

THREE NEW PARAJULID MILLIPEDS FROM TEXAS¹H. F. LOOMIS²

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ABSTRACT

Three new species of parajulid millipeds are described and figured: *Apacheiulus guadelupensis*, *Aniulus fli*, and *Hakiulus occidentalis*.

The 3 new millipeds described here were collected in Texas by my son, J. C. Loomis, and belong in the genera *Apacheiulus*, *Aniulus*, and *Hakiulus*. The first genus has been known only from the type species from Arizona. The other 2 genera have been represented, nearly equally, in Texas by 17 species, several with short or vague descriptions from which it seems impossible to make positive identifications. All but 4 species were supported by drawings of gonopods, and reference to these is the most effective way of identifying specimens, since good keys cannot be formulated from the descriptions for their recognition.

It is becoming apparent that several distinctive characters may be found in females of many parajulid species, but early taxonomists made practically no use of them. Probably many species in the future may be identified from females almost as readily as from males, a condition generally not existing in other milliped families.

Holotype males and if available, allotype females of the new species, have been deposited in the Florida State Collection of Arthropods, Gainesville; male paratypes are in the U. S. National Museum of Natural History, Smithsonian Institution, Washington, D. C.

Apacheiulus guadelupensis Loomis, new species

Holotype male, female, and young female, Bush Mt., Guadalupe Mts., Hudspeth Co., 8-IV-1974; male, 2 young males, same locality, IV-V-1973.

Diagnosis: Similar to *A. pinalensis* Loomis 1968 in having pleurae of male segment 7 greatly produced ventrad and clasping base of gonopods; male and female organs differing in details from those of *pinalensis* but of same type; females lacking second legs, their sternal plate closely applied to front of gynaspis.

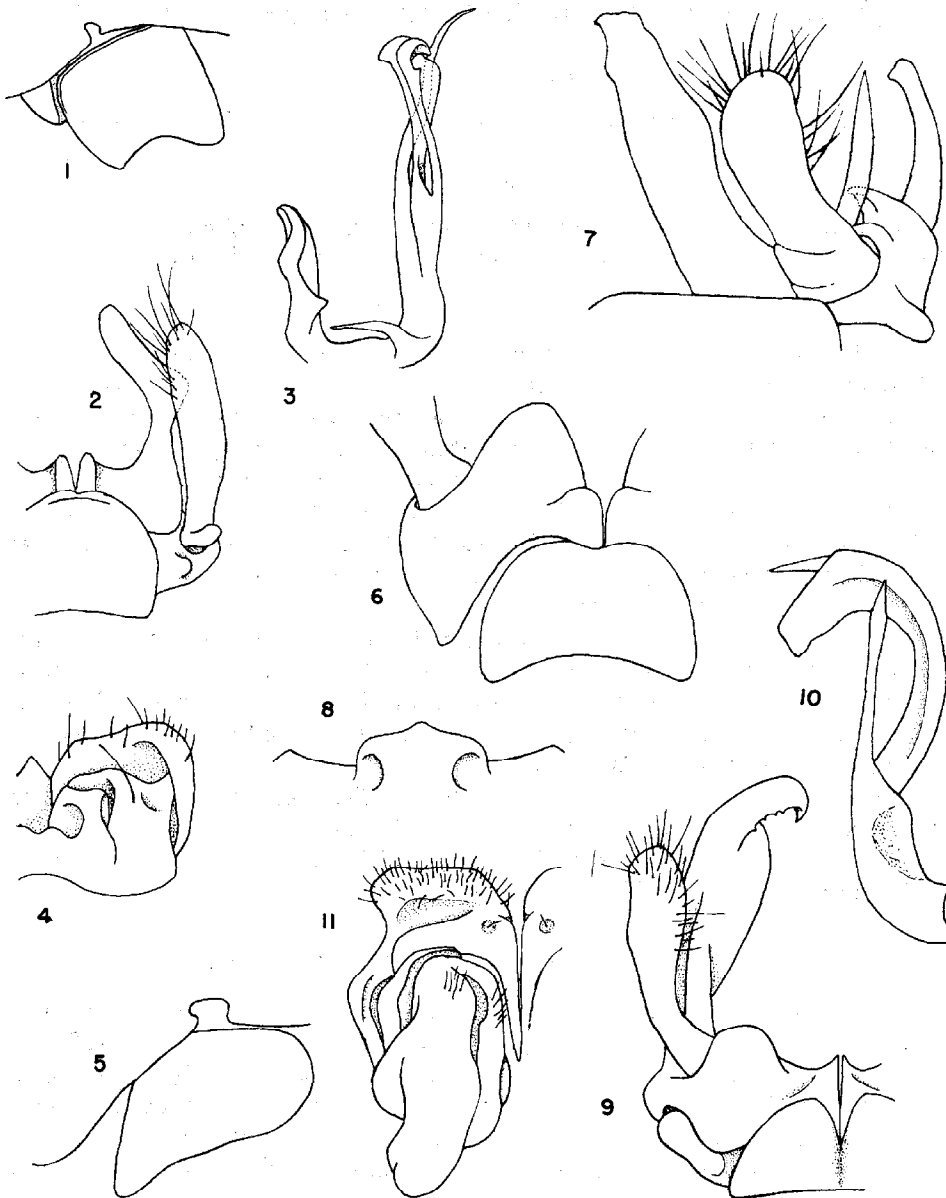
Description: Male 25 mm long, 1.3 mm wide, 51 segments; female 32 mm long, 1.8 mm wide, 53 segments.

