

**Two new *Glaresis* from the desert Southwest,
with notes on the identity of *Glaresis mendica* Horn
(Coleoptera: Scarabaeidae: Glaresinae)**

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Abstract: Diagnostic characters of *Glaresis mendica* Horn are discussed, and an undescribed species, confused with *G. mendica* by authors subsequent to Horn, is described as *Glaresis gordonii* new species. A second new species, *Glaresis zvirgzdinsi*, is described from two isolated sand dunes in Yuma County, Arizona, USA. Diagnostic characters of the new species, as well as those of *G. mendica*, are illustrated.

Recent collecting on sand dunes of southwestern Arizona resulted in the discovery of a new species of *Glaresis* which I here describe as *Glaresis zvirgzdinsi*. The type locality is within 200 m of the north boundary of the Barry M. Goldwater Air Force Range, at the north end of Mohawk Dune. Mohawk Dune is a 25 km long, consolidated sand ridge which lies along the west side of the Mohawk Mountains. The dune is stabilized except on its apex. Dominant perennial plants on the dune are big galleta grass (*Hilaria rigida* (Thurb.)) and *Ephedra* sp., with a few *Larrea* invading from the surrounding flats. No trees are present in the area of the dune. Specimens of both *Glaresis ecostata* Fall and *Glaresis phoenicis* Fall were collected at the same lights with the new species. Specimens of *Glaresis gordonii* new species were collected a few km away on the rocky foothills of the Mohawk Mountains (rest area on Interstate 8) on the same night.

After the description for *G. zvirgzdinsi* was submitted for publication, I was able to examine *Glaresis* in the Horn and Fall collections at the Museum of Comparative Zoology (Harvard University), and discovered that the holotype of *Glaresis mendica* Horn was not the same species as "*mendica*" sensu Fall (1907) and Gordon (1970, 1974). As this leaves the latter taxon without a name, it is also here described as new. Horn (1885) was apparently unaware of spination of the middle and posterior legs as important diagnostic characters in the genus, so his *Glaresis* descriptions are now inadequate. Given this and the subsequent confu-

sion, diagnostic characters of the true *G. mendica* are figured and discussed as well.

Terminology for appendages follows Gordon (1970).

***Glaresis zvirgzdinsi* Warner, new species
(figs. 1-4)**

Holotype male (Florida State Collection of Arthropods) and allotype female from: "USA: Arizona, Yuma Co., N end of Mohawk Dunes, west of Mohawk Mountains, ca. 1 mi. S of I-8, iii-6-1988, at UV light, W. B. Warner".

Paratypes (86) with data as follows: same as holotype (19); same except: iv-9-1993 (60); same except "v-4-1991"; same except: v-14-1988, W. B. Warner & A. Zvirgzdins (5); USA: AZ, Yuma Co., large sand dunes SE of Yuma, 32°27'N, 114°25', iv-16-1994, UV light, W. B. Warner. Paratypes are deposited at Arizona State University (Tempe), University of Arizona (Tucson), Florida State Collection of Arthropods (Gainesville), Museum of Comparative Zoology (Cambridge), US National Museum of Natural History (Washington, DC), Canadian National Collection (Ottawa), and the private collections of D. Carlson, R. Cunningham, L. Delgado-Castillo, A. V. Evans, B. D. Gill, R. D. Gordon, H. F. Howden, M. A. Morón, A. Reifschneider, E. G. Riley, B. C. Ratcliffe, D. Russell, P. Skelley, C. Wolfe, and the author.

Description: holotype male, length 4.1 mm, width 2.3 mm. Head tuberculate, dull, tubercles becom-

ing smaller toward vertex; clypeus shiny between tubercles, anterior clypeal margin weakly reflexed, minutely tuberculate; lateral angles nearly right (fig. 1). Pronotum with posterior angles subprominent, tuberculate; posterior margin medially angulate, disc with following areas impressed: midline, medioposterior to anterior angles, lateral foveae (submedial foveae are obsolescent). Elytra costate, intercostal puncture rows strong. Mesotibia with six spines on external margin distal to submedial sinuation; apex with external angle rounded, not spiniform (fig. 2). Posterosuperior margin of metatrochanter with a single large tooth; posterosuperior margin of metafemur with two teeth, inner one larger than outer one; outer margin of metatibia with median projection small (fig. 3). Male genitalia (fig. 4) short, broad; parameres subequal in length to basal piece; aedeagus sharply upturned, apex narrowly rounded.

