; 9 km. NW rancho Santa Ines; 5 km. N. Ruben Jaramillo. **Baja California Sur:** 10 mi. N Cabo San Lucas; 34.6 mi. SE Guerrero; 8. mi. N Loreto; N. side of Loreto; 3.3 mi. N El Cien; 33.8 mi. N Loreto; 3 km. S. Los Barriles; 23 km. W La Paz; 8 mi. S. Mulege; 20 km. N Mulege, N. Palo Verde; 2 km. N El Progreso; 7 km. N Ranch Tablon. **Sonora:** 8 mi. S. Santa Ana; 2.5 mi. N. Hermosillo. **UNITED STATES. Arizona:** Cochise Co, 5 mi. N Benson; Cochise Co., San Simon Rd, 3 mi. N Portal; Tombstone; 5.8 km. SE Willcox, Blue Sky Road; Coconino Co., Sedona, Red Rock Crossing; Graham Co., Pinaleno Mts.; Maricopa Co., Jct Airport Rd. & Gila R., S. of Liberty; 10 mi. S Buckeye; Fort McDowell; Liberty; Tempe; Wickenburg; Pima Co., Baboquivari Mts.; Continental; Organ Pipe Cactus National Monument; Palo Verde Camp; Sabino Canyon, Santa Catalina Mts.; Tucson Mts, Gilbert Ray Cmpg.; Pinal Co., Magma; Pinal Co., Superior; Santa Cruz, Co., Santa Rita Mts.; Yavapai Co., Camp Verde, Clear Creek Cmpg.; wash at NW side of Lake Pleasant. **California:** Riverside Co., Blythe; Cathedral City; Indio. **Nevada:** Clark Co., 15 mi. W. Searchlight; White's City. **New Mexico:** Eddy Co., Carlsbad; San Juan Co., Cuaco Canyon. **Utah:** Washington Co., Zion National Park, Oak Creek. (BYUC) (CASC) (CSCA) (CICC) (CMNC) (CMNH) (FSCA) (JCIC) (KUNHM) (MJPC) (SMCC) (RAAC) (RCCC) (TAMU) (UCRC) (USNM) (USUL).

**Remarks.** *Glaresis gordonii* is similar to *G. tumida* and *G. caenulenta*, but either completely lacks a tooth on the posterosuperior metafemoral margin, or occasionally with very small trace of a tooth, and has 3 small teeth on the hind trochanteral margin. It is also unusual in this group because the lateral mesotibial margin nearly always has only 3 teeth.

Very frequently collected in southern Arizona, this species must also occur commonly south of the border. The Zion National Park site in Utah is distinctly disjunct from the primary known distribution of *G. gordonii*, as is the San Juan Co. locality in New Mexico, and these may be indicators of other seemingly isolated populations.

***Glaresis caenulenta* Gordon and Hanley, new species**

**Description.** Male. Length 3.0 mm, width 1.6 mm; body form slightly elongate, widened from elytral base to apical 1/3 (Fig. 28A). Color dark yellowish brown. Head with clypeal surface and frons densely rugose, lacking noticeable reticulate ridges, with large, irregular tubercles throughout, setae short, indistinct; vertex without basal carina, surface rugose, lacking reticulation, without tubercles or setae. Clypeal apex emarginate, with small, evenly spaced tubercles, appearing somewhat serrate, lateral angles oblique, angulate (Fig. 28B). Mandible pair symmetrical; mesal tooth strong; lateral prominence strong, pronounced; outer margin slightly abruptly rounded. Pronotum with deep, long, transverse fovea in anterior 1/4 extended completely across pronotum, small, slightly transverse fovea on each side of middle in anterior 1/2, wide, deep fovea on each side medially near lateral margin, deep central furrow extended from base to transverse furrow; surface densely rugose, with sparse, setae-bearing carinae, carinae mostly straight in anterior 1/2, somewhat irregular in basal 1/2, setae decumbent, about 1/2 length of carina (Fig. 28C); anterior and lateral pronotal margins not bordered, lateral and basal margins crenulate. Elytra with surface slightly shiny, densely microreticulate; all striae strongly carinate, carinae appearing continuous but narrowly interrupted adjacent to space between interval punctures, each carinal segment bearing an apical seta about 1/2 length of segment; intervals with deep, slightly rectangular punctures (Fig. 28E). Metasternum long, dull, finely, densely microreticulate, median surface not tuberculate medially, laterally with short, irregularly Y-shaped ridges extended from base to basal 2/3, ridges not forming reticulate pattern, median area flat, with faint median carina extended anteriorly from apical keel 1/2 distance to base; metasternal groove wide, deep, sides abrupt, weakly ridged (Fig. 28D). Lateral protibial teeth not evenly spaced, 2nd and 3rd teeth close together. Mesotibia with 3 short, widely spaced spines laterally, tibia slightly projecting at apex (Fig. 28D). Posterior metatrochanteral margin serrate with several teeth; posterosuperior surface of metatrochanter with single small tooth, tooth not visible directly in ventral view. Metafemoral surface with widely scattered, elongate, setae-bearing tubercles, microreticulate; width to length ratio 1.0:1.5, with wide flange on anterior margin, posterior margin lacking teeth (Fig. 28H); posterosuperior margin with single tooth. Metatibia broadly triangular, surface entirely microreticulate, with small, bifid posteromedian lateral projection, series of small teeth on outer margin from near base to lateral projection, medially with irregular row of coarse tubercles extended from base nearly to projection, inner margin smooth, pubescent (Fig. 28G). Apex of 5th abdominal ventrite broadly rounded. Genitalia long, basal piece shorter than parameres, proximal end curved; median lobe shorter than parameres, 1 1/4 times as wide as a paramere, curved upward in apical 1/3, apex rounded in ventral view; parameres weakly curved in lateral view, slightly curved on inner margin, apex bluntly rounded (Fig. 28F).

**Female.** Apex of 5th abdominal ventrite same as in male.

**Variation:** Length 2.8 to 3.2 mm, width 1.6 to 1.7 mm. Degree of metasternal sculpture varies from sculpture mostly confined to basal 1/2 to having entire basal 2/3 of metasternum heavily sculptured; lateral mesotibial margin occasionally with 4 teeth; posterosuperior metafemoral surface sometimes with 2 teeth.

**Type material:** Holotype male: **Texas:** USA, Big Bend, Texas, USA, Dr. Lenczy, 6 1965 (USNM). Paratypes, 149: (10) same data as holotype; (4): Big Bend N.P., Chirhuahuan (sic) desert nr. Nugent Mt., IV-6-1967, A.&M.E. Blanchard; (27) Brewster Co., Big Bend National Park, K-Bar Cmpgd., 3400', 29° 18' N 103° 10' W, uv light, 29.VI.82, R. S. Anderson; (13) Brewster Co., Big Bend National Park, Grapevine Hills Cmpgd., 29° 16' N 103° 16' W, uv light, 23.VI.82, R. S. Anderson; (1) Brewster Co., Big Bend National Park, Paint Gap Hills, 28.VI.82, R. S. Anderson; (1) Big Bend Nat. Pk., Texas, Boquillas, 1850', May 23 1959, Howden & Becker; (76) Big Bend Nat. Pk., TEX., Tornillo Flat, 3200', May 12 1959, Howden & Becker; Taken at light; (1) Brewster Co., Stillwell RV Park on hwy. 2627, VI-4-5-1994, E. G. Riley, UV; (1) Brewster Co., Heath Cyn. Ranch, Jct. hwy 2627 & Rio Grande, VI-4-5-1994, Coll. E. G. Riley, UV; (1) Brewster Co., Heath Canyon Ranch, VII-3-1999; (1) Presidio Co., Chinati Hot Sprgs., 7 mi NE Ruidosa, 8-VIII-2003, H. & A. Howden; (3) TEXAS: PRESIDIO Co., Big Bend Ranch SP, Colorado Cnyn, N29°8.8' W104°03'.2"; 746m; 20 AUG 2006, AD Smith, R. Smith, MJ Paulsen; (1) Presidio Co., West side Marfa, 5000ft., 4-VIII.03, H. & A. Howden, At light; (1) Presidio Co., Marfa, 5000 ft., 2-VIII-

2003, H. & A. Howden, At light; (6) Presidio Co., Big Bend Ranch St. Nat. Area, Colorado Cyn. Riv. Acc., Vi-5-6-1962, E. G. Riley & C. S. Wolfe, UV light; (1) Lajitas, Texas, s. w. Brewster Co., May 19, 1959, Howden & Becker; (2) Winkler Co., 10 mi. NE Kermit, N. Rulien, VII-26-1979. (CMNC) (CNIC) (MJPC) (TAMU) (USNM).

**Other specimens:** 38: **New Mexico:** (2) Catron Co., 4 mi. S Glenwood Springs, 5-VI-1987, Robert Gordon; (1) Eddy Co., 26 mi E Carlsbad, 15 July 1977; (8) (Hidalgo Co.) 18 mi. N. Rodeo, Peloncillo Mts. N. M., VII 7 1956, H. & A. Howden; (1) (Dona Ana Co.) Organ Mts., Filmore Canyon, Las Cruces N. M., July 12 '56, H. & A. Howden, Light; (4) Hidalgo Co., Animas, .5mi. S of town dump at UV light, el 4390ft, 10-VIII-96, Zfalin, col.; (1) 14 mi. N. Rodeo N. Mex., 7 VII 56, Howden; (3) Luna Co., Deming; (9) Otero Co., Three Rivers Petroglyphs, 7-VI-1987, Robert Gordon; (1) Otero Co., 24km SW Alamogordo (rt. 82), 24.VII.1992, H. & A. Howden Lt.; (11) **Texas:** El Paso Co., red dunes, 24 N of Fabens, VI-23-97, C. Wolfe; (1) Hudspeth Co., Dell City; (5) Val Verde Co., Langtry, 12-V-1976, uv light, Robert Gordon. (CMNC) (CNIC) (KUNHM) (TAMU) (USNM)

**Remarks.** This species is similar to *G. gordonii*, but differs by having a small, distinct tooth on the posterosuperior metafemoral surface; slightly larger average size; and metasternal surface with more pronounced, closely spaced ridges. Male genitalia also differ with the basal lobe in *G. gordonii* narrow and “pinched” medially, basal lobe of *G. caenulenta* wider, not or feebly restricted medially. *Glaresis caenulenta* could be a primarily Mexican species with its range extending into New Mexico and Texas. Specimens not designated as paratypes differ slightly from the typical, therefore we restrict the type series.

A series in the USNM collection, labeled Portal, AZ, has been identified as *G. gordonii*, but has the large size, distinct tooth on posterosuperior metafemoral surface, and other characteristics of *G. caenulenta*. This series is labeled “Portal Arizona, Dr. Lenczy” and some of the paratypes of *G. caenulenta* from “Big Bend Texas” were also collected by Dr. Lenczy. We suspect an instance of mislabeling here, that the series labeled Portal was actually collected in Big Bend. It is certainly not impossible that *G. caenulenta* is present in southern Arizona via Mexico, but hundreds of specimens from that area have been examined without another occurrence of that species.

**Etymology.** The specific name is the Latin *caenulentus*, meaning “covered with mud” in reference to the encrustation of dirt found on nearly all specimens.

### ***Glaresis australis* Gordon and Hanley, new species**

**Description. Male.** Length 3.4 mm, width 1.8 mm; body form slightly elongate, feebly widened from elytral base to apical 1/3 (Fig. 29A). Color dark yellowish brown. Head with clypeal surface, frons and vertex with dense, pronounced, reticulate sculpture, clypeus and anterior 1/2 of frons with large, dense tubercles separated by less than diameter of a tubercle, setae short, indistinct. Clypeal apex emarginate, with coarse, evenly spaced tubercles, appearing somewhat serrate, lateral angles oblique, angulate (Fig. 29B). Mandible pair symmetrical; mesal tooth strong; lateral prominence strong, pronounced; outer margin slightly abruptly rounded. Pronotum with deep, long, transverse fovea in anterior 1/4 extended completely across pronotum, small, slightly transverse fovea on each side of middle in anterior 1/2, wide, deep fovea on each side medially near lateral margin, deep central furrow extended from base to transverse furrow; surface densely rugose, with dense, extremely irregular, setae-bearing carinae, carinae often coalesced forming a somewhat reticulate pattern, setae decumbent, about 1/2 length of carina; anterior and lateral pronotal margins not bordered, anterior and basal margins crenulate. Elytra with surface slightly shiny, densely microreticulate; all striae strongly carinate, carinae appearing continuous but narrowly interrupted adjacent to space between interval punctures, each carinal segment bearing an apical seta about 1/2 length of segment; intervals with deep, round punctures (Fig. 29C). Metasternum long, dull, finely, densely microreticulate, median surface smooth medially, laterally with short, irregular ridges often coalesced, forming slightly reticulate pattern, median area flat, with faint median carina extended anteriorly from apical keel 1/2 distance to base; metasternal groove deep, inner margin abruptly tapered, outer margin abruptly ridged (Fig. 29D). Lateral protibial teeth not evenly spaced, 2nd and 3rd teeth close together. Mesotibia with 4 short, widely spaced spines laterally, tibia slightly projecting at



apex. Posterior metatrochanteral margin serrate with several teeth; posterosuperior surface of metatrochanter with single small tooth, tooth not visible directly in ventral view. Metafemoral surface with widely spaced, elongate, obliquely transverse setae-bearing tubercles, surface microreticulate; width to length ratio 1.0:1.5, with wide flange on anterior margin; posterosuperior margin without teeth (Fig. 29G). Metatibia broadly triangular, surface finely, irregularly sculptured, with large, apically blunt, posteromedian lateral projection, small tubercles on outer margin from near base to lateral projection, row of coarse, pronounced, obliquely angulate row of tubercles extended from base nearly to apex medially, inner margin smooth, pubescent (Fig. 29F). Apex of 5th abdominal ventrite broadly, weakly rounded. Genitalia long, basal piece shorter than parameres, proximal end curved; median lobe shorter than parameres, slightly wider than paramere, curved upward in apical 1/3, apex rounded in ventral view; parameres weakly curved in lateral view, slightly curved on inner margin, apex bluntly rounded (Fig. 29E).

**Female.** Apex of 5th abdominal ventrite strongly, broadly rounded.

**Variation.** Length 2.7 to 3.5 mm, width 1.5 to 2.0 mm. Head with tubercles confined to clypeus and anterior 1/2 of frons, or frons entirely tuberculate, size and spacing of tubercles varies slightly; lateral mesotibial margin may have either 3 or 4 teeth; posterosuperior margin of metafemur occasionally has a single, very small tooth; posteromedian metatibial projection may be bluntly truncate apically, or apically bifid.

**Type material.** Holotype male; **Baja California Sur:** MEX: Baja Cal. Sur, 9.4 mi. W hwy 1 on Ramal a San Felipe, IX-10-11-88: E. Riley, blacklight (TAMU). Paratypes, 57: (3) same data as holotype; (1) MEXICO: Baja CA Sur, Naranjas Road, 7 km W. Hwy 1, 100 m. el., 5-X-1991, BL + MV, RA Cunningham coll.; (1) MEX. Baja CA.Sur, 22 km S Jct. Hwy 19 + dirt Rd. 1.5, km S. Todos Santos, Vic. Rancho El Cachania, 380 m. El.; (6) Mex. Baja Cal. Sur, Las Barracas, 14-X 1985, Coll. P. DeBach, blk. light (1) MEXICO, Baja Calif. Sur, 14.8 km SE Todos Santos, 300 m. el., 30-IX-1990, RA Cunningham Collector; (1) MEX: Baja Cal. Sur, 9.5 mi. W hwy 1 on Ramal Sn. Antonio de la Sierra, IX-19-1988: E. G. Riley, at blacklight; (1) MEX: Baja CA Sur, 10-22 km S. La Paz, Rt. 1, 16/VIII/94, J. Huether; (7) Mexico, Baja California Sur, 10 mi. N Cabo San Lucas nr. El Salto de San Nicolas, 1500', IX-4-1990, Blacklight, F. Andrews, T. Eichlin & A. Gilbert collectors; (3) MEX: Baja Calif. Sur, 4.2 mi. W Miraflores, IX-30-1981, F. Andrews & D. Faulkner, coll. at blacklight; (1) MEX: Baja Calif. Sur, El Triunfo, X-3-1981, F. Andrews & D. Faulkner, coll. at blacklight; (1) MEX: Baja Cal Sur, 9.4 mi. W hwy 1 on Ramal a San Felipe, IX-10-88, A.J. Gilbert; (9) MEX: Baja Calif. Sur, Playa Los Cerritos, 11.2 mi. S Todos Santos, IX-28-1981, BLACKLIGHT, F. Andrews & D. Faulkner; (14) MEX: Baja Calif. Sur, 2.3 mi. SW San Bartolo, X-1-1981, F. Andrews & D. Faulkner, coll. at blacklight; (5) MEX: Baja Calif. Sur, 17.1 mi. S La Paz, IX-27-1981, F. Andrews & D. Faulkner; (3) BAJA CALIFORNIA, Playa Pedrito, 3 mi. S. Todos Santos, 14-XI-1981, Robert Gordon. (CSCA) (RCCC) (TAMU) (UCRC) (USNM).

**Remarks.** *Glaresis australis* is a comparatively large species of the mendica group distinguished from all other species by the strongly reticulate head surface; lack of posterosuperior metafemoral tooth; and large metatibial posteromedian lateral projection. All specimens examined were from Baja California Sur, although *G. australis* may occur on adjacent mainland Mexico.

**Etymology.** This species name is the Latin *australis*, meaning south, and refers to the Baja California Sur type locality.

### ***Glaresis tumida* Gordon and Hanley, new species**

**Description. Male.** Length 3.0 mm, width 1.6 mm; body form short, robust, sides slightly rounded, widest in posterior 1/3 (Fig. 30A). Color dark yellowish brown. Head with clypeal surface and frons densely rugose, with dense ridges forming somewhat reticulate pattern, with large, sparse tubercles throughout, setae short, indistinct; vertex without basal carina, surface rugose, with ridges forming somewhat reticulate pattern, without tubercles or setae. Clypeal apex emarginate, with small, evenly



spaced tubercles, appearing somewhat serrate, lateral angles oblique, acute (Fig. 30B). Mandible pair symmetrical; mesal tooth strong; lateral prominence strong, pronounced; outer margin angulate. Pronotum with deep, long, transverse fovea in anterior 1/4 extended completely across pronotum, small, slightly transverse fovea on each side of middle in anterior 1/2, wide, deep fovea on each side medially near lateral margin, deep central furrow extended from base to transverse furrow; surface densely rugose, with dense, seta-bearing carinae, carinae mostly straight in anterior 1/2, slightly irregular in basal 1/2, setae decumbent, about 2/3 length of carina; anterior and lateral pronotal margins not bordered, lateral and basal margins crenulate. Elytra with surface slightly shiny, densely microreticulate; all striae strongly carinate, carinae appearing continuous but narrowly interrupted adjacent to space between interval punctures, each carinal segment bearing an apical seta about 1/2 length of segment; intervals with deep, slightly rectangular punctures (Fig. 30C). Metasternum long, tumid, dull, finely, densely microreticulate, median surface smooth, laterally with dense irregular ridges forming somewhat reticulate pattern from base to apex, median area rounded, without median carina; metasternal groove deep, sides abruptly ridged (Fig. 30D). Lateral protibial teeth not evenly spaced, 2nd and 3rd teeth close together. Mesotibia with 4 short, widely spaced spines laterally, tibia slightly projecting at apex (Fig. 30D). Posterior metatrochanteral margin serrate with several teeth; posterosuperior surface of metatrochanter with single small tooth, tooth not visible directly in ventral view. Metafemoral surface with widely scattered, elongate, setae-bearing tubercles, microreticulate; width to length ratio 1.0:1.5, with wide flange on anterior margin; posterosuperior margin with single small tooth (Fig. 30G). Metatibia broadly triangular, surface entirely microreticulate, with small, bifid, posteromedian lateral projection, medially with an irregular row of coarse tubercles extended from base nearly to lateral projection, inner margin smooth, pubescent (Fig. 30F). Apical margin of 5th abdominal ventrite broadly, weakly rounded. Genitalia long, basal piece shorter than parameres, proximal end curved; median lobe shorter than parameres, slightly wider than paramere, slightly "pinched" medially, curved upward in apical 1/3, apex rounded in ventral view; parameres weakly curved in lateral view, slightly curved on inner margin, apex bluntly rounded (Fig. 30E).

**Female.** Apex of 5th abdominal ventrite same as male.

**Variation.** Length 2.8 to 3.0 mm, width 1.6 to 1.7 mm. Size of head tubercles varies slightly; lateral mesotibial margin may have 3 or 4 teeth; some specimens have the metasternum less tumid than typical; and metasternal sculpture sometimes less pronounced than typical.

**Type material.** Holotype female: **Texas:** Tex., Kenedy Co., Armstrong, 8-VIII-1971, W.H. Tyson, Attracted to black light (USNM). Paratypes, 16: (1) same data as holotype; (1) Atascosa Co., Pleasanton, uv. lt., 15-VI-1975, M. Druckenbrod; (1) Atascosa Co., Lytle, 14 mi. S., 26/V/1994, BL, Wm. Godwin, R. Gibson, ex. Charles S. Wills Collection, June 2006; (1) Brooks Co., 7.3 mi. S. Falfurrias, hwy. 281 rest stop, V-I-89, E. G. Riley; (3) Brooks Co., 8 mi. S. Falfurrias, IX-12-1987, Coll. E. G. Riley, collected at mercury vapor & blacklight; (7) Kenedy Co., 6 S of Sarita, BL, IX-4-96, D. Sundberg; (1) (Presidio Co.), Shafter, Sept. 2, 1949, Werner, Nutting; (1) Shafter, Presidio Co., VII-18-1968, J. E. Hafernik. (TAMU) (USNM).

**Remarks.** This species is similar to *G. gordonii* and *G. caenulenta* but differs primarily by the tumid metasternum and by the heavily sculptured lateral metasternal surface. *Glaresis tumida* has the most southeastern distribution of any species of *Glaresis* known from the United States, one almost certainly wider than listed here.

**Etymology.** The specific name is the Latin *tumidus*, meaning swollen, referring to the swollen metasternum of this species.

