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ABSTRACT

The leafhopper assassin bug, *Zelus renardii* Kolenati, is a natural enemy and stands out among species in the large New World genus *Zelus* Fabricius (~60 spp.) by its introduction to and establishment in 3 biogeographic regions. We here present documentation of the distribution and habitat of *Z. renardii* in its native range in North and Central America and compare it with *Z. tetracanthus* Stål, a wide-ranging New World congener that apparently has not dispersed outside of its native range. In addition, we document and compare predatory and reproductive behaviors in the 2 species. *Zelus renardii* is widely distributed in the Western USA and shows a continuous geographic range south to Guatemala; *Z. tetracanthus* is broadly distributed across North and Central America and also occurs in Brazil. In Riverside County, California, *Z. renardii* is common in suburban and disturbed habitats in addition to certain natural areas, whereas *Z. tetracanthus* is usually restricted to natural areas. The behavioral comparison under laboratory conditions indicated that *Z. renardii* caught prey faster and that feeding duration in this species was shorter than in *Z. tetracanthus*. The duration of pre-copulatory behaviors in *Z. renardii* was shorter than in *Z. tetracanthus*, resulting in a shorter overall mating duration. Based on the higher percentage of egg batches that produced first instars in *Z. renardii*, this species may establish large populations under adverse conditions faster than *Z. tetracanthus*. Our observations on distribution and biology contribute toward an understanding of the differences in invasiveness between the 2 species.
Supplemental Fig. 1. World map with simplified climatic zones (Köppen-Geiger classification; by Murray C. Peel, The University of Melbourne) with the superimposed native distribution range of *Z. renardii* (black border, grey stripes) and *Z. tetracanthus* (grey border, white stripes) and, indicated by arrow heads 1–4, the invasions of *Zelus renardii* in other geographic areas. In Chile (2), Spain (3) and Greece (4) *Z. renardii* occurs in Mediterranean type climates similar to those found along the west coast of North America. Hawaii, Johnston Island, Samoa (1) and the Philippines have wet tropical climate as also found in parts of Central America in the native distribution range of this species. Abbreviations: Af, Tropical rain forest climate; Am, Tropical monsoon climate; Aw, Tropical wet and dry or savanna climate; BWh, desert climate, dry and heat; BWk, desert climate, dry and cold; BSh, steppe climate, dry and heat; BSk, steppe climate, dry and cold; Csa, Mediterranean climate: humid moderate climate with dry summer, hot summer; Csb, Mediterranean climate: humid moderate climate with dry summer, moderate summer.
Supplemental Fig. 2. Habitats of Zelus renardii and Z. tetracanthus in Baja California, Mexico (A, B) and Riverside County, USA (C-E). (A) Both species were abundant at this locality in Baja California on blooming Prosopis sp. (Fabaceae) (Ensenada, 8.5 km S of Bahia de los Angeles, 28.88248°N 113.53095°W, 8 m asl, 14 May 2009, C. Weirauch). (B) Habitat of Zelus tetracanthus in the San Pedro Mártir mountains in Baja California (62 km E of Hwy 1 to San Pedro Martir, 30.95681°N 115.68381°W, 1106 m asl, 18 May 2009, C. Weirauch). (C) Only Z. renardii were collected on Chilopsis sp. (Bignoniaceae) in this arroyo in Riverside County (White Water Canyon, 33.925°N 116.6375°W, 598m asl, 2 Jun 2009, C. Weirauch, L. Berniker, G. Zhang). (D) Chilopsis sp. in White Water Canyon. (E) Suburban front yard in Riverside where Z. renardii is found regularly.