

TWO NEW SPECIES OF *GYMNODAMAEUS*
FROM COLORADO
(ACARINA: CRYPTOSTIGMATA, GYMNODAMAEIDAE)¹

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ABSTRACT.— *Gymnodamaeus plokosus* and *G. leurolomasus*, n. spp., are described from soil at an ecological study site near Hayden, Colorado. Their relationship to allied species is discussed.

A review of the literature indicates that the first species of *Gymnodamaeus* were described by Berlese (1910, 1916). Woolley (1972) reviews the literature of known soil mites in the genus *Gymnodamaeus* and describes a new species, *Gymnodamaeus chalazionus*, from the mountainous areas of northern Colorado. The two new species described below are additions to this genus.

The specimens of the first species described below were taken in soil beneath sage and grass along the undisturbed margin of a spoil bank near one of the coal strip-mining sites of the Hayden, Colorado, power plant. Comparisons of these specimens with others in the collections of the writers and with descriptions in the literature indicate that the species is new. It is described below and compared with other known species.

Those species of *Gymnodamaeus* from North America with which this new species were compared are *G. veriornatus* Higgins, 1961, and *G. chalazionus* Woolley, 1972. The new species is smaller in size than the above species but averages very close to the size of *G. gildersleeveae* Hammer, 1952, and *G. elegantulus* Hammer, 1958; it is smaller than *G. minor* Banks, 1947, slightly larger than *G. pearsei* Banks, 1947, and much larger than *G. quadricaudiculus* Jacot, 1937. The details of this size comparison are given below with collection data and measurements of the new species.

Gymnodamaeus plokosus, n. sp.

(Figs. 1, 2)

DIAGNOSIS.— Most easily recognized by the crenulated posterior margin of notogaster with four nubbins, each bearing an ornate, curved hair (Figure 1); differs from *G. gildersleeveae* Hammer, 1952, in this feature as well as in the marginal placement of the posterior notogastral hairs; without reticulate pattern on dorsum of notogaster as in *gildersleeveae*, but with an arched, transverse bar on prodorsum just anterior to interlamellar hairs which is not present in *gildersleeveae*. Differs from *G. quadricaudiculus* Jacot, 1937, in the absence of the dorsal oval sculpturing with rays. The interlamellar hairs of the new species are short and most nearly resemble