### ***Glaresis dentata* Gordon and Hanley, new species**

**Description. Male.** Length 3.6 mm, width 1.8 mm; body form short, wide, slightly widened from elytral base to apical 1/3 (Fig. 31A). Color dark brown. Head with clypeal surface and frons dull, smooth,

without reticulate ridges, with large, irregular tubercles throughout, tubercles separated by about a diameter, setae short, indistinct; vertex without basal carina, surface with dense carinae forming irregular reticulation, without tubercles or setae. Clypeal apex emarginate, with coarse, irregularly spaced tubercles, appearing somewhat serrate, lateral angles oblique, angulate (Fig. 31B). Mandible pair symmetrical; mesal tooth strong; lateral prominence strong, pronounced; outer margin slightly abruptly rounded. Pronotum with deep, long, transverse fovea in anterior 1/4 extended completely across pronotum, small slightly transverse fovea on each side of middle in anterior 1/2, wide, deep fovea on each side medially near lateral margin, deep central furrow extended from base to transverse furrow; surface densely rugose, surface with dense, short, tubercular, setae-bearing carinae, carina oval, setae decumbent, longer than carina; anterior and lateral pronotal margins not bordered, all margins crenulate. Elytra with surface dull, densely microreticulate; all striae strongly carinate, carinae appearing continuous but narrowly interrupted adjacent to space between interval punctures, each carinal segment bearing an apical seta about 1/2 length of segment; intervals with deep, slightly rectangular punctures (Fig. 31C). Metasternum long, dull, finely, densely microreticulate, median surface not tuberculate medially, remainder of surface with pronounced, oval, dense tubercles, median area flat, with faint median carina extended anteriorly from apical keel more than 1/2 distance to base; metasternal groove wide, moderately deep, inner margin weakly tapered, outer margin abruptly ridged (Fig. 31D). Lateral protibial teeth not evenly spaced, 2nd and 3rd teeth close together. Mesotibia with 4 short, widely spaced spines laterally, strongly projecting at apex, tibial projection apically acute (Fig. 31D). Posterior metatrochanteral margin appearing serrate, with coarse row of tubercles on surface of posterior flange, second tubercle in from base pronounced, large, tooth-like; posterosuperior surface of metatrochanter with single large tooth, tooth not visible directly in ventral view (Fig E, F). Metafemoral surface with closely spaced, elongate, setae-bearing tubercles, microreticulate; width to length ratio 1.0:1.6, with wide flange on anterior margin, posterior margin with projecting tooth next to trochanter, posterior flange with series of non-projecting tubercles on surface (Fig. 31E); posterosuperior margin without teeth. Metatibia narrow at base, abruptly widened before apex, surface entirely, strongly microreticulate, lateral margin with broad, laterally serrate flange, lateral teeth small, weakly projecting, uniformly, closely spaced, equal in size, without posteromedian lateral projection, medially with uniform row of small, highly raised, closely spaced round tubercles, inner margin smooth, pubescent (Fig. 31G). Apex of 5th female abdominal ventrite broadly, strongly emarginate medially.

**Female.** Unknown.

**Variation.** Holotype only.

**Type material.** Holotype female: Guatemala. Guatemala, Yepocapa, 21-IV-48, HDalmat (USNM).

**Remarks.** *Glaresis dentata* is distinguished by the heavily tuberculate surface of clypeus and frons; tubercular, oval carinae on pronotum and metasternum with setae shorter than carina; posterior metatrochanteral margin with pronounced, tooth-like tubercle near trochanteral base; small, projecting tooth on posterior metafemoral margin; and wide flange on lateral metatibial margin serrate with small teeth, lacking posteromedian lateral projection.

The holotype specimen is a unique female. This specimen and the following species from Costa Rica are the southernmost species of *Glaresis* known north of South America.

**Etymology.** The specific name is the Latin *dentatus*, meaning tooth or pointed, referring to the armature on posterior margins of metatrochanter and metafemur

### ***Glaresis donaldi* Gordon and Hanley, new species**

**Description. Female.** Length 2.8 mm, width 1.5 mm; body form short, wide, strongly widened from elytral base to apical 1/3 (Fig. 32A). Color dark brown. Head with clypeal surface and anteromedian 1/3 of frons slightly shiny, with finely reticulate sculpture and small, sparse tubercles, posterior portion of frons and vertex feebly shiny, with coarse reticulate sculpture; setae short, indistinct. Clypeal apex

truncate, with small, evenly spaced tubercles, appearing somewhat serrate, lateral angles oblique, angulate (Fig. 32B). Mandible pair symmetrical; mesal tooth strong; lateral prominence strong, pronounced; outer margin slightly abruptly rounded. Pronotum with deep, long, transverse fovea in anterior 1/4 extended completely across pronotum, small slightly transverse fovea on each side of middle in anterior 1/2, wide, deep fovea on each side medially near lateral margin, deep central furrow extended from base to transverse furrow; surface densely rugose, surface with sparse, short, slightly irregular, setae-bearing carinae, setae about 1/2 length of carinae (Fig. 32C); anterior and lateral pronotal margins crenulate, not bordered, lateral margin slightly crenulate. Elytra with surface shiny, finely microreticulate; all striae smooth, strongly carinate, carinae appearing continuous but narrowly interrupted adjacent to space between interval punctures, each carinal segment bearing an apical seta about 1/2 length of segment; intervals with deep, round punctures (Fig. 32E). Metasternum long, dull, finely, densely microreticulate, median surface not tuberculate medially, most of remaining surface with short, dense, irregular carinae forming reticulate pattern, median area flat, with median carina extended 2/3 distance to mesocoxae; metasternal groove narrow, shallow, inner margin rounded, outer margin with weak ridge (Fig. 32D). Lateral protibial teeth not evenly spaced, 2nd and 3rd teeth close together. Mesotibia with 4 short, closely spaced spines from base to apex of posterolateral emargination, tibia strongly projecting at apex, projection with acute apex (Fig. 32D). Posterior metatrochanteral margin smooth, with indistinct row of tubercles on surface of posterior flange; posterosuperior surface of metatrochanter with single large tooth, tooth not visible directly in ventral view. Metafemoral surface densely, coarsely microreticulate, with sparse, small, round, setae-bearing tubercles in anterior 1/2; width to length ratio 1.0:1.6, with wide flange on anterior margin, posterior margin without teeth; posterosuperior margin without teeth (Fig. 32F). Metatibia narrow at base, abruptly widened before apex, surface entirely, strongly microreticulate, lateral margin with narrow row of small teeth from near base to lateral projection, with distinct posteromedian lateral projection, medially with uniform row of large, widely spaced, tubercles, tubercles posterior to posteromedian lateral projection transversely oblique, inner margin smooth, pubescent (Fig. 32F). Apex of 5th abdominal ventrite not examined.

**Male.** Unknown.

**Variation.** Holotype only.

**Type material.** Holotype female: Mexico. **Puebla:** MEXICO: Puebla, 6 Mi. SW. Tehuacan, July 8-10m 1973, Mastro & Schaffner (TAMU).

**Remarks.** The unique female holotype is distinguished from other known species in this subgroup by the metatibia having a distinct posteromedian lateral projection. It is also smaller in size and has a ventral surface somewhat more strongly, densely microreticulate than the other species.

This specimen represents the first published record of a *Glaresis* species from southern Mexico. All other Mexican species are recorded from northern Mexico and Baja California.

**Etymology.** This species is named in honor of the late Donald Whitehead, coleopterist, old Mexico hand, and former colleague of one of us (RDG). A good friend, excellent scientist, and good man to travel with.

### ***Glaresis zacateca* Gordon and Hanley, new species**

**Description. Male.** Length 3.2 mm, width 1.6 mm; body form short, robust, widened from elytral base to apical 1/3 (Fig. 33A). Color dark yellowish brown. Head with clypeal surface coarsely rugose, frons finely rugose, vertex coarsely reticulate, entire head tuberculate, clypeal tubercles coarse, dense, tubercles on frons and vertex slightly smaller, sparse, setae short, barely evident. Clypeal apex truncate, with small tubercles, appearing serrate, lateral angles feebly oblique, acute (Fig. 33B). Mandible pair symmetrical; mesal tooth strong; lateral prominence strong, pronounced; outer margin angulate. Pronotum with deep, long, transverse fovea in anterior 1/4 extended completely across pronotum, small slightly transverse fovea on each side of middle in anterior 1/2, wide, deep fovea on each side medially near lateral margin, deep central furrow extended from base to transverse furrow; surface densely rugose, with

irregular, mostly vertical, dense setae-bearing carinae, setae decumbent, 1/2 length of carinae (Fig. 33D). Anterior and lateral pronotal margins not bordered, all margins crenulate. Elytra with surface dull, densely microreticulate; all striae distinctly, strongly carinate, carinae narrowly interrupted adjacent to space between interval punctures, each carinal segment bearing an apical seta about 1/2 length of segment; intervals with deep, slightly rectangular punctures (Fig. 33C). Metasternum long, surface dull, finely, densely microreticulate, not tuberculate medially, laterally with some elongate, oblique, setae-bearing ridges, median area flat, with feeble carina extended from apical keel 2/3 distance to base; metasternal groove strong, deep, both margins ridged (Fig. 33E). Lateral protibial teeth unevenly spaced, basal two teeth close together. Mesotibia with 4 short, widely spaced spines laterally, tibia distinctly projecting at apex, projection apically acute. Posterior metatrochanteral margin lacking teeth, smooth, posterosuperior metatrochanteral surface with 1 tooth (Fig. 33G). Metafemoral surface with widely scattered, short, setae-bearing tubercles, microreticulate, dull throughout; width to length ratio 1.0:1.6, with broad flange on anterior margin; posterosuperior margin without teeth. Metatibia narrow at base, abruptly widened before apex, surface entirely, strongly microreticulate, lateral margin with strong, dentate posteromedian projection, margin anterior to projection with about 5 small, acute teeth, margin posterior to projection slightly uneven, medially with short row of about 3 small tubercles in basal 1/3, inner margin smooth, pubescent (Fig. 33H). Apical margin of male 5th abdominal ventrite feebly emarginate medially. Male genitalia short, basal piece much shorter than parameres, proximal end straight; median lobe slightly shorter than parameres, twice as wide at middle as paramere, slightly curved upward in apical 1/3, apex broadly rounded in ventral view; paramere tapered in lateral view, not flattened, tapered from base to nearly truncate apex (Fig. 33F).

**Female.** Unknown.

**Variation.** Holotype only.

**Type material.** Holotype male: Mexico. **Zacatecas:** 10 mi. N Fresnillo, Zac. Mex, V-10 1962, F.D. Parker L.A. Stange Collectors (CMNC).

**Remarks.** The unique holotype is most similar to *G. confusa* in most characteristics, including male genitalia. It is distinguished from that species by a lack of tubercles on vertex of head; metatibia with complete row of small, median tubercles; apex of male 5th abdominal ventrite weakly emarginate; and central Mexico type locality. Within Group C it is most similar to *G. donaldi* because both have a distinct posteromedian metatibial projection, but *G. zacateca* is distinguished from the former species by presence of tubercles on vertex of head; lack of reticulate carinae on metasternum; and metafemoral surface nearly smooth.

This is another member of Group C in a string of species extending from northern Mexico to Costa Rica. Species are now known from Coahuila, Zacatecas, Puebla, Guatemala, and Costa Rica, nearly all from unique specimens. This pattern seems to indicate the presence of other unknown southern species, particularly in central Mexico.

**Etymology.** This species is named for the state of Zacatecas where the holotype was found.

### ***Glaresis costaricensis* Gordon and Hanley, new species**

**Description. Sex unknown.** The unique specimen was completely dissected at some point in its history, and the various parts glued to a card. Therefore the following description is necessarily limited in scope.

Color yellowish brown. Head with clypeal surface weakly microreticulate, surface of frons dull, smooth, surface of vertex with carinae forming coarse, dense reticulation, clypeus and frons with large, dense tubercles, tubercles separated by less than diameter of tubercle, becoming more widely spaced on frons with dense carinae forming irregular reticulation, without tubercles or setae. Clypeal apex emarginate, emargination with large, coarse, dense, tooth-like tubercles, lateral portion of apex with small, evenly spaced tubercles, lateral angles rounded, angulate (Fig. 34B). Mandible pair symmetrical; mesal tooth strong; lateral prominence strong, pronounced; outer margin slightly, abruptly rounded. Pronotum



with deep, long, transverse fovea in anterior 1/4 extended completely across pronotum, small slightly transverse fovea on each side of middle in anterior 1/2, wide, deep fovea on each side medially near lateral margin, deep central furrow extended from base to transverse furrow; surface densely rugose, surface with dense, short, setae-bearing carinae, setae decumbent, 1/2 length of carina; anterior and lateral pronotal margins not bordered, all margins crenulate. Elytra with surface dull, densely microreticulate; all striae strongly carinate, carinae appearing continuous but narrowly interrupted adjacent to space between interval punctures, each carinal segment bearing an apical seta nearly as long as segment; intervals with deep, slightly rectangular punctures (Fig. 34A). Metasternum long, dull, finely, densely microreticulate, small, restricted median surface not tuberculate medially, remainder of surface with pronounced, short, dense carinae, median area flat, with faint median carina extended anteriorly from apical keel less than 1/2 distance to base; metasternal groove widened from apex to base, nearly reaching metepimeron at base, shallow, inner margin weakly tapered, outer margin abrupt (Fig. 34D). Lateral protibial teeth not evenly spaced, 2nd and 3rd teeth close together. Mesotibia with 5 short, widely spaced spines laterally, tibia strongly projecting at apex, projection apically acute (Fig. 34C). Posterior metatrochanteral margin without teeth or tubercles; posterosuperior surface of metatrochanter with single large tooth, tooth not visible directly in ventral view (Fig. 34F). Metafemoral surface with widely spaced, short, setae-bearing tubercles, surface densely microreticulate; width to length ratio 1.0:1.6, without noticeable flange on anterior margin, posterior margin with large, projecting tooth next to trochanter (Fig. 34F); posterosuperior margin without teeth. Metatibia narrow at base, abruptly widened before apex, surface entirely, strongly microreticulate, lateral margin with broad, laterally serrate flange, lateral teeth large, protruding, widely spaced, posteromedian tooth most pronounced, without posteromedian lateral projection, medially with uniform row of large, very widely spaced, round tubercles, inner margin smooth, pubescent (Fig. 34E). Abdomen lost.

**Variation.** Holotype only.

**Type material.** Holotype, sex unknown: Costa Rica. **San Jose:** Costa Rica, F. Nevermann, San Jose, 1000-2000 m (USNM).

**Remarks.** The unique holotype specimen of *G. costaricensis* is made up of body parts glued to a card. All parts are present except the abdomen, and we suspect this was a damaged specimen that someone salvaged. Normally we would not describe a species from a specimen in that condition, but it represents the southernmost locality for *Glaresis* north of South America, and it is a highly distinctive species.

It is most similar to *G. dentata* but differs by the large, tooth-like tubercles in median clypeal emargination; pronotal surface with short, elongate carinae; metasternum with small, restricted smooth median area; metasternal groove very wide at basal end, nearly reaching metepimeron; presence of large tooth on metafemoral margin near trochanter; narrow lateral flange of metatibia; and median row of tubercles on metatibial surface sparse, widely spaced.

**Etymology.** This species is named for Costa Rica, the country of origin.

### ***Glaresis limbata* Gordon and Hanley, new species**

**Description. Female.** Length 3.0 mm, width 1.5 mm; body form short, wide, slightly widened from elytral base to apical 1/3 (Fig. 35A). Color dark brown. Head with clypeal surface and anteromedian 1/3 of frons dull, densely, strongly rugose, both clypeus and frons with small, indistinct, scattered punctures, posterior portion of frons and vertex feebly shiny; vertex with small ridges forming an indistinct reticulate sculpture, setae short, indistinct. Clypeal apex emarginate, with small, evenly spaced tubercles, appearing somewhat serrate, lateral angles oblique, angulate (Fig. 35B). Mandible pair symmetrical; mesal tooth strong; lateral prominence strong, pronounced; outer margin slightly, abruptly rounded. Pronotum with deep, long, transverse fovea in anterior 1/4 extended completely across pronotum, small slightly transverse fovea on each side of middle in anterior 1/2, wide, deep fovea on each side medially near lateral margin, deep central furrow extended from base to transverse furrow; surface densely rug-



ose, surface with sparse, short, slightly irregular, setae-bearing carinae, setae about 1/2 length of carinae (Fig. 35E); anterior and lateral pronotal margins crenulate, not bordered. Elytra with surface shiny; all striae smooth, strongly carinate, carinae appearing continuous but narrowly interrupted adjacent to space between interval punctures, each carinal segment bearing an apical seta about 1/2 length of segment; intervals with deep, slightly rectangular punctures (Fig. 35E). Metasternum long, dull, finely, densely microreticulate, median surface not tuberculate medially, most of remaining surface with short, elongate tubercles, median area flat, without median carina; metasternal groove wide, shallow, inner margin weakly tapered, outer margin weakly ridged (Fig. 35D). Lateral protibial teeth not evenly spaced, 2nd and 3rd teeth close together. Mesotibia with 5 short, closely spaced spines in anterior 1/2 of postero-lateral emargination, tibia strongly projecting at apex, projection with acute apex. Posterior metatrochanteral margin smooth, with indistinct row of tubercles on surface of posterior flange; postero-superior surface of metatrochanter with single large tooth, tooth not visible directly in ventral view (Fig. 35C). Metafemoral surface densely, strongly microreticulate, with closely spaced, elongate, setae-bearing tubercles; width to length ratio 1.0:1.6, with wide flange on anterior margin, posterior margin without teeth; posterosuperior margin without teeth. Metatibia narrow at base, abruptly widened before apex, surface entirely, strongly microreticulate, lateral margin with broad, laterally serrate flange, without posteromedian lateral projection, medially with uniform row of small, widely spaced, nearly round tubercles, inner margin smooth, pubescent (Fig. 35F). Apex of 5th abdominal ventrite nearly truncate, indistinctly emarginate medially.

**Variation.** Holotype only.

**Male.** Unknown.

**Type material.** Holotype female: Mexico. **Coahuila:** 12 mi. no. Hermanas, Coah., MEX, VIII 11 1959 (USNM).

**Remarks.** *Glaresis limbata* is distinguished from all other known species in this subgroup by the dull, dense, strongly rugose clypeal surface and medioanterior portion of frons; widely spaced pronotal carinae; and smooth elytral surface completely lacking microreticulation.

The holotype is a unique female.

**Etymology.** The species name is the Latin *limbata*, meaning border, referring to the well defined, lateral flange of the metatibia.

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## Literature Cited

- Báguena, L. 1959.** Cuatro novedades y un comenatior sobre coleópteros de España. Eos (Revista Española Entomología) 35: 209-214.
- Baker, C. W. 1968.** Larval taxonomy of Troginae in North America with notes on biologies and Life Histories (Coleoptera: Scarabaeidae). Bulletin of the U.S. National Museum 279: 1-79.
- Brown, W. J. 1928.** Three new species of *Glaresis* (Coleoptera). Canadian Entomologist 60: 73-76.
- Erichson, W. F. 1848.** Scaphididae-Scarabaeidae. Naturgeschichte der Insecten Deutschlands 3: 1-968.
- Fall, H. C. 1907.** The North American species of *Glaresis*. Psyche 14: 23-24
- Gordon, R. D. 1969.** A new *Glaresis* from the western United States. Proceedings of the Entomological Society of Washington 71: 148-149.
- Gordon, R. D. 1970.** A review of the genus *Glaresis* in the United States and Canada. Transactions of the American Entomological Society 96: 499-517.
- Gordon, R. D. 1974.** Additional notes on the genus *Glaresis*. Proceedings of the Biological Society of Washington 87: 91-94.
- Horn, G. H. 1886.** Descriptions of new North American Scarabaeidae. Transactions of the American Entomological Society 12: 117-118.
- Jameson, M. L. 2002.** Glaresidae. p. 15-16. In: R. H. Arnett, Jr., M. C. Thomas, P. E. Skelley, and J. H. Frank (eds). American Beetles, Vol. 2. Polyphaga; Scarabaeoidea through Curculionoidea. CRC Press; Boca Raton, London, New York, Washington DC. 861 p.
- Kolbe, H. J. 1905.** Über die Lebensweise und die geographische Verbreitung der coprophagen Lamellicornier. Zoologische Jahrbücher, Supplement 8: 475-594.
- Král, D., and I. Löbl. 2006.** Family Glaresidae H. J. Kolbe, 1904. p. 81-82. In: I. Löbl and A. Smetana (eds.). Catalogue of Palaearctic Coleoptera, Vol. 3: Scarabaeoidea - Scirtoidea - Dascilloidea - Buprestoidea - Byrroidea. Apollo Books; Stenstrup. 690 p.
- Longcore, T. 1997.** The endangered Delhi sand dunes. Western Tanager 63:1-2.
- Martín-Piera, F., and J. I. López-Colón. 2000.** Fauna Iberica 14, Coleoptera Scarabaeoidea 1. Museo Nacional de Ciencias Naturales; Madrid. 526 p.
- Martinez, A., F. A. Pereira, and M. A. Vulcano. 1961.** Glaresini, nueva tribu d Trogidae para la region neotropical. Anales de la Sociedad Científica Argentina 171: 67-82.
- Pardo Alcaide, A. 1958.** Contribución al conocimiento de la fauna entomológica Marroqui, 7 El genero *Glaresis* en Marruecas. Eos (Revista Española de Entomología) 34: 161-168.
- Paulian, R. 1980.** Insects of Saudi Arabia. Coleoptera: Scarabaeoidea (<sup>re</sup> contribution). Fauna of Saudi Arabia 2: 141-154.
- Petrovitz R. 1968.** Die afrikanischen Arten der Gattung *Glaresis* Erichson nebst einer mit dieser nahe verwandten neuen Gattung. Entomologische Arbeiten aus dem Museum G. Frey 19:257-272.
- Ratcliffe, B. C. 1991.** The scarab beetles of Nebraska. Bulletin of the University of Nebraska State Museum 12: 1-333.
- Ratcliffe, B. C., and M. J. Paulsen. 2008.** The Scarabaeoidea beetles of Nebraska (Coleoptera: Scarabaeoidea). Bulletin of the University of Nebraska State Museum 22: 1-569.
- Scholtz, C. H. 1982.** Catalogue of world Trogidae (Coleoptera: Scarabaeoidea). Republic of South Africa, Department of Agriculture and Fisheries, Entomology Memoir 54: 1-27.
- Scholtz, C. H. 1983.** A review of the genus *Glaresis* Erichson (Coleoptera: Trogidae) of subsaharan Africa. Journal of the Entomological Society of South Africa 46: 209-225.
- Scholtz C, G. 1986.** Phylogeny and systematics of the Trogidae (Coleoptera: Scarabaeoidea). Systematic Entomology 11:355-363.
- Scholtz, C. H., D. D'Hotmann, and A. Nel. 1987.** Glaresidae, a new family of Scarabaeoidea (Coleoptera) to accommodate the genus *Glaresis* Erichson. Systematic Entomology 12(3): 345-354.

