

THE CAVERNICOLOUS FAUNA OF HAWAIIAN LAVA TUBES

14. A SECOND TROGLOBITIC *TYRANNOCHTHONIUS* (PSEUDOSCORPIONIDA: CHTHONIIDAE)¹

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Abstract. *Tyrannochthonius pupukeanus* is described from Pupukea Lava Cave on the island of Oahu. It is not as highly cave-adapted as *T. howarthi* from the island of Hawaii.

Continued biological exploration of Hawaiian caves by F.G. Howarth and his colleagues has resulted in the discovery of a population of pseudoscorpions in Pupukea Lava Tube on Oahu. The new form belongs to the genus *Tyrannochthonius* Chamberlin but is distinct from *T. howarthi*, previously described from Ainahou Petroglyph Cave on the island of Hawaii (Muchmore 1979).

***Tyrannochthonius pupukeanus* Muchmore, new species**

Fig. 1–4

Diagnosis. A cave-adapted form with somewhat attenuated appendages and reduced eyes. Distinguishable from *T. howarthi* Muchmore, the only other known member of the genus in Hawaii, by its smaller size (palpal femur < 0.5 mm long) and less slender appendages (palpal femur l/w < 5.2).

Description. ♂ and ♀ generally similar. Very light brown in color. Carapace longer than wide, slightly narrowed posteriorly; 4 small eyes, barely discernible in some specimens; epistome small, triangular, with 2 setae flanking base (Fig. 1); chaetotaxy d4d-4-4-2-2, the dwarf setae (d) lying anterior and ventral to anterior eyes. Abdomen typical; tergal chaetotaxy of holotype ♀ 4:4:4:4:5:5:5:5:4:T2T:0, others similar; sternal chaetotaxy of holotype ♀ 9:(3)6(3):(3)5(3):9:9:9:10:8:7:0:2, other ♀ similar; anterior sternites of ♂ with 8:[4-4]:(3)6-8/5(3):(3)6(3):—. Chelicera ca. 7/8 as long as carapace; hand with 5 setae; flagellum of 8 pinnate setae, the distal one gently curved; fixed finger with 7–10 teeth, distal one largest; movable finger with ca. 10 small denticles; galea represented by slight thickening of finger margin; galeal seta just distad of middle of finger; serrula exterior of 19 blades. Palp rather slender (Fig. 2); femur 1.31–1.38 and chela 1.92–2.01× as long as carapace; trochanter 1.5–1.7, femur 4.8–5.15, tibia 1.85–2.05, and chela 5.25–5.6× as long as wide; hand 1.95–2.15× as long as deep; movable finger 1.65–1.75× as long as hand. Surfaces smooth; setae generally long and thin; 1 prominent, thicker seta on medial side of chelal hand at base of fixed finger (Fig. 2). Trichobothria as shown in Fig. 3; *sb* slightly nearer to *b* than to *st*. Fixed chelal finger with 24–26 tall, sharp, slightly recurved teeth and a few small denticles basally; movable finger with 19–21 similar large teeth and 6–8 low, rounded denticles basally; both fingers with occasional tiny denticles between the large ones; movable finger with a small sensillum on lateral side between trichobothria *st* and *sb*, usually nearer to *sb*, and a larger one on medial side very close to dental

1. Material examined is the partial result of fieldwork supported by a grant from the U.S. National Science Foundation (DEB-79-04760) to F.G. Howarth.

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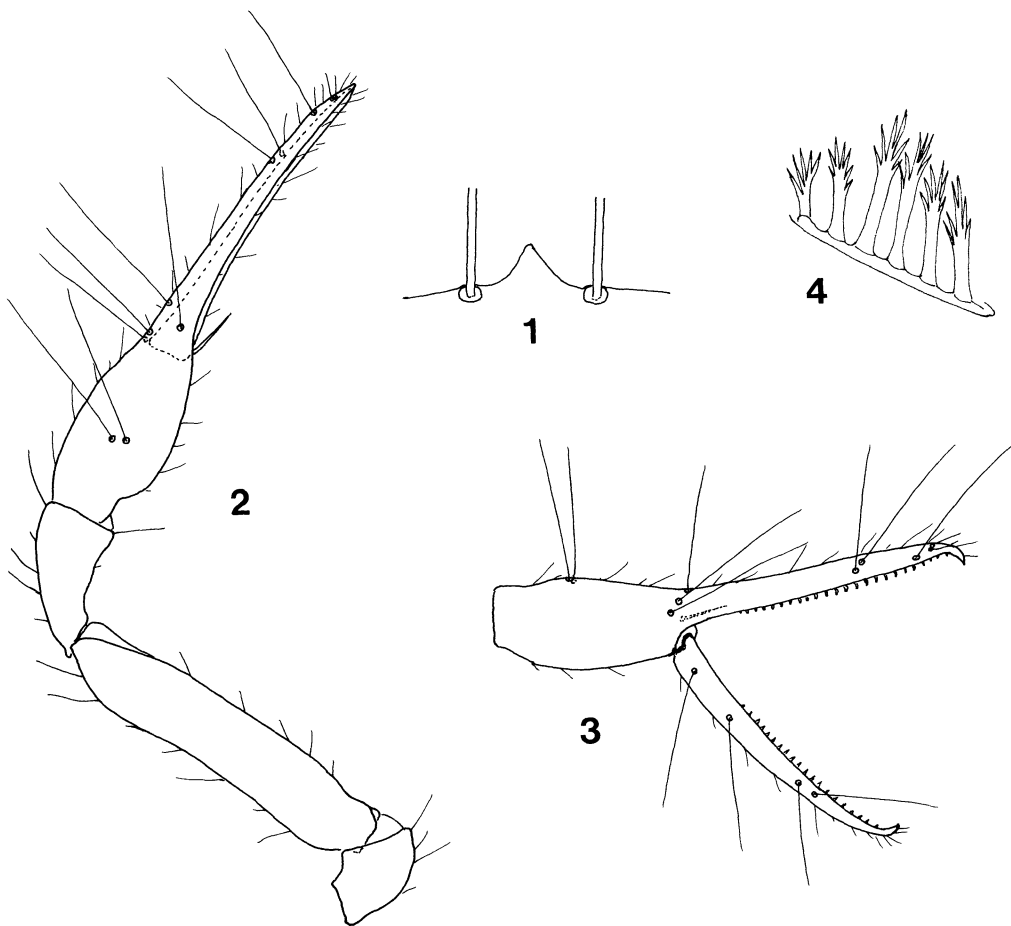


