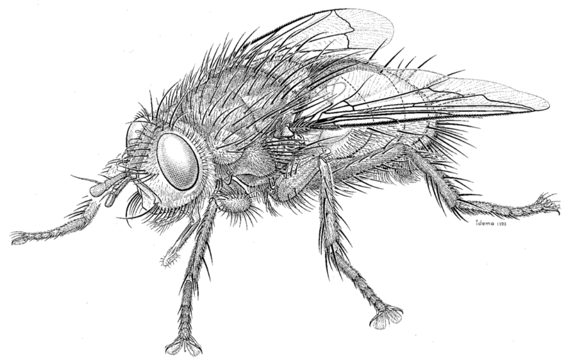
The Tachinid Times

ISSUE 21
February 2008



Jim O'Hara, editor
Invertebrate Biodiversity
Agriculture & Agri-Food Canada
C.E.F., Ottawa, Ontario, Canada, K1A 0C6
Correspondence: oharaj@agr.gc.ca or oharaje@hotmail.com

This issue of **The Tachinid Times** marks an anniversary. It was twenty years ago, in March 1988, that Monty Wood and I started this newsletter to encourage better communication among tachinid workers and to serve as a "forum for the exchange of information and ideas about the Tachinidae". There was no Internet or e-mail in 1988, so persons had to rely on publications, letters, and telephone calls (for those who could afford them), to keep abreast of what others were doing. We hoped that by publicizing what people were working on there would be more cooperation within the community and less surprise when a new paper was published. To that end, the early issues of this newsletter had few true articles but more news items about people's interests, current research, and field trips. Monty stepped down as co-editor after the first issue and soon thereafter retired from Agriculture and Agri-Food Canada (AAFC), Ottawa. So it came to pass that by issue 3, in February 1990, I had been hired into Monty's former position with AAFC, enabling me to continue my systematic studies on the Tachinidae and my editing of **The Tachinid Times**.

This newsletter has not changed substantially during the past twenty years, although it is now a mostly electronic publication and attracts more articles than the "Personal Notes" that used to be a popular part of the newsletter. At some point during the past ten years the *Zoological Record* began citing articles in **The Tachinid Times**, and this development may have given some authors an added incentive to publish in the newsletter. However, I continue to keep the newsletter non-peer reviewed to avoid competing with scientific journals and to keep the focus on short newsworthy articles of interest primarily to tachinid enthusiasts. Moving forward into the 21st year of publication I have no immediate plans to change the basic tenets of the newsletter, but I am open to any suggestions that readers might have to improve its appeal within its niche audience.

I would like to dedicate this 21st issue of **The Tachinid Times** to the late Professor Chien-ming Chao, the pioneer of Chinese tachinidology and former Director of the prestigious Institute of Zoology, Chinese Academy of Sciences, Beijing. Prof. Chao passed away in March 2007. A biography of Prof. Chao is published herein and I thank Chun-tian Zhang and Jing Hao for contributing this insightful article.

Reproduced below is my annual statement about publication of **The Tachinid Times** and my appeal for submissions for next year's issue:

The Tachinid Times is primarily an online newsletter but continues to be offered in hardcopy to provide a permanent record of all issues in a few libraries around the world, and to comply with the wishes of those persons who prefer to receive a print copy for their own files. Both versions are based on the same PDF original and have the same pagination and appearance. The online version of this issue is available as a PDF file (ca. 4.3 MB in size) on the North American Dipterists Society (NADS) website at: http://www.nadsdiptera.org/Tach/TTimes/TThome.htm.

If you wish to contribute to **The Tachinid Times** next year, then please send me your article, note or announcement before the end of January 2009. This newsletter accepts submissions on all aspects of tachinid biology and systematics, but please keep in mind that this is not a peer-reviewed journal and is mainly intended for shorter news items that are of special interest to persons involved in tachinid research. Student submissions are particularly welcome, especially abstracts from theses and accounts of studies in progress or about to begin. I encourage authors to illustrate their articles with colour images, since these add to the visual appeal of the newsletter and are easily incorporated into the final PDF document. Please send images as separate files apart from the text.

Chien-ming Chao, 1927–2007 (by C.-t. Zhang and J. Hao)

At the age of 81 years, one of the most outstanding experts on tachinids, a famous biologist, entomologist, and taxonomist of China, former Prof. Chien-ming Chao (= Jian-ming Zhao) (Fig. 1) of the Institute of Zoology, Chinese Academy of Sciences (IZCAS), died of cancer in Beijing on 24 March 2007.

Figure 1. Prof. Chien-ming Chao in Beijing, 2006. Photo courtesy of X.-k. Sun.

C.-m. Chao was born in Laoting County, Hebei Province, North China on 10 January 1927. From 1948 to 1949, Chao studied in the Department of Biology at the China-France University in Beijing. Due to the arrangement of faculties and departments of universities in China, Chao transferred to the Department of Biology at Nankai University in Tianjin in 1950 and continued studying biology. He finished his studies and graduated from Nankai University in August 1952. Chao then started work as a probational research fellow at the Institute of Entomology, Chinese Academy of Sciences, Beijing. In 1955, he was sent to study abroad in the Department of Biology and Pedology at Moscow University in the USSR (now Russia). He received his vice-Doctor degree from Moscow University in 1959. Chao went on to study ecology and Tachinidae in the Institute of Zoology of the Academy of Sciences of USSR in Leningrad (now St. Petersburg) and the Agricultural Academy of USSR in Moscow. One year later, in July 1960, Chao returned to the Institute of Entomology (merged with the Institute of Zoology, Beijing in 1962), Chinese Academy of Sciences, and began his professional study of tachinids. He began as an assistant research fellow, was appointed as head of the Diptera group in the 1960s, became associate research fellow as head of the Insect Classification Department in the 1970s, became research fellow (= professor) and associate Director of IZCAS in 1979, and served as the standing council member of the Entomological Society of China (ESC) from 1982. He was later appointed Director of IZCAS from 1983 to 1986, elected as vice council director of ESC from 1987 to 1991, and served as the member of the Editorial Committee of Fauna Sinica from 1976 to 2007. He served as a Council member of the International Congresses of Dipterology from 1984 to 1990. After 1980, he traveled separately to England, Germany and Japan for short term academic study of Tachinidae. Prof. Chao retired from IZCAS in October 1991.