- Scholtz, C. H., D. J. Browne, and J. Kukalová-Peck. 1994.** Glaresidae, archaeopteryx of the Scarabaeoidea (Coleoptera). Systematic Entomology (1994) 19: 259-277.
- Semenov-Tian-Shanskij, A., and S. Medvedev. 1932.** Revisio synoptica specierum palaearcticarum novae tribus Glaresini (Coleoptera, Scarabaeidae). Livre de Centenaire, Société Entomologique de France (1932): 337-342.
- Solsky, S. 1870.** Coléoptères de la Sibérie orientale. Horae Societatis Entomologicae Rossica 7: 334-406.
- Van Dyke, E. C. 1928.** Notes and descriptions of new species of Scarabaeidae from western North America. Pan-Pacific Entomologist 4: 151-162.
- Warner, W. G. 1995.** Two new *Glaresis* from the desert Southwest, with notes on the identity of *Glaresis mendica* Horn (Coleoptera:Scarabaeidae:Glaresinae). Insecta Mundi 9: 3-4.
- Zidek, J. 2007** (*in litt.*). A review of the Glaresidae (Scarabaeoidea). Unpublished ms.

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**Appendix.** List of American *Glaresis* species groups arranged as they appear in the text, and species names arranged alphabetically within groups

**Genus *Glaresis* Erichson**

***Glaresis* - Pardoalcaidei Group**

*G. pardoalcaidei* Martinez et al., 1961

***Glaresis* - Ecostata Group**

*G. bajaensis*, new species

*G. costata*, new species

*G. ecostata* Fall, 1885

***Glaresis* - Phoenicis Group**

*G. clypeata* Van Dyke, 1928

*G. dakotensis* Gordon, 1970

*G. imitator*, new species

*G. medialis* Gordon, 1969

*G. montenegro*, new species

*G. phoenicis* Fall, 1885

*G. yanegai*, new species

***Glaresis* - Inducta Group**

*G. arenata* Gordon, 1974

*G. canadensis* Brown, 1928

*G. fritzi* Martinez et al., 1961

*G. inducta* Horn, 1885

*G. cartwrighti* Gordon, 1970. New synonym.

*G. knausi* Brown, 1928

*G. sabulosa*, new species

*G. warneri*, new species

*G. zvirgzdinsi* Warner, 1995

***Glaresis* - Mendica Group**

*G. australis*, new species

*G. bautista*, new species

*G. caenulenta*, new species

*G. californica*, new species

*G. confusa* Brown, 1928

*G. costaricensis*, new species

*G. dentata*, new species

*G. donaldi*, new species

*G. falli*, new species

*G. gordonii* Warner, 1995

*G. howdeni* Gordon, 1970

*G. limbata*, new species

*G. mendica* Horn, 1885

*G. paramendica*, new species

*G. texana* Gordon, 1970

*G. tumida*, new species

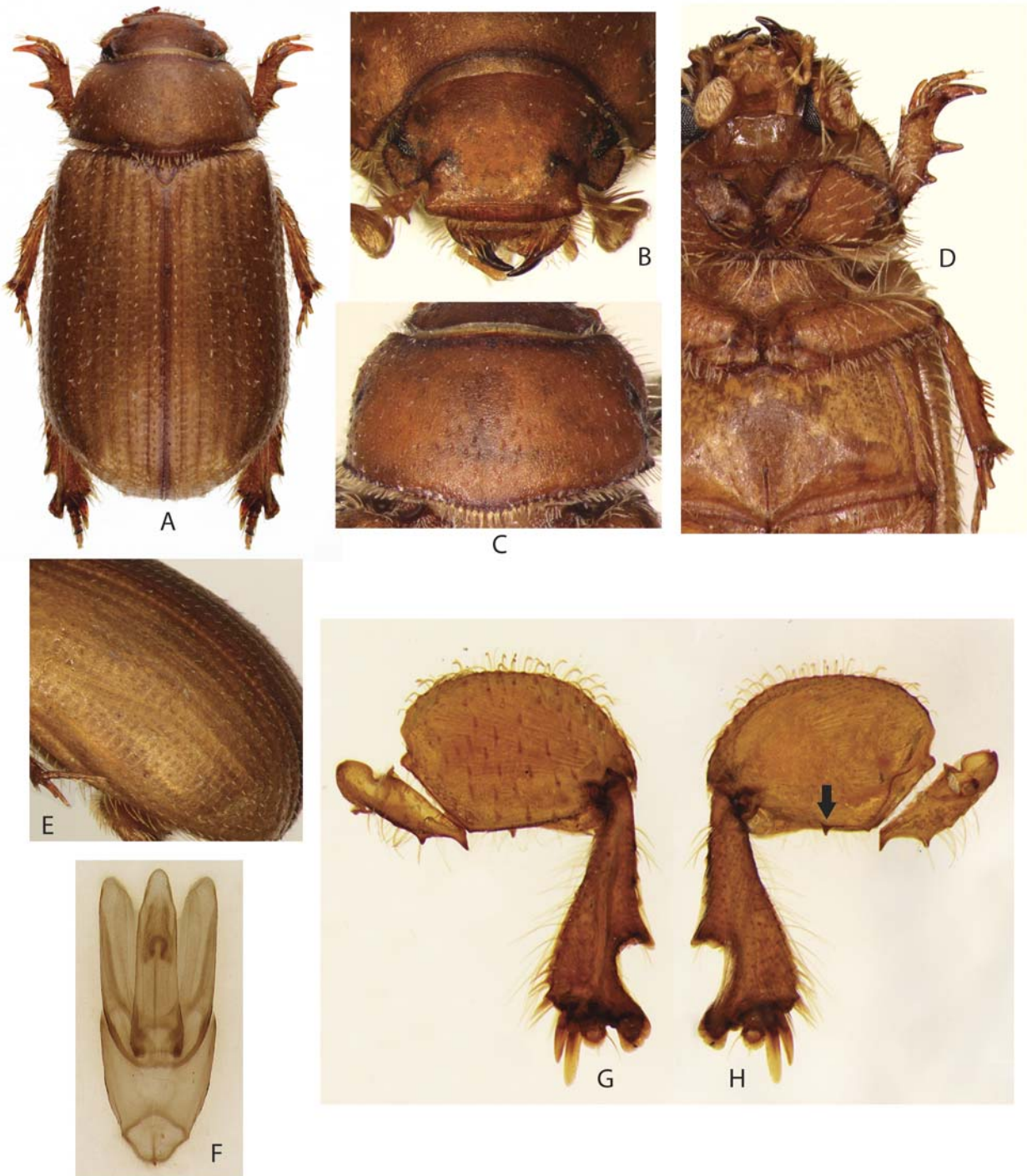
*G. zacateca*, new species



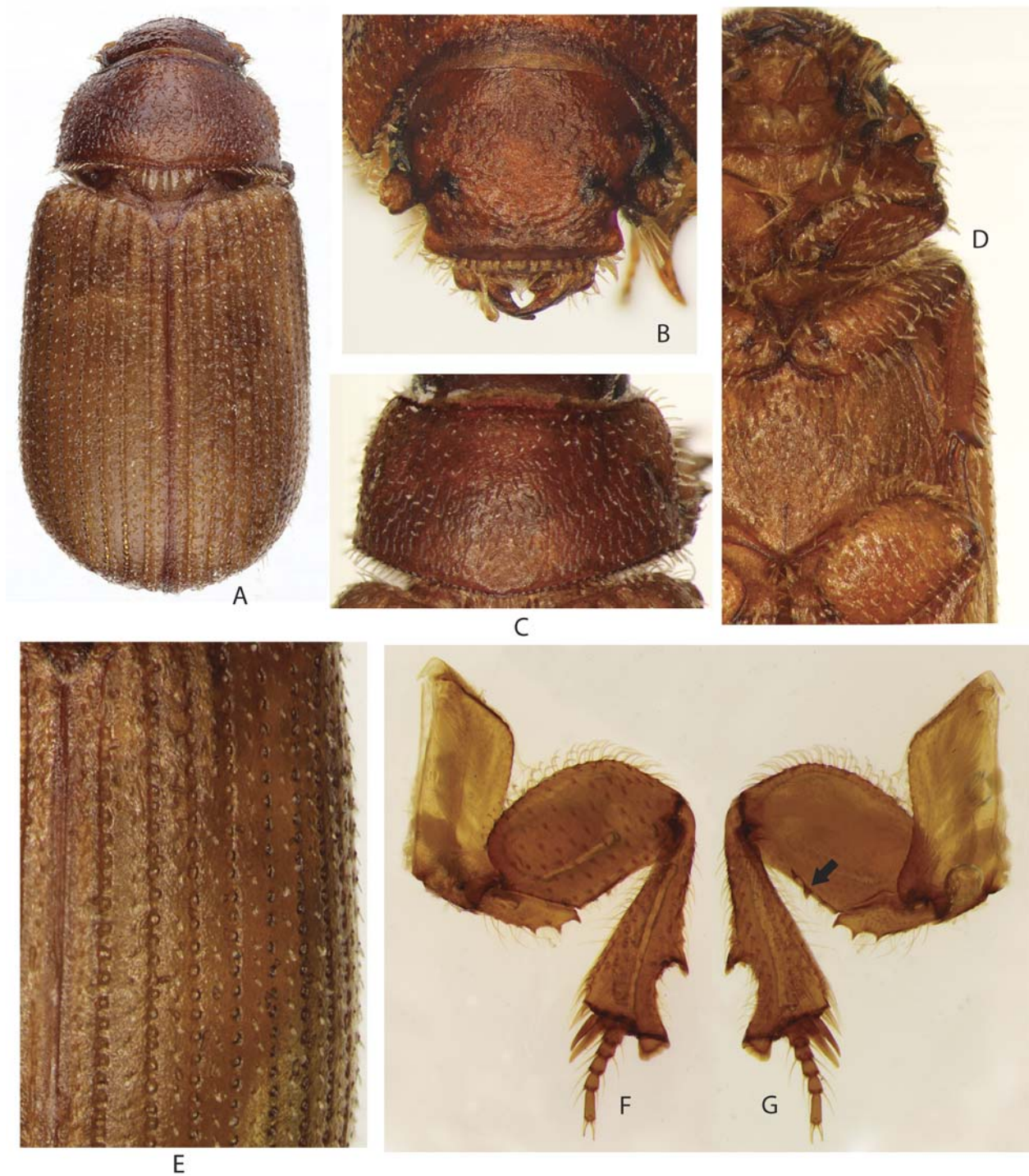


**Figures 1A-1H.** *Glaresis pardoalcaidei* Martinez. **A)** Habitus view. **B)** Clypeus and head surface. **C)** Metasternum. **D)** Elytral striae. **E)** Pronotal surface and protibia. **F)** Male genitalia. **G)** Metaleg, dorsal view. **H)** Metaleg, ventral view.



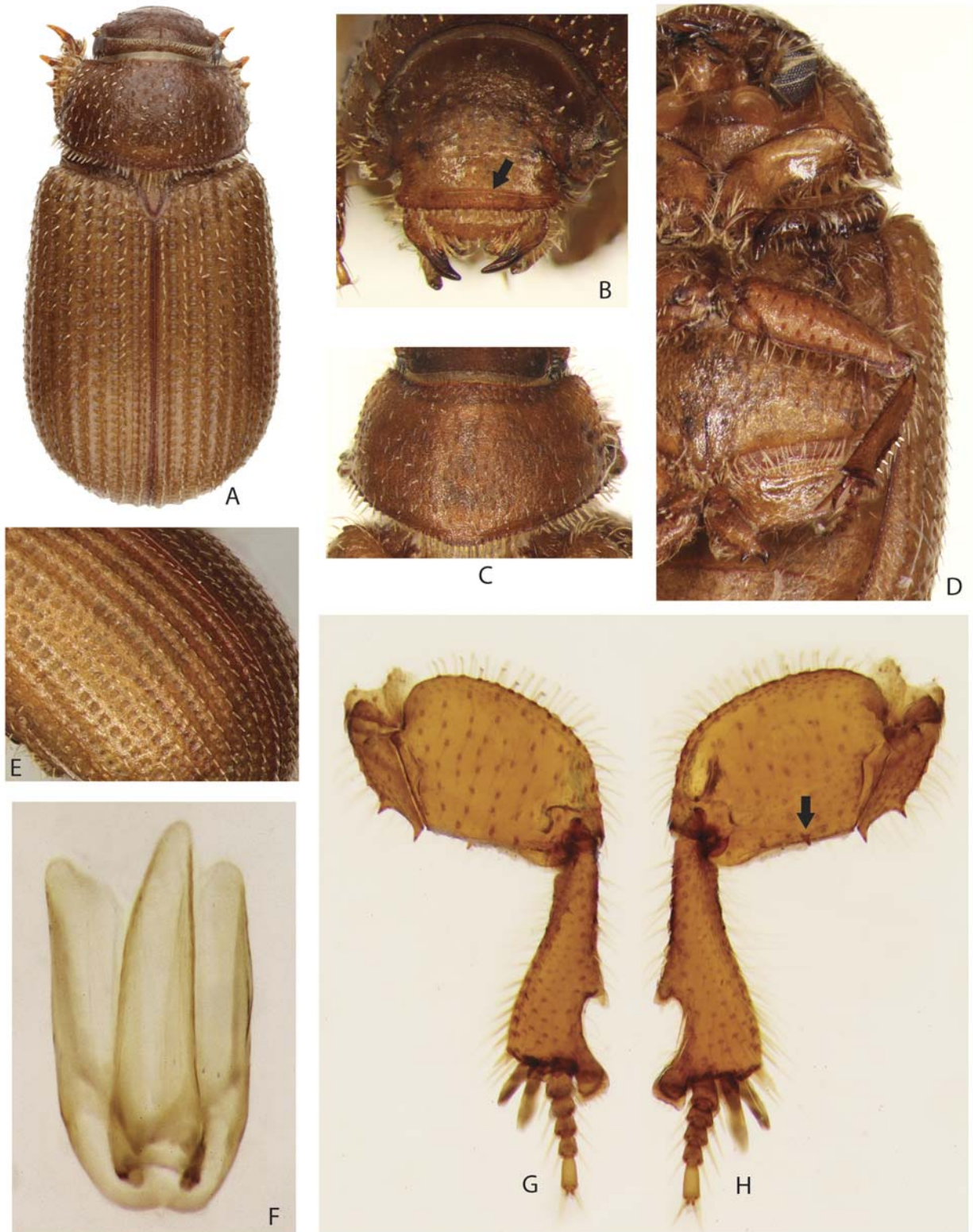


**Figures 2A-2H.** *Glareis ecostata* Fall. **A)** Habitus view. **B)** Clypeus and head surface. **C)** Pronotal surface. **D)** Metasternum and mesotibia. **E)** Elytral striae. **F)** Male genitalia. **G)** Metaleg and trochanter, dorsal view. **H)** Metaleg and trochanter, ventral view.

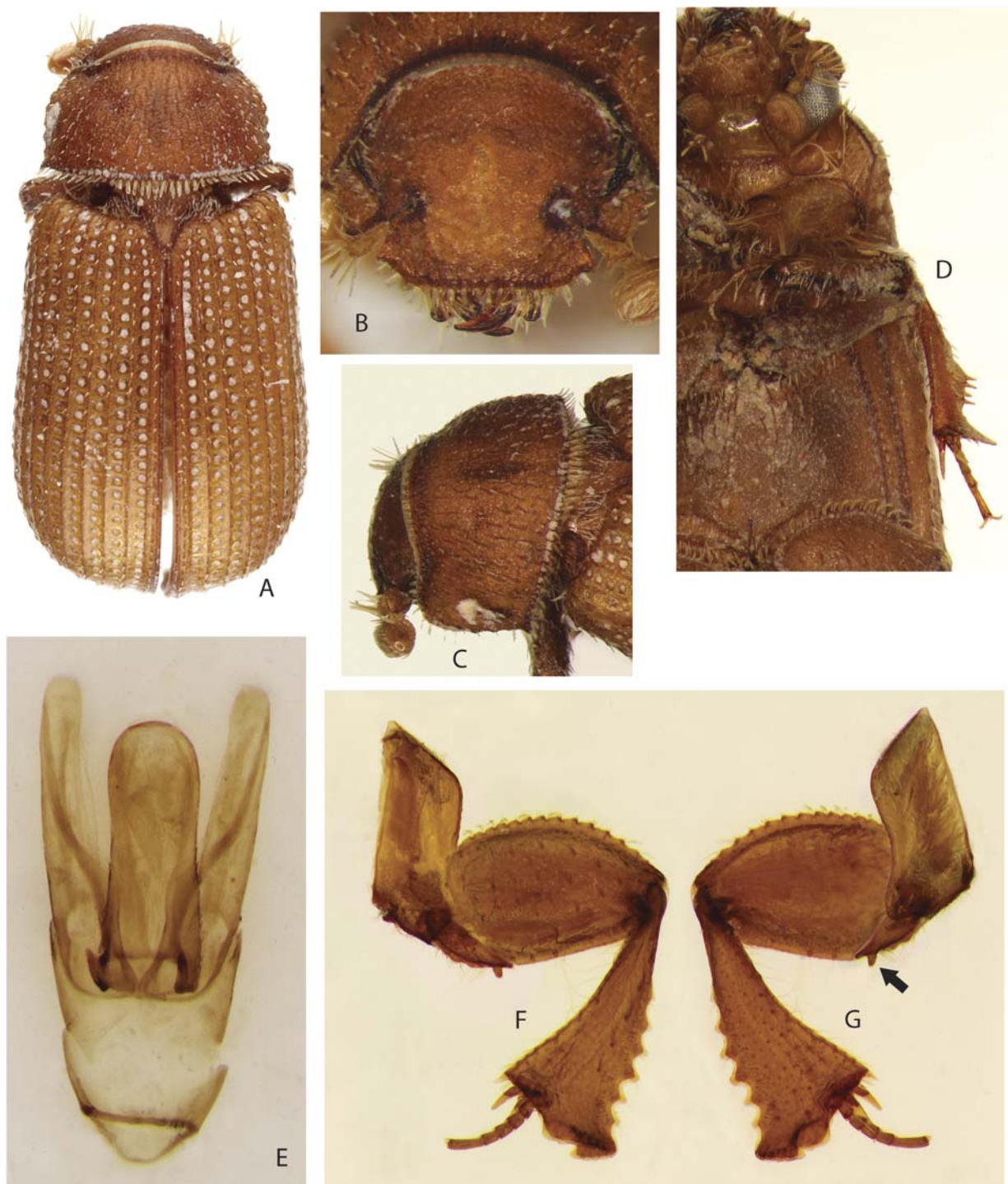


**Figures 3A-3G.** *Glaresis bajaensis*, new species. **A)** Habitus view. **B)** Clypeus and head surface. **3C)** Pronotal surface. **D)** Metasternum and mesotibia. **E)** Elytral striae. **F)** Metaleg and trochanter, dorsal view. **G)** Metaleg and trochanter, ventral view.



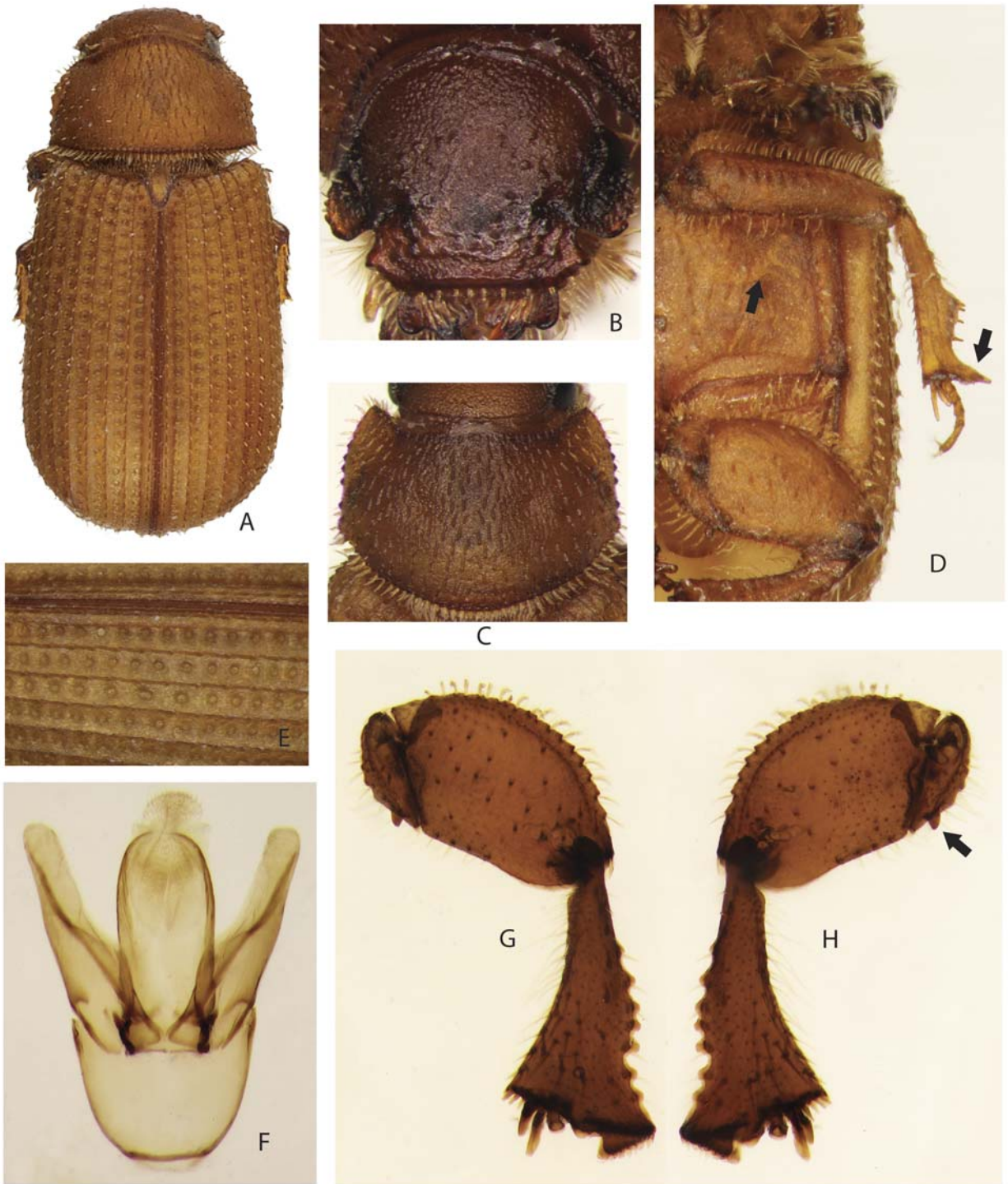


**Figures 4A-4H.** *Glaresis costata* Fall. **A)** Habitus view. **B)** Clypeus and head surface. **C)** Pronotal surface. **D)** Metasternum and mesotibia. **E)** Elytral striae. **F)** Male genitalia. **G)** Metaleg and trochanter, dorsal view. **H)** Metaleg and trochanter, ventral view.