FIG. 1-4. *Tyrannochthonius pupukeanus*: 1: epistome and flanking setae; 2, dorsal view of left palp; 3, lateral view of right chela; 4, coxal spines.

margin proximad of *sb*. Legs generally typical; apex of coxa I with prominent projection; coxal chaetotaxy 2-2-1:3-0:2-2-CS:2-3:2-3; on apex of palpal coxa, medial seta distinctly shorter than lateral one; a row of 6-8 long, terminally incised clavate coxal spines (CS) on each coxa II (Fig. 4). Leg IV with entire femur 2.8-2.9 \times as long as deep.

Measurements (mm). Figures given for holotype, followed in parentheses by ranges for the 5 mounted paratypes. Body length 1.18 (1.10-1.27). Carapace length 0.36 (0.355-0.40). Chelicera length 0.31 (0.30-0.355). Palpal femur 0.47 (0.49-0.555) by 0.095 (0.095-0.11); tibia 0.21 (0.20-0.22) by 0.105 (0.105-0.12); chela 0.67 (0.695-0.785) by 0.13 (0.125-0.15); hand 0.25 (0.26-0.30) by 0.125 (0.12-0.15); movable finger 0.43 (0.45-0.495) long. Leg IV: entire femur 0.39 (0.40-0.445) by 0.14 (0.14-0.155).

Type data. Known only from the type-locality. Holotype ♀ (BPBM 12,786), 1♂, 9♀, 2TN paratypes, HAWAIIAN IS: Oahu I: Pupukea, Pupukea Lava Tube, 50 m, baited pitfall trap, 4-25.X.1981; 112 additional paratypes, including adults and nymphs, from the same cave, pitfall

trap #2, 25.X.1981–31.VIII.1982; all collected by F.G. Howarth & F.D. Stone. Types in the Bishop Museum, Honolulu.

Etymology. The specific name refers to the type-locality.

Remarks. The new species is modestly but distinctly modified for cavernicolous existence with its slightly larger size, more attenuated appendages, lighter coloration, and reduced eyes, as compared with many epigeal species of the genus. In these respects it is rather similar to the 2 troglotic *Tyrannochthonius* species known from Mexico (Muchmore 1969, 1973), but not as strongly modified as *T. howarthi* from Ainahou Petroglyph Cave on the island of Hawaii.

It is most interesting that both cavernicolous pseudoscorpions known in the Hawaiian Islands belong to the genus *Tyrannochthonius* Chamberlin, which is otherwise unknown in the Islands. Representatives of the genus have been reported from the edge of the Pacific Basin, from Mexico, Galapagos Islands, New Zealand, New Caledonia, Solomon Islands, Caroline Islands, and Japan, where they occur mainly in forest litter. Likely there are others on the more remote islands in the Pacific Ocean which have not yet been collected or studied. The lack of records from epigeal sites in the Hawaiian Islands is probably due to insufficient collecting from suitable habitats, though it is possible that the 2 known species are really cavernicolous relicts.

In the original description there was some uncertainty about the generic placement of *T. howarthi* (Muchmore 1979). Now, however, after recent comparative study of other species of *Tyrannochthonius* and *Paraliochthonius* (Muchmore 1983), I am convinced that it was correctly placed. In all diagnostic characters except the possession of 3 large, spinelike setae on the chelal hand and fingers, it is similar to species of *Tyrannochthonius*, including *T. pupukeanus*, and differs from *Paraliochthonius*. It seems inappropriate to consider it a representative of a new genus on the basis of the 1 character, which is probably an adaptation to life in its particular cave environment.

Acknowledgment. I am indebted to F.G. Howarth for making the specimens available for study.

LITERATURE CITED

- Muchmore W.B.** 1969. A cavernicolous *Tyrannochthonius* from Mexico (Arachn., Chelon., Chthon.). *Ciencia, Mexico* **27**: 31–32.
1973. A second troglotic *Tyrannochthonius* from Mexico (Arachnida, Pseudoscorpionida, Chthoniidae). *Assoc. Mex. Cave Stud. Bull.* **5**: 81–82.
1979. The cavernicolous fauna of Hawaiian lava tubes. 11. A troglotic pseudoscorpion (Pseudoscorpionida: Chthoniidae). *Pac. Insects* **20**: 187–90.
1983. Pseudoscorpions from Florida and the Caribbean area. 13. New species of *Tyrannochthonius* and *Paraliochthonius* from the Bahamas (Chthoniidae). *Florida Entomol.* (in press).