



Order Thysanoptera Haliday, 1836 *

LAURENCE A. MOUND

CSIRO Ecosystems Sciences, GPO Box 1700, Canberra ACT 2601, Australia; Laurence.Mound@csiro.au

* *In*: Zhang, Z.-Q. (Ed.) *Animal Biodiversity: An Outline of Higher-level Classification and Survey of Taxonomic Richness* (Addenda 2013). *Zootaxa*, 3703, 1–82.

The world fauna of the insect Order Thysanoptera continues to be poorly sampled, with the tropical and subtropical areas of the southern continents inadequately surveyed (Mound 2014), and an almost complete lack of knowledge of the thrips fauna of New Guinea. In Australia, the number of described thrips species has increased from 400 to over 800 in 10 years, published largely in *Zootaxa* (Mound 2011a; Mound & Masumoto, 2005 & 2009; Mound & Tree, 2011). The number of described thrips species worldwide has increased 1.3% between 2011 (Mound 2011b) and 2013, and the other geographic areas responsible for this descriptive activity are China and South America. However, these numbers do not reflect the numbers of employed or experienced taxonomists, with the major international collections in Frankfurt, London, San Francisco and Washington no longer employing any thrips specialists.

Thysanoptera is considered sister-group to Hemiptera within the Paraneoptera (Grimaldi & Engel, 2005). These insects, the thrips, are generally classified into two Suborders (Terebrantia and Tubulifera) and 14 Families, of which five families are known only from fossils (ThripsWiki 2013). The nine families of recent thrips include 774 genera and 5938 species, whereas fossil thrips taxa are represented by 57 genera and 153 species distributed across 12 families. A different classification has been advocated by palaeontologists, with an Order Thripida comprising two Suborders, Lophioneurina and Thripina (=Thysanoptera) with two Infraorders, Thripomorpha and Phloeothripomorpha (Zherikin 2002). From a neontological perspective, Bhatti (1988) proposed a classification recognising the suborders Terebrantia and Tubulifera as separate Orders, and then provided a catalogue of Family-group names in the Terebrantia (Bhatti, 1990) and in the Tubulifera (Bhatti, 1992b). Subsequently, within the Terebrantia Bhatti (2006) treated Aeolothripidae, Heterothripidae, Merothripidae and Thripidae each as a different superfamily, and in each of these superfamilies included eight families, two families, two families, and nine families respectively. However, among these 21 families, 11 were monogeneric, with 230 genera retained in the Thripidae. Within the Tubulifera Bhatti (1992a) recognised nine families, to which five further families were added subsequently (Bhatti 1998a; 1998b), with the result that of the 14 families, 10 were monogeneric, and more than 400 genera retained in the Phlaeothripidae. Molecular data from five genes (Buckman *et al.* 2013) provided no support for the recognition of such a large number of families, but supported a sister relationship between the suborders Terebrantia and Tubulifera.

Order **Thysanoptera** Haliday, 1836

Suborder **Terebrantia** Haliday, 1836

Family **Aeolothripidae** Uzel, 1895 (29 genera, 206 species: †6/11)

Family **Fauriellidae** Priesner, 1949 (4 genera, 5 species)

†Family **Hemithripidae** Bagnall, 1923 (1 genus, 9 species)

- Family **Heterothripidae** Bagnall, 1912 (7 genera, 84 species: †3/4)
 †Family **Keratothripidae** Sharov, 1972 (1 genus, 1 species)
 †Family **Liassothripidae** Priesner, 1949 (1 genus, 1 species)
 Family **Melanthripidae** Bagnall, 1913 (6 genera, 76 species: †2/10)
 Family **Merothripidae** Hood, 1914 (5 genera, 18 species: †2/3)
 †Family **Moundthripidae** Nel, Azar & Nel, 2007 (1 genus, 1 species)
 Family **Stenurothripidae** Bagnall, 1923 (12 genera, 24 species: †9/18)
 Family **Thripidae** Stevens 1829
 Subfamily **Dendrothripinae** Priesner, 1925 (15 genera, 98 species: †4/6)
 Subfamily **Panchaethripinae**, Bagnall, 1912 (40 genera, 141 species: †2/5)
 Subfamily **Sericothripinae** Karny, 1921 (3 genera, 152 species)
 Subfamily **Thripinae** Stephens, 1829 (247 genera, 1718 species: †13/64)
 †Family **Triassothripidae** Grimaldi & Shmakov, 2004 (2 genera, 2 species)
 Family **Uzelothripidae** Hood, 1952 (1 genus, 1 species)
 Suborder **Tubulifera** Haliday, 1836
 Family **Phlaeothripidae** Uzel, 1895
 Subfamily **Idolothripinae** Bagnall, 1908 (81 genera, 723 species)
 Subfamily **Phlaeothripinae** Uzel, 1895 (375 genera, 2831 species: †10/18)