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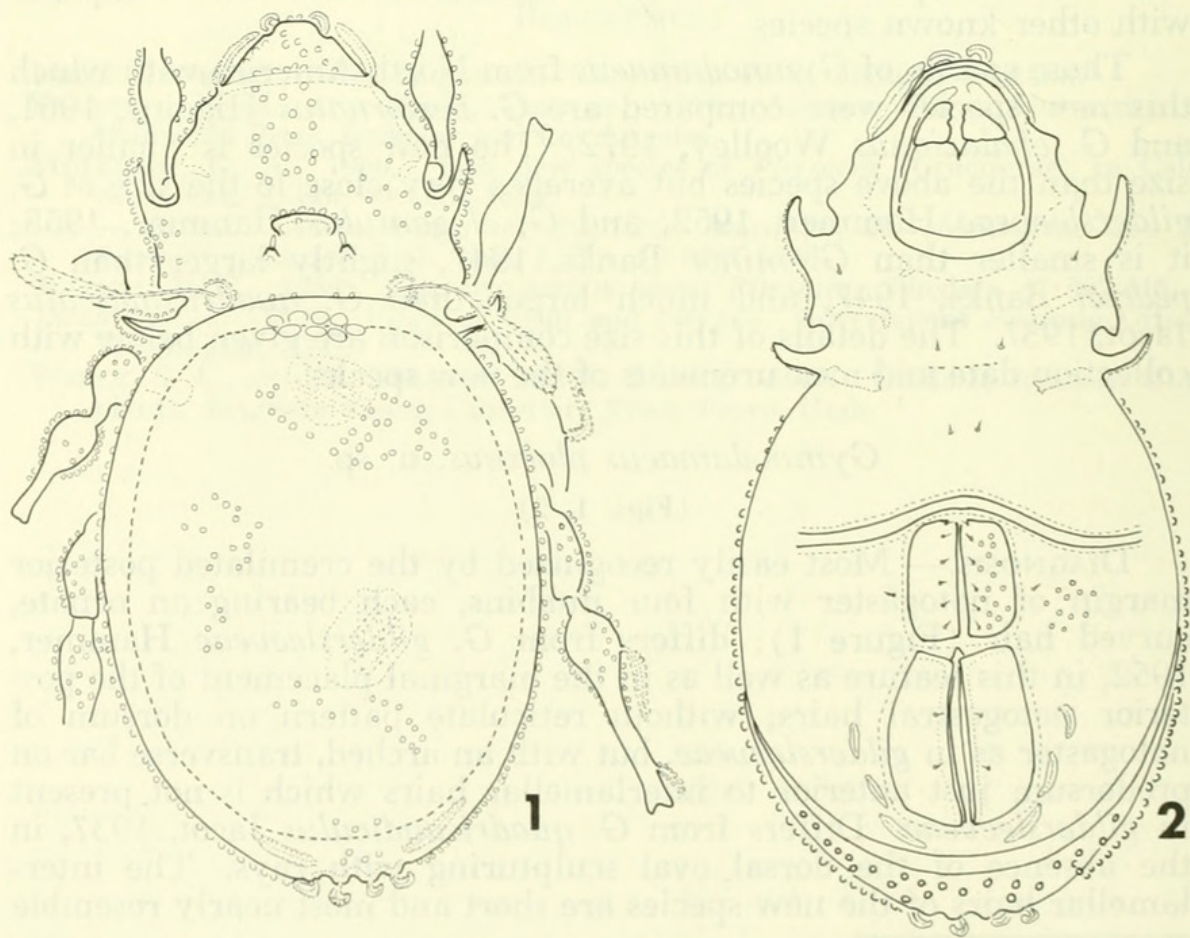
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those of *G. chalazionus* Woolley, 1972. The sensillum of the new species is most similar to *G. gildersleeveae*, broadly flabelliform and spined for its entire length.

The trivial name *plokosus* is from the Greek, meaning "a lock of hair," or "curled," and refers to the four ornate, posterior notogastral hairs that arise from the nubbins and are so characteristic of the species.

DESCRIPTION.— Color golden brown with a tuberculated, yellowish cerotegument giving a halo effect around the margins of body and legs; this cerotegument on prodorsum, notogaster, venter, legs, prodorsal hairs (except for interlamellar hairs), and notogastral hairs; prodorsum less than half as long as notogaster, broadly triangular in shape, with blunt, squarish rostrum; rostral and lamellar hairs of about equal length, decurved, covered with tuberculated integument; rostral hairs inserted in slight notches in anterolateral margin of prodorsum; lamellar hairs inserted in short apophyses at lateral margins, a transverse, sclerotized bar extending between insertions, hairs also covered with tuberculated integument, but tubercles of minute size compared to those of prodorsum; an arched, slightly U-shaped bar in posterior third of prodorsum immediately anterior to interlamellar hairs, extending in width about distance between interlamellar hairs; interlamellar hairs short, simple, in-



Figs. 1-2. *Gymnodamaeus plokosus*: 1, dorsal aspect, legs partially omitted; 2, ventral aspect, legs omitted.

serted in inverted V-shaped apophyses posterolaterad of arched bar; pedotecta I and II as in Figure 1, with tuberculated surface due to cerotegument; pseudostigmata rounded, cup-shaped, with lip raised above surface of prodorsum, covered externally and internally with small tubercles; sensillum flabelliform, flattened in one plane, head broad, pedicel narrow, spined throughout length.

Notogaster oval in shape, with nearly straight anterior margin; surface covered with tuberculated cerotegument; 8 to 10 large, more flattened tubercles near median area of anterior margin, other tubercles of surface smaller, more rounded; four short, sclerotized nubbins posteriorly, forming a crenulated posterior margin; each nubbin with an inserted curved, ornate hair covered with small tubercles, a similar, less curved hair anterolaterad of nubbins on each side (placement of these six hairs apparently a specific characteristic in species of *Gymnodamaeus*); other hairs and surface features as in Figure 1.