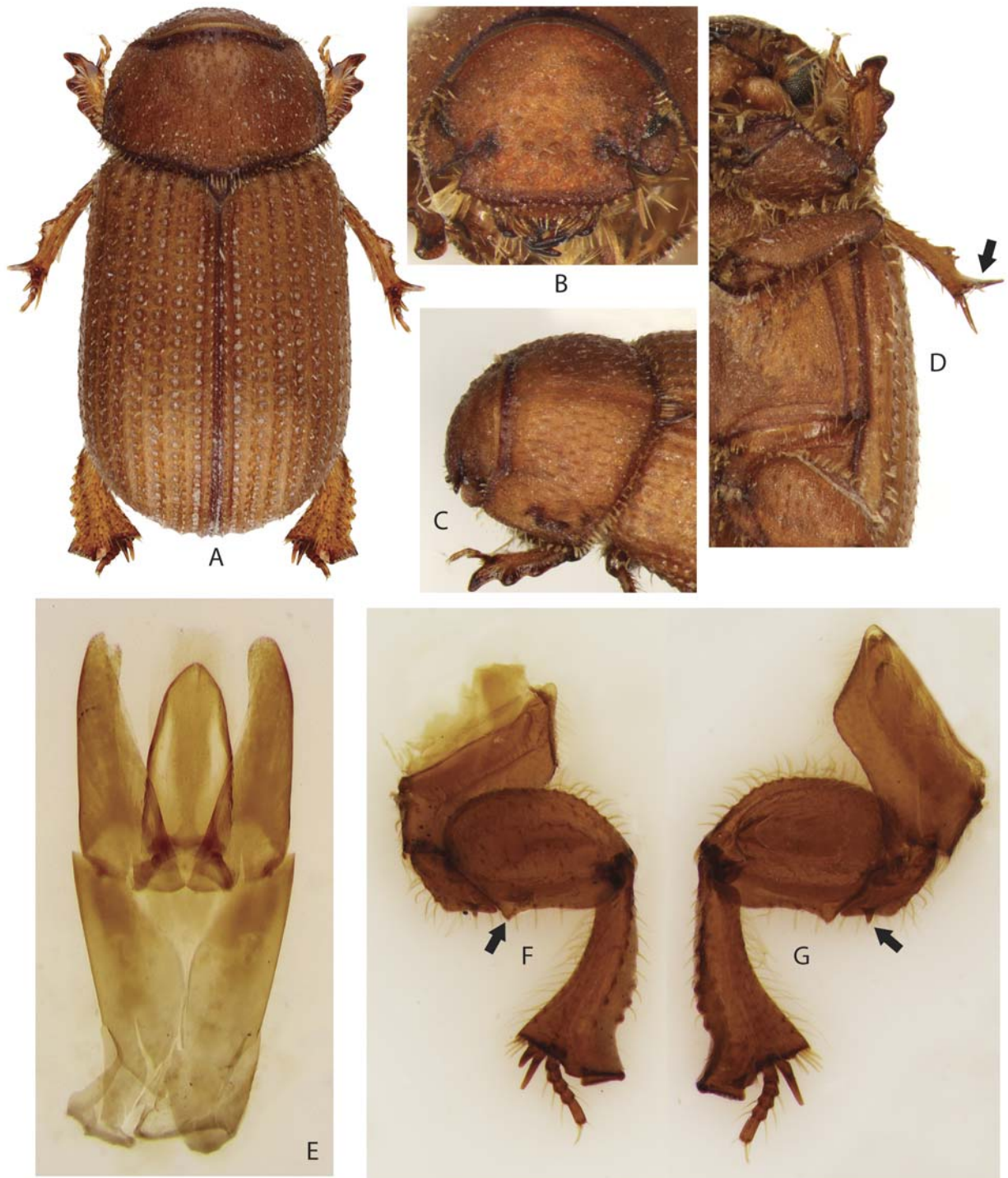
**Figures 5A-5G.** *Glarensis montenegro*, new species. **A)** Habitus view. **B)** Clypeus and head surface. **D)** Metasternum and mesotibia. **C)** Pronotal surface. **E)** Male genitalia. **F)** Metaleg and trochanter, dorsal view. **G)** Metaleg and trochanter, ventral view.



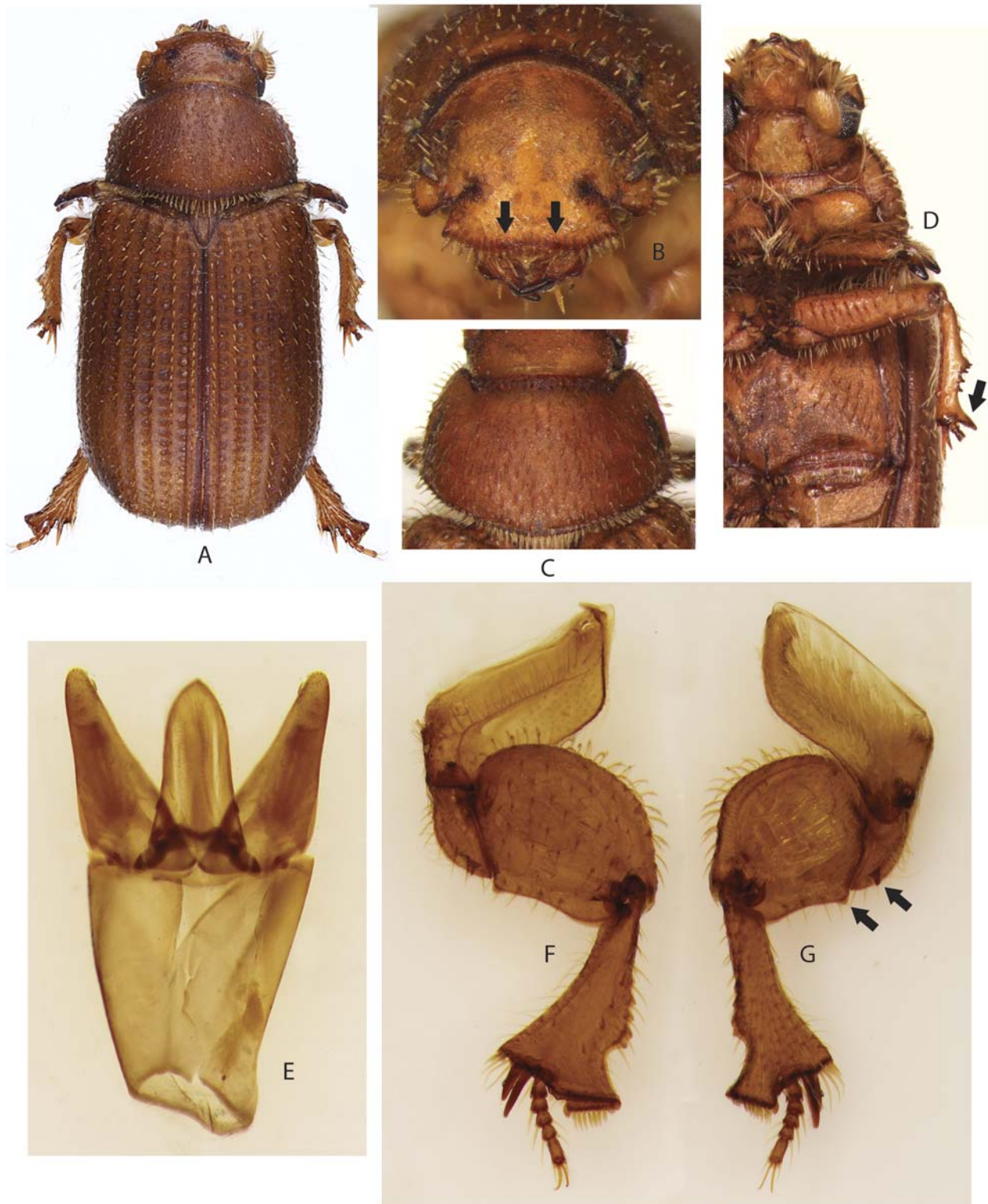


**Figures 6A-6H.** *Glaresis yanegai*, new species. **A)** Habitus view. **B)** Clypeus and head surface. **C)** Pronotal surface. **D)** Metasternum and mesotibia. **E)** Elytral striae. **F)** Male genitalia. **G)** Metaleg and trochanter, dorsal view. **H)** Metaleg and trochanter, ventral view.



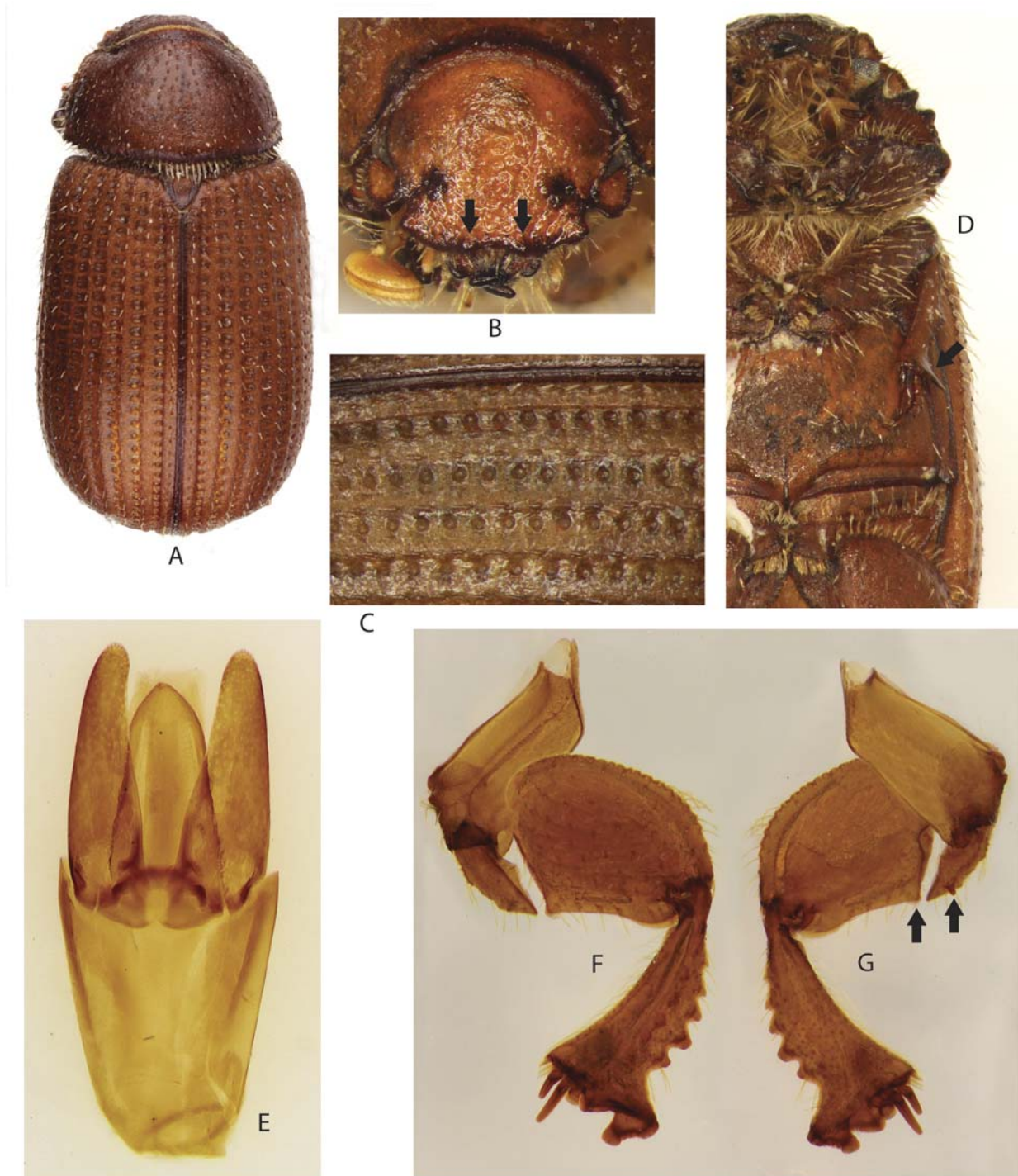


**Figures 7A-7G.** *Glarensis phoenicis* Fall. **A)** Habitus view. **B)** Clypeus and head surface. **C)** Pronotal surface. **D)** Metasternum and mesotibia. **E)** Male genitalia. **F)** Metaleg and trochanter, dorsal view. **G)** Metaleg and trochanter, ventral view.

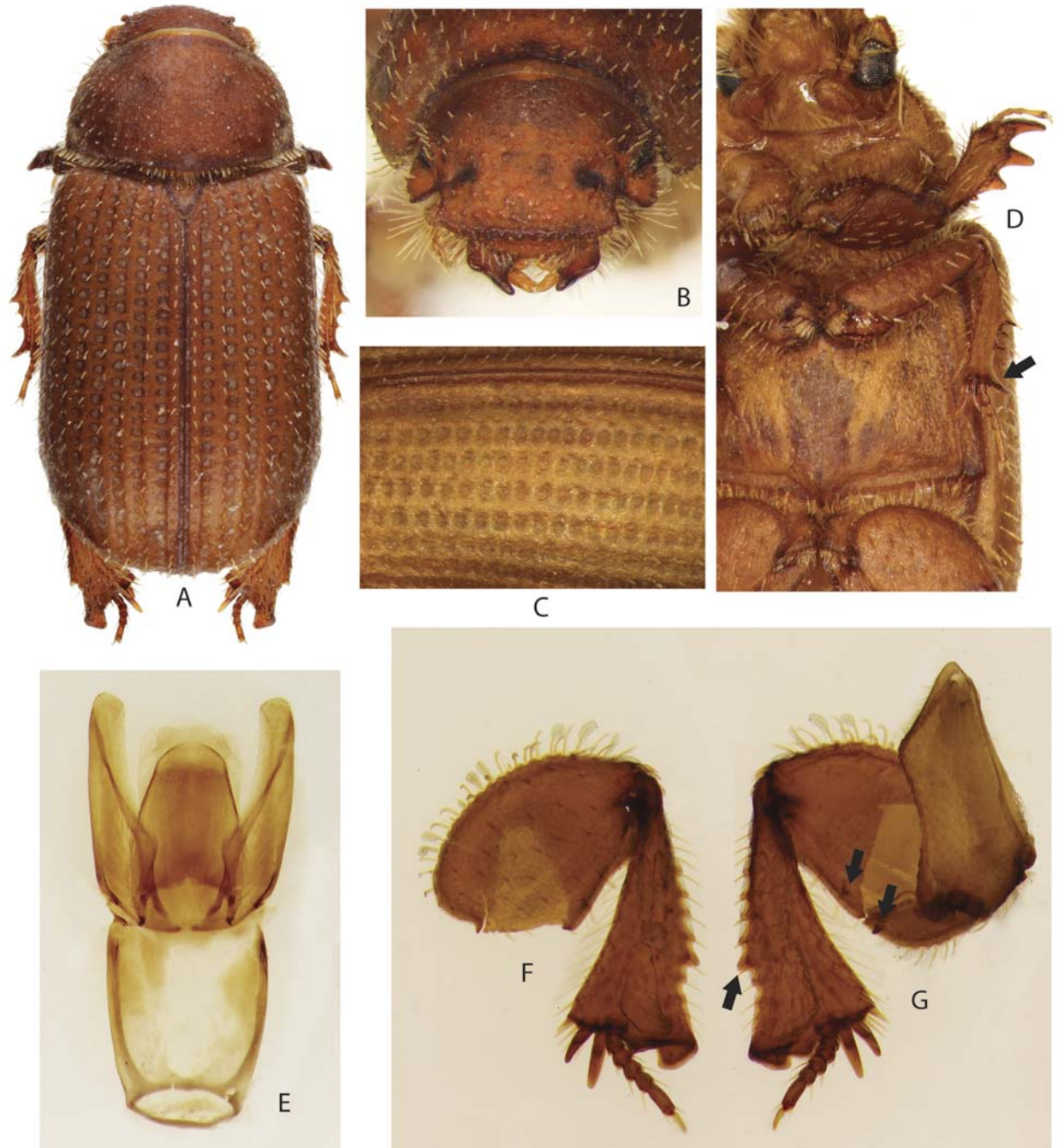


**Figures 8A-8G.** *Glaresis dakotensis* Gordon. **A)** Habitus view. **B)** Clypeus and head surface. **C)** Pronotal surface. **D)** Metasternum and mesotibia. **E)** Male genitalia. **F)** Metaleg and trochanter, dorsal view. **G)** Metaleg and trochanter, ventral view.



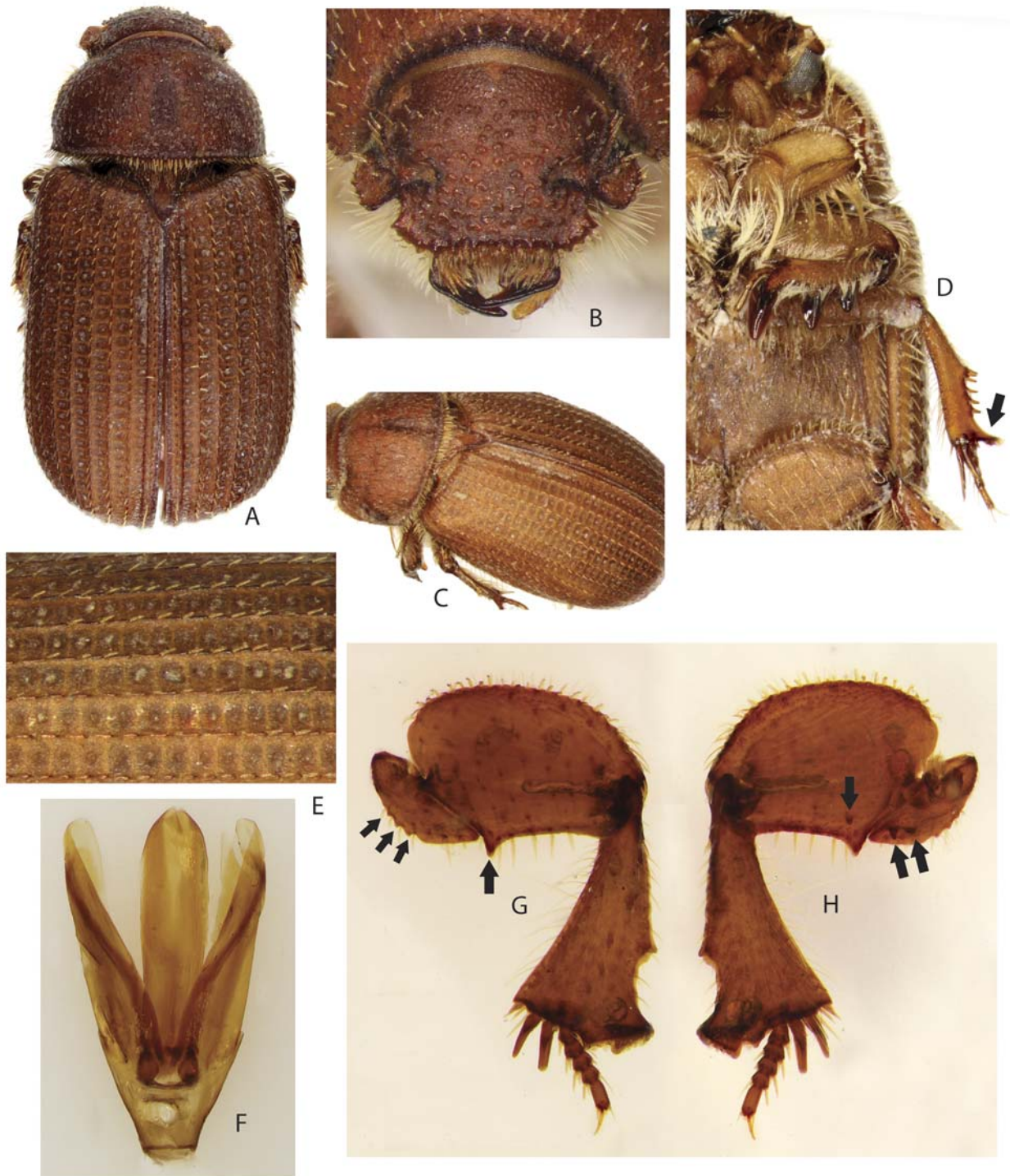


**Figures 9A-9G.** *Glarens imitator*, new species. **A)** Habitus view. **B)** Clypeus and head surface. **C)** Elytral striae. **D)** Metasternum and mesotibia. **E)** Male genitalia. **F)** Metaleg and trochanter, dorsal view. **G)** Metaleg and trochanter, ventral view.

