

FIGURE 150. Regression latitude vs. pulse rate in *G. veletis*.

***Gryllus planeta* Weissman and Gray, n. sp.**

McDonald Observatory Wood Cricket

Figs 130–132, 136, 151–154, 205, Table 1

Distribution. Known only from the sky island oak-woodlands of the Davis Mountains in west Texas, around the area of the McDonald Observatory.

Recognition characters and song. *G. planeta* is microsympatric with each of the other three slow chirping *Gryllus* species in the Davis Mts., but with only one species at a time. A small-medium body length, black (except for inside of hind femur), always short hind winged, cricket characterized by short cerci (Fig. 151). *Song* (Fig. 152) a slow chirp with 3 p/c, 150–200 c/m, and a PR of around 27 at 25°C. Morphologically most similar to western Texas *G. veletis* (microsympatric at S15-62) but generally separated by habitat (oak woodland vs grassy meadows), smaller, more slender size, and no overlap in the following 6 parameters (Table 1, p. 18): *G. planeta* has shorter file length with higher tooth density, shorter tegmina length and width, shorter ovipositor and shorter hind femur length even where they occur microsympatric. Also overlaps in length of cercus with *G. veletis* but when body length size differences compensated for (Fig. 151), cerci relatively longer in *G. planeta* even if only by 1–2 mm.

Genetically different from *G. veletis* for multilocus (Gray *et al.* 2019) and ITS2 (Fig. 132) but similar for 16S (Fig. 143). Separated from microsympatric *G. transpecos* (Davis Mts., S15-61) by 6 mostly non-overlapping characters (Table 1, p. 18): shorter cerci length in *G. planeta*, number of teeth, file length, tegminal length and width, and faster chirp rate in addition to genetics (different multilocus, 16S and ITS2 gene profiles). Separated from microsympatric *G. longicercus* (Davis Mts., S15-63) by non-overlapping (Table 1, p. 18) number of teeth, file length, teeth/mm, cerci length, PR, and DNA. *G. planeta* is morphologically similar to other narrow, small, spring-adult, black, slow chirping, allopatric western *Gryllus* species, such as *G. montis* (nearest population ~500 km west in Chiricahua Mts., Arizona) and *G. saxatilis* (nearest population ~1000 km west in Arizona) but, except for *G. veletis*, *G. planeta* can immediately be separated in the field on the basis of its short cerci and restricted geographic distribution. Also, similar to New Mexico, Organ Mountains sky island endemic *G. sotoi*, ~280 km to the NW, but can be separated by cerci length, DNA, habitat, and maturation time (summer for *G. sotoi* vs. spring for *G. planeta*).

Holotype. Male (Fig. 153). Texas, Jeff Davis Co., Davis Mts., Mt. Locke, McDonald Observatory, in oak woodland at base of Otto Struve Telescope, 1-vii-2015. 6747', 30° 40' 16.82" -104° 01' 24.76". D.B. Weissman & D.W. Weissman. S15-61, R15-189, G3114. 16S GenBank accession # MK446549; ITS2 GenBank accession #

MK441918. BL 20.16, HF 10.63, LC 10.38. Right tegmen removed: 128 teeth, file length 2.8, TL 9.4, TW 3.9. Deposited CAS, Entomology Department #19269.