Allotype female, length 4.2 mm, width 2.4 mm. Essentially identical to male in external characters.

Variation: Male and female, length 3.3 to 4.4 mm, width 1.8 to 2.4 mm. The number of spines on the external mesotibial margin distal to submedial sinuation varies from five to seven (usually six), but may be lost through abrasion.

Diagnosis: *Glareis zvirgzdinsi* is similar to *Glareis inducta* Horn, and keys to that species in Gordon's (1970) key. Although the smallest specimens are as small as the largest *G. inducta*, *G. zvirgzdinsi* may be separated from that species by its usually larger size, broader hind tibiae with less prominent medial tooth, and the more numerous spines on the external margin of its mesotibiae (five to seven versus (usually) three or four in *G. inducta*). Larger specimens of *Glareis gordonii* may also be confused with *G. zvirgzdinsi*, but *G. gordonii* has different mesotibiae and male genitalia, and has three small teeth on the hind margin of the metatrochanter.

Etymology: I take pleasure in naming this species in honor of my friend and colleague, Andris Zvirgzdins, who assisted in the collection of some of the specimens of this new species.

Remarks: Although currently not known from Mexico, this species undoubtedly occurs in Sonora as one paratype was collected within 10 km of the

Mexican border on the northern end of a large dune field centered in northwestern Sonora.

***Glareis gordonii* new species**
(figs. 5-8)

Glareis mendica, Fall 1907:25 (nec Horn 1885); Gordon 1970:505.

Holotype male and allotype female (Florida State Collection of Arthropods) from: "USA: AZ: Yavapai Co., wash at NW side of Lake Pleasant, v-18-1992, W. B. Warner".

Paratypes (137) with data as follows: USA, **Arizona:** same as holotype (38); "Geronimo, viii-6-1948, Werner-Nutting"; "So. Az.". Cochise Co.: "Cochise Stronghold, Dragoon Mts., vii-12-15-1970, R. J. Shaw, u.v. trap"; same except: "vii-16-1958, C. W. O'Brien" (2); "Guadeloupe Cyn., viii-30-1986, D. Russell". Graham Co.: "Graham Mts., Marijilda Cn., vii-9-1955, F. G. Werner & G. D. Butler"; "Dripping Spring, Whitlock Mtns., viii-5-1976, D. S. Chandler". Maricopa Co.: "Phoenix, v-17-1941, Parker"; same except: "viii-31-1935" (2); . Maricopa Co.: "Ft. McDowell, vii-11-1986, at light, W. B. Warner" (6); "Lake Pleasant, vi-6-1986, at light, W. B. Warner" (3). Pima Co.: "14 mi. S jct. Hwy. 86 & 286, viii-9-1974, R. A. Cunningham"; "S. Catalina Mts., viii-24-1949, F. H. Parker"; "Brown Cn., Baboquivari Mts., viii-4-1962, F. Werner, P. Johnson, u.v. lt. trap" (2); "Chutum Vaya Cn., W. sl. B'quivari Mts., 31° 43' N, 111° 37'W, viii-4-1966, lt. trap, 3250', F. Werner family" (2); "Chutum Vaya Cn., Baboq. Mts., 3250', viii-4-1966, u.v. lt. trap, F. G. Werner family" (24); "Ariz-Son. Desert Mus., viii-1-4-1962, lt. trap, W. L. Nutting, S. Oman" (11); same except: "viii-5-8-1962" (7); same except: "viii-21-24-1962" (2); 8 mi. N. Vail, viii-7-1966, F. Werner fam." (3); "Tangerine Rd., 5 mi. E of I-10, vii-19-1990, at light, W. B. Warner" (3). Pinal Co.: "Boyce Thomp. Arb., Superior, ix-5-1955, B. W. Benson, lt. trap"; "Picacho Peak on I-10, viii-5-1988, W. B. Warner"; "Sacaton Rd. at Hwy. 87 (16 mi. N of Casa Grande), vii-24-1993, u.v., B. C., E. L., L. R., & W. B. Warner" (4). Yavapai Co.: "Skull V., vii-31-1970, J. E. May, u.v. trap" (2). Yuma Co.: "I-8 rest area at MP 56 (nr. Mohawk), v-14-1988, at light, W. B. Warner". **California,** Imperial Co.: "1.3 mi. NW Glamis, ix-15-1988"; "Hwy. 78, vic. 1.3 rd. mi. SW Glamis, iv-17-1992, 345 ft., R. A. Cunningham". Inyo Co.: "Saline Valley Dunes, 2 mi. SW of dunes in mesquite area, v-27-1990, Cunningham, Streit, Russell". River-