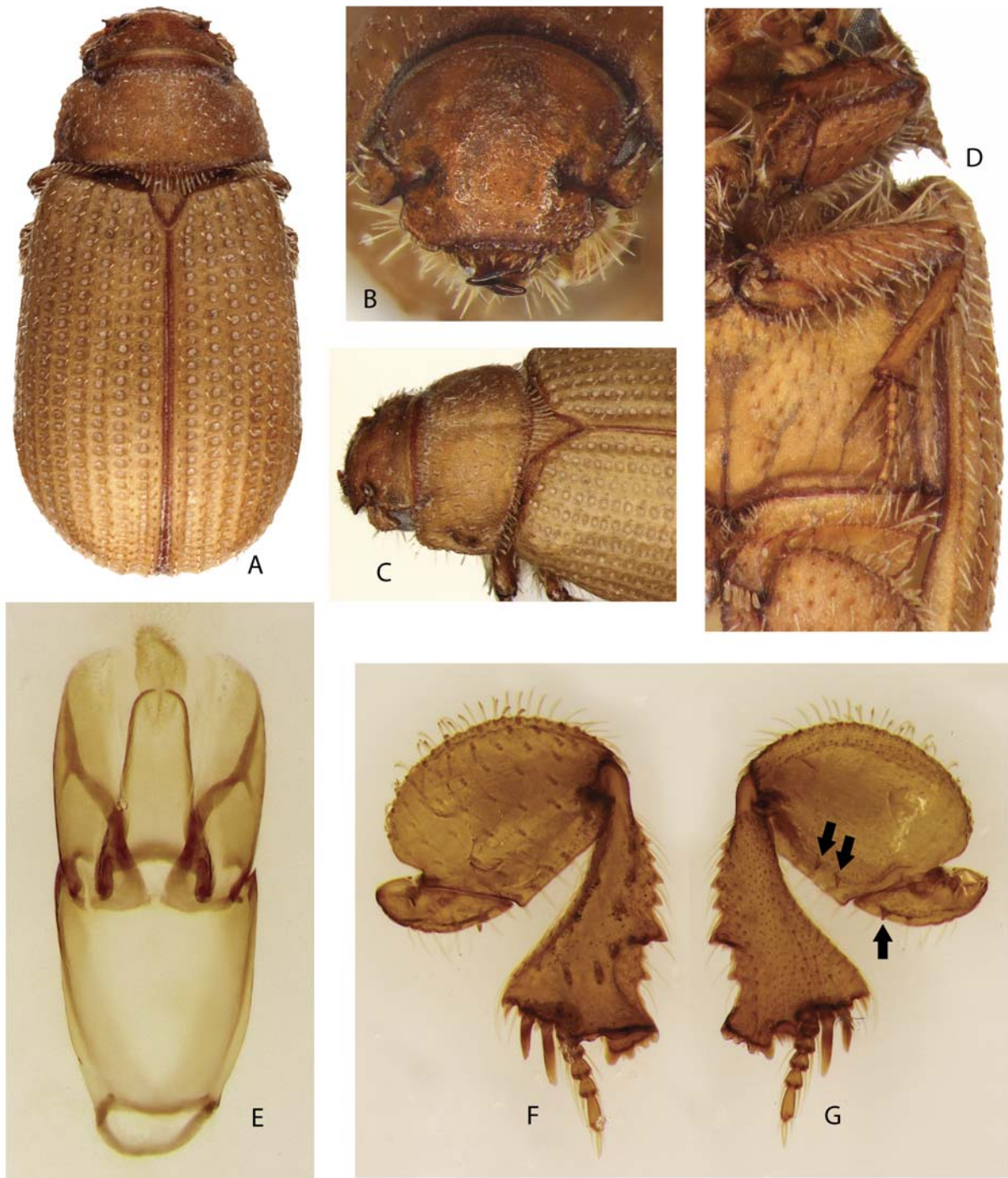


**Figures 10A-10G.** *Glaresis medialis* Gordon. **A)** Habitus view. **B)** Clypeus and head surface. **C)** Elytral striae. **D)** Metasternum and mesotibia. **E)** Male genitalia. **F)** Metaleg and trochanter, dorsal view. **G)** Metaleg and trochanter, ventral view.



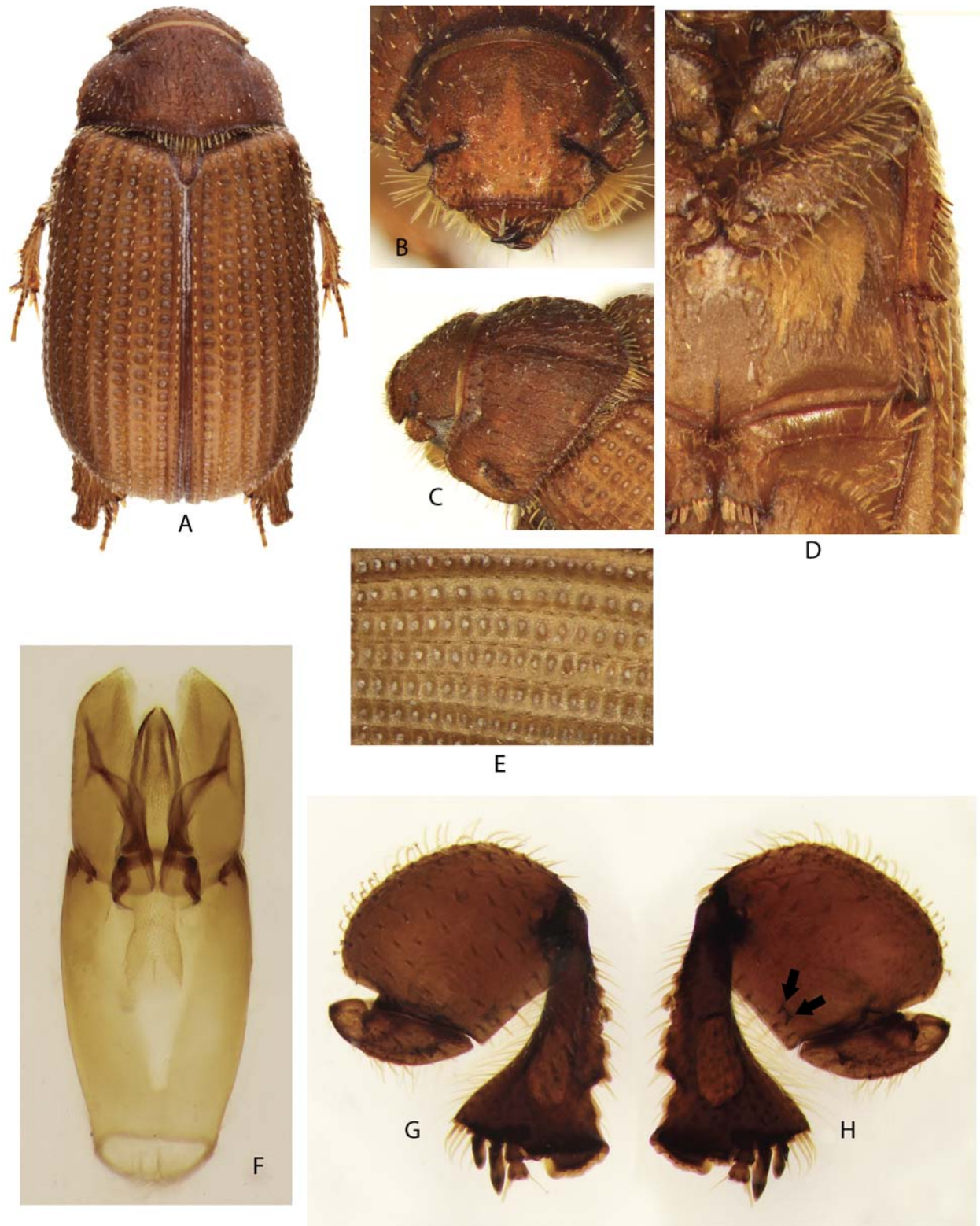


**Figures 11A-11H.** *Glaresis clypeata* Van Dyke. **A)** Habitus view. **B)** Clypeus and head surface. **C)** Elytra. **D)** Metasternum and mesotibia. **E)** Elytral striae. **F)** Male genitalia. **G)** Metaleg and trochanter, dorsal view. **H)** Metaleg and trochanter, ventral view.

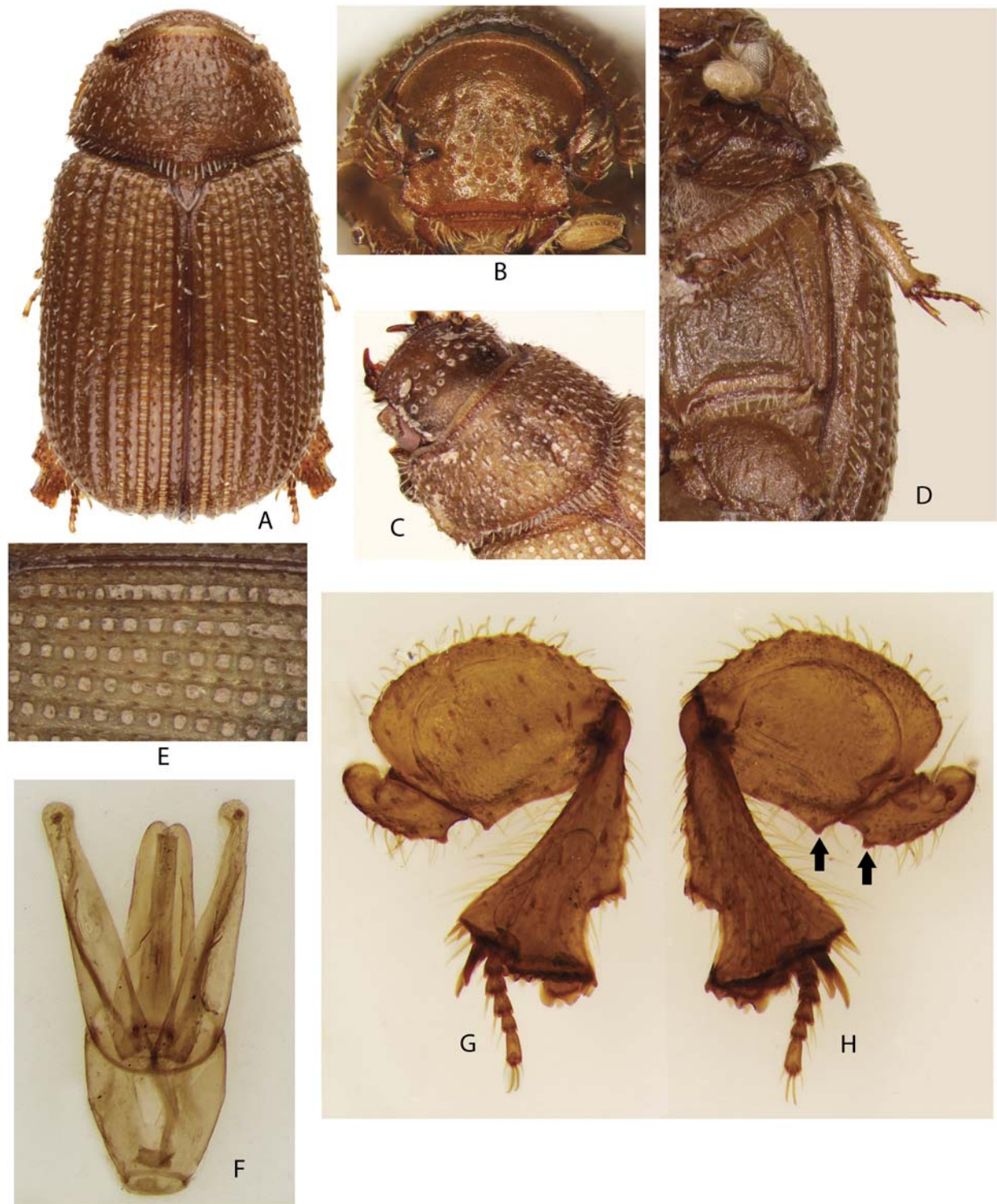


**Figures 12A-12G.** *Glaresis arenata* Gordon. **A)** Habitus view. **B)** Clypeus and head surface. **C)** Pronotal surface. **D)** Metasternum and mesotibia. **E)** Male genitalia. **F)** Metaleg and trochanter, dorsal view. **G)** Metaleg and trochanter, ventral view.



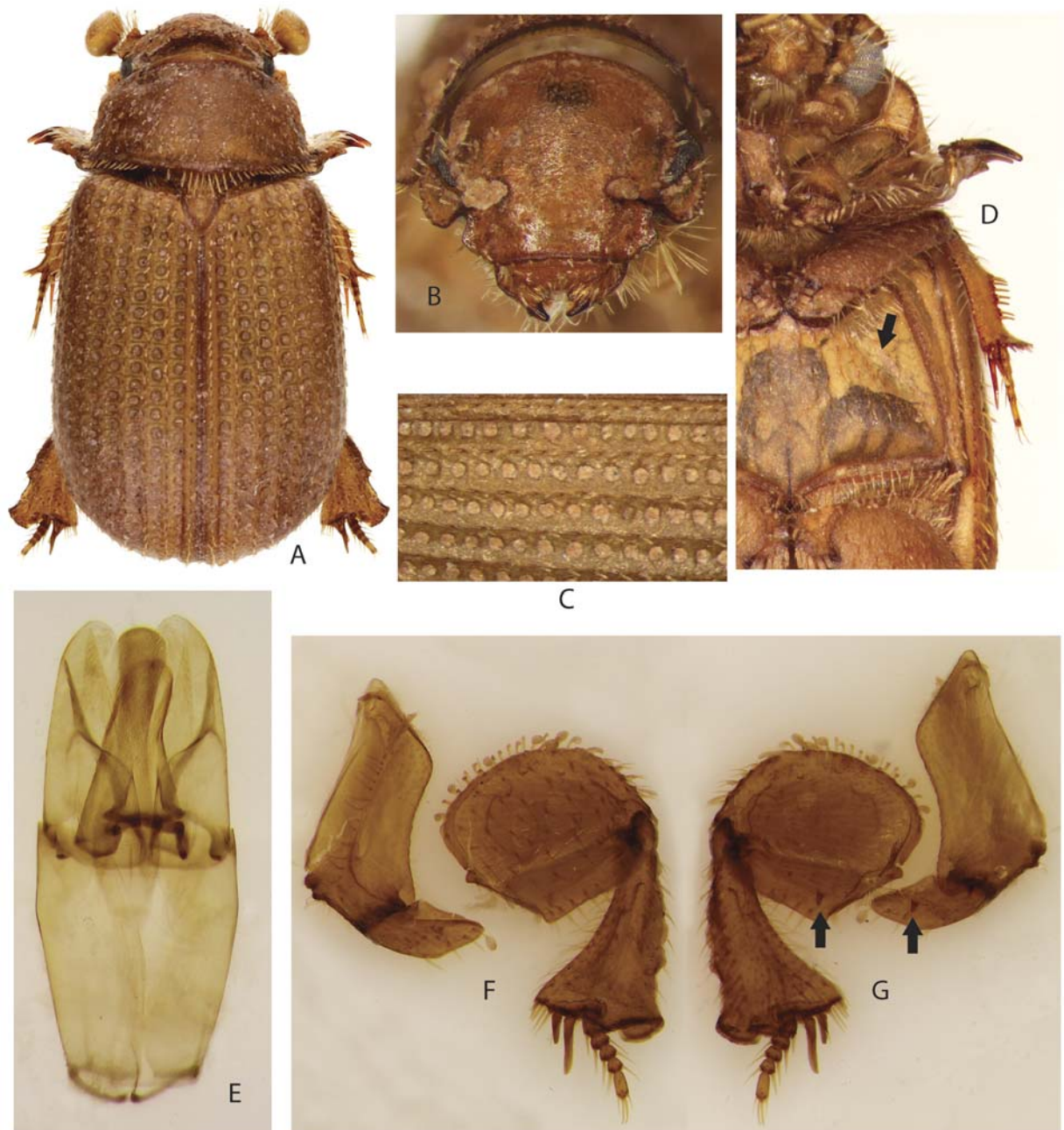


**Figures 13A-13H.** *Glarensis zvirgzdinsi* Warner. **A)** Habitus view. **B)** Clypeus and head surface. **C)** Pronotal surface. **D)** Metasternum and mesotibia. **E)** Elytral striae. **F)** Male genitalia. **G)** Metaleg and trochanter, dorsal view. **H)** Metaleg and trochanter, ventral view.

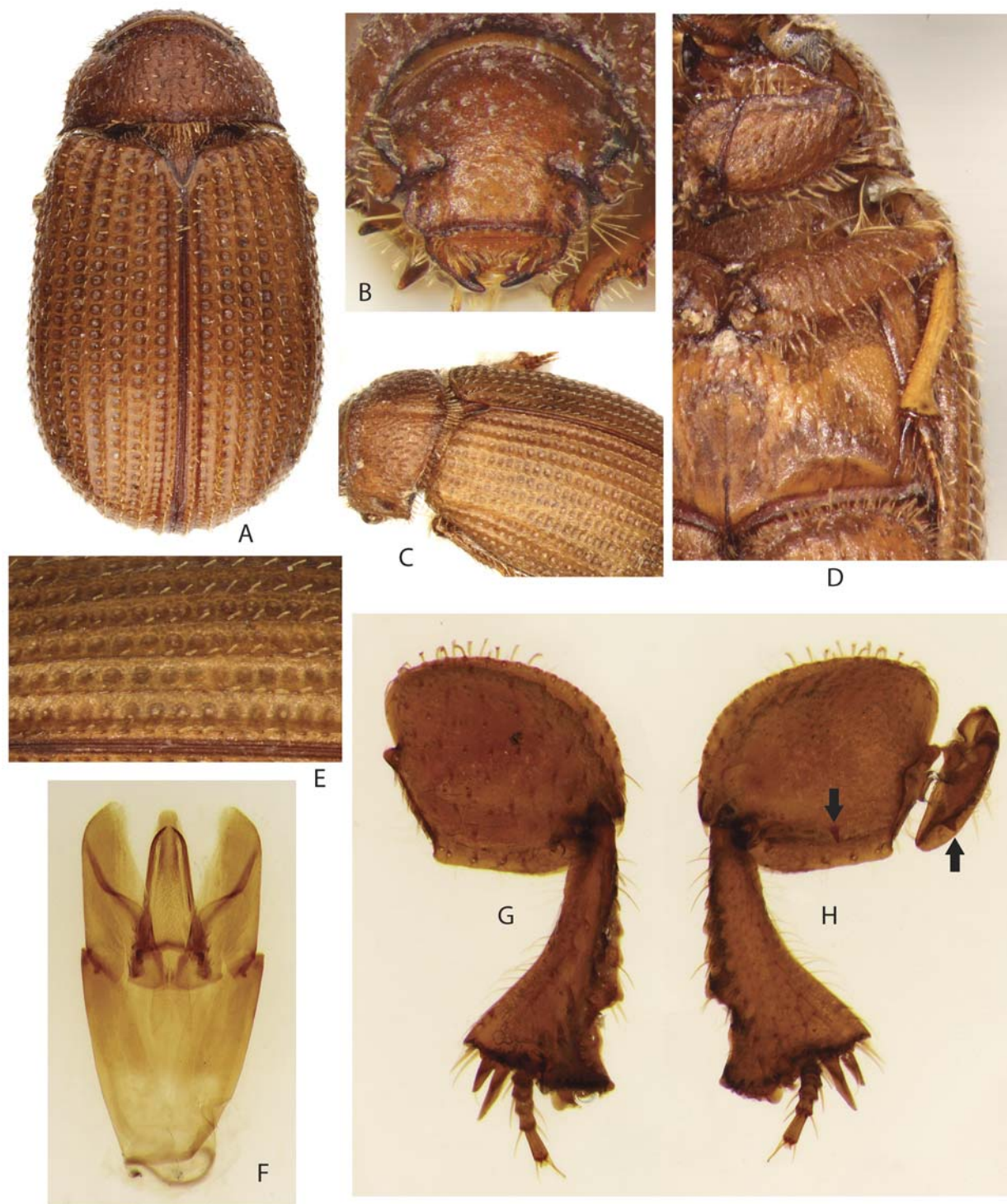


**Figures 14A-14H.** *Glaresis fritzi* Martinez. **A)** Habitus view. **B)** Clypeus and head surface. **C)** Pronotal surface. **D)** Metasternum and mesotibia. **E)** Elytral striae. **F)** Male genitalia. **G)** Metaleg and trochanter, dorsal view. **H)** Metaleg and trochanter, ventral view.



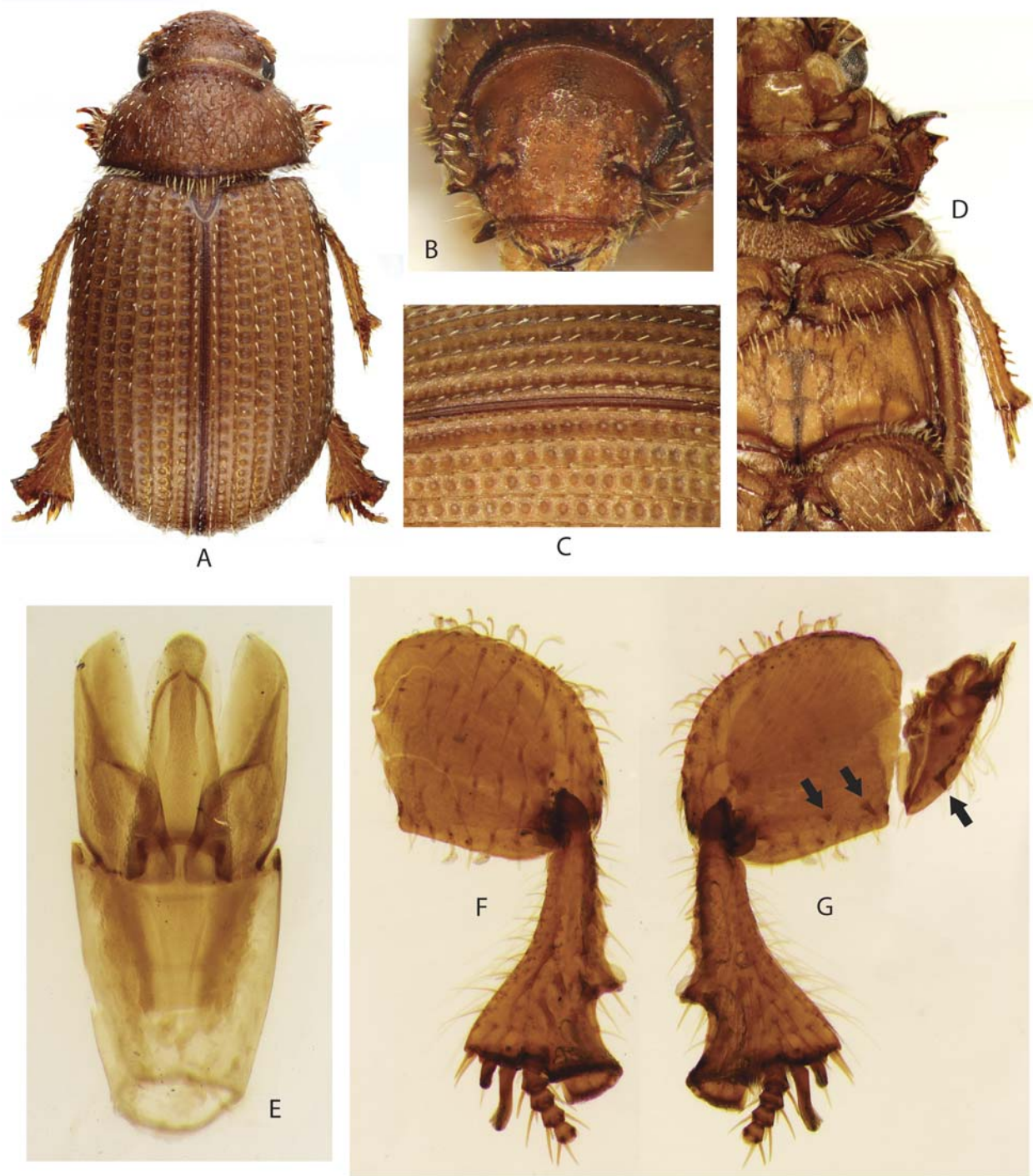


**Figures 15A-15G.** *Glaresis sabulosa*, new species. **A)** Habitus view. **B)** Clypeus and head surface. **C)** Pronotal surface. **D)** Metasternum and mesotibia. **E)** Male genitalia. **F)** Metaleg and trochanter, dorsal view. **G)** Metaleg and trochanter, ventral view.