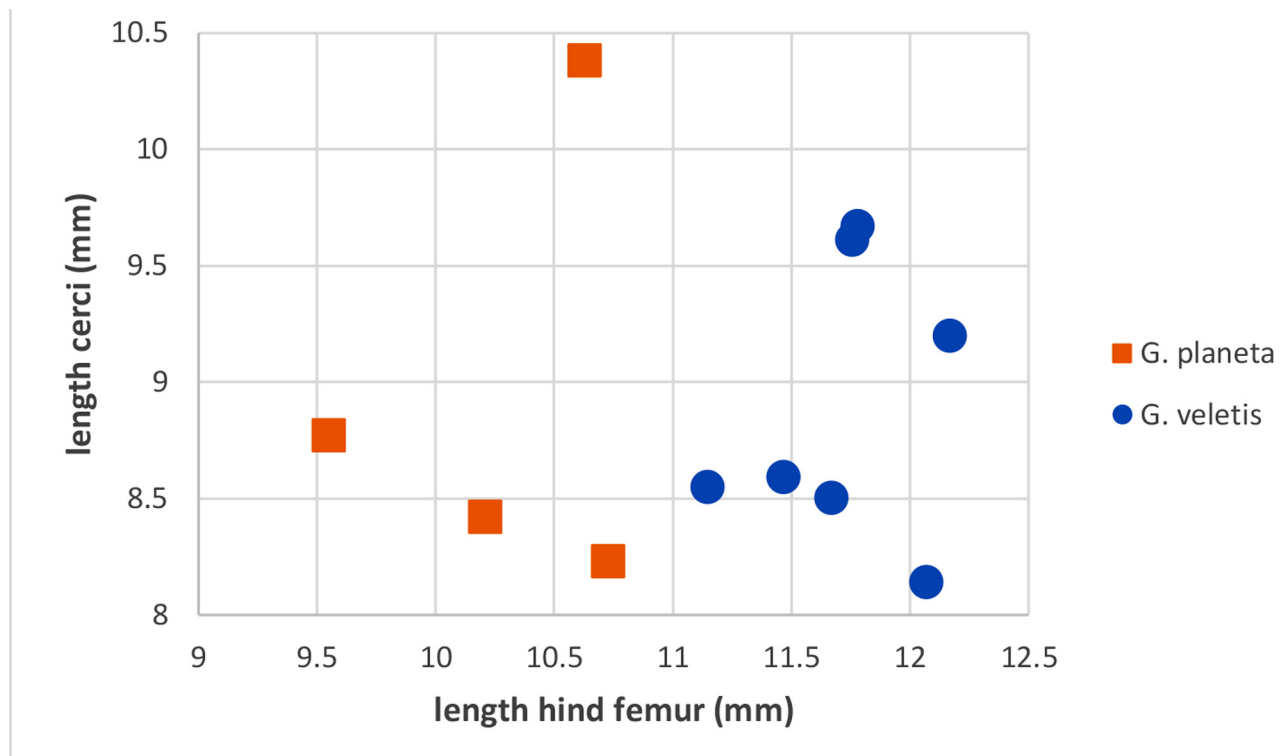


FIGURE 151. Regression hind femur length vs. length cerci in *G. planeta* vs. *G. veletis*, in the Davis Mts., TX, showing separation between these sympatric species.

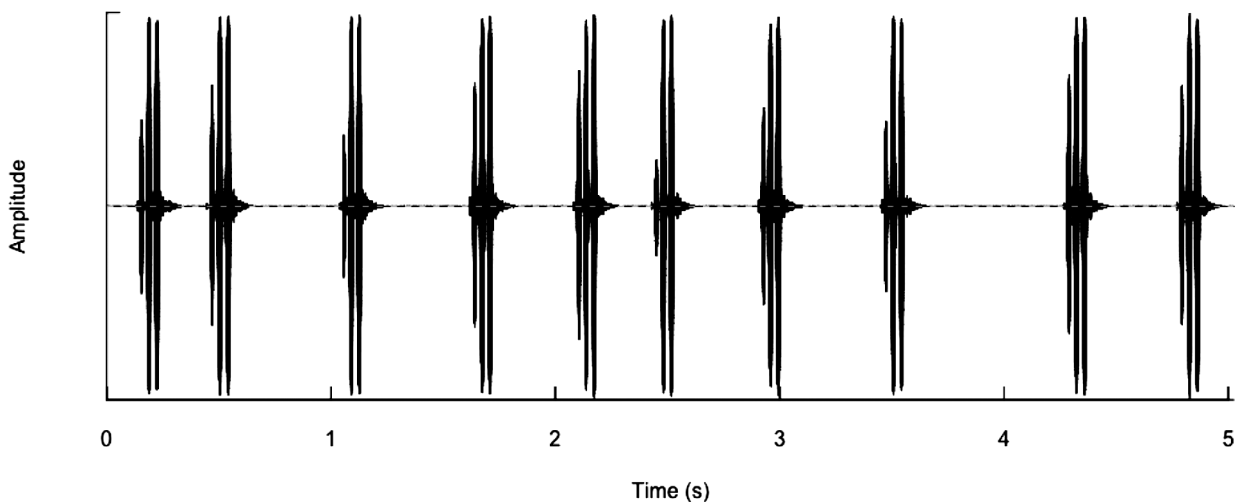


FIGURE 152. Calling song (R15-160) of *G. planeta* from the type locality (S15-61), recorded at 24.9°C.

