

## Macrotera magniceps (Andrenid Bee)

---



Tara Armijo-Prewitt,

### Taxonomy

- **Class:** INSECTA
- **Order:** HYMENOPTERA
- **Family:** ANDRENIDAE
- **Genus:** Macrotera
- **Scientific Name:** *Macrotera magniceps* (Timberlake, 1960)
- **Common Name:** Andrenid Bee
- **Synonyms:**
- **Taxonomic Name Source:** Integrated Taxonomic Information System (ITIS). 2008. World Bee Checklist Project (version 03-Oct-2008). Integrated Taxonomic Information System: Biological Names. Online. Available: <http://www.itis.gov>.

### Agency Status

- **NMDGF:**
- **Federal Status:**
- **BLM Sensitive:**
- **USFS:**
- **IUCN Red List:** [Not Evaluated](#)
- **Nature Serve Global:** [GNR](#)
- **NHNM State:** S1
- **NM Endemic:** NO

### Description

Male *Macrotera magniceps* are distinct from closely related species because the head is orange or rusty red with small, black facial foveae. The mandibles are simple, unlike those of similar species *M. haplura* and *M. portalis*. The genitalia are also unique. Females are distinctive due to their orange, rusty red maculations on the head, which are much less extensive than that seen in the males. One of the most distinctive feature of this species, in both males and females, are dense, closely situated setae clothing the mesoscutum, scutellum and lateral portions of the mesopleura. These setae gives the females in particular a frosted appearance (Danforth 1996).

### Habitat and Ecology

*Macrotera magniceps* is often collected in large dune formations, suggesting it prefers mostly sandy soils (Danforth 1996). The nesting habits of this particular species are unknown, though *Macrotera* species typically nest in the

ground, sometimes communally. They are usually oligolectic, often specializing on plants in the mallow or cactus families (Malvaceae and Cactaceae respectively) (Carril and Wilson 2023). This species is usually collected on globe mallow species (*Sphaeralcea* spp.), which it appears to specialize. In particular, it is associated with *S. incana*, a distinct species, which grows up to two meters in height in very dry, sandy localities (Danforth 1996).

## Geographic Range:

This goblin bee is known from a few scattered occurrences in the southwestern United States and northern Mexico. It was described from a male collected near Deming, New Mexico (Timberlake 1960), and has since been recorded from Los Lunas, Albuquerque, and the Sevilleta National Wildlife Refuge (Gordon 2022, Armijo-Prewitt 2019, Chesshire *et al.* 2023). There are also records from the American Museum of Natural History from unknown localities within Arizona and Texas, though these records are not digitized so further information, such as collection date, is not available (Ascher and Pickering 2024). It has also been recorded in Ciudad Juarez and the Samalayuca Dunes in Chihuahua, Mexico (Chesshire *et al.* 2023). There is an outlying record from Chiapas, in southern Mexico, collected in 1991 (Chesshire *et al.* 2023). Records for Arizona, Texas, and Chiapas were not included in the range stated by Danforth (1996), so they may not be accurate.

## Conservation Considerations:

There are no conservation measures in place for this species. It is known to occur in at least one protected area, the Sevilleta National Wildlife Refuge, though it is not removed from the main threat of severe drought in this refuge. Research is needed to better understand the current distribution, population size and trend, habitats and ecology, and threats.

## Threats:

The threats to this species are not well understood, though drought is likely the main threat. The Southwestern U.S. saw its driest 22-year period from 2000 to 2021, since at least 800 CE (the time period used in previous climatic reconstructions) (Williams *et al.* 2022). Droughts are projected to become more prolonged, severe, and common in the region under future climate change scenarios (USGCRP 2018). Drought may negatively impact bee species by reducing floral resource availability (Phillips *et al.* 2017). In addition, declines observed in *Macrotera* species at one site in the Chihuahuan Desert have been attributed to small body size of these bees, and associated sensitivity to heat and desiccation (Kazenel *et al.* 2024).

## Population:

The population size and trend are not well understood for this species. However, based on 16 years of abundance data from the Sevilleta National Wildlife Refuge and experimentally determined heat and desiccation tolerances, climate sensitivity models predict this species is likely to decline in the coming years (Kazenel *et al.* 2024). This species has only been recorded recently in New Mexico. Surveys are needed to ensure the species remains extant across the range.

## References:

- Chesshire, P.R., Fischer, E.E., Dowdy, N.J., Griswold, T.L., Hughes, A.C., Orr, M.C., Ascher, J.S., Guzman, L.M., Hung, K-L.J., Cobb, N.S. and McCabe, L.M.. 2023. Completeness analysis for over 3000 United States bee

- species identifies persistent data gap. *Ecography* e06584: (13-Jan).
- Danforth, B.N.. 1996. Phylogenetic Analysis and Taxonomic Revision of the *Perdita* Subgenera *Macrotera*, *Macroteropsis*, *Macroterella* and *Cockerellula* (Hymenoptera: Andrenidae) . *University of Kansas Science Bulletin* 55: (635-692).
  - Timberlake P.H.. 1960. A revisional study of the bees of the genus *Perdita* F. Smith, with special reference to the fauna of the Pacific Coast (Hymenoptera, Apoidea) Part IV. *University of California Publications in Entomology* 17: (1-156).
  - [Ascher, J.S. and Pickering, J.. 2024. Discover Life bee species guide and world checklist \(Hymenoptera\): \*Macrotera magniceps\* \(Timberlake, 1960\). 2024. <https://www.discoverlife.org/mp/20q?search=Macrotera+magniceps&flags=subgenus:>](https://www.discoverlife.org/mp/20q?search=Macrotera+magniceps&flags=subgenus:)
  - [Gordon, E.. 2022. iNaturalist observation.: 2024. <https://www.inaturalist.org/observations/130428520>](https://www.inaturalist.org/observations/130428520)
  - [Armijo-Prewitt, T.. 2019. iNaturalist observation. 2024. <https://www.inaturalist.org/observations/27107432>](https://www.inaturalist.org/observations/27107432)
  - Kazenel, M.R., Wright, K.W., Griswold, T., Whitney, K.D. and Rudgers, J.A.. 2024. Heat desiccation tolerances predict bee abundance under climate change. *Nature* 628: (342-362).
  - Phillips, B.B., Shaw, R.F., Holland, M.J., Fry, E.L., Bardgett, R.D., Bullock, J.M. and Osborne, J.L.. 2017. Drought reduces floral resources for pollinators. *Global Change Biology* 24: (3226-3235).
  - USGCRP. 2018. Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II. *U.S. Global Change Research Program* , Washington, DC, USA : (1515).
  - [ITIS. 2024. Integrated Taxonomic Information System \(ITIS\). 2024. <https://www.itis.gov/>](https://www.itis.gov/)
  - Carril, O.M. and Wilson, J.S.. 2023. Common Bees of Western North America. Princeton University Press, Princeton, NJ .
  - Williams, A.P., Cook, B.I. and Smerdon, J.E. . 2022. Rapid intensification of the emerging southwestern North American megadrought in 2020â€”2021. *Nature Climate Change* 12: (232-234).

## More Information