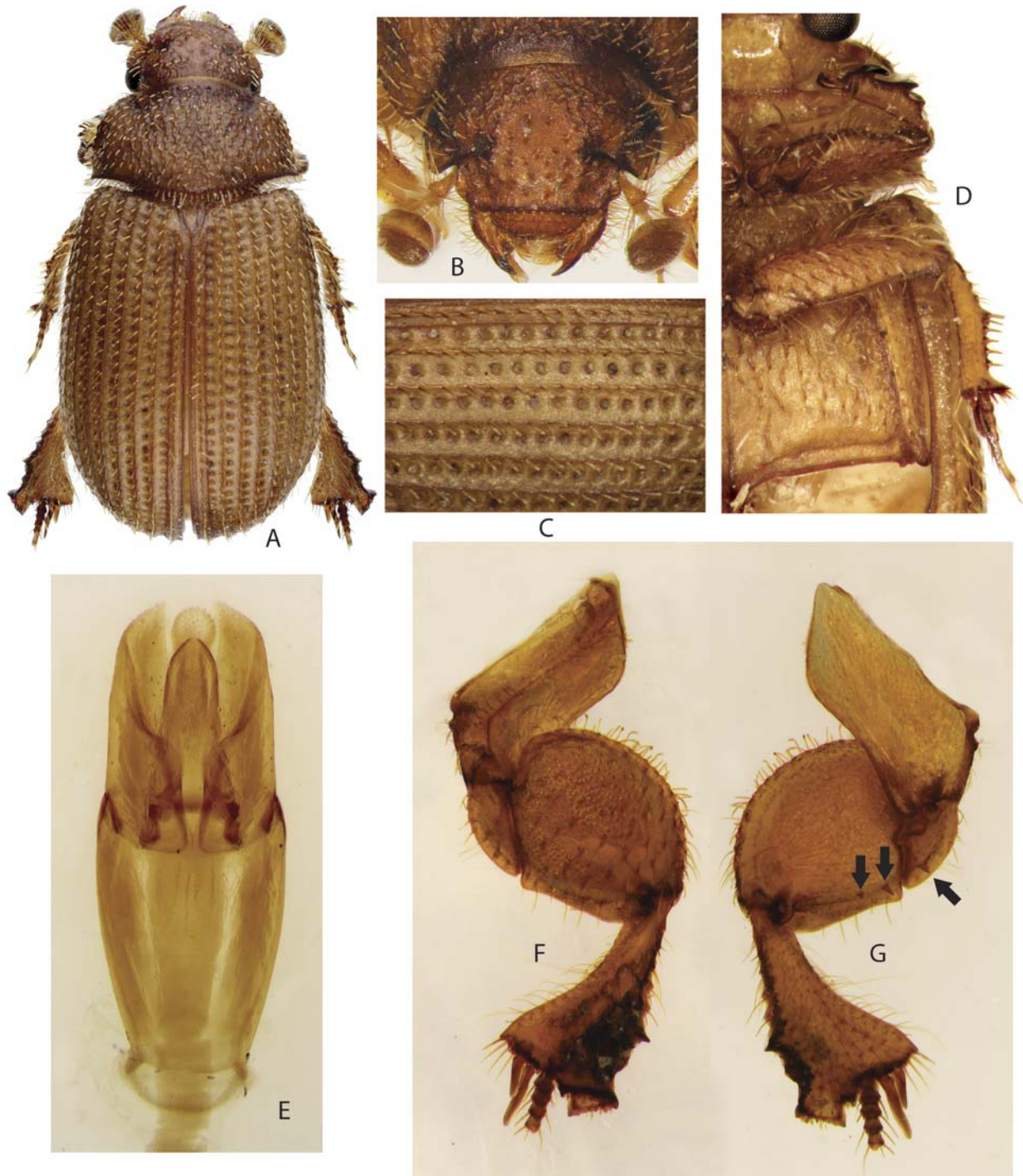


**Figures 16A-16H.** *Glaresis warneri*, new species. **A)** Habitus view. **B)** Clypeus and head surface. **C)** Elytra. **D)** Metasternum and mesotibia. **E)** Elytral striae. **F)** Male genitalia. **G)** Metaleg, dorsal view. **H)** Metaleg and trochanter, ventral view.



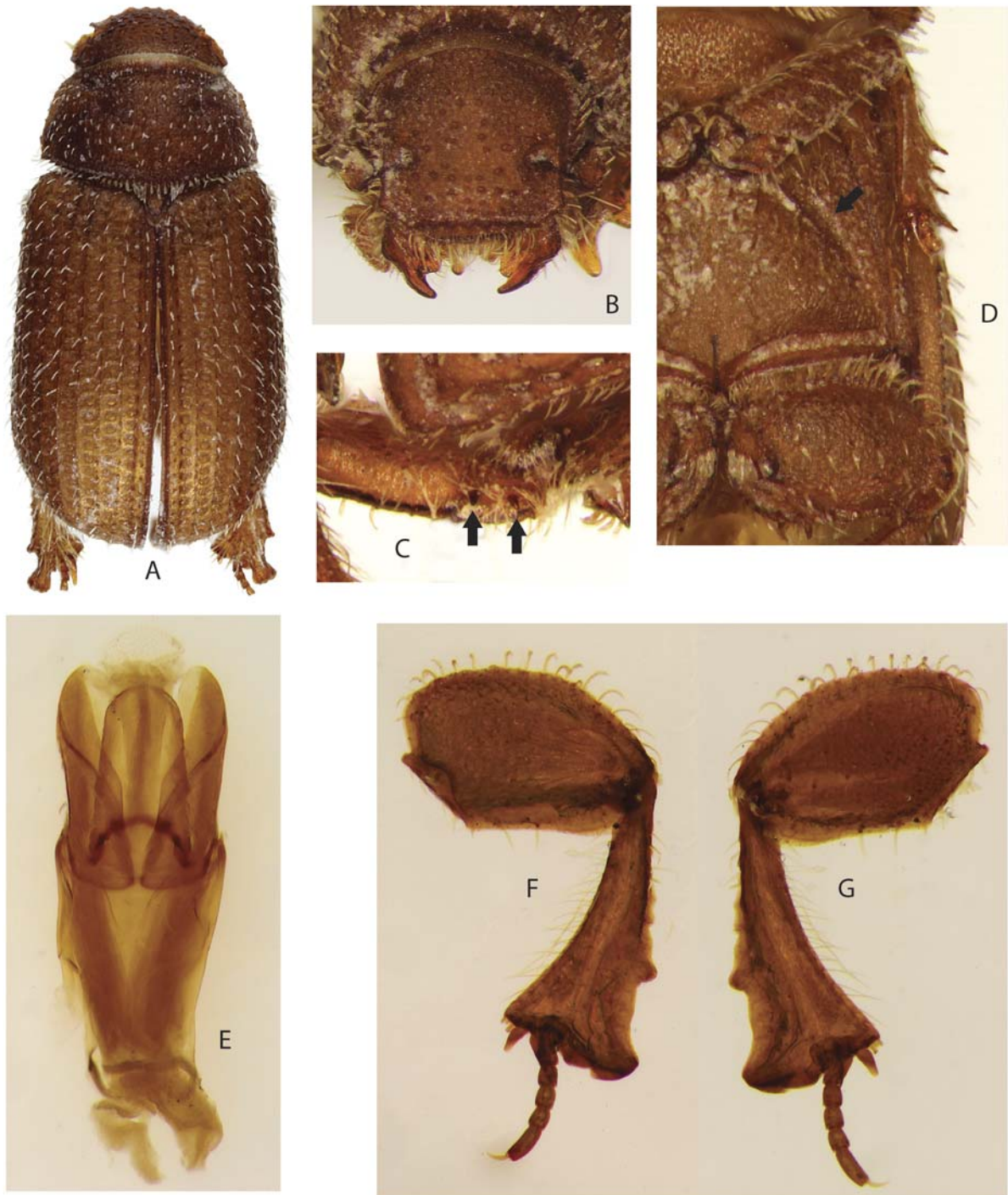


**Figures 17A-17G.** *Glarexis inducta* Horn. **A)** Habitus view. **B)** Clypeus and head surface. **C)** pronotal surface. **D)** Metasternum and mesotibia. **E)** Male genitalia. **F)** Metaleg, dorsal view. **G)** Metaleg and trochanter, ventral view.

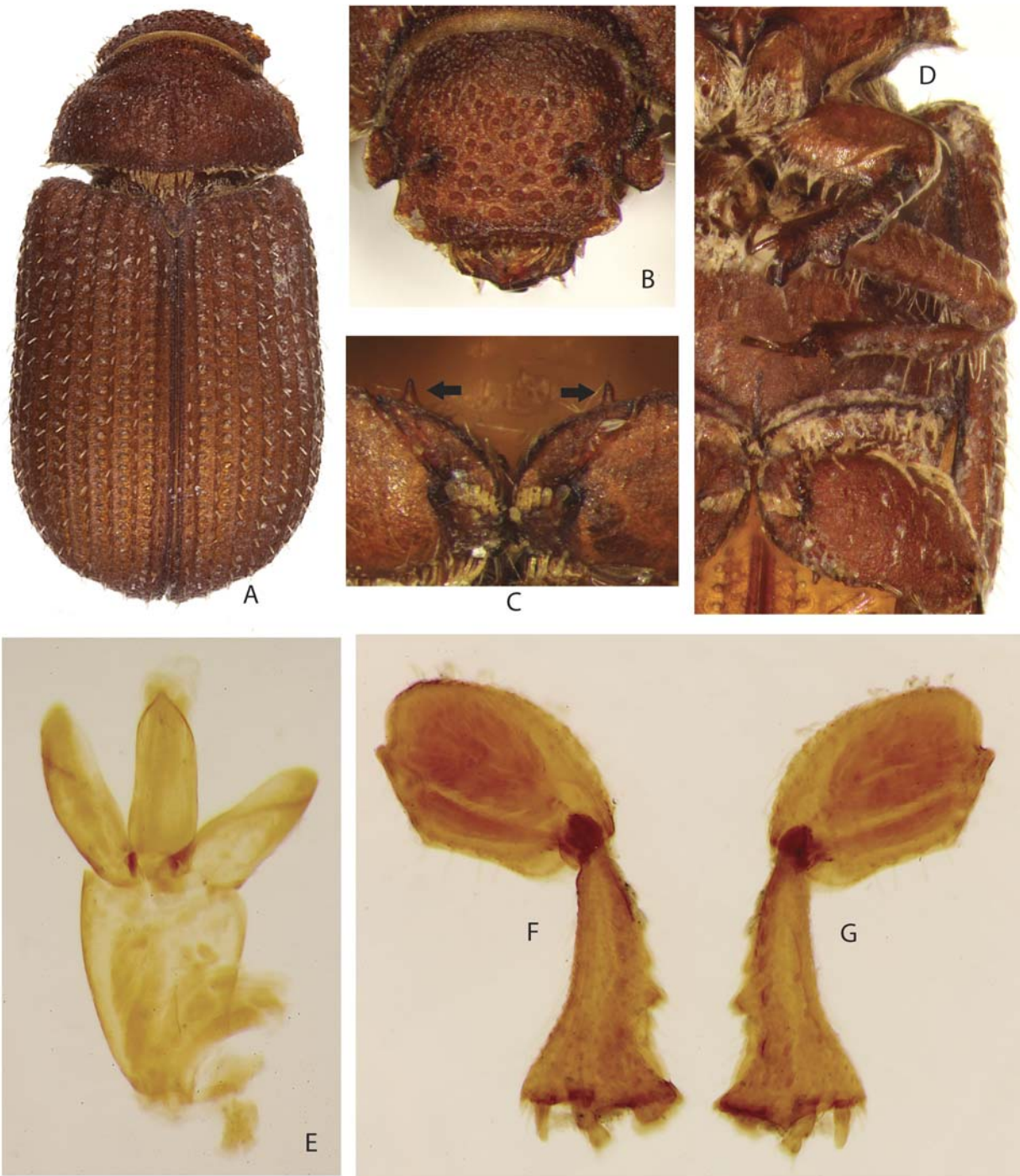


**Figures 18A-18G.** *Glaresis canadensis* Brown. **A)** Habitus view. **B)** Clypeus and head surface. **C)** Elytral striae. **D)** Metasternum and mesotibia. **E)** Male genitalia. **F)** Metaleg and trochanter, dorsal view. **G)** Metaleg and trochanter, ventral view.



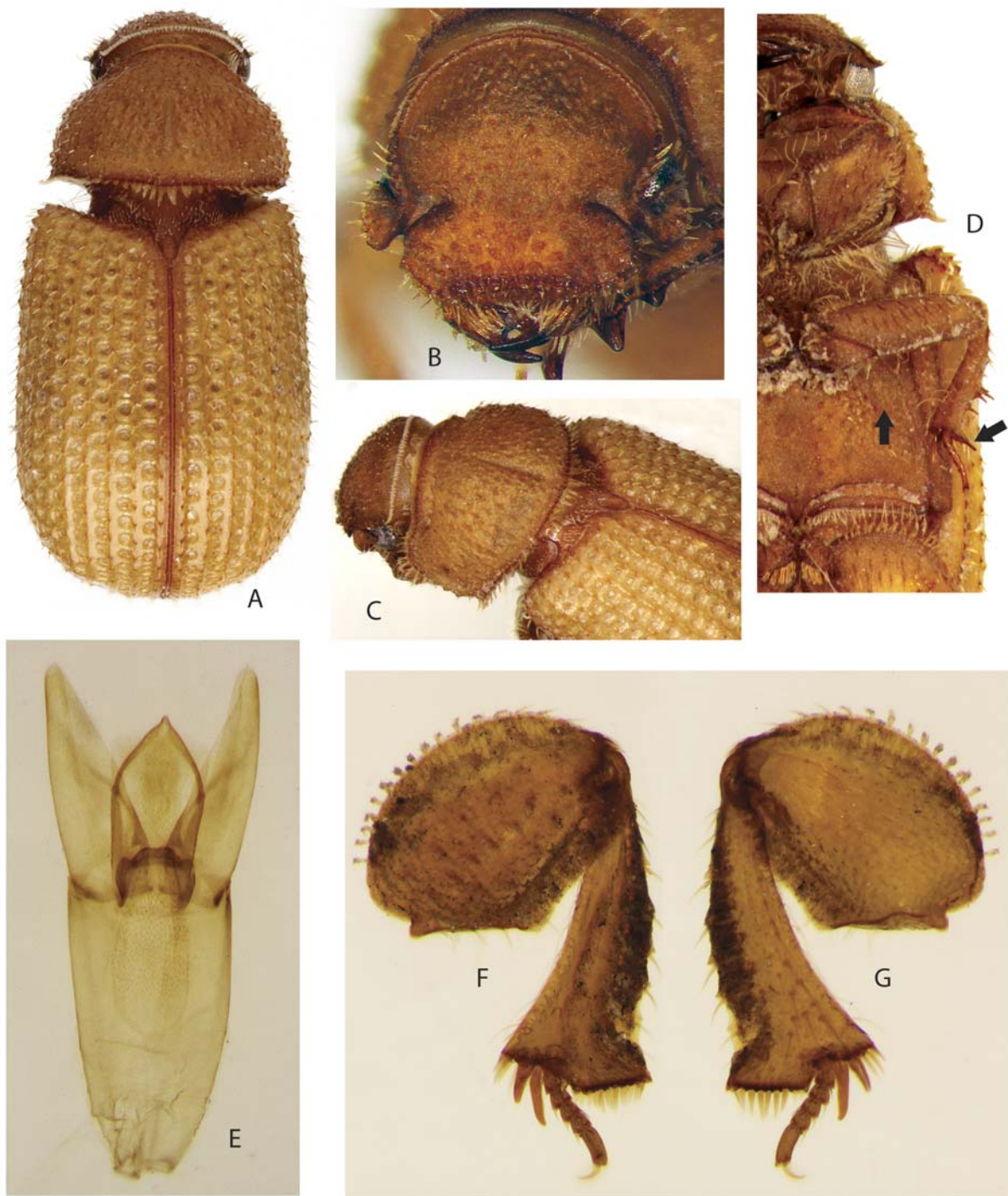


**Figures 19A-19G.** *Glarensis californica*, new species. **A)** Habitus view. **B)** Clypeus and head surface. **C)** Trochanter with 2 teeth. **D)** Metasternum and mesotibia. **E)** Male genitalia. **F)** Metaleg, dorsal view. **G)** Metaleg, ventral view.



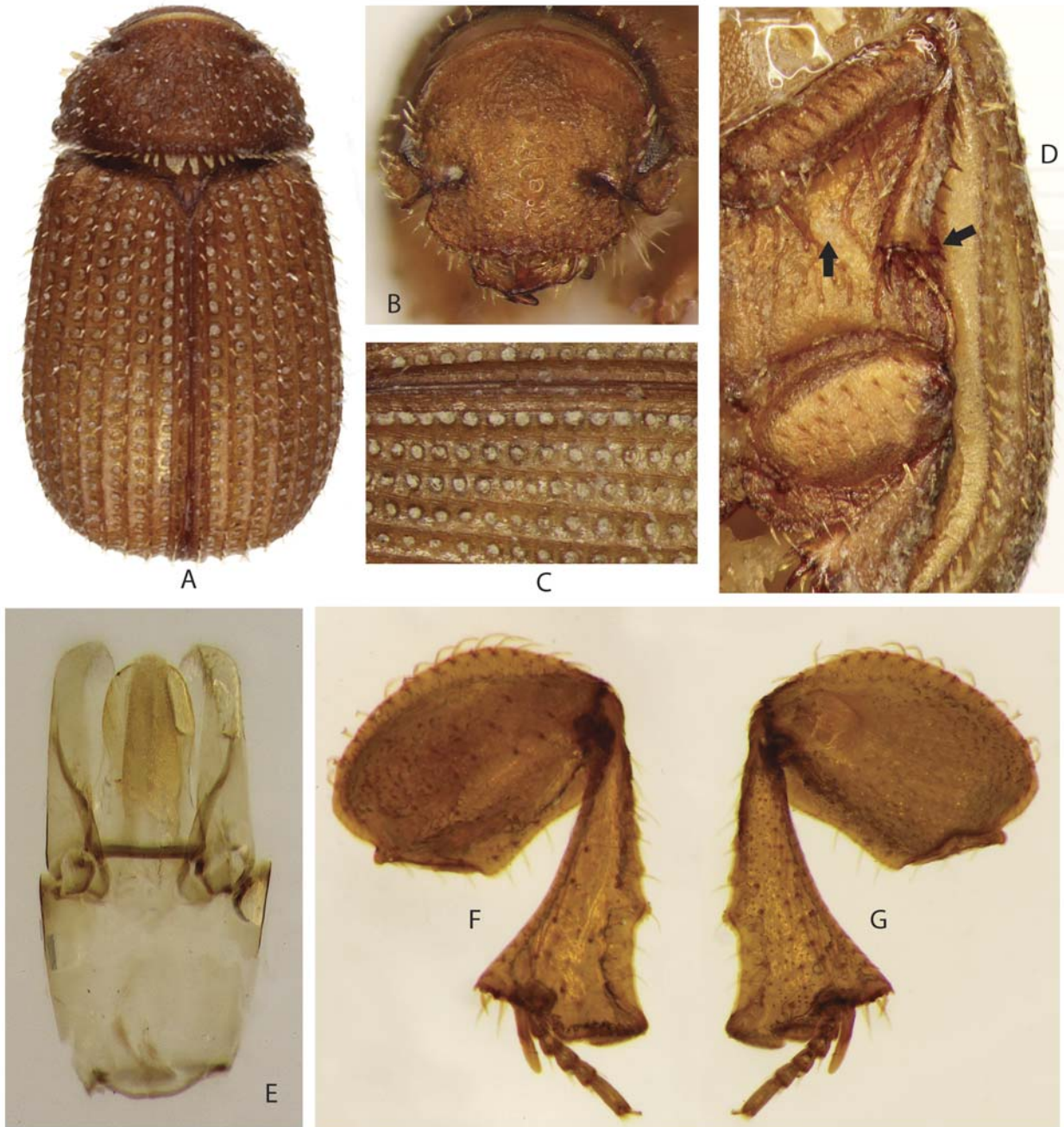
**Figures 20A-20G.** *Glaresis howdeni* Gordon. **A)** Habitus view. **B)** Clypeus and head surface. **C)** Trochanter with single tooth. **D)** Metasternum and mesotibia. **E)** Male genitalia. **F)** Metaleg, dorsal view. **G)** Metaleg, ventral view.



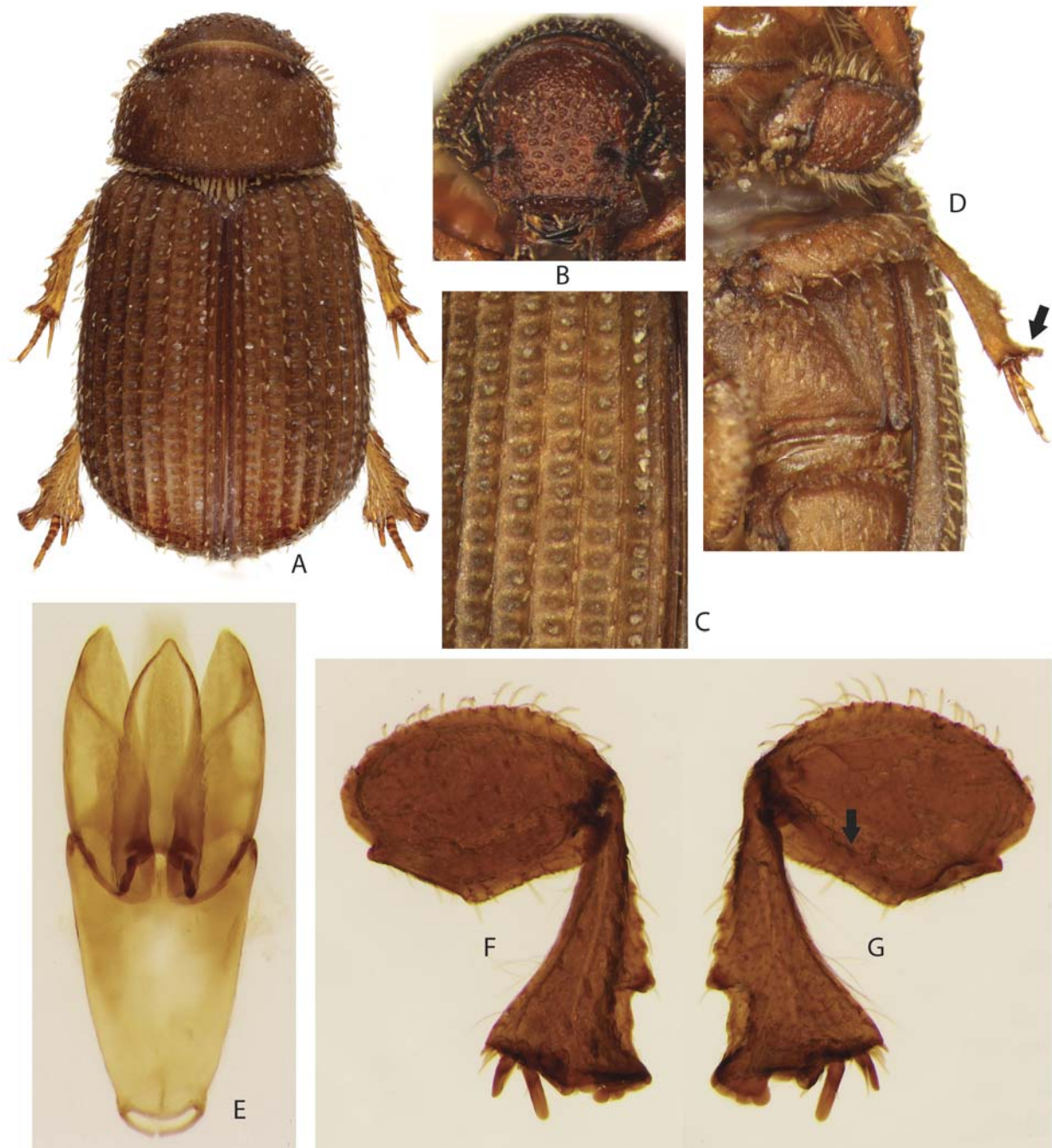


**Figures 21A-21G.** *Glarexis texana* Gordon. **A)** Habitus view. **B)** Clypeus and head surface. **C)** Pronotal surface and elytra. **D)** Metasternum and mesotibia. **E)** Male genitalia. **F)** Metaleg, dorsal view. **G)** Metaleg, ventral view.