Paratypes. (Total: 5♂ 3♀). **Texas**, Jeff Davis Co., Davis Mts., Mt. Locke, 6747', same data as holotype, S15-61, 3♂ 3♀; 6246'; open mowed field 1.1 road miles below Telescope, 1-vii-2015, S15-62, 30° 40' 51.03" -104° 01' 22.78". D.B. Weissman & D.W. Weissman, 1♂; 6073', rocky road cut 2.7 road miles below Telescope, 1-vii-2015, S15-63, 30° 39' 57.79" -104° 02' 10.41". D.B. Weissman & D.W. Weissman, 1♂.

Derivation of name. “planeta” from Latin (masculine) for planet or planetary, in reference to its only known occurrence being from 1851-2056 m elevation on Mt. Locke in the Davis Mountains, site of the McDonald Observa-

tory operated by the University of Texas at Austin. The highest elevation of 2056m is at the base of the Otto Struve Telescope which is also the highest state maintained road in Texas.

Geographic range. (Fig. 154) Known only from the Davis Mts.



FIGURE 153. Holotype male (left) *G. planeta*. Female (right) also from type locality.

Habitat. From 1851m to 2056m elevation. At Telescope (S15-61), most common *Gryllus*, and microsympatric with *G. transpecos*, under short oaks with a fairly open canopy. Several collected there walking around with males singing in the open or from cracks in stone wall. Farther down the mountain (S15-62), 1 male singing with more common *G. veletis* in an open field but his microhabitat not noted. Still farther down the mountain (S15-63), 1 male singing in area of rocky road cut with locally more common *G. longicercus*.

Life cycle & seasonal occurrence. Egg diapause not checked but probably absent given the presence of apparently old adults, as indicated by broken cerci, in early summer specimens. No nymphs seen on 1-vii-2015. Given elevation, probably 1 generation/year.

Variation. Nothing significant except for measurements in Table 1, p. 18.

DNA. Multilocus G3088, type locality. Nearest relative is *G. veletis* (Astral analysis) or Clade 1 of *G. montis* (see G2416 and G2464 in concatenated analysis, Gray *et al.* 2019), the latter two both from the Chiricahua Mts. in eastern Arizona. In the Davis Mts., all individuals verified as to species by ITS2, to insure separation from *G. transpecos*, since if cerci damaged in the latter, can be confused with *G. planeta* due to some overlap in several morphological characters (see under “Recognition characters”).

Discussion. Our field attention was first called to this cricket, on the top of Mt. Locke (S15-61), by cerci that seemed 1-3 mm too long for *G. veletis* but not long enough for microsympatric *G. transpecos*. While under mountain top tree canopy is not a typical habitat for *G. transpecos*, *G. veletis* is known from such areas, such as Cloudcroft, NM. We subsequently collected obvious *G. veletis* 150 m lower (S15-62) on our elevational transect. At the latter site, *G. veletis* were much larger than those *G. planeta* from higher up but the cerci of these *G. veletis* were still shorter than those of the smaller *G. planeta* (see Fig. 151). Critically, at S15-62, we collected one much smaller male which

morphologically agrees with *G. planeta* (see “Recognition characters”). Our first genetic efforts with mitochondrial 16S showed no difference between *G. planeta* and *G. veletis*, but ITS2 clearly separated the two taxa, which then revealed the many physical characters that also separate them. When the paratype series of *G. planeta* was collected in early July, the situation was complicated, by damaged cerci in microsympatric *G. transpecos* (probably reflecting their old adult age), which then resembled, in length, those of *G. planeta*. Thus, ITS2 was run on all paratype individuals to confirm identity. The calling songs of *G. planeta*, *G. veletis*, and *G. transpecos* are indistinguishable from one another in the field, despite them being microsympatric in places. Perhaps if we knew beforehand which species we were listening to, then better field identification might be possible.

G. planeta, along with *G. chisosensis* and *G. sotol*, are all sky island, geographically restricted taxa, occupying cooler, wetter, and more biologically diverse habitats than the surrounding Chihuahua Desert (Cullen, 2015). The Davis Mountains receive 51 cm of rainfall a year, contrasted with 25 cm a year in the surrounding Desert (Cullen, 2015).