Prof. Chao was mainly engaged in the systematics of Tachinidae and Sarcophagidae after 1960, making many contributions to the entomology of China. Altogether, he published 4 new genera and 277 new species of Tachinidae, and 21 new species of Sarcophagidae. From 1960, he (Chao and Shi 1980) studied *Blepharipa* Rondani of China and suggested that IPM could control pests of silkworm for sericulture production in Liaoning, N.E. China. With the help of the natural host *Ostrinia furnacalis* (Guenée), he bred *Lydella grisescens* R.-D. artificially, achieving great success. He also successfully used *Phryxe vulgaris* (Fallén) against the pest *Pieris rapae* L., opening up a new approach to biological control. He (Chao and Liang 1984) was the first to make important contributions on the biology and ecology of Tachinidae and Sarcophagidae of the main insect pests in China. As one of the chief editors of *Flies of China* (Xue and Chao 1998), he helped prepare the most significant publication on Chinese Diptera ever produced. As a major contributor to that work, Chao summarized the taxonomy of the Tachinidae of China that he had worked on since 1960. In *Flies of China*, Chao et al. (1998) recognized 5 subfamilies, 191 genera, and 754 species (including 30 new species) of Tachinidae, gave provincial distributions for each species, included information on the biology of certain species, and provided keys to the identification of species, genera, tribes, and subfamilies. Later, in *Fauna Sinica Insecta* (Chao, Liang, Shi and Zhou 2001), Chao and coauthors reviewed 146 species belonging to 39 genera of Exoristinae and cited observations and research methods pertaining to the parasitic way of life and ecological behavior of tachinids (e.g., *Blepharipa tibialis* (Chao, 1963)). Chao authored or edited 25 monographs and 120 academic papers on taxonomy, biology and ecology throughout his career. He received 15 awards from the Government of P.R. China, Shanxi Province, the Minister of Education of P.R. China, and the Chinese Academy of Sciences.

Chao was Associate Editor-in-Chief of Acta Zootaxonomica Sinica (AZS) from 1979 to 1996, and a member of the Editorial Board of Entomotaxonomia from 1979 to 2007. He was Editor-in-Chief of AZS from 1997 to 1999, and a member of the Editorial Board of AZS from 2000 to 2004. His efforts in later years were reduced because of ill health.

Prof. Chao was a serious scientist who spared no effort in the performance of his duty. He was a kind teacher, and patient with every student. Prof. C.-m Chao's memory and achievements will live on forever!

Reference

Editorial Board of AZS. 2007. The deep memory of Prof. Chao, Chien-ming [In Chinese] Acta Zootaxonomica Sinica **32**: 495.

Publications of Prof. Chien-ming Chao

Chao, C.-m. 1962. Studies on tachinids of Chinese army worm (*Mythimna*). [In Chinese.] Acta Entomologica Sinica **11** (Suppl.): 32–43.

Chao, C.-m. 1962. Notes on the Chinese Larvaevoridae (Tachinidae). I. Genus *Linnaemyia* R-D. [In Chinese with Russian key.] Acta Entomologica Sinica **11**: 83–98.

Chao, C.-m. 1962. Notes on the Chinese Larvaevoridae (Tachinidae). II. *Servillia* R-D. [In Chinese with Russian key.] Acta Entomologica Sinica **11** (Suppl.): 45–65.

Chao, C.-m. 1963. Notes on the Chinese Larvaevoridae. III. Record of a new species of *Crossocosmia*, parasitic on the Chinese oak tussah silkworm in Northeast China. [In Chinese with Russian summary.] Acta Entomologica Sinica **12**: 37–40.

Chao, C.-m. 1963. Notes on the Chinese Larvaevoridae. IV. *Hemipeletieria* Zimin. [In Chinese with Russian summary.] Acta Entomologica Sinica **12**: 220–224.

Chao, C.-m. 1964. Notes on the Chinese Larvaevoridae. V. *Exorista* Meigen. [In Chinese with German summary.] Acta Entomologica Sinica **13**: 362–375.

Chao, C.-m. 1964. Notes on the Chinese Larvaevoridae. VI. *Phorocera* R.-D. [In Chinese with English summary.] Acta Zootaxonomica Sinica **1**: 293–297.

Chao, C.-m. 1964. Notes on the Chinese Larvaevoridae. VII. *Biomeigenia* Mesnil. [In Chinese with English summary.] Acta Zootaxonomica Sinica **1**: 298–299.

Chao, C.-m. 1964. Studies on tachinids of Chinese lappet (*Dendrolimus*). [In Chinese.] Acta Entomologica Sinica **13**: 877–884.

Chao, C.-m. 1965. Fauna Larvaevoriden Chinas. VIII. Gattung *Chaetexorista* B. B. [In Chinese with German summary.] Acta Zootaxonomica Sinica **2**: 101–105.

Chao, C.-m. 1974. Notes on the Chinese Larvaevoridae. IX. *Hystriomyia* Portschinsky. [In Chinese with English summary.] Acta Entomologica Sinica **17**: 474–478.

Chao, C.-m. 1976. New species of the genus *Thecocarcelia* T. T. (Diptera: Tachinidae). [In Chinese with Russian key.] Acta Entomologica Sinica **19**: 335–338.

Chao, C.-m. 1979. New species of the subtribe Peleteriina from China (Diptera: Tachinidae). [In Chinese with English summary.] Acta Zootaxonomica Sinica **4**: 156–161.

Chao, C.-m. 1979. New species of Tachinidae (Diptera) from Mount Tomuer, Xinjiang, China. [In Chinese with English summary.] Entomotaxonomia **1**: 79–82.

Chao, C.-m. 1984. Tachinid flies in China and prospects for their utilization in biological control. Pp. 324–332. *In*: Adkisson, P.L. and Ma, S., eds., Proceedings of the Chinese Academy of Sciences – United States National Academy of Sciences Joint Symposium on Biological Control of Insects, September 25–28, 1982, Beijing, China. Science Press, Beijing.

Chao, C.-m. 1985. Tachinidae. Pp. 124–131. *In*: Huang, F.-s., Han, Y.-h. & Zhang, X.-z., The insect fauna of the Mt. Tuomuer area in Tianshan. Pp. 53–165. *In*: The Mountain Climbing Scientific Expedition Team of Chinese Academy of Sciences, ed., Biota of Tuomuer Region, Tianshan. [In Chinese.] Xinjiang People's Press, Urumqi. 353 pp.

Chao, C.-m. 1985. Diptera: Tachinidae. Pp. 5–6. *In*: Zhao, X.-f., Hua, L.-z., Chao, C.-m. and Li, Y.-q., eds., Report on the survey of insects from Jianfengling tropical forest of Hainan Island, Guangdong Province, a Natural Protective Area (IV) (natural enemy insects). [In Chinese.] Insects of Jianfengling **2** (3): 1–15.

Chao, C.-m. 1987. Diptera: Tachinidae and Sarcophagidae. Pp. 664–733. *In*: Institute of Zoology, Chinese Academy of Sciences, ed., Agricultural Insects of China. [In Chinese.] Agriculture Press, Beijing.

