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Annotated Checklist of Chinese Cladocera (Crustacea: Branchiopoda). Part I. Haplopoda, Ctenopoda, Onychopoda and Anomopoda (families Daphniidae, Moinidae, Bosminidae, Ilyocryptidae)

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Abstract

Approximately 199 cladoceran species, 5 marine and 194 freshwater and continental saltwater species, live in China. Of these, 89 species are discussed in this paper. They belong to the 4 cladoceran orders, 10 families and 23 genera. There are 2 species in Leptodoridae; 6 species in 4 genera and 3 families in order Onychopoda; 18 species in 7 genera and 2 families in order Ctenopoda; and 63 species in 11 genera and 4 families in non-Radopoda Anomopoda. Five species might be endemic of China and three of Asia. Many records are suspect at the species level, and numerous taxonomic problems remain to be settled.

Key words: Cladocera, Checklist, China, taxonomy

Introduction

History of research. The study of the taxonomy of the Cladocera (Crustacea: Branchiopoda) is no longer regarded as an attractive field of research. As a result, Europe and North America, loose their taxonomists rapidly. There is a significant chance that both of these regions, with a long history of taxonomic studies, will soon be moved to the list of territories with out dated information. In less than two decades interest in cladocerans shifted from the Holarctic to some countries of South America and Mexico (Elías-Gutiérrez *et al.* 2008 a, b) and SE Asia (Maiphae *et al.* 2008; this paper), which are now studied better than some regions of the former.

China is among countries where study of cladoceran taxonomy is in progress, and interest in faunistic and taxonomic works is rising. But while cladocerans in Europe have been studied for more than 300 years, the earliest studies on China, by Poppe (1888), Poppe & Richard (1890), Richard (1895), and Richard (1897), are little more than a century old. Poppe's paper is the oldest reference available, and deals with a marine onychopod, obtained from M. Schmacker, a German from Bremen living and collecting around Shanghai. The species, *Podon schmackeri*, is named after him. Schmacker also collected freshwater material, studied by Poppe & Richard (1890) and Richard (1895, 1896). A short list of taxa, mainly identified to genus level, resulted from this. The haplopod *Leptodora kindtii* (subsequently described as a separate species, *L. richardi* Korovchinsky, 2009) thus became the first freshwater cladoceran to be recorded from China. Richard (1895, 1896) again dealt with marine cladocerans, and first reported a ctenopod, *Penilia avirostris*, from Nanhai near Hong Kong. Richard (1897) was also given four samples by P. Chaffanjon, a French explorer who traveled between Ulan Baatar in Mongolia and Qiqihar in Heilongjiang Province (then called Manchuria) in 1894. These samples contained *Sinodiaptomus chaffanjoni* (Richard, 1897) and *Daphnia similis* Claus, 1876.

sampling locations has to date not been uniform: in the early period of studies, most investigations were carried out in the basin of the Yangtze River, the Qinghai-Tibet Plateau and in northeast China. Other areas, such as the Yunnan-Guizhou Plateau and the North China Plain, have remained almost unstudied. So the comprehensive and extensive investigations maybe add some new records to the fauna list of China.

Interestingly, the fauna of South Korea has recently revealed several tropical-subtropical cladocerans, like *Ilyocryptus* cf. *raridentatus*, also found in the Far East of Russia (Kotov *et al.* 2011, 2012), but not yet recorded from China. This might be a consequence of using inappropriate keys for the determination of taxa. Recently, as well a complex of species endemic to temperate latitudes of East Asia was revealed (Kotov *et al.* 2011, 2012), but information on such species in China is yet to become available.

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