side Co.: "Deep Canyon, ix-18-1977, D. Carlson" (3); "Palm Springs, vic. Bogert Trl. Rd. & Palm Cyn. Dr., iv-8-1989, R. A. Cunningham". San Bernardino Co.: "49 Palms Cyn., viii-1-1970, R. A. Cunningham". **Mexico, Baja California:** "approx. 30-35 rd. mi. SE of El Rosario, Hwy. #1 (kilometer post #115), ix-8-9-1988, D. A. La Rue, at fluorescent & m.v. lights, cardon cactus-mesquite-creosote bush ecotone"; "San Agustin, lat 29°56'N, long 114°58'W, el 580 m, i-22-1984 - iv-7-1985, pitfall trap #2, ethylene glycol, W. H. Clark & P. E. Blom". **Sonora:** "40 mi. N. Guaymas, viii-21-1967, A. R. Hardy"; "40 mi. NW Santa Ana, viii-20-1967, R. & A. R. Hardy". Paratypes are deposited at Arizona State University (Tempe), University of Arizona (Tucson), Florida State Collection of Arthropods (Gainesville), Museum of Comparative Zoology (Cambridge), US National Museum of Natural History (Washington, DC), Canadian National Collection (Ottawa), and the private collections of D. Carlson, R. Cunningham, L. Delgado-Castillo, A. V. Evans, B. D. Gill, R. D. Gordon, H. F. Howden, M. A. Morón, B. C. Ratcliffe, A. Reifschneider, E. G. Riley, D. Russell, P. Skelley, C. Wolfe, and the author.

Description: Holotype male, length 2.6 mm, width 1.4 mm. Medium brown, dull. Head tuberculate, tubercles obsolete on vertex; clypeus dull, with anterior margin straight, weakly beaded and tuberculate; lateral angles obtuse. Pronotum with posterior angles narrowly rounded; posterior margin medially rounded; disc with midline, anterior submargin medioposterior to anterior angles, lateral fovae (weakly), and submedial fovae (distinctly) impressed. Elytra costate, costal carinae distinct; intervals with punctures weakly transverse, separated by less than their lengths. Mesotibia with three spines on external margin distal to weak submedial situation; apex with external angle rounded, not spiniform (fig. 6). Posterosuperior margin of metatrochanter with a single large tooth, posterior margin with three small tubercles; posterosuperior margin of metafemur with two tiny (obsolescent) teeth; outer margin of metatibia with median projection small (fig. 7). Male genitalia (fig. 8) comparatively elongate, narrow; parameres slightly longer than basal piece; aedeagus upturned apically, apex rounded.

Allotype female, length 2.8 mm, width, 1.4 mm. Essentially identical to holotype externally.

Variation: Male and female, length 2.4 to 3.4 mm, width 1.2 to 1.7 mm. In a minority of specimens,

one or both of the two teeth on the posterosuperior metafemoral margin are lacking or apparently lacking on one or both sides. The number of spines distal to the medial mesotibial situation varies from three to four.

Diagnosis: *Glaresis gordonii* differs from other North American species in having three or four tiny spines or tubercles at the posterior metatrochanteral margin. Excluding that character, it is similar to *Glaresis inducta* Horn and its allies, but may be additionally differentiated from those species by the deep submedial pronotal impressions, rounded posterior pronotal margin, and narrower male genitalia. It is also similar to *G. mendica*, but differs in having only a single spine on the posterosuperior metatrochanteral margin, less protuberant external angle of the mesotibial apex, and its often less sharply carinate elytral costae (Arizona specimens). Baja California specimens of *G. gordonii* tend to have sharper elytral carinae as in *G. mendica*.

Etymology: This species is named for Robert D. Gordon in honor of his considerable contributions to the knowledge of this genus.