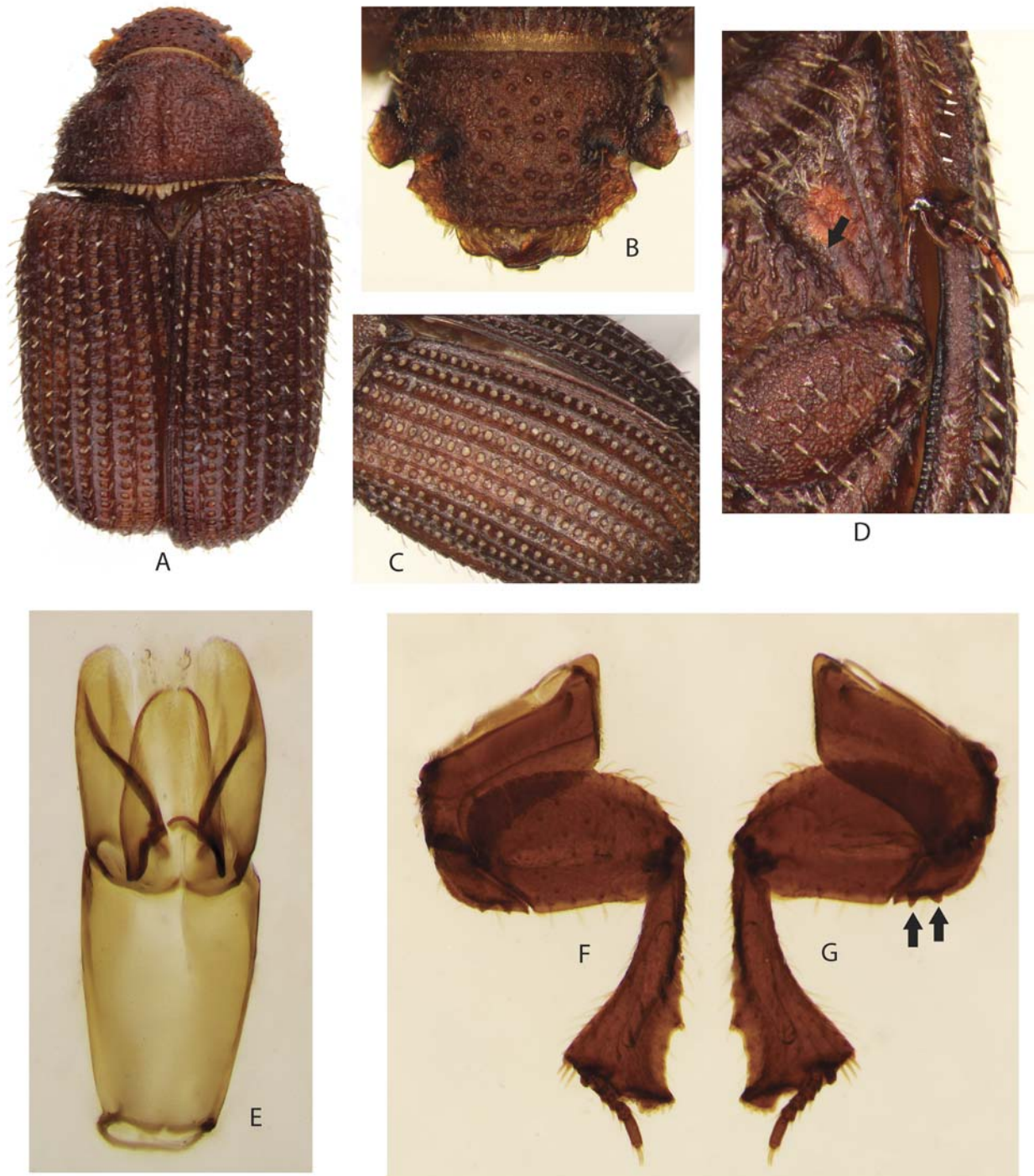


**Figures 22A-22G.** *Glaresis confusa* Brown. **A)** Habitus view. **B)** Clypeus and head surface. **C)** Elytral striae. **22D)** Metasternum and mesotibia. **E)** Male genitalia. **F)** Metaleg, dorsal view. **G)** Metaleg, ventral view.



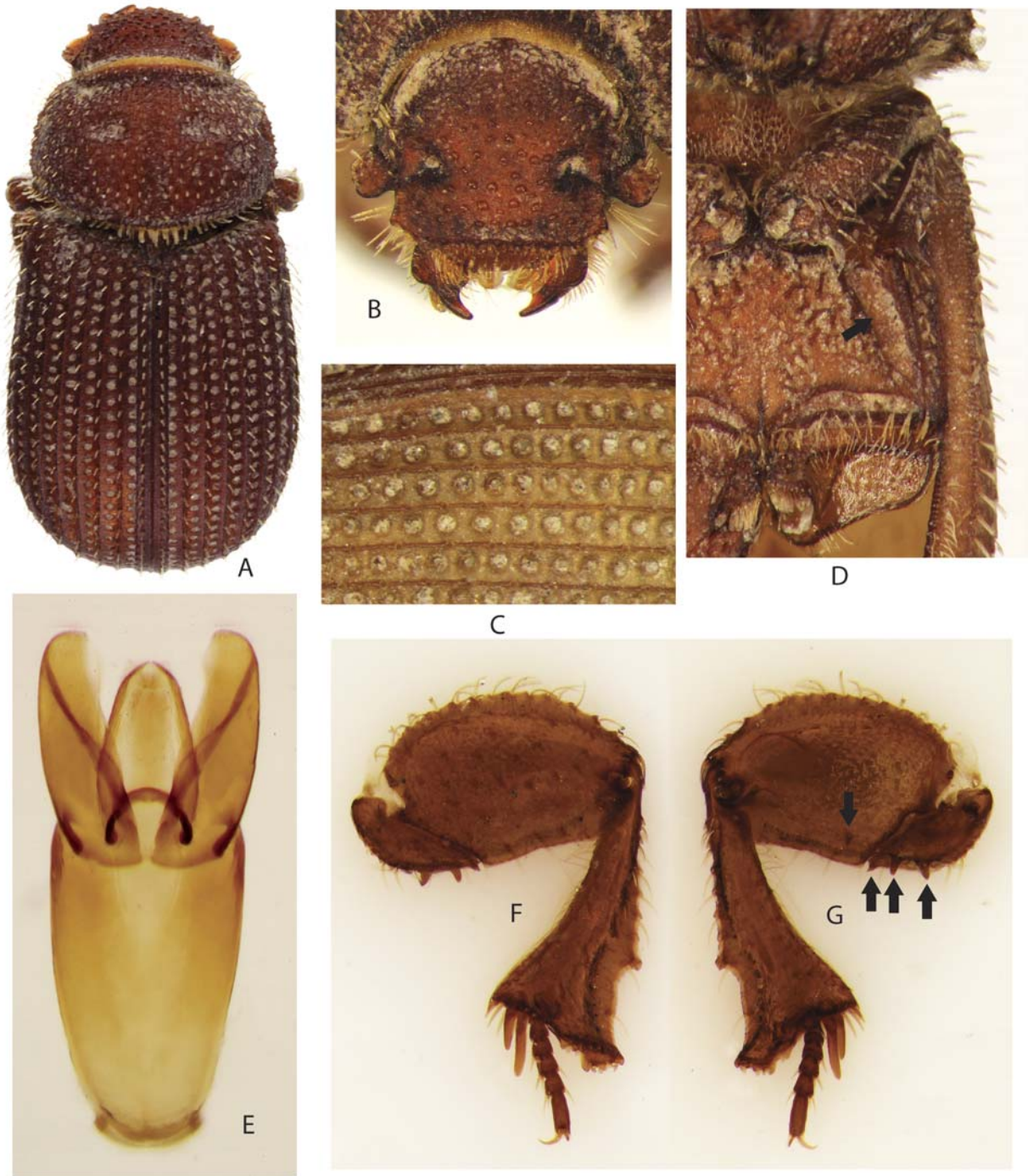
**Figures 23A-23G.** *Glarensis falli*, new species. **A)** Habitus view. **B)** Clypeus and head surface. **C)** Elytral striae. **D)** Metasternum and mesotibia. **E)** Male genitalia. **F)** Metaleg, dorsal view. **G)** Metaleg, ventral view.



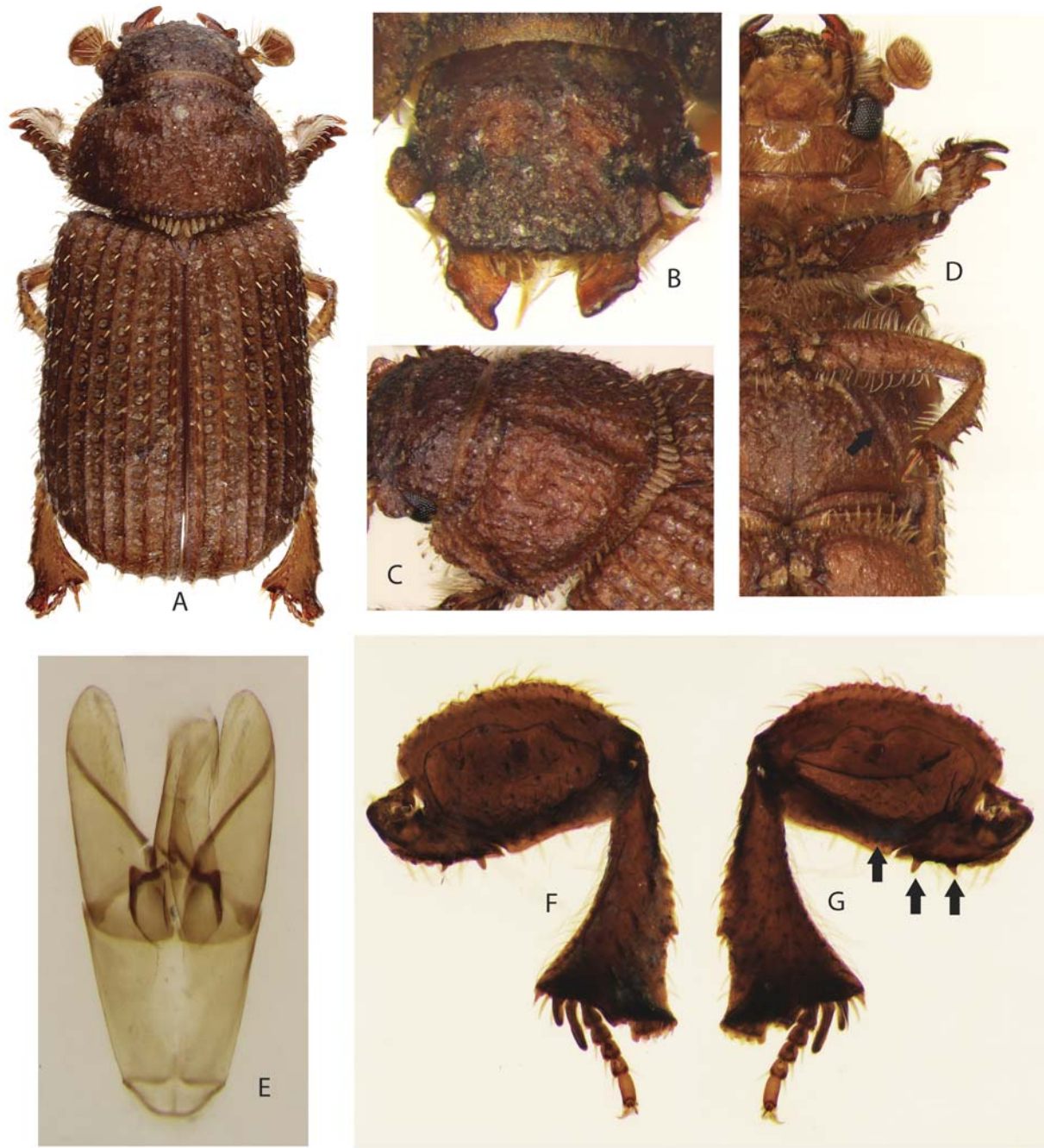


**Figures 24A-24G.** *Glaresis mendica* Horn. **A)** Habitus view. **B)** Clypeus and head surface. **C)** Elytral striae. **D)** Metasternum and mesotibia. **E)** Male genitalia. **F)** Metaleg, dorsal view. **G)** Metaleg, ventral view.



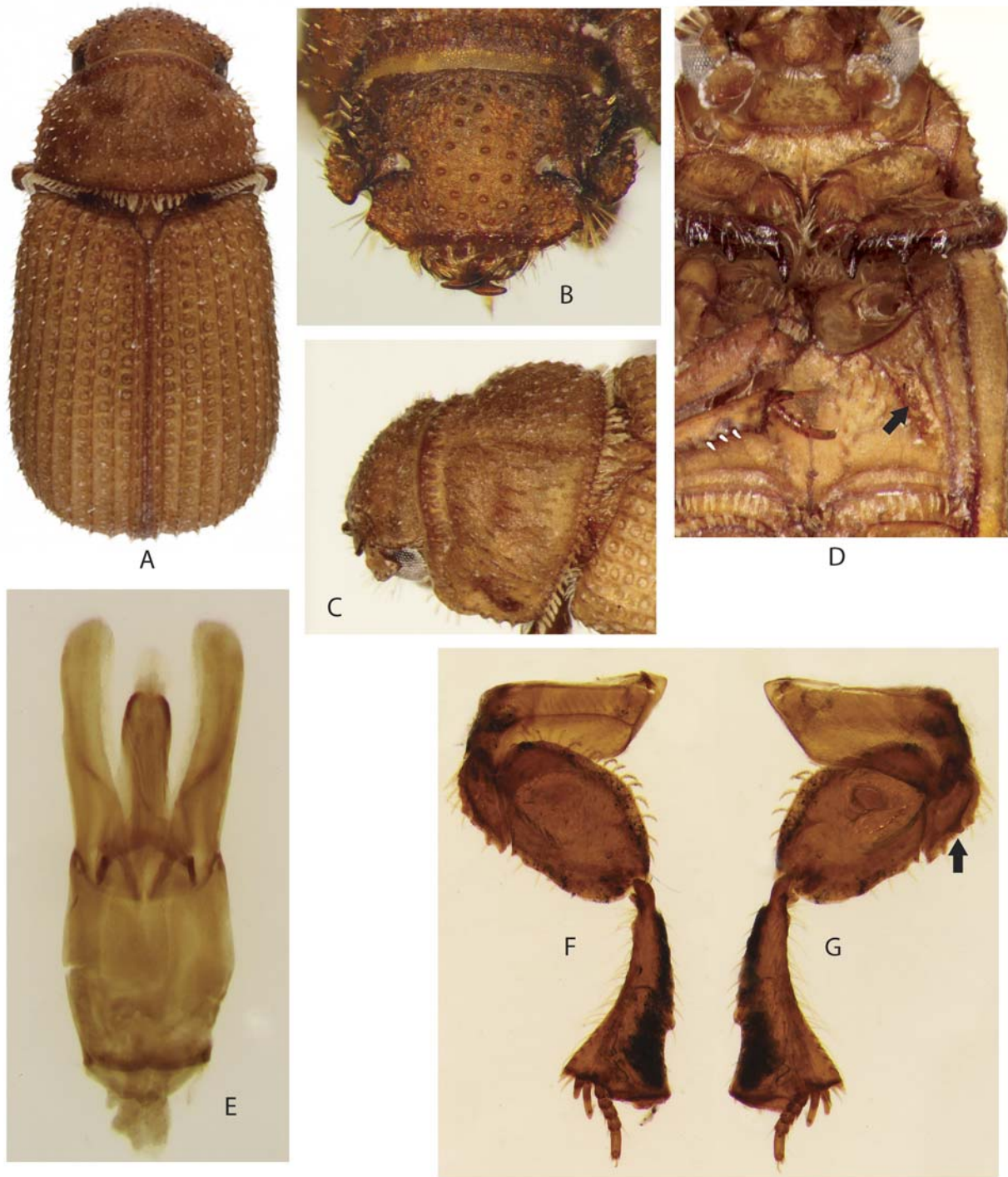


**Figures 25A-25G.** *Glarensis paramendica*, new species. **A)** Habitus view. **B)** Clypeus and head surface. **C)** Elytral striae. **D)** Metasternum with metasternal groove. **E)** Male genitalia. **F)** Metaleg and trochanter, dorsal view. **G)** Metaleg and trochanter, ventral view.



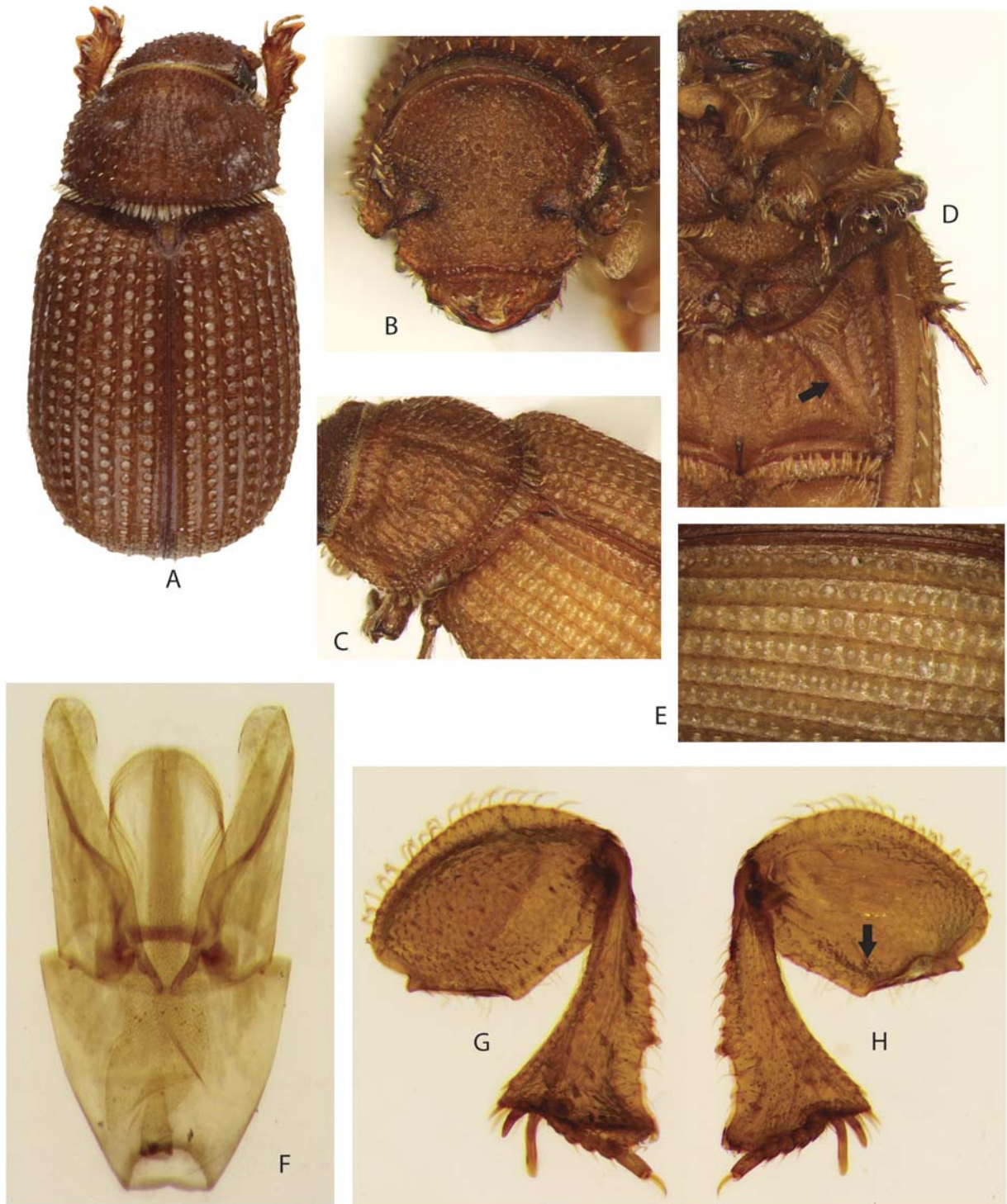
**Figures 26A-26G.** *Glaresis bautista*, new species. **A)** Habitus view. **B)** Clypeus and head surface. **C)** Pronotal surface. **D)** Metasternum with metasternal groove and mesotibia. **E)** Male genitalia. **F)** Metaleg and trochanter, dorsal view. **G)** Metaleg and trochanter, ventral view.





**Figures 27A-27G.** *Glarexis gordonii* Warner. **A)** Habitus view. **B)** Clypeus and head surface. **C)** Pronotal surface. **D)** Metasternum with metasternal groove and mesotibia. **E)** Male genitalia. **F)** Metaleg and trochanter, dorsal view. **G)** Metaleg and trochanter, ventral view.