Camerostome somewhat triangular, with heavily sclerotized margins; ventral setae, apodemata as seen in Figure 2; ventral surface with tubercles, but ventral tubercles only a third as large as dorsal tubercles; ventral setae simple, short; apodemata IV arched anteriorly over genital opening as in other species of *Gymnodamaeus*; genital and anal openings contiguous throughout widths; genital covers with cerotegument of tubercles, each cover with six genital setae; aggenital setae short, simple, laterad of genital opening; anal covers with tubercles, each cover bearing two simple anal setae; adanal setae ornate, covered with cerotegument of smaller tubercles (Figure 2).

Legs heterotridactylous; surface of legs covered with cerotegument similar to dorsum; hairs of legs also covered with tuberculated cerotegument, but tubercles of proportionately smaller size.

COLLECTIONS AND MEASUREMENTS.— Ten males and two females of *G. plokosus* were collected by the writers at the Seneca site number 2, Hayden, Colorado, 10-IV-1971. The males ranged in size from 432-372 μ x 216-186 μ , with an average of 399 μ x 207 μ . Four females and three males were collected from the same site on 8-VI-1971 by the writers. These males ranged in size from 420-408 μ x 210-204 μ , averaging 410 μ x 208 μ . The females ranged in size from 444-420 μ x 238-210 μ , with an average size of 432 μ x 228 μ .

Additional specimens were taken in the project areas as follows: 3 males (425-415 μ x 212-205 μ) from under scrub oaks, 4 miles N Seneca Road, 1-VIII-1971, by H. G. Higgins; 2 males (425-430 μ x 210-205 μ) from under chokecherries, one-fourth mile N Hayden Power Plant, 1-VIII-1971, by H. G. Higgins; 1 male specimen (395 μ x 205 μ) under serviceberry on spoil bank, 10-IV-1971, by H. G. Higgins and T. A. Woolley; 1 male (380 μ x 210 μ) from beneath sagebrush, two miles S Yampa Valley Airport, 9-VI-1971, by H. G. Higgins and T. A. Woolley. Three specimens (2 females and 1 male) of this species were collected at Terry Falls, Trail Lake Ranch, Dubois, Wyoming, 20-VII-1964, by H. and M. Higgins. They ranged in size from 432-420 μ x 210-204 μ . A single specimen was

also collected by H. and M. Higgins at Soapstone, Wasatch County, Utah, on 4-IX-1955. The specimen is so broken, however, that sex and size are not distinguishable. Two females were collected by T. A. Woolley in South Dakota, one ($426\ \mu \times 204\ \mu$) at Black Hills, 28-VIII-1968, and one ($426\ \mu \times 316\ \mu$) in the Nordbeck Game Preserve, 28-VIII-1968.

The measurements of the width of all measurable specimens were taken at the level of legs IV. Generally speaking, females appear to be larger and more elongated in shape than males.

The drawings were made of a male specimen collected 10-IV-1971. The type and a paratype specimen will be deposited in the U.S. National Museum.

The second new species was collected in soil beneath aspens and scrub oak in an undisturbed area about four miles south of the spoil banks mentioned above. Compared to *G. plokosus*, it is much larger.

Gymnodamaeus leurolomasus, n. sp.