Mandibular stipes (Fig. 1) more nearly quadrate than in *pinalensis*, lower anterior corner more abruptly rounded, and emargination behind it more pronounced.

Segment 1 of male with lower margin broadly rounded, little longer than that of segment 2, with strong lateral rim; posterior part of segment forming widest part of body, narrowing thereafter to segments 4 and 5, then

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Explanation of Figures

Fig. 1-11, new parajulid millipeds. Fig. 1-4, *Apacheiulus guadelupensis*, n. sp.: 1. Right mandibulary stipes; 2. Right anterior gonopod and sternum, anterior view; 3. Left posterior gonopod, outer lateral view; 4. Left cyphopod, gynaspis, and tip of second sternum, posterior view. Fig. 5-8, *Aniulus fili*, n.sp.: 5. Left mandibulary stipes; 6. Coxa and base of second joint of left anterior gonopod, anterior view; 7. Left gonopods and edge of segment 7; 8. Sternal lobe of male segment 8, ventral view. Fig. 9-11, *Hakiulus occidentalis*, n. sp.: 9. Left anterior gonopod and sternum, anterior view; 10. Left posterior gonopod, outer lateral view; 11. Right cyphopod and gynaspis, posterior view.

broadening. Segment 2 of male not extending as low as 1 or 3; female segments 2 and 3 produced much below 1 or 4, 2 rounded at lower extremity, 3 subtriangular. Male segment 3 strongly concave on ventral surface. Transverse sulcus of all segments curving slightly forward, regardless of proximity to pores which are small and have small peritremes. Body surface much as in *pinalensis*. Last segment with apex barely projecting over valves.

Gonopods shown in Fig. 2 and 3; coxal joints of anterior pair bowed inward and quite close at tips, posterior gonopods projecting through median space. Pleurae of male segment 7 essentially as shown for *pinalensis*. Anterior ventral margin of segment 8 thin and transversely broadly emarginate, not produced forward.

Female organs shown in Fig. 4, not strongly chitinized although specimen fully mature. No second legs, but sternum present and pressed against front face of gynaspis.

Aniulus fili Loomis, new species

Holotype male and another male, 2 mi SW of Comfort, Kendall Co., III-1970.

Diagnosis: Probably more closely related to *A. craterus* Chamberlin 1940 than to any other member of genus, but differences of gonopods evident, and second segment of male has 3 (not 2) strong lateral striae.

Description: Males ca. 38 mm long, 2.3 mm wide, number of segments 54-57. In alcohol dorsum rather light between dark areas around pores, except for a narrow, dark, almost continuous, middorsal line.

Head with median furrow of vertex very lightly impressed. Eyes composed of 8 series of ocelli—2, 4, 5, 6, 7, 8, 9, 10, counting from front. Mandibular stipes shown in Fig. 5.

Lower edge of segment 1 not as long as those of segments 2 and 3 combined; margining furrow very strong. Segment 2 projecting only slightly below segment 1 and with 3 deep lateral striae. Pores large, opening a slight distance behind strong, curved interzonal stria on anterior segments but more widely separated farther back, as much as diameter of pore peritreme. Last segment produced into a long, straight, narrow, and very acute tip, much exceeding anal valves.

Gonopods shown in Fig. 6 and 7. Segment 7 very little lower on sides than segments 6 and 8; large median lobe on anterior margin of latter shown in Fig. 8.

Hakiulus occidentalis Loomis, new species

Holotype male, another male, 6 females, and a young male, Guadelupe Mts., Hudspeth Co., IV-V-1973.

Diagnosis: The deeply divided sternum of anterior gonopods is not credited to any other member of genus and may be unique; posterior gonopods suggest relationship with *H. parallelus* Chamberlin 1940, of which his *Ethojulus diversifrons* 1931 is a synonym, the latter name preoccupied by *H. diversifrons* (Wood 1867), Chamberlin and Hoffman 1958. *Ethojulus* was the original spelling of that name.

Description: Very heavy bodied species with 50-54 segments; to 47 mm

long, 2.3-2.5 mm wide. Color light brown with a narrow continuous mid-dorsal dark line. Surface of segments slightly dulled by short, deep, elongate scratches.

Head with inner corner of eyes joined by deep, narrow furrow with a macroseta in a broad depression at each inner third. Prozonites with fine middorsal raised line from front to back, similar to lines encircling them. Pores small but in conspicuous depressed peritreme usually separated from transverse sulcus. Last segment with apex moderately extended above anal valves.

Males with mandibular stipes much as shown for *H. amophor* Chamberlin 1940, but posterior projection larger and more evenly rounded. Lower margin of segment 1 distinctly longer than that of segment 2 and emarginate for much of length, with strong marginal rim and short stria above caudal end; lower margin of segments 6 and 7 extending below 5 and 8; front margin of anterior sternum of segment 8 produced forward into a long, somewhat elevated, triangular lobe, its median surface strongly depressed.

Gonopods shown in Fig. 9 and 10; anterior ones with coxal projection toothed along lower edge of posteriorly directed apex in holotype but not in paratype; sternum broad and deeply cleft at middle, a strong channel below it; coxal base with a broad, thin, rounded, transverse lobe mesad of base of second joint in front.

Females with sexual organs as shown in Fig. 11; segment 2 angularly projecting much below segments 1 and 3, the latter a little elevated behind cyphopods.

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