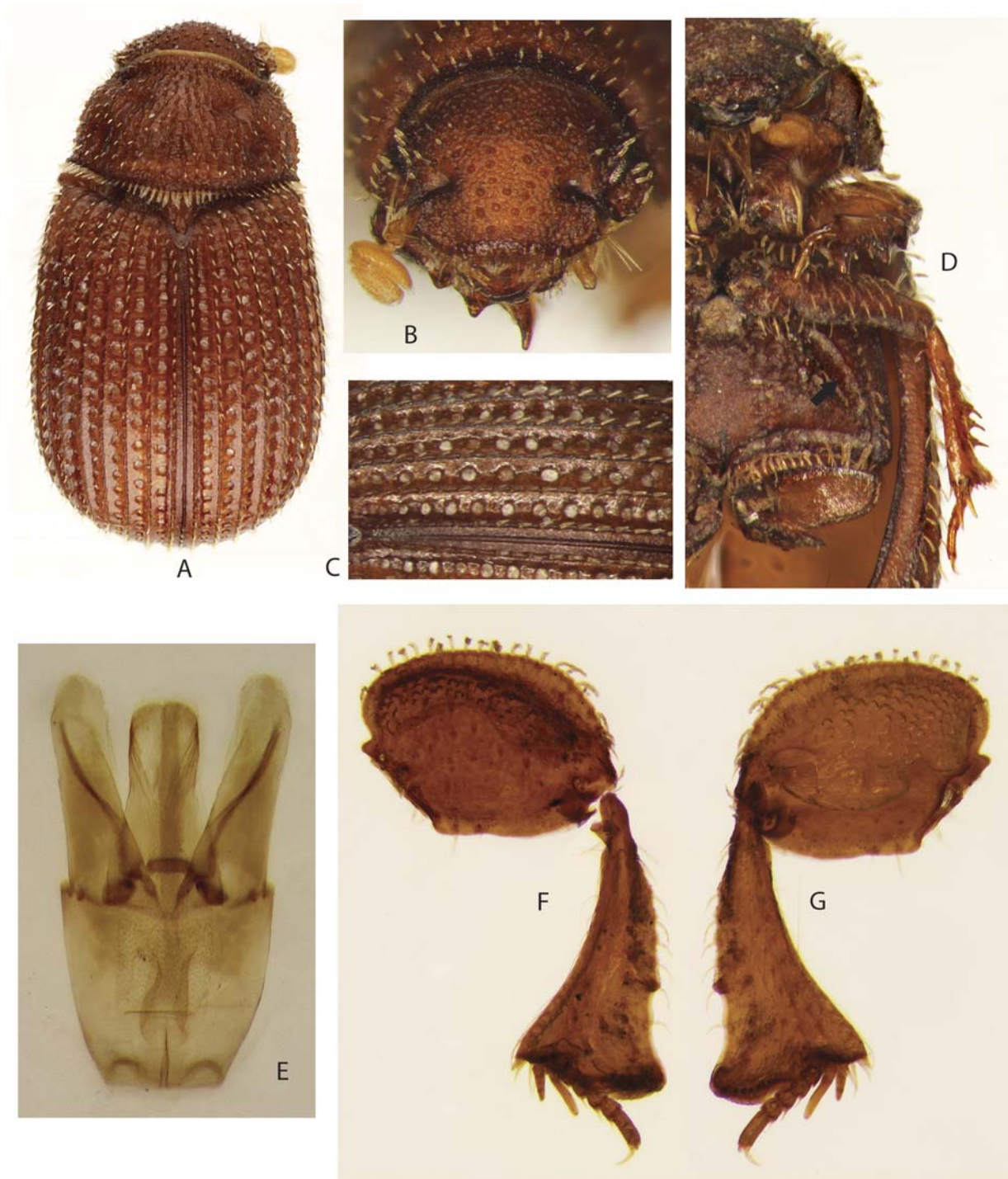


**Figures 28A-28H.** *Glaresis caenulenta*, new species. **A)** Habitus view. **B)** Clypeus and head surface. **C)** Pronotal surface and elytra. **D)** Metasternum with metasternal groove and mesotibia. **E)** Elytral striae. **F)** Male genitalia. **G)** Metaleg, dorsal view. **H)** Metaleg, ventral view.



**Figures 29A-29G.** *Glaresis australis*, new species. **A)** Habitus view. **B)** Clypeus and head surface. **C)** Pronotal surface. **D)** Metasternum with metasternal groove and mesotibia. **E)** Male genitalia. **F)** Metaleg, dorsal view. **G)** Metaleg, ventral view.





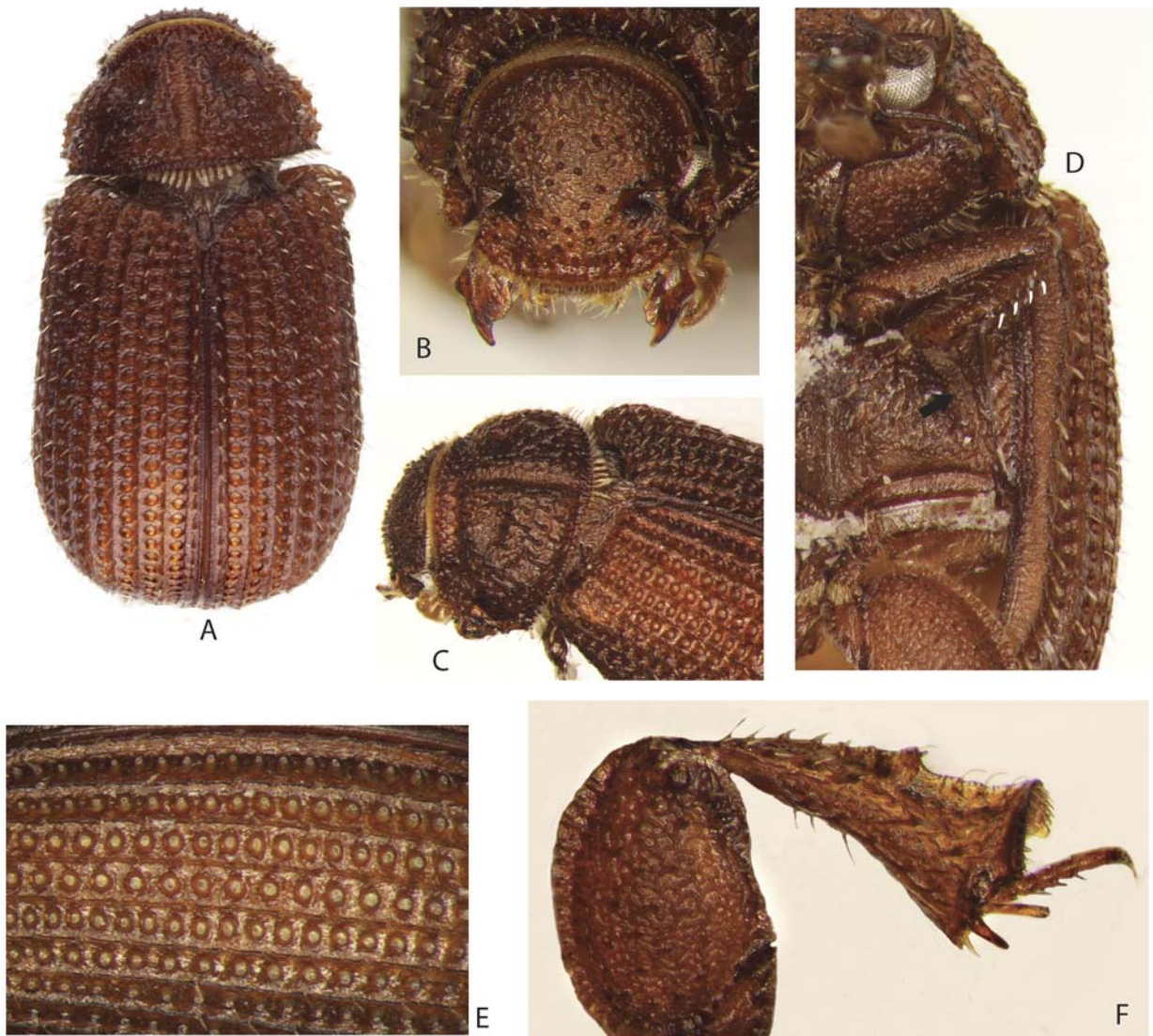
**Figures 30A-30G.** *Glaresis tumida*, new species. **A)** Habitus view. **B)** Clypeus and head surface. **C)** Elytral striae. **D)** Metasternum and mesotibia. **E)** Male genitalia. **F)** Metaleg, dorsal view. **G)** Metaleg, ventral view.



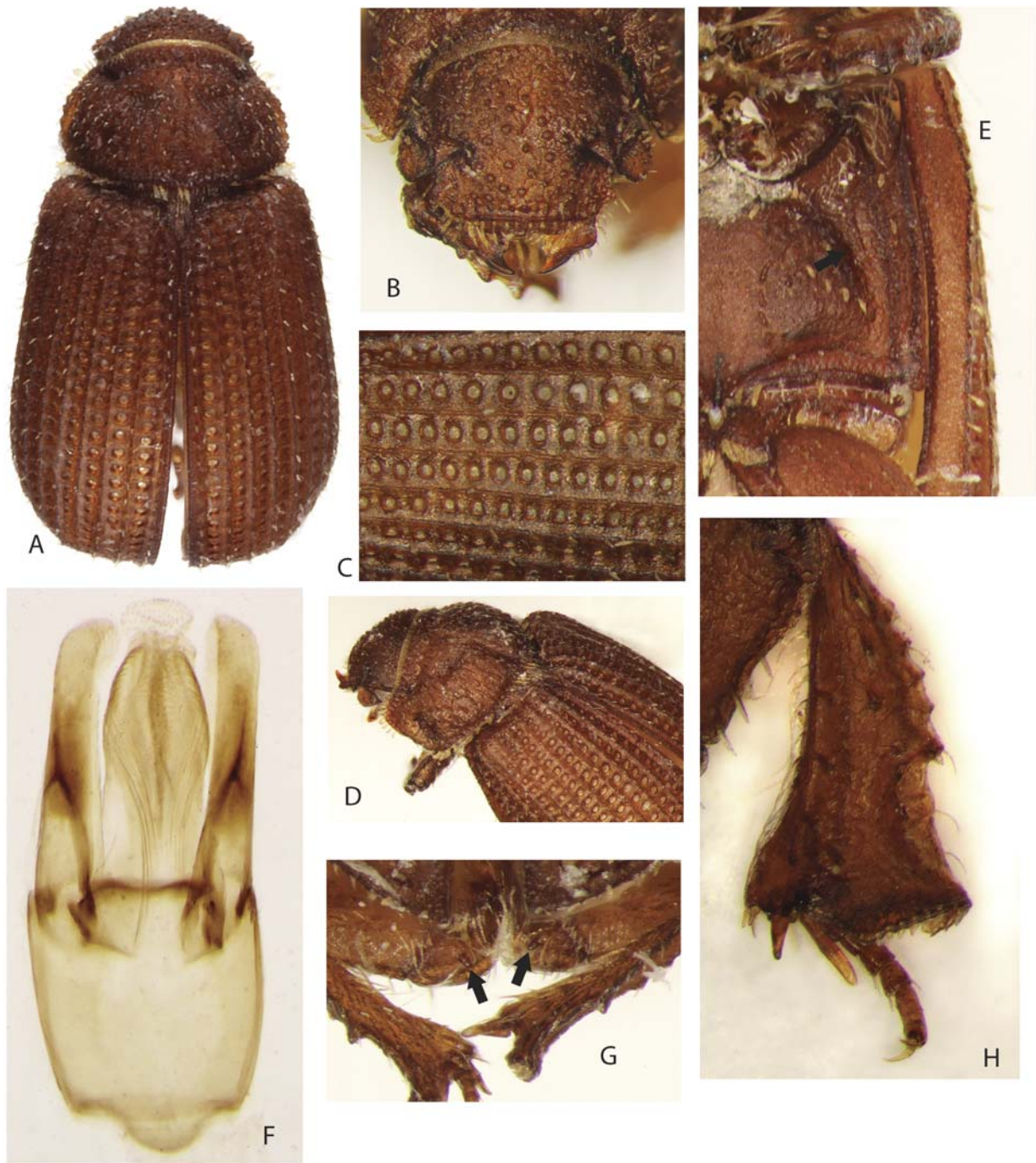


**Figures 31A-31G.** *Glarensis dentata*, new species. **A)** Habitus view. **B)** Clypeus and head surface. **C)** Elytral striae. **D)** Metasternum and mesotibia. **E)** Metafemur and trochanter, dorsal view. **F)** Metafemur and trochanter, ventral view. **G)** Metatibia, ventral view.



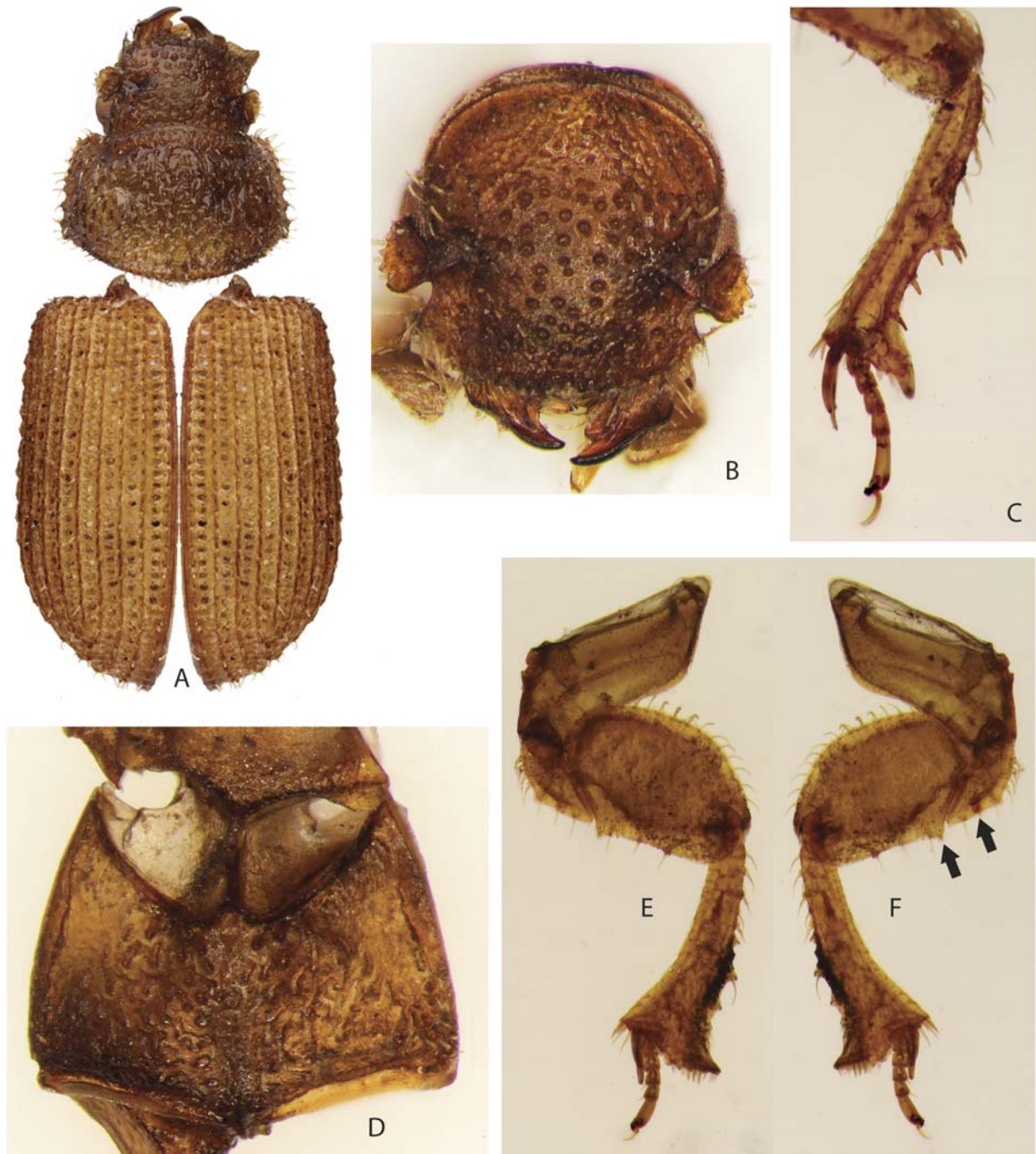


**Figures 32A-32F.** *Glaresis donaldi*, new species. **A)** Habitus view. **B)** Clypeus and head surface. **C)** Pronotal surface and elytral striae. **D)** Metasternum and mesotibia. **E)** Elytral striae. **F)** Metaleg and trochanter with teeth, dorsal view.

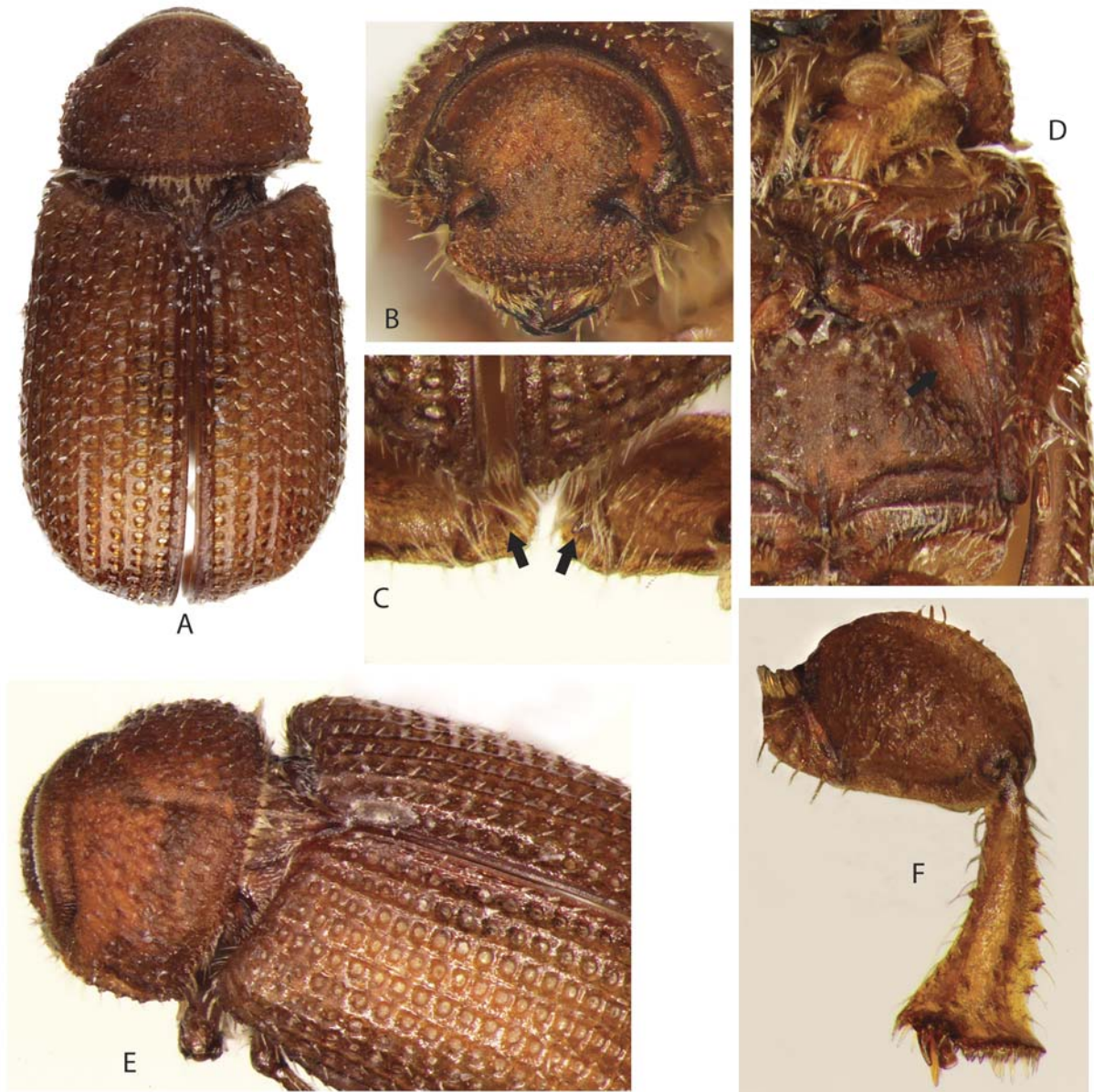


**Figures 33A-33H.** *Glarensis zacateca*, new species. **A)** Habitus view. **B)** Clypeus and head surface. **C)** Elytral striae. **D)** Pronotal surface and elytra. **E)** Metasternum. **F)** Male genitalia. **G)** Metalegs and trochanter. **H)** Metatibia, dorsal view.





**Figures 34A-34F.** *Glaresis costaricensis*, new species. **A)** Habitus view. **B)** Clypeus and head surface. **C)** Mesotibia. **D)** Metasternum. **E)** Metafemur and trochanter, dorsal view. **F)** Metafemur and trochanter, ventral view.



**Figures 35A-35F.** *Glaresis limbata*, new species. **A)** Habitus view. **B)** Clypeus and head surface. **C)** Metatrochanter with teeth indicated. **D)** Metasternum. **E)** Pronotal surface and elytra. **F)** Metaleg, dorsal view.

**Figures 36A-36CC.** Male genitalia. **A)** *Glaresis pardoalcaidei* Martinez. **B)** *Glaresis ecostata* Fall. **C)** *Glaresis costata*, new species. **D)** *Glaresis montenegro*, new species. **E)** *Glaresis yanegai*, new species. **F)** *Glaresis phoenicis* Fall. **G)** *Glaresis dakotensis* Gordon. **H)** *Glaresis imitator*, new species. **I)** *Glaresis medialis* Gordon. **J)** *Glaresis clypeata* Van Dyke. **K)** *Glaresis arenata* Gordon. **L)** *Glaresis zvirgzdinsi* Warner. **M)** *Glaresis fritzi* Martinez. **N)** *Glaresis sabulosa*, new species. **O)** *Glaresis warneri*, new species. **P)** *Glaresis inducta* Horn. **Q)** *Glaresis canadensis* Brown. **R)** *Glaresis californica*, new species. **S)** *Glaresis howdeni* Gordon. **T)** *Glaresis texana* Gordon. **U)** *Glaresis confusa* Brown. **V)** *Glaresis falli*, new species. **W)** *Glaresis mendica* Horn. **X)** *Glaresis paramendica*, new species. **Y)** *Glaresis bautista*, new species. **Z)** *Glaresis gordonii* Warner. **AA)** *Glaresis caenulenta*, new species. **BB)** *Glaresis australis*, new species. **CC)** *Glaresis tumida*, new species.





