



Research status and an analysis of the taxonomy of the Family Torrenticolidae (Acari, Hydrachnidiae, Lebertioidea) in China*

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The family Torrenticolidae belongs to Lebertioidea (Trombidiformes: Hydrachnidiae), one of the most abundant groups in species diversity in water mites (Krantz & Walter 2009). Up to now, the world's total number of known torrenticolid species is 618 (Gu *et al.* 2019c, 2022a, b, c; Gu & Guo 2019; Pešić *et al.* 2019, 2020a, b, 2022). The earliest taxonomic study of Torrenticolidae started in 1837 (Koch 1837), but that in China started later in the 1990s (Jin 1997; Gu & Guo 2019). Therefore, the taxonomy of Torrenticolidae in China is relatively backward. As of December 2016, only 13 torrenticolid species were identified in China. So there are still many new taxonomic categories to be discovered. In addition, some other critical scientific problems are required to be solved quickly, such as limited available morphological characteristics and taxonomical methods.

To solve the above problems, our team has conducted systematic collection and research on water mites in China. We added geometric morphometrics to identify species of Torrenticolidae based on traditional morphological and molecular methods (Gu *et al.* 2022b, 2022c). Up to now, 34 new species and seven new record species in China have been reported (Gu & Guo 2019; 2019a, b, 2020a, b, c, d, e, 2022a, b, c). As of October 2022, there are 54 known species of Torrenticolidae in China, accounting for 8.74% of the total known species of this family in the world. In addition, we also carried out phylogenetic analysis based on morphological characteristics and molecular data. However, the result needs further improvement due to the the lack of molecular data for some species.

In general, great progress has been made in the taxonomy of the Torrenticolidae in China. But it is still at a backward stage compared with other groups. In future research, we should increase the application of molecular biological methods and other new taxonomical methods to improve the reliability of species identification, promote the understanding of the development and evolution of its fauna, and ultimately promote the research on the protection and utilization of Torrenticolidae and even other water mites.

Keywords: Torrenticolidae, taxonomy, research status, China

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