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 (Protogglomeridae) than the other two