Remarks: *Glaresis gordonii* is one of the few members of this genus commonly collected away from large sand dune habitats. It is generally not found or not common on deep sand dunes where *G. ecostata*, *G. phoenicis*, or *G. zvirgzdinsi* commonly occur. It is often common in or near washes and desert riparian areas, however, and so may ecologically specialize in small, sandy microhabitats found in areas of generally heavier soils.

Glaresis mendica Horn

(figs. 9-10)

A review of the Fall and Horn collections in the Museum of Comparative Zoology (Harvard University) showed that Fall (1907) confused the species here described as *G. gordonii* with *G. mendica* Horn. Gordon (pers. comm.) was unable to see Horn's collection prior to his (1970) revision, but did review Fall's collection which contained *G. gordonii* labeled by Fall as "*G. mendica*", and so unknowingly perpetuated the confusion. The two species are indeed very similar in size, and in a side by side comparison differ dorsally only in the perceptibly sharper elytral carinae of *G. mendica* (Arizona specimens). I was unable to dissect Horn's holotype (sex undetermined); however the following middle

and hind leg characters of *G. mendica* immediately differentiate the two species: mesotibial apex more prominent (fig. 9); metatrochanter with two long teeth on posterosuperior margin, posterior margin without tubercles (fig. 10); posterosuperior margin of metafemur apparently without teeth (a vague indication of one tooth is visible at 60 X magnification). The metatrochanteral teeth are so long that their apices are visible even when the beetle is viewed directly ventrally. In most other *Glaresis*, the posterosuperior spines can only be seen by tipping the specimen backward and viewing the trochanters at an angle.

Fall's (1907) figure of the metatibia of *G. "mendica"* appears more similar to the tibia of Horn's holotype than to that of *G. gordonii*. However, Fall clearly states (1907:25): "...there is a small spiniform tooth near the outer extremity of the posterosuperior margin of the hind trochanters. This tooth is not visible directly from beneath, being concealed by the more prominent lower margin of the trochanter, but may be viewed obliquely from behind.", so his diagnosis obviously does not refer to Horn's species.

The apparent lack of teeth on the posterosuperior margin of the holotype's metafemur may not be normal for this species, as the only other specimen I have examined that is (apparently) referable to *G. mendica* has two tiny teeth on the posterosuperior metafemoral margin as in most *G. gordonii*. This specimen was collected "6 mi. S of Howe, Butte Co., Idaho, vi-11-1981, pit fall trap, M. Stafford". As mentioned by Gordon (1970), the femoral teeth may be so small in *G. gordonii* (cited as "*mendica*") that they may appear to be absent; possibly a likewise situation occurs with *G. mendica*.

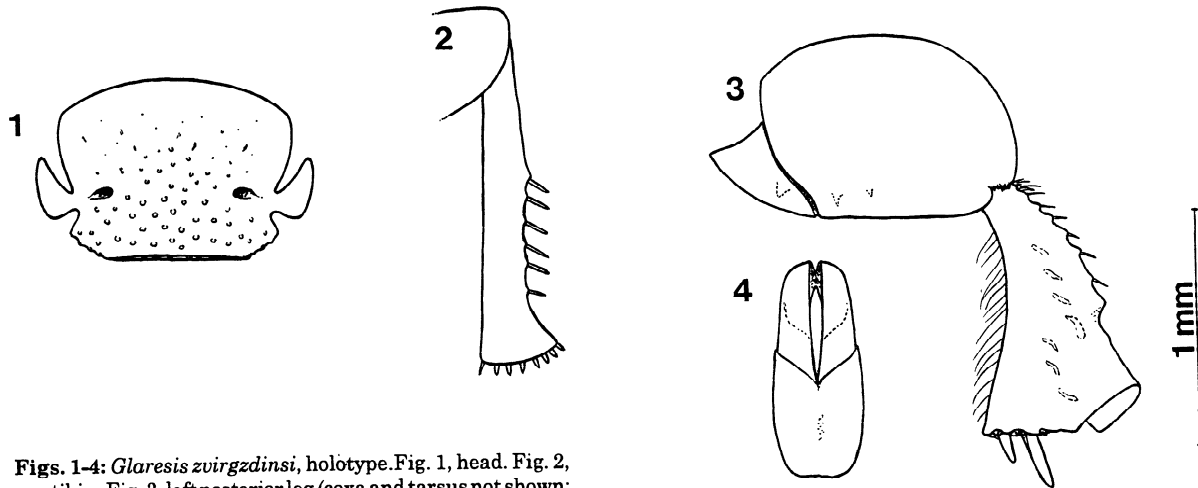
From other species with two spines on the posterosuperior metatrochanteral margin (*G. howdeni* Gordon and *G. clypeata* Van Dyke), *G. mendica* may be differentiated by its small size, less strongly tuberculate head, and different hind legs (the metatibia of *G. howdeni* has a large subapical tooth, and the metafemur of *G. clypeata* is toothed on its posterior margin adjacent to the metatrochanter).

