



Revision of the American Pill Millipedes I: *Onomeris* and *Trichomeris* (Diplopoda, Glomerida, Glomeridae)

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Abstract

The unique characters which distinguish *Trichomeris* Loomis, 1943 from *Onomeris* Cook, 1896 are based on erroneous drawings and not actual differences. *Trichomeris* is a junior synonym of *Onomeris*. All three species of *Onomeris*, *O. sinuata* (Loomis), 1943, *O. underwoodi* Cook, 1896 and *O. australora* Hoffman, 1950 are redescribed, based on their holotypes, as well as additional specimens. Scanning electron micrographs are presented for the first time for an American member of the order Glomerida. A key to the three species of *Onomeris* is provided. The available distribution data for *Onomeris* is still rudimentary, but the distribution areas of the three species are Cumberland Plateau from NW Alabama to Virginia for *O. sinuata* n. comb., lowland areas from Mississippi to Georgia for *O. underwoodi*, mountainous areas of Tennessee, Georgia and North Carolina for *O. australora*. Additional *Onomeris* species can potentially be discovered in the eastern United States.

Key words: Glomerida, soil arthropod, Cumberland Plateau, microendemism, systematics

Introduction

The pill millipedes (order Glomerida) belong to the millipede subclass Pentazonia (Bond & Sierwald 2007) and encompass currently approximately 282 species organized in 34 genera (see Table 1). Pill millipedes are usually 10–20 mm long and can roll into a perfect ball as defense behavior. In the subclass Pentazonia, only the Glomerida can secrete poisonous substances out of their dorsal defense glands. The defense glands of the Glomerida are probably a convergent, unique development, not related to the ones found in members of the other millipede subclass, Helminthomorpha (Enghoff 1984, Sierwald *et al.* 2003).

The order Glomerida shows a holarctic distribution, mainly in Europe and Asia, with less than a dozen of species belonging to European genera also occurring in North Africa (Golovatch *et al.* 2009). Its center of diversity is Europe, with 23 genera living there, most prominently in Italy and the Balkans. A sharp decline in species numbers is observable towards the North in Europe (four genera and 15 species in southern Germany; only one species occurring naturally in northern Germany, Scandinavia and Great Britain) and the U.S. (absent in all except the southern states), probably because of limited re-colonization after the Ice Ages. Several other genera are also found in Asia (mainly *Hyleoglomeris* and *Rhopalomeris*), with a distribution from Turkey through Mesopotamia, India, Indochina, Indonesia up to the Philippines and Japan (Golovatch *et al.* 2006).

Three named genera with 20 species occur in America (Hoffman 1999). The three American genera are found in the SE part of the U.S., approximately from Mississippi to Kentucky (*Onomeris* Cook, 1896 and *Trichomeris* Loomis, 1943), and in a separate area of distribution in Guatemala and southern Mexico (Shear 1986, Hoffman 1999) of the genus *Glomeroides* Chamberlin, 1922. *Glomeroides* has an isolated occurrence in the north of California, and an undescribed species from southern Texas (FMNH-INS 55346). The two available classification systems for Glomerida (Hoffman 1980, Mauriès 1971, 2005) differ in the placement of the three American genera (see Table 1). Both systems agree that *Glomeroides* belongs in a different family (Protoglomeridae) than the other two