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## **Bioclimatic profile and potential distribution of the Mesopotamian harvestman *Discocyrtus testudineus* (Holmberg, 1876) (Opiliones, Gonyleptidae)**

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### **Abstract**

The geographic range of the Neotropical harvestman *Discocyrtus testudineus* (Holmberg, 1876) (Gonyleptidae) is addressed by determining the species' bioclimatic profile and modeling its potential distribution. Analysis was performed on a record set of 71 localities, including literature records and 34 new localities reported here. The bioclimatic profile was characterized through extreme, median and dispersion features of the values of 19 bioclimatic variables across the record set. Predictive models were built with the presence-only methods MAXENT and, secondarily, BIOCLIM. *Discocyrtus testudineus* is a typical Mesopotamian harvestman, spreading across a wide region along the middle and lower Paraná River in subtropical / temperate Argentina, and extending, more or less continuously, up to the central province of Córdoba. Apparently diverging records (Paso de los Libres, on the Uruguay River, and Quilmes, on the southern coast of Río de la Plata) proved to be predictable, even if suppressed from the dataset. Comparisons of cumulative frequencies curves and dispersion features (box-plots) were made with *Discocyrtus dilatatus* Sørensen, 1884 and *Gryne orensis* (Sørensen, 1884), other Mesopotamian species for which bioclimatic data are available. The relative importance of the bioclimatic variables used for modeling was also estimated.

**Key words:** Neotropical Region, Mesopotamia, bioclimatic profile, species distribution modeling, MAXENT, BIOCLIM

### **Introduction**

The gonyleptid *Discocyrtus testudineus* (Holmberg, 1876) is one of the most characteristic harvestmen inhabiting the so-called “Mesopotamian *sensu stricto*” opilio-geographical area in Argentina (Acosta 2002). It is also one of the earliest species described in the region: it was named by Holmberg (1876) from a single specimen collected in Puerto Obligado, about 170 km NW of Buenos Aires. While originally assigned to the “repository” genus *Gonyleptes* Kirby, 1818, Holmberg then erected for this species the monotypic genus *Discocyrtus* Holmberg, 1878. With the passing of time and continued contributions of several authors, *Discocyrtus* has become nearly the largest gonyleptid genus, containing about 80 nominal species, most concentrated in the Brazilian states of Rio de Janeiro, São Paulo, Minas Gerais, Paraná, Santa Catarina and Rio Grande do Sul (Soares & Soares 1954; Kury 2003). In such an extensive genus range, the type species, *D. testudineus*, and two Mesopotamian congeners—*D. prospicius* (Holmberg, 1876) and *D. dilatatus* Sørensen, 1884—are the southern- and westernmost representatives (Acosta 1995, 2002). The current taxonomical concept of *D. testudineus* relies on Ringuelet (1956, 1959), who recognized the intraspecific variation, thereby determining that *Discocyrtus laevis* Mello-Leitão, 1931 and *Microgoniosoma fuscum* Mello-Leitão, 1930 (successively placed in Gonyleptinae and Goniosomatinae: Mello-Leitão 1930, 1935) are its junior synonyms. Among Argentinean gonyleptids, *D. testudineus* can be easily identified by the paired acute apophyses arming the scutal area III, and for males, by the curved femora that give this species its typical “knock-kneed” habitus (Fig. 1). Ringuelet (1959) based his redescription on external features alone, but several depictions of the male genital morphology of this species are scattered in the literature (Hansen & Sørensen 1904: plate VI, figs. 28–31; Pinto-da-Rocha & Giribet 2007: 200; Macías-Ordóñez *et al.* 2010: 296).

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