Chao, C.-m. and Arnaud, P.H., Jr. 1993. Name changes in the genus *Tachina* of the eastern Palearctic and Oriental regions (Diptera: Tachinidae). Proceedings of the Entomological Society of Washington **95**: 48–51.

Chao, C.-m. and Chen, X.-l. 2007. A taxonomic study on the genus *Phebellia* R-D (Diptera: Tachinidae) from China. [In Chinese.] Acta Entomologica Sinica **50**: 933–940.

Chao, C.-m. and Jin, Z.-c. 1984. Two new species of Chinese tachinid flies (Diptera: Tachinidae). [In Chinese with English summary.] Acta Zootaxonomica Sinica **9**: 284–287.

Chao, C.-m. and Liang, E.-y. 1982. Notes on new species of Chinese *Erycilla* Mesnil (Diptera: Tachinidae). [In Chinese with English summary.] Zoological Research **3**: 77–81.

Chao, C.-m. and Liang, E.-y. 1984. Parasitic flies (Tachinidae and Sarcophagidae) of Chinese main pests. [In Chinese.] 212 pp. + 5 pls.

Chao, C.-m. and Liang, E.-y. 1986. A study of the Chinese *Carcelia* R.-D. (Diptera: Tachinidae). [In Chinese with English summary.] Sinozoologia **4**: 115–148.

Chao, C.-m. and Liang, E.-y. 1992. Tachinidae. Pp. 719–810. *In*: Fan, Z.-d., ed., Key to the common flies of China. Second revised edition. [In Chinese.] Science Press, Beijing. xlviii + 1032 pp.

Chao, C.-m. and Liang, E.-y. 2002. Review of the Chinese *Carcelia* R.-D. (Diptera: Tachinidae). [In Chinese with English summary.] Acta Zootaxonomica Sinica **27**: 807–848.

Chao, C.-m and Liang, E.-y. 2003. A study of the Chinese genus *Smidtia* Robineau-Desvoidy (Diptera, Tachinidae). [In Chinese with English summary.] Acta Zootaxonomica Sinica **28**: 152–158.

Chao, C.-m., Liang, E.-y., Shi, Y.-s. and Zhou, S.-x. 2001. Fauna Sinica. Insecta. Vol. 23. Diptera. Tachinidae (1). Science Press, Beijing. ix + 305 pp. + 11 pls.

Chao, C.-m., Liang, E.-y., Shi, Y.-s., Zhou, S.-x., Sun, X.-k. and Chen, R.-j. 1998. Tachinidae. Pp. 1661–2206 + pls. 1–30. *In*: Xue, W.-q. and Chao, C.-m., chief eds., Flies of China. Volume 2. [In Chinese with English summary.] Liaoning Science and Technology Press, Shenyang. 17 pp. + 1366–2425 + 32 pls. [Dated 1996 but published in 1998.]

Chao, C.-m., Liang, E.-y. and Zhou, S.-x. 2002. Diptera: Tachinidae. Pp. 814–834. *In*: Huang, F.-s., ed., Forest insects of Hainan. [In Chinese with English summary.] Science Press, Beijing. xi + 1064 pp. + 31 pls.

Chao, C.-m., Liang, E.-y. and Zhou, S.-x. 2004. Diptera: Tachinidae. Pp. 563–575. *In*: Yang, X.-k. ed., Insects from Mt. Shiwandashan area of Guangxi. [In Chinese with English summary.] China Forestry Publishing House, Beijing. 668 pp.

Chao, C.-m. and Shi, Y.-s. 1978. Diptera: Tachinidae. Pp. 172–223. *In*: Institute of Zoology, Chinese Academy of Sciences, Zhejiang Agricultural University et al., eds., Iconography of natural enemy insect. [In Chinese.] Science Press, Beijing. 306 pp. + 50 pls.

Chao, C.-m. and Shi, Y.-s. 1980. Descriptions of the genus *Blepharipa* Rondani of China (Diptera: Tachinidae). Pp.1–6. *In*: Liaoning Institute of Sericulture, ed., Collected works of *Blepharipa* Rondani. [In Chinese.] Science Press, Beijing. 139 pp.

Chao, C.-m. and Shi, Y.-s. 1980. Notes on Chinese Tachinidae: genus *Linnaemya* R.-D. (II). [In Chinese with English summary.] Acta Zootaxonomica Sinica **5**: 264–272.

Chao, C.-m. and Shi, Y.-s. 1980. Notes on new species of *Hyalurgus* Brauer & Bergenstamm (Diptera: Tachinidae). [In Chinese with English summary.] Acta Entomologica Sinica **23**: 314–321.

Chao, C.-m. and Shi, Y.-s. 1981. A preliminary report on investigations and identification of Larvaevoridae in rice fields in South China. [In Chinese.] Natural Enemies of Insects **3**: 50–51.

Chao, C.-m. and Shi, Y.-s. 1981. On the Chinese *Eurythia* with descriptions of seven new species (Diptera: Tachinidae). [In Chinese with English summary.] Sinozoologia **1**: 75–82.

Chao, C.-m. and Shi, Y.-s. 1981. Notes on new genus *Flavicorniculum* Chao et Shi of Tachinidae from China. [In Chinese with English summary.] Acta Entomologica Sinica **24**: 203–208.

Chao, C.-m. and Shi, Y.-s. 1982. A new species of *Metoposisyrops* Townsend from China (Diptera: Tachinidae). [In Chinese with English summary.] Sinozoologia **2**: 71–73.

Chao, C.-m. and Shi, Y.-s. 1982. Diptera: Tachinidae – Tachininae. Pp. 235–281. *In*: The Scientific Expedition Team of Chinese Academy of Sciences to the Qinghai – Xizang Plateau, eds., Insects of Xizang 2. [In Chinese with English summary.] Science Press, Beijing. 508 pp.

Chao, C.-m. and Shi, Y.-s. 1985. Study on the subtribe Nemoraeina from China (Diptera: Tachinidae). [In Chinese with English summary.] Sinozoologia **3**: 163–167.

Chao, C.-m. and Shi, Y.-s. 1985. Notes on the genus *Thelaira* Robineau-Desvoidy from China (Diptera: Tachinidae). [In Chinese with English summary.] Sinozoologia **3**: 169–174.

Chao, C.-m. and Shi, Y.-s. 1987. Two new species of genus *Chetogena* (Rondani) from China (Diptera: Tachinidae). [In Chinese.] Sinozoologia **5**: 203–206.

Chao, C.-m. and Sun, X.-k. 1994. Chapter 12. Studies and evaluations on tachinid flies, an important group of the insect natural enemies from Wuling Mountains Area. Pp. 262–270. *In*: Song, D.-x., ed., Evaluation on Animal Resources from Wuling Mountains Area, Southwestern China. Science Press, Beijing.

