

DESCRIPTION OF THE FEMALE OF *ACROPSOPILIO CHOMULAE* (GOODNIGHT & GOODNIGHT 1948) FROM CHIAPAS, MEXICO (OPILIONES, CADDIDAE, ACROPSOPILIONINAE)

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ABSTRACT. The tiny caddid harvestman *Acropsopilio chomulae* (Goodnight & Goodnight 1948), from Chiapas, Mexico, has been known only from the immature holotype. Mature females are described from specimens taken near the type locality. The absence of spermathecae in the ovipositor makes it likely that the species is parthenogenic.

RESUMEN. Hasta el momento, los únicos datos disponibles del pequeño opilión *Acropsopilio chomulae* (Goodnight & Goodnight 1948) de Chiapas (México) proceden del estudio del holotipo, un ejemplar inmaduro. En este trabajo se describen hembras maduras procedentes de cerca de localidad típica. La ausencia de espermateca en el oviscapto sugiere que la especie es partenogenética.

Keywords: North America, harvestman, parthenogenesis

In my 1975 revision of the harvestman family Caddidae (Shear 1975), I was unable to treat the interesting species *Acropsopilio chomulae* (Goodnight & Goodnight 1948) in detail because the immature holotype was the only available specimen. Having described the species as *Caddo chomulae* in 1948, Goodnight and Goodnight later (1950) mentioned collecting numbers of mature individuals, but when I enquired in the early 1970s, they could not locate this material, and the present whereabouts of these specimens remains unknown. However, the American Museum of Natural History (AMNH) has a small collection of this species made near the type locality by Wilton and Jean Ivie. I take this opportunity to describe these specimens.

TAXONOMY

Family Caddidae Banks 1892

Subfamily Acropsopilioninae Roewer 1923

Acropsopilio chomulae (Goodnight &
Goodnight 1948)

Figs. 1, 2

Caddo chomulae Goodnight & Goodnight 1948:
201.

Acropsopilio chommulae (sic): Ringuelet 1962:79.

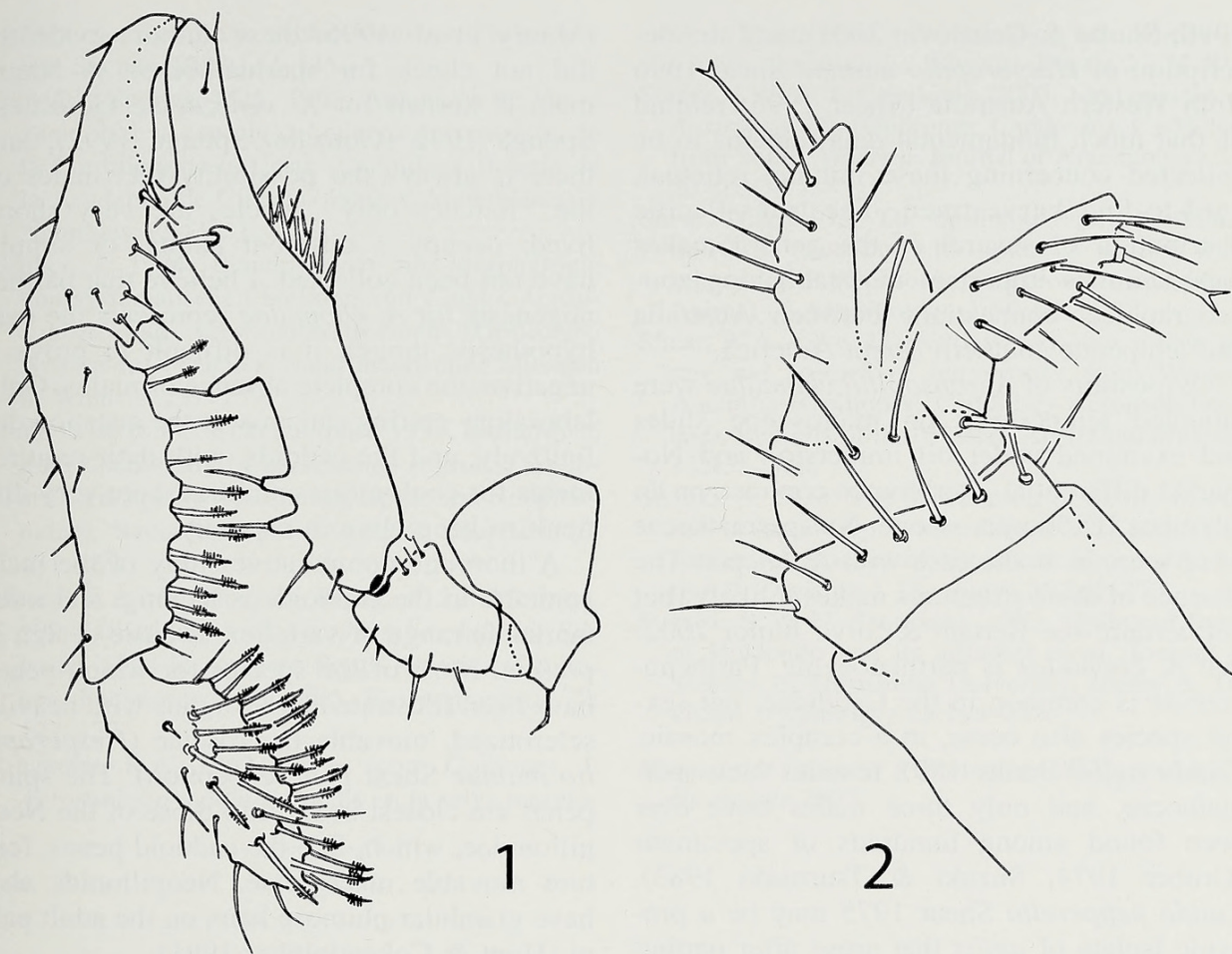
Acropsopilio chomulae: Shear 1975:79.

