



## Terrestrial Parasitengona (except chiggers) of China: a review of progress in systematics and biology, with a checklist of species\*

ZHI-QIANG ZHANG

New Zealand Arthropod Collection, Landcare Research, 231 Morrin Road, St. Johns, Auckland 1072, New Zealand

Email: zhangz@landcareresearch.co.nz

\* *In*: Zhang, Z.-Q., Hong, X.-Y. & Fan, Q.-H. (eds) Xin Jie-Liu Centenary: Progress in Chinese Acarology. *Zoosymposia*, 4, 1–345.

### Abstract

This paper reviews the research on taxonomy and biology of the terrestrial Parasitengona (except chiggers) in China, with an updated checklist of 47 species (+9 undetermined species) belonging to 5 superfamilies, 9 families and 25 genera. Major contributions to the Chinese fauna of the terrestrial Parasitengona were made by Zhang Zhi-Qiang and his colleagues, Zheng Bo-Yi and R. Haitlinger. There have been some studies on the biology and use in biological control of the Trombidioidea and Erythraeioidea in China and these are briefly reviewed.

**Key words:** velvet mites, larvae, predators, Trombidioidea, Erythraeioidea, ectoparasites, faunistics, biology, biocontrol, mainland China, Taiwan

### Introduction

The Parasitengona is one of the most diverse groups of the Trombidiformes. With about 15 superfamilies, over 60 families and 8000 species, it accounts for over half of all species of the Trombidiformes (Smith *et al.*, 2001; Zhang & Fan, 2007; Walter *et al.*, 2009). The majority of the described species of the Parasitengona are highly specialized water mites (over 6000 species, mostly known from adults) and chiggers (over 2000 species of Trombiculidae and Leewenhoekiidae, mostly known from larvae parasitic on vertebrates). Terrestrial Parasitengona other than chiggers were mostly described as adults in early years but larvae have been more and more commonly described in the last few decades. Some species of the Trombidioidea and Erythraeioidea are of potential importance in biological control as predators (adult/nymphal stages) and parasites (larvae) of insect and mite pests (Welbourn, 1983; Zhang, 1988b, 1991, 1998; Gerson *et al.*, 2003).

Jin *et al.* (2010, this volume) provides a review of water mites from China. In this paper, I provide a historical review of the research on the systematics and biology of the terrestrial Parasitengona other than chiggers in China, with an updated checklist of species. I also briefly review recent studies on the biology and the roles in biological control of these mites in China. I hope that this review will help stimulate further studies of this important group of mites in China and also facilitate access to Chinese literature for researchers outside China.