Chao, C.-m., Sun, X.-k. and Zhou, S.-x. 1990. Studies on the tribe Parerigonini from China (Diptera: Phasiinae). [In Chinese with English summary.] Acta Zootaxonomica Sinica **15**: 230–241.

Chao, C.-m. and Wang, X.-j. 1985. Studies on mass rearing of the tachinid fly *Lydella grisescens* on its natural host, corn borer. [In Chinese.] Acta Ecologica Sinica **5**: 357–363 + 1 pl.

Chao, C.-m. and Yang, L.-l. 1990. Notes on a new genus and species of Tachinidae from China. [In Chinese with English summary.] Acta Zootaxonomica Sinica **15**: 77–82.

Chao, C.-m. and Yuan, S.-y. 1996. A new species of the genus *Linnaemya* from Gansu, China (Diptera: Tachinidae). Acta Zootaxonomica Sinica **21**: 229–231.

Chao, C.-m. and Zhou, S.-x. 1987. Notes on Chinese Tachinidae: genus *Servillia* R.D. (II). [In Chinese with English summary.] Entomotaxonomia **9**: 1–15.

Chao, C.-m. and Zhou S.-x. 1987. New species of tachinid flies from Hengduan Mountains of China (Diptera: Tachinidae). [In Chinese with English summary.] Sinozoologia **5**: 207–215.

Chao, C.-m. and Zhou, S.-x. 1987. Diptera: Tachinidae. [In Chinese.] Agricultural Insects, Spiders, Plant Diseases and Weeds of Xizang **2**: 205–223.

Chao, C.-m. and Zhou, S.-x. 1988. Diptera: Tachinidae. Pp. 513–523. *In*: The Mountaineering and Scientific Expedition, Academia Sinica (Huang, F.-s. et al.), eds., Insects of Mt. Namjagbarwa Region of Xizang. [In Chinese.] Science Press, Beijing. xii + 621 pp.

Chao, C.-m. and Zhou S.-x. 1989. Studies on the genus *Chrysocosmius* Beggi [sic] from China (Diptera: Tachinidae). [In Chinese with English summary.] Acta Zootaxonomica Sinica **14**: 66–72.

Chao, C.-m. and Zhou, S.-x. 1993. Diptera: Tachinidae. Pp. 1271–1347. *In*: Chen, S.-x., chief ed., Insects of the Hengduan Mountains Region. Vol. 2. [In Chinese with English summary.] The Series of the Scientific Expedition to the Hengduan Mountains Region of Qinghai – Xizang Plateau. Science Press, Beijing. (1992), xvi + 867–1547.

Chao, C.-m. and Zhou, S.-x. 1996. Diptera: Tachinidae. Pp. 217–224. *In*: Wu, S.-g. and Feng, Z.-j., eds., The biology and human physiology in the Hoh Xil Region. [In Chinese with English summary.] The Series of the Comprehensive Scientific Expedition to the Hoh Xil Region. Science Press, Beijing. 357 pp.

Chao, C.-m. and Zhou, S.-x. 1996. Diptera: Tachinidae. Pp. 252–266. *In*: Huang, F.-s. ed., Insects of the Karakorum – Kunlun Mountains. [In Chinese with English summary.] The Series of the Scientific Expedition to the Qinghai – Xizang Plateau. Science Press, Beijing. xii + 349 pp.

Chao, C.-m. and Zhou, S.-x. 1997. Diptera: Tachinidae. Pp. 1529–1552. *In*: Yang, X.-k., ed., Insects of the Three Gorge Reservoir area of Yangtze River. Part 2. [In Chinese.] Chongqing Publishing House, Chongqing. x + 975–1847.

Chao, C.-m. and Zhou, S.-x. 2001. Diptera: Tachinidae. Pp. 476–502. *In*: Wu, H. and Pan, C.-w., eds., Insects of Tianmushan National Nature Reserve. [In Chinese.] Science Press, Beijing. xv + 764 pp.

Chao, C.-m. and Zhou, S.-x. 2003. Tachinidae. Pp. 443–498. *In*: Huang, B.-k., ed., Fauna of Insects in Fujian Province of China. Vol. 8. [In Chinese.] Fujian Science and Technology Press, Fuzhou. 706 pp.

Chao, C.-m., Zhou, S.-x., Wang, X.-j. 1987. Tachinidae. Pp. 1190–1275 + 2 pls. *In*: Forest Department of Yunnan Province & Institute of Zoology Academia Sinica (Cai, B.-h. and Zheng, L.-y.), eds., Forest insects of Yunnan. [In Chinese.] Yunnan Science and Technology Press. 1662 pp. + 16 pls.

Liang, E.-y. and Chao, C.-m. 1990. A study of the Chinese *Thecocarcelia* Townsend (Diptera: Tachinidae). [In Chinese with English summary.] Acta Zootaxonomica Sinica **15**: 362–368.

Liang, E.-y. and Chao, C.-m. 1992. On the Genus *Exorista* Meigen from China (Diptera: Tachinidae). [In Chinese with English summary.] Acta Zootaxonomica Sinica **17**: 206–223.

Liang, E.-y. and Chao, C.-m. 1992. On the genus *Neophryxe* Townsend from China (Diptera: Tachinidae). [In Chinese with English summary.] Acta Zootaxonomica Sinica **17**: 224–226.

Liang E.-y. and Chao, C.-m. 1994. A new species of the genus *Carcelia* R.-D. (Diptera: Tachinidae). [In Chinese with English summary.] Acta Zootaxonomica Sinica **19**: 484–486.

Liang, E.-y. and Chao, C.-m. 1995. Two new species of the genus *Istochaeta* Rondani from China (Diptera: Tachinidae). [In Chinese with English summary.] Acta Zootaxonomica Sinica **20**: 487–491.

Liu, Y.-z., Chao, C.-m. and Li, L.-f. 1999. Five new species of Tachinidae from Shanxi province, China (Diptera). [In Chinese with English summary.] Acta Zootaxonomica Sinica **24**: 347–354.

Liu, Y.-z., Chao, C.-m., Li, L.-f., Zhou, S.-x., Wang, H.-x. and Zhang, W.-j. 1998. Fauna of Tachinidae from Shanxi Province, China. [In Chinese.] Science Press, Beijing. x + 378 pp. + 11 pls.

Liu, Y.-z., Li, L.-f. and Chao, C.-m. 1986. Descriptions of five new species of Exoristinae (Diptera: Tachinidae). [In Chinese with English summary.] Entomotaxonomia **7** (1985): 165–173.

Mao, Z.-h. and Chao, C.-m. 1990. A new species of the genus *Parasetigena* from China (Diptera: Tachinidae). [In Chinese with English summary.] Sinozoologia **7**: 301–302.