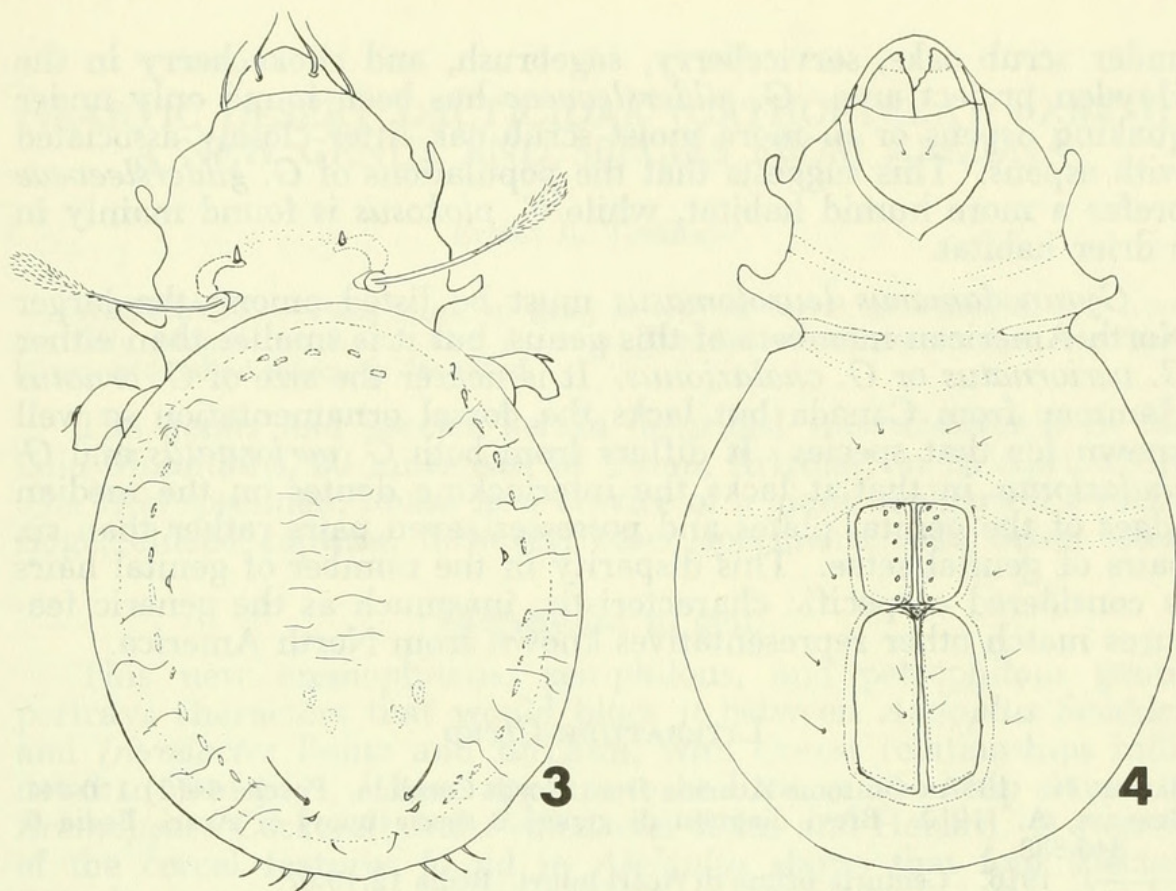
(Figs. 3, 4)

DIAGNOSIS.—Larger size (.70 mm) median edge of genital plate smooth, lacking the interlocking dentes found in both *G. chalazionus* and *G. veriornatus*; each genital cover with seven setae; entire body and setae covered with a fine, granular cerotegument. The words *leuros* 'smooth' and *loma* 'border,' from the Greek, refer to the smooth median edge of the genital covers. This feature, along with the seven pairs of genital setae, distinguishes the new species from the other larger representatives of *Gymnodamaeus* from North America.

DESCRIPTION.—Color dark reddish brown, entire dorsal and ventral surfaces covered with a granular cerotegument; prodorsum about half as long as notogaster, broadly triangular in shape; rostral and lamellar setae about equal in length, rostral setae inserted dorsally, posterior to rostral margin but anterior to transverse sclerotized line between lamellar hairs; interlamellar hairs short, simple, conical, each inserted near tip of curved, sclerotized, median ridge anterior to pseudostigmata; in some specimens, a faint, transverse, curved sclerotized bar can be seen anteriomedial of interlamellar hairs (Figure 3); costulae absent; pseudostigmata rounded, with edge erected above surface of prodorsum; sensillum clavate, surface of club spined; entire organ slightly longer than prodorsum.