Cited references

- Bhatti, J.S. (1988) The orders Terebrantia and Tubulifera of the superorder Thysanoptera (Insecta). A Critical Appraisal. *Zoology (Journal of Pure and Applied Zoology)*, 1, 167–240.
- Bhatti, J.S. (1990) Family group names in the Order Terebrantia (Insecta). *Zoology (Journal of Pure and Applied Zoology)*, 2, 185–192.
- Bhatti, J.S. (1992a) The Order Tubulifera (Insecta): Its characters and classification into families. *Zoology (Journal of Pure and Applied Zoology)*, 3, 127–162.
- Bhatti, J.S. (1992b) Family-group names in the Order Tubulifera of the superorder Thysanoptera (Insecta). *Zoology (Journal of Pure and Applied Zoology)*, 3, 163–168.
- Bhatti, J.S. (1998a) New structural features in the Order Tubulifera (Insecta). 1. Amalgamation of labro-maxillary complex with cranium and other cephalic structures. *Zoology (Journal of Pure and Applied Zoology)*, 5, 147–176.
- Bhatti, J.S. (1998b) New structural features in the Order Tubulifera (Insecta). 2. Thoracic structures. *Zoology (Journal of Pure and Applied Zoology)*, 5, 177–252.
- Bhatti, J.S. (2006) The classification of Terebrantia (Insecta) into families. *Oriental Insects*, 40, 339–375.
<http://dx.doi.org/10.1080/00305316.2006.10417487>
- Buckman, R.S., Mound, L.A. & Whiting, M.F. (2013) Phylogeny of thrips (Insecta: Thysanoptera) based on five molecular loci. *Systematic Entomology*, 38, 123–133.
<http://dx.doi.org/10.1111/j.1365-3113.2012.00650.x>
- Grimaldi, D. & Engel, M.S. (2005) *Evolution of the Insects*. Cambridge University Press, New York. 755 pp.
- Mound, L.A. (2011a) Grass-dependent Thysanoptera of the family Thripidae from Australia. *Zootaxa*, 3064, 1–40.
- Mound, L.A. (2011b) Order Thysanoptera Haliday, 1836. In: Zhang, Z.-Q. [Ed] Animal biodiversity: An outline of higher-level classification and survey of taxonomic richness. *Zootaxa*, 3148, 201–202.
- Mound, L.A. (2014) Austral Thysanoptera – 100 years of progress. *Austral Entomology* [in press]
- Mound, L.A. & Masumoto, M. (2005) The genus *Thrips* (Thysanoptera, Thripidae) in Australia, New Caledonia and New Zealand. *Zootaxa*, 1020, 1–64.
- Mound, L.A. & Masumoto, M. (2009) Australian Thripinae of the *Anaphothrips* genus-group (Thysanoptera), with three new genera and thirty-three new species. *Zootaxa*, 2042, 1–76.
- Mound, L.A. & Tree, D.J. (2011) Australian spore-feeding Thysanoptera of the genus *Bactrothrips* (Phlaeothripidae – Idolothripinae). *Zootaxa*, 3087, 56–65.
- ThripsWiki (2013) ThripsWiki - providing information on the World's thrips. <http://thrips.info/wiki/> [last accessed 19.viii.2013]
- Zherikin, V.V. (2002) Order Thripida Fallén, 1914 (=Thysanoptera Haliday, 1836). The thrips. In: Rasnitsyn, A.P. & Quicke, D.L.J. (eds.), *History of Insects*. Kluwer Academic, Dordrecht, pp. 133–143.