Shima, H. and Chao, C.-m. 1988. A new genus and six new species of the tribe Goniini (Diptera: Tachinidae) from China, Thailand and New Guinea. Systematic Entomology **13**: 347–359.

Shima, H. and Chao, C.-m. 1992. New species of Tachinidae (Diptera) from Yunnan Province, China. Japanese Journal of Entomology **60**: 633–645.

Shima, H., Chao, C.-m. and Zhang, W.-x. 1992. The genus *Winthemia* (Diptera, Tachinidae) from Yunnan Province, China. Japanese Journal of Entomology **60**: 207–228.

Sun, X.-k. and Chao, C.-m. 1992. A new species of *Zenilliana* from China (Diptera: Tachinidae). [In Chinese with English summary.] Sinozoologia **9**: 331–333.

Sun, X.-k. and Chao, C.-m. 1993. Notes on the genus *Pexopsis* Brauer & Bergenstamm from China (Diptera: Tachinidae). [In Chinese with English summary.] Sinozoologia **10**: 445–458.

Sun X.-k. and Chao, C.-m. 1994. Study on the Chinese species of *Phorocerosoma* Townsend (Diptera: Tachinidae). [In Chinese with English summary.] Acta Zootaxonomica Sinica **19**: 119–121.

Sun, X.-k. and Chao, C.-m. 1994. A new genus and species of the tribe Sturmiini from China (Diptera: Tachinidae). [In Chinese with English summary.] Acta Zootaxonomica Sinica **19**: 480–483.

Sun, X.-k., Chao, C.-m., Zhou, S.-x. and Qiao, Y. 1993. Diptera: Tachinidae. Pp. 620–639. *In*: Huang, F.-s. ed., Insects of Wuling Mountains Area, Southwestern China. [In Chinese.] Science Press, Beijing. (1992), 777 pp.

Sun, X.-k., Liang, E.-y., Qiao, Y., Chao, C.-m. and Zhou, S.-x. 1992. Diptera, Tachinidae. Pp.1163–1207. *In*: Peng, J.-w. and Liu, Y.-q. eds., Iconography of Forest Insects in Hunan China. [In Chinese with English summary.] Hunan Science and Technology Press. 60 + 4 + 1473 pp.

Sun, X.-k., Qiao, Y., Zhou, S.-x. and Chao, C.-m. 1992. A preliminary study on the control of *Pieris rapae* using *Phryxe vulgaris*. [In Chinese.] Chinese Journal of Applied Ecology **3**: 96–98.

Sun, X.-k., Qiao, Y., Zhou, S.-x. and Chao, C.-m. 1992. Studies on the biology of *Phryxe vulgaris* Fallén (Diptera, Tachinidae) and its mass reproduction on natural host, *Pieris rapae* L. (Lepidoptera, Pieridae). Pp. 198–203. *In*: Zhu, G.-r., Zhang, Z.-l. and Shen, C.-y., eds., Advance in IPM on main vegetables. [In Chinese.] Chinese Agricultural Science and Technology Press, Beijing.

Qiao, Y. and Chao, C.-m. 1990. On differences between two closely related species of tachinid flies – *Exorista civilis* Rondani and *E. xanthaspis* Wiedemann. Sinozoologia **7**: 303–305.

Yang, L.-l. and Chao, C.-m. 1990. Four new species of tribe Blondeliini from the Nanling Mountains of China (Diptera: Tachinidae). [In Chinese with English summary.] Sinozoologia **7**: 307–313.

Zhang, C.-t., Shima, H., Chao, C.-m. and Pang, H. 2004. Catalogue of Chinese Dexiini (Diptera, Tachinidae). Pp. 127–132. *In*: Li, D.-m. et al., eds., Proceedings of Contemporary Entomology. Issues of the 60th Anniversary of the founding of the Entomological Society of China. [In Chinese.] Chinese Agricultural Science and Technology Press, Beijing. 753 pp.

Zhang, C.-t., Pang, Y. and Chao, C.-m. 2005. Tachinid flies of Guangdong, China (Diptera: Tachinidae). Pp. 297–306. *In*: Ren, G.-d., Zhang, R.-z. and Shi, F.-m., eds., Classification and diversity of insects in China. [In Chinese.] China Agricultural Science and Technology Press, Beijing. 402 pp.

Cataloguing the Tachinidae (by J.E. O'Hara)

There are an estimated 10,000 described species of Tachinidae belonging to about 1520 recognized genera (O'Hara 2007). This immense family of flies is even more diverse than suggested by these numbers because many undescribed species are known to exist in all regions except in the relatively well known Nearctic and Palearctic regions. Our understanding of the Tachinidae is hampered not just by these undescribed taxa but by the discordance among the six regional catalogues (listed in O'Hara 2007). Taken together, these catalogues geographically provide world coverage of the Tachinidae, but the earliest dates from 1971 and the most recent from 2004, so the earlier ones are much less complete and modern than the later ones. There are also differences in the concepts of genera and tribes among the regional catalogues. One catalogue in particular, the Neotropical one (Guimarães 1971), is so overburdened with small and meaningless genera (erected primarily by C.H.T. Townsend during the early 1900s) that it is almost incomprehensible to everyone except Monty Wood.

The regional catalogues also vary with respect to the amount of type information they provide. Three catalogues (Crosskey 1973, 1976, O'Hara and Wood 2004) cite primary type data (number, sex, and depository of holotypes, syntypes, lectotypes and neotypes) and type localities for their nominal species (valid species and synonyms), but these catalogues together only document type details for 25% of the world's named tachinids.

This situation is about to change because of two cataloguing projects, one underway and the other about to begin later this year. The former will result in a catalogue of the Tachinidae of China and the latter will produce a catalogue of the world Tachinidae.

The catalogue of the Tachinidae of China is being prepared by myself, Hiroshi Shima and Chuntian Zhang. China is an especially interesting country to treat separately for a number of reasons. From a biodiversity perspective, China has a huge Tachinidae fauna that is only partially known. From a biogeographic perspective, China is one of the few countries in the world straddling the boundary between two regions, in this case the Palearctic and Oriental. From an agricultural and economic perspective, knowledge of China's native flora and fauna is necessary to permit the identification of exported invasive alien species and their parasitoids, and to guard against invasive organisms reaching China from abroad. The fragility of China's vast wealth of native species, in a country with a human population of 1.3 billion and a soaring economy, lends added urgency to our efforts to document the country's biodiversity.

The most significant advance in dipterology in China was the 1998 publication of the 2-volume set, *Flies of China*, edited by W.-q. Xue and the late C.-m. Chao (see biography earlier in this issue). Chao et al. (1998) wrote the 546-page chapter on Tachinidae, recognizing 754 species and 191 genera. A great amount of systematic work has been published on the Tachinidae of China since the publication of *Flies of China*, and that work overlooked some species, so now the number of species known from China is approaching 1100. Although this is a remarkable increase in ten years, the current total is not high for the size and geographic diversity of China and many species undoubtedly remain to be discovered and named.