Hysterosoma longer than wide, with a wrinkled surface; posterior margin with six setae and two pairs of dorsal setae of different sizes, with muscle scars and pores as shown in Figure 3; no distinct dorsal ornamentation as seen in *G. veriornatus* Higgins or *G. ornatus* Hammer.

Camerostome oval in outline, mentum broad, rutella narrowed anteriorly; ventral surface with apodemata and setae as shown in Figure 4; genital and anal apertures contiguous; genital covers smooth on medial edge, each cover with seven simple setae; anal covers much longer than wide, each cover with two simple setae;



Figs. 3-4. *Gymnodamaeus leurlamasus*: 3, dorsal aspect, legs omitted; 4 ventral aspect, legs omitted.

entire ventral surface covered with a granular cerotegument that obscures the location of coxisternal setae.

Legs long, surface and hairs covered with cerotegument; all legs heterotridactylous, median claw larger than laterals.

COLLECTIONS AND MEASUREMENTS.—Length, .65-.70 mm; width, .36-.41 mm. The type, a male, and eight other paratype specimens (six males, two females) were taken from under quaking aspens, 4 miles S Seneca Road, Hayden, Colorado, 8-X-1971, by H. G. Higgins. Five specimens were taken from under scrub oaks associated with aspens, 4 miles S Seneca Road, Hayden, Colorado, 1-VIII-1971, by H. G. Higgins. The type and one paratype will be deposited in the U.S. National Museum.

DISCUSSION AND ECOLOGICAL NOTES

It is interesting that two species of smaller *Gymnodamaeus*, *G. gildersleeveae* and *G. plokosus*, should be found in the project area. The latter species was first found under sagebrush along the edge of a spoil bank in rather dry soil. Subsequent collections have shown that this species is fairly well distributed throughout the western United States (Colorado, North Dakota, Utah, and Wyoming) as well as being found in the litter of several plant communities. For example, *G. plokosus* has been taken in rather dry soil and litter

under scrub oaks, serviceberry, sagebrush, and chokecherry in the Hayden project area. *G. gildersleeveae* has been found only under quaking aspens or in more moist scrub oak litter closely associated with aspens. This suggests that the populations of *G. gildersleeveae* prefer a more humid habitat, while *G. plokosus* is found mainly in a drier habitat.

Gymnodamaeus leurolomasus must be listed among the larger North American members of this genus, but it is smaller than either *G. veriornatus* or *G. chalazionus*. It is nearer the size of *G. ornatus* Hammer from Canada but lacks the dorsal ornamentation so well known for that species. It differs from both *G. veriornatus* and *G. chalazionus* in that it lacks the interlocking dentes on the median edges of the genital plates and possesses seven pairs rather than six pairs of genital setae. This disparity in the number of genital hairs is considered a specific characteristic, inasmuch as the generic features match other representatives known from North America.

LITERATURE CITED

- BANKS, N. 1947. On some Acarina from North Carolina. *Psyche* 54(2):110-141.
- BERLESE, A. 1910. Brevi diagnosi di generi e specie nuovi di Acari. *Redia* 6: 346-388.
- . 1916. Centuria prima di Acari nuovi. *Redia* 12:19-67.
- HAMMER, M. 1952. Investigations on microfauna of Northern Canada. *Acta Arctica* 4:108p.
- . 1958. Investigations of Oribatid fauna of Andes Mts.-I. The Argentine and Bolivia. *Biol. Skr. Dan. Vid. Selsk.* 10(1):1-129.
- HIGGINS, H. G. 1961. A new beetle mite from Utah (Oribatei: Gymnodamaeidae). *Great Basin Nat.* 21(1-2):27-28.
- JACOT, A. P. 1937. Journal of North American moss mites. *J. New York Entomol. Soc.* 45(3-4):353-375.
- WOOLLEY, T. A. 1972. A new species of *Gymnodamaeus* from Colorado. *Great Basin Nat.* 32(2):97-103.



Woolley, Tyler A. and Higgins, Harold G. 1973. "Two new species of *Gymnodamaeus* from Colorado (Acarina: Cryptostigmata. *Gymnodamaeidae*)." *The Great Basin naturalist* 33, 37–42.
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