Material examined.—MEXICO: *Chiapas*:
8 ♀, from 4 miles east of San Cristobal de las

Casas (92°36' W, 16°42' N), 25 August 1966,
W. & J. Ivie (AMNH).

Description of female.—Total length, 1.14 mm; width of eye tubercle, 0.42 mm. Eye tubercle occupies entire propeltidium when seen from above, projecting considerably over chelicerae, deeply impressed in median line. Eyes 0.17 mm in diameter, slightly protruding, circular. Free thoracic tergites (meso- and metapeltidium) only slightly distinct when seen from above (for general form of body, see Shear 1975, fig. 10). Body soft, not heavily sclerotic, devoid of spines or tubercles. Labrum triangular, pointed, large. Coxae and endites as in *A. boopis* (Crosby 1904) (Shear 1975, fig. 7), but endites of coxae II in some specimens entirely separating endites of coxae I from their coxae. Genital operculum large, broad, bluntly pointed. Sternum not sclerotized. Spiracles vestigial, closed.

Palpus (Fig. 1) longer in proportion to body length in mature specimens than in juvenile holotype. Palpal trochanter with one prominent seta and several smaller ones. Femur 0.67 mm long, 0.10 mm wide, with characteristic group of three seta-bearing tubercles near base, single seta-bearing tubercle near midline and at femoral apex on mesal side, brushlike group of small setae on lateral side about two-thirds from base of femur. Patella 0.34 mm long, 0.10 mm wide; tibia 0.32 mm long, 0.10



Figures 1, 2.—*Acropsopilio chomulae* female: 1. Right palpus, mesal view; 2. Ovipositor, ventral view.

mm wide, with 10–12 glandular setae ventrally. Tarsus 0.25 mm long, 0.10 mm wide; with small, immobile, vestigial claw, 20–24 glandular setae ventrally.

Legs relatively short and thin, leg IV much the longest. Femora I–IV 0.38, 0.57, 0.50, 0.76 mm long respectively; tibiae I–IV 0.25, 0.30, 0.34, 0.44 mm long respectively.

Ovipositor (Fig. 2) short, membranous, with two rings marked by apical transverse rows of setae, valves irregularly setose, sensillum single, apically bifurcate seta. Seminal receptacles not detected.

Color light brown, darker on abdominal dorsum, eye tubercle pale tan, eyes broadly ringed in black, palpus with femur and patella striking pure white, tibia and tarsus dark brown, legs medium tan.