One of the interesting aspects of our Tachinidae of China project is that distributional data is being gathered on a provincial level from virtually every available paper and book that has data on the tachinids of China. From this work a picture of tachinid biodiversity in China is emerging, including areas of high endemicity, species-rich and species-poor provinces, and information about the pattern of Oriental vs. Palearctic species throughout China. A paper on this subject will be given at the International Congress of Entomology in Durban in July 2008 (O'Hara, Shima and Zhang, in prep.). Completion of the catalogue is planned for fall 2008.

The world Tachinidae project will begin after completion of the catalogue of the Tachinidae of China, and will benefit from experience gained during the first project. It is difficult to comprehend the magnitude of this project, for it will catalogue not just the 10,000 names of valid species, but the thousands of synonyms and thousands of generic names. An optimistic guess might put the length of this project at five years, but it could take seven or eight. The team involved in this project comprises myself, Monty Wood, Vera Richter, Hiroshi Shima, and Shannon Mahony.

The reason our world catalogue will take so long to complete is that virtually every original description of a species or genus, and every designation of a type species or a lectotype or neotype, will be checked for accuracy in the original source. Providing accurate information on types, type depositories, type localities, and distributions is also time-consuming and tedious work, not all of which is as straightforward as one might think (see below). Modern technological advances make it possible for just about anyone to compile names from the *Zoological Record*, to scan catalogues, and to gather information from secondary sources to produce an unimpressive world catalogue in record time (as we have seen lately), but it is our aim to prepare a more proper and thorough catalogue that will hopefully garner more praise than scorn.

I will now briefly review a few of the challenges that we face with both the Chinese and world catalogues.

Tachinid Classification. The Tachinidae of China catalogue has some difficulties associated with merging taxa from two regional catalogues, but these problems are manageable, especially with Hiroshi Shima's years of experience working with the tachinid fauna of the region. Of a more insidious nature are misidentifications, caused by inexperienced workers or the near total reliance on the literature for identification (there being, at least historically, little access to primary types residing outside China). For the cataloguing of the world Tachinidae, the greatest difficulty we will face is the modernizing of the classification of the Tachinidae of the Neotropical Region. Here we will rely heavily on Monty Wood's 40 years of experience with the fauna.

Database. Monty Wood and I used Platypus® as a database platform for our catalogue of the Tachinidae of America north of Mexico (O'Hara and Wood 2004) (Fig. 1), with a custom output designed by Jennifer Read (AAFC, Ottawa). That program is now out of development and the Tachinidae of China catalogue is being compiled mostly as a text file. The distributional component of Tachinidae of China is kept in a FileMaker Pro® database developed by Shannon Mahony. For the world Tachinidae, a robust database will be absolutely necessary and at this stage it is looking as though this database will be custom-designed by Shannon.

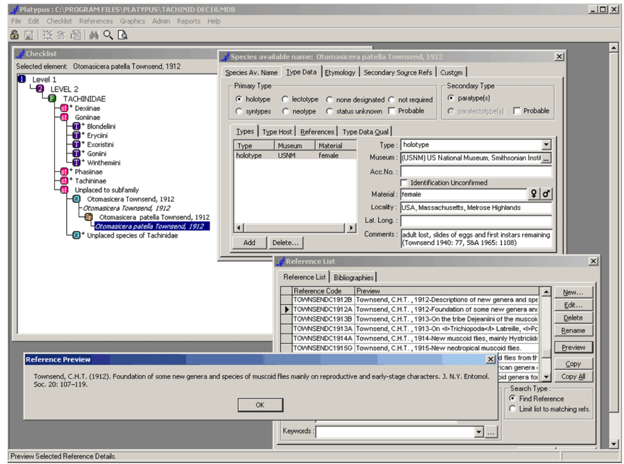


Figure 1. Platypus® database used for "Catalogue of the Tachinidae (Diptera) of America north of Mexico" (O'Hara and Wood 2004). Screen is open at *Otomasicera patella* Townsend, 1912.

Literature. Our manuscript on the Tachinidae of China cites over 500 references; for the world Tachinidae several thousand references will be cited. I am fortunate that I work for an institution that has a good entomology library, with strong holdings of older literature and good journal coverage up to the 1980s (when library support began to diminish). My predecessor, Monty Wood, also made a concerted effort to gather tachinid literature otherwise not present in our library or our reprint collection in the Diptera Unit, so there are relatively few tachinid publications that are not immediately at hand in Ottawa. Chien-ming Chao kindly sent me reprints of his papers and books on the Tachinidae of China, and I made an effort to accumulate other literature on Chinese Tachinidae as it was published during the last twenty years, so the Tachinidae of China project began with good holdings of Chinese literature in Ottawa. Chuntian Zhang has helped supply us with missing literature and we have also purchased a number of books on regional faunas throughout China. A few of the old and new books vital to the Tachinidae of China are shown in Fig. 2.

Collections. Recording type data includes citing type depositories. This information is not always given in the original publication and can involve some sleuthing to determine. The locations of the collections of the more prominent dipterists can be found online or in reference works like "Litteratura taxonomica dipterorum (1758–1930)" (Evenhuis 1997). Although collections around the world are databasing their holdings, there are still relatively few with their types documented online. We will gather as much type data as we can from existing sources and will make enquiries of curators for additional assistance. We also plan to travel to certain institutions to record data from their primary types of Tachinidae.

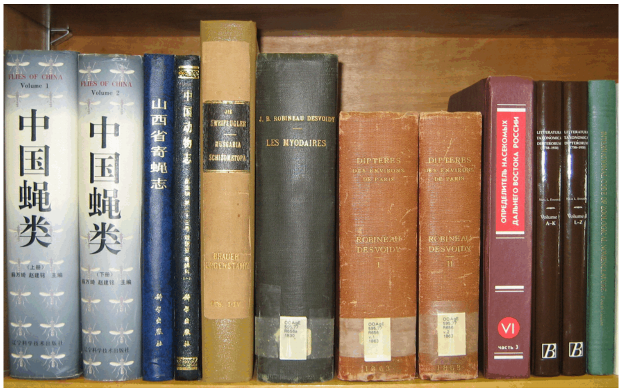


Figure 2. A few of the books vital to our cataloguing efforts. Left to right: Xue and Chao (1998, 2 vols.), Liu et al (1998), Chao et al. (2001), Brauer and Bergenstamm (1889–1895), Robineau-Desvoidy (1830), Robineau-Desvoidy (1863, 2 vols.), Richter (2004), Evenhuis (1997, 2 vols.), ICZN (1999).