The Davis Mountains were created about 35 million years ago by the same volcanic thrust that formed the front range of the Rockies.

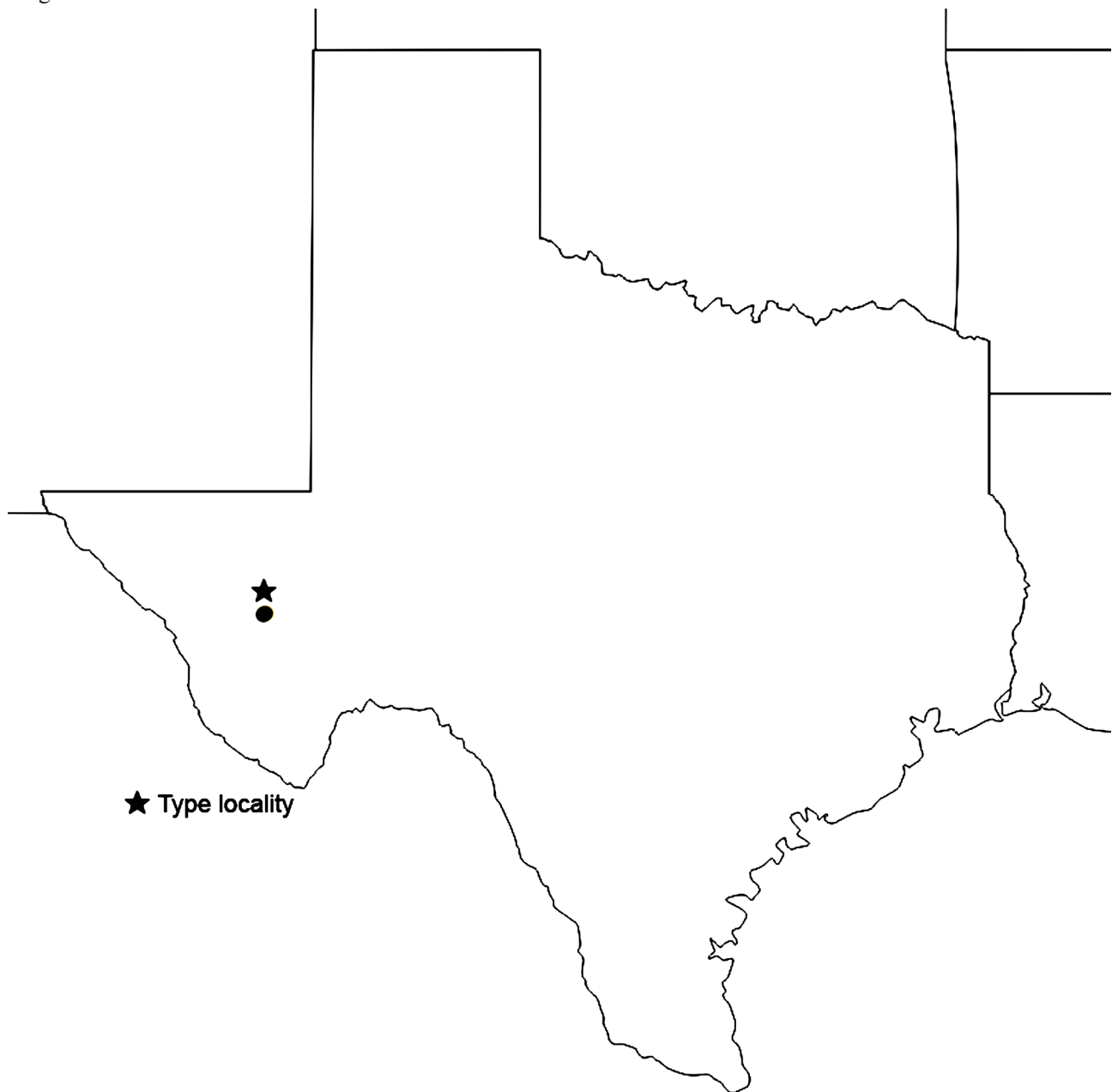


FIGURE 154. Known distribution of *G. planeta*.