DISCUSSION

As implied from an earlier description of the juvenile holotype, *A. chomulae* is a distinct species. It differs from *A. boopis* in having no spined tubercles on the palpal patella

and tibia, from *A. venezuelensis* Gonzales-Sponga 1992 in having the apical spined tubercle of the palpal femur close to the distal end rather than set back about 1/3 the length of the femur, from *A. chilensis* in having the palpal tarsus shorter than the tibia, and from *A. neozealandiae* (Forster 1948) in stronger spined tubercles at the palpal femur base. In overall appearance and especially palpal morphology, *chomulae* most closely resembles *neozealandiae*.

Recently, I briefly summarized the biogeography and evolutionary relationships of the acropsopilionines (Shear 1996). Writing that paper, I was not aware of the description by González-Sponga (1992) of *Acropsopilio venezuelae*, from northern South America. This species provides a biogeographic link between *A. chilensis* Silvestri 1904 in southern South America and the northern hemisphere species *A. chomulae* and *A. boopis*. González-Sponga's discovery, the finding of *Austropsopilio sudamericanus* Shultz & Cekalovic 2003 in Chile and Argentina (Cokendolpher & Maury

1990; Shultz & Cekalovic 2003), and the description of *Hesperopilio mainae* Shear 1996 from Western Australia (Shear 1996) remind us that much fundamental data remains to be collected concerning these minute, relictual, hard-to-find harvestmen. The trans-Pacific distribution of several of the genera makes these animals important in establishing zoogeographical connections between Australia and temperate southern South America.

Ovipositors of *Acropsopilio chomulae* were mounted temporarily on microscope slides and examined under oil immersion and Nomarski differential interference contrast, on an Olympus BX50 microscope. No spermathecae were seen, as is the case with *A. boopis*. The absence of these structures makes it likely (but not certain; see Bertani & Silva Junior 2002) that *A. chomulae* is parthenogenic. Parthenogenesis is common in the Caddidae, but sexual species also occur, in a complex mosaic. *Caddo agilis* Banks 1892 females lack spermathecae, and only three males have ever been found among hundreds of specimens (Gruber 1974; Suzuki & Tsurusaki 1983). *Caddo pepperella* Shear 1975 may be a progenic isolate of *agilis* that arose after parthenogenesis had become established; males are unknown, spermathecae are lacking. The progenesis event may have happened at least twice, since the species is known from a small region of eastern North America and from Japan (Shear 1996). *Caddo agilis* has an Oligocene fossil record (Shear 1975) from Europe, so it is less likely that the origin of *agilis* from *pepperella* took place via peramorphosis.

Males are known for two of the three South African species of *Caddella* (Shear 1975), and for *Hesperopilio mainae* (Shear 1996).

Males have been described for *Austropopilio fuscus* (Hickman 1957), but for no other species of the genus; females of *A. fuscus* have spermathecae. Despite the highly detailed description, Shultz and Cekalovic (2003) did not mention finding spermathecae in *A. sudamericanus*, which is known only from females.

Acropsopilio boopis males have never been collected either in North America (Shear 1975) or Japan (Suzuki 1976; Suzuki & Tsurusaki 1983), and *A. chilensis*, widespread in southern South America (Brazil, Chile, Argentina), is likewise known only from females

(Maury et al. 1996; these authors evidently did not check for spermathecae). A single male is known for *A. venezuelae* González-Sponga 1992 (González-Sponga 1992), and there is always the possibility that males of the "females only" species are very short-lived, occupy a different habitat or simply have not been collected. I believe that parthenogenesis for *A. chomulae* represents the best hypothesis, though it is difficult to prove a negative—the complete absence of males. Only laboratory rearing can answer the question definitively, and the caddids, with their requirements for cool, moist conditions, are very difficult to keep alive in captivity.

A thorough comparative study of the male genitalia in the caddoids is lacking, and a remarkable range of variation in basic design is present. Most of the species for which penes have been illustrated have organs with heavily sclerotized, movable macrosetae (*Hesperopilio mainae* Shear is an exception). The spiny penes are closest in form to those of the Neopilionidae, which, like the caddoid penes, feature movable macrosetae. Neopilionids also have glandular-plumose hairs on the adult palpi (Hunt & Cokendolpher 1991).

No comparative information is available on the respiratory systems of *Acropsopilio* species, but the spiracles of *A. chomulae* are small and imperforate. One specimen was sacrificed in order to look for tracheae, and none were found. Such a small animal with its thin cuticle, living in a constantly humid environment, may be able to satisfy its respiratory needs by diffusion through the body wall.

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