Languages. Tachinids have been described in a variety of languages, complicating the recording of the necessary details for our catalogues. We, as authors of these catalogues, can comfortably handle a good portion of the languages involved and my colleagues in Ottawa can collectively read almost every language used in a tachinid publication. Such assistance from a colleague is fine for an occasional translation, but one cannot look for help of this sort on a daily basis. I have developed a "protocol" that others might find useful for dealing with multiple languages. The procedure is this: scan the desired text into Acrobat Professional® (preferably version 8), perform OCR (Optical Character Recognition) after selecting the desired language, select and copy text, go to the Internet and paste text into "Babel Fish Translation", select 'from' and 'to' languages, and hope for an intelligible translation. Do not expect descriptions to work because of the specialized terms. If Babel Fish does not give an acceptable result, then 'Google' the desired language and try a dedicated language translator. Version 8 of Acrobat Professional® has incorporated many languages not included in Version 7. Sample translations from Simplified Chinese and Russian are shown in Figs. 3–5.

Nomenclatural issues. It is especially important to have a good grasp of the Code (ICNZ 1999) when dealing with a catalogue of huge proportions because decisions on sticky nomenclatural issues can affect not just a few species but hundreds. For example, we need to take a carefully reasoned approach to Recommendation 73F ("Avoidance of assumption of holotype"), which recommends that a type series should be interpreted as consisting of syntypes and not a holotype if no information about the size of the type series is given. This may not be the best approach for authors of species whose collections have been well managed and where many species are represented by single specimens traditionally regarded as holotypes.

4 叶蜂菲寄蝇 **Phebellia clavellariae** (**Brauer** & **Bergenstamm**, **1891**) 中国新记录种

Parexorista clavelliariae Brauer & Bergenstamm, 1891: 326.

观察标本: 13 ♂♂,2 ♀♀,吉林土门岭,1981-07-11,毛增华; 3 ♂♂,北京三堡,1980-07-17,梁恩义。

分布: 吉林,北京,山西,青海; 捷克,波兰,德国,奥地利,西伯利亚。

Figure 3. Passage on *Phebellia clavellariae* (B. & B.) in Chao and Chen (2007: 936).

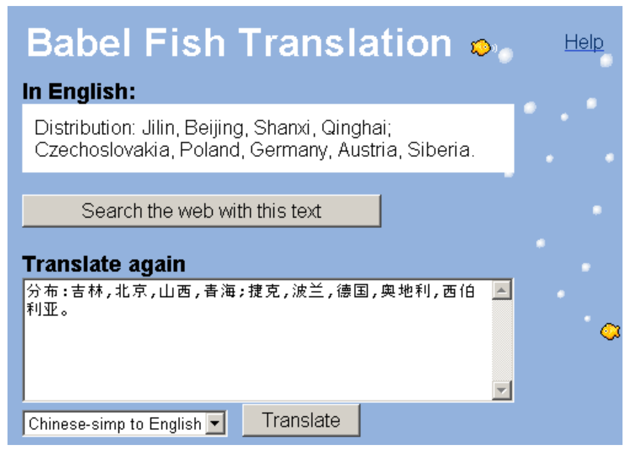


Figure 4. Babel Fish translation of the distribution of *Phebellia clavellariae* (B. & B.) given in Simplified Chinese in Chao and Chen (2007: 936) and shown in Fig. 3.

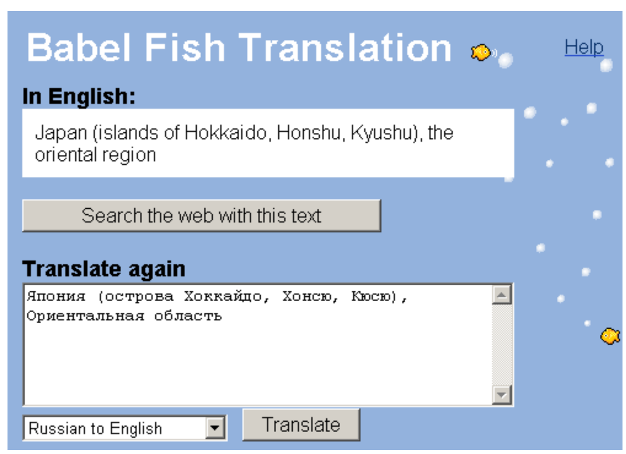


Figure 5. Babel Fish translation of the distribution of *Torocca munda* Walker given in Russian in Richter (2004: 370).

Another problem is that of unjustified emendations (Article 33). Most dictionaries define an emendation more or less as: "An intentional change to a previously proposed name". Names of taxa were frequently changed by subsequent authors if the Latin or Greek spellings were not quite right, but such changes are not allowed under the

Code and are termed "unjustified emendations". These unjustified emendations are nomenclaturally important because they are available names, unlike unintentional subsequent spellings (errors). However, in the eyes of the Code, an emendation is only officially "unjustified" (meaning the name only becomes available), when it is "demonstrably intentional". There have been hundreds of intentional emendations to tachinid names that do not meet the strict provisions of Article 33.2.1. For example, many fly names proposed with the ending "-mya" have had their ending emended to "myia" (meaning "fly" in Greek) by subsequent authors to make them grammatically correct. The change is only an "unjustified emendation" if the author said he/she made the change on purpose, or cited both the original and emended spellings, or treated two or more names in a similar way. So, an emended name can appear in the literature multiple times before becoming officially an unjustified emendation. Although it would be nice to record all the "demonstrably intentional" unjustified emendations by author and date in our catalogues, this would be a herculean task for a very small gain. We will cite unjustified emendations by taxon name without author and date except for those names that are senior homonyms, which as available names take priority over junior homonyms.

The rules governing lectotypes underwent some changes in the 1999 Code (Article 74). Certain provisions for lectotype designations after 1999 (Art. 74.7) have been softened by a subsequent ruling, but there are still some difficulties concerning the implementation of Article 74.5, the section governing lectotype designations before 2000. Wittingly or unwittingly, the wording was changed from the 1985 Code to exclude unintentional lectotype fixations. Authors following older versions of the Code legitimately accepted the mention of a "type", "typus", "holotype" or "Ht" as the lectotype fixation of a single specimen in a series of syntypes if that specimen could be singled out from the others. For example, the mention of the sex of the type might restrict the term to a single specimen, or the cited depository might have only one specimen standing under the specified name. Unfortunately, the current Code did not "grandfather" lectotypifications already documented and accepted in the literature. Hence, as an example, Crosskey's (1971) meticulous documentation of Townsend's mention of a "Ht" (or "Ht male" or "Ht female") for many non-Palearctic Old World species described by Macquart and Bigot, in which some lectotypifications are accepted and others rejected, could be considered a wasted effort. Townsend routinely cited holotypes regardless of whether syntypes were known and regardless of whether he had seen them. It would be no trivial matter to determine the individual merits of each mention of a "Ht" among the many hundreds cited by Townsend in his *Manual of Myiology* (1934–1942) alone (Fig. 6); that is to say, which mention of a "Ht" had actually restricted the usage of the term to a single specimen thereby providing a lectotype fixation according to Crosskey and others following pre-1999 Codes. This is a mute point now because the 1999 Code does not allow Townsend's lectotypifications to be accepted because he had not "explicitly indicated that he or she was selecting from the type series that particular specimen to serve as the name-bearing type". However, rather than start all over again with the taxa dealt with by Crosskey (1971), for example, one could interpret Crosskey's review of Townsend's lectotypifications as lectotype fixations of Crosskey (1971), thereby at least preserving the lectotypes in the sense intended by Crosskey and negating the need for further action with these nominal species.