Acknowledgements

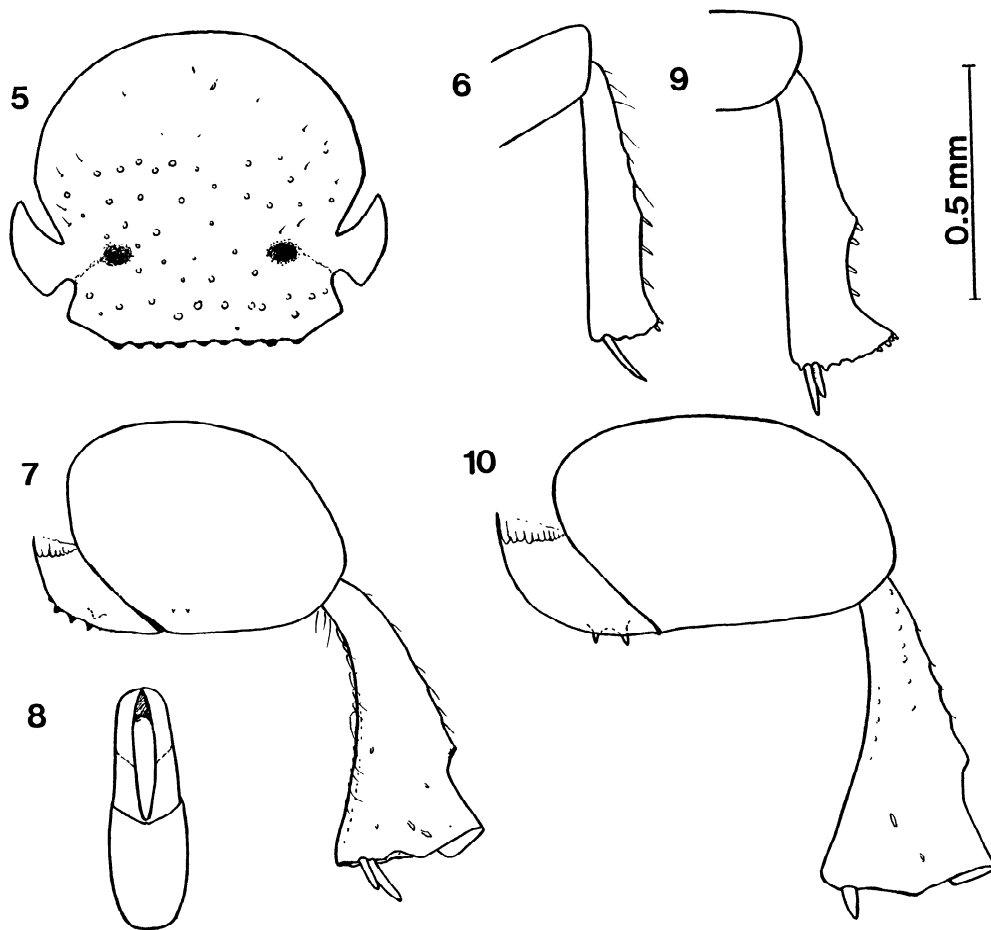
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Figs. 1-4: *Glaresis zvirgzdinsi*, holotype. Fig. 1, head. Fig. 2, left mesotibia. Fig. 3, left posterior leg (coxa and tarsus not shown; dotted-lined teeth on trochanter and femur are on underside). Fig. 4, male genitalia, dorsal view.



Figs. 5-8: *Glaresis gordonii*, holotype. Fig. 5, head. Fig. 6, left mesotibia. Fig. 7, left posterior leg (coxa and tarsus not shown; dotted-lined teeth on trochanter and femur are on underside). Fig. 8, male genitalia, dorsal view. Figs. 9-10, *Glaresis mendica*. Fig. 9, left mesotibia. Fig. 10, left posterior leg.