Genus **Masistylum** Brauer & Bergenstamm

1893 — Musc. Schiz., III, 37. One species.
Gt — *Pachystylum arcuatum* Mik, Verh. Z. B. Ges., XIII, 1240 (1863).
Ht — Origin, Austria; location, Vienna.

Figure 6. Entry for *Masistylum* B.& B. in Part VIII of Townsend's (1939) *Manual of Myiology*, showing his typical use of "Ht" for type data of the type species ("Gt", or genotype, *Pachystylum arcuatum* Mik).

Localities. There is more to recording distributions and type localities than one might think. Place names change over time, borders between countries shift or disappear, and some recorded localities represent such tiny places that they seem not to be recorded anywhere. Place names written in foreign languages over 100 years ago pose their own special problems because the translated name may represent a place that now has a different name. Any serious cataloguer will want to include both original and modern place names in their type locality citations. Deciphering place names used to require the cataloguer to own or have access to a stack of atlases and a shelf of gazetteers, but now most localities can be tracked down on the Internet. I prefer to find any given locality in several sources before confirming its modern name and location because online searches are so powerful that the same name may be found in different places with alternate spellings. One of the best sites is MSN Encarta® World Atlas that finds places under multiple spellings and shows the location on a zoomable map. Alternate locations are shown in a window below the map. Fig. 7 shows the result for "Peking", the old name for Beijing. Enter "Peking, China" and the search will be confined to China. I also like WorldWide Index at Tageo.com, where searches are conducted by country.

Figure 7. Result of search for "Peking" using online MSN Encarta® World Atlas.

References

Brauer, F. and Bergenstamm, J.E. von. 1889–1895. Die Zweiflügler des Kaiserlichen Museums zu Wien. IV–VII. Vorarbeiten zu einer Monographie der Muscaria schizometopa (exclusive Anthomyidae). Pars I–IV. Wien.

Chao, C.-m. and Chen, X.-l. 2007. A taxonomic study on the genus *Phebellia* R-D (Diptera: Tachinidae) from China. [In Chinese.] Acta Entomologica Sinica **50**: 933–940.

Chao, C.-m., Liang, E.-y., Shi, Y.-s. and Zhou, S.-x. 2001. Fauna Sinica. Insecta Vol. 23. Diptera. Tachinidae (1). Science Press, Beijing. ix + 305 pp. + 11 pls.

Chao, C.-m., Liang, E.-y., Shi, Y.-s., Zhou, S.-x., Sun, X.-k. and Chen, R.-j. 1998. Tachinidae. Pp. 1661–2206 + pls. 1–30. *In*: Xue, W.-q. and Chao, C.-m., chief eds., Flies of China. Volume 2. [In Chinese with English summary.] Liaoning Science and Technology Press, Shenyang. (1996), 17 pp. + 1366–2425 + 32 pls.

Crosskey, R.W. 1971. The type-material of Australasian, Oriental and Ethiopian Tachinidae (Diptera) described by Macquart and Bigot. Bulletin of the British Museum (Natural History). Entomology **25**: 251–305 + 1 pl.

Crosskey, R.W. 1973. A conspectus of the Tachinidae (Diptera) of Australia, including keys to the supraspecific taxa and taxonomic and host catalogues. Bulletin of the British Museum (Natural History). Entomology Supplement **21**. 221 pp.

Crosskey, R.W. 1976. A taxonomic conspectus of the Tachinidae (Diptera) of the Oriental Region. Bulletin of the British Museum (Natural History). Entomology Supplement **26**. 357 pp.

Evenhuis, N.L. 1997. Litteratura taxonomica dipterorum (1758–1930). Backhuys Publishers, Leiden. 871 pp. [2-volume set.]

Guimarães, J.H. 1971. Family Tachinidae (Larvaevoridae). A catalogue of the Diptera of the Americas south of the United States. São Paulo. Vol. **104**, 333 pp.

International Commission on Zoological Nomenclature. 1985. International Code of Zoological Nomenclature. Third edition adopted by the XX General Assembly of the International Union of Biological Sciences. International Trust for Zoological Nomenclature, London: xx + 338 pp.

International Commission on Zoological Nomenclature. 1999. International Code of Zoological Nomenclature. Fourth edition adopted by the International Union of Biological Sciences. International Trust for Zoological Nomenclature, London. xxix + 306 pp.

Liu, Y.-z., Chao, C.-m., Li, L.-f., Zhou, S.-x., Wang, H.-x. and Zhang, W.-j. 1998. Fauna of Tachinidae from Shanxi Province, China. [In Chinese.] Science Press, Beijing. x + 378 pp. + 11 pls.

O'Hara, J.E. 2007. World genera of the Tachinidae (Diptera) and their regional occurrence. Version 3.0. PDF document, 71 pp. [Published on the Internet at http://www.nadsdiptera.org/Tach/Genera/generahom.htm]

O'Hara, J.E. and Wood, D.M. 2004. Catalogue of the Tachinidae (Diptera) of America north of Mexico. Memoirs on Entomology, International **18**. iv + 410 pp.

Richter, V.A. Fam. Tachinidae – tachinids. Pp. 148–398. *In*: Sidorenko, V.S., ed., Key to the insects of Russian Far East. Volume VI. Diptera and Siphonaptera. Part 3. [In Russian.] Vladivostok, Dal'nauka. 659 pp.

Robineau-Desvoidy, J.B. 1830. Essai sur les Myodaires. Mémoires présentés par divers Savans à l'Académie Royale des Sciences de l'Institut de France. Science Mathématiques et Physiques, Ser. **2**, **2**: 1–813.

Robineau-Desvoidy, J.B. 1863. Histoire naturelle des Diptères des environs de Paris. Paris. 2 vols.

Townsend, C.H.T. 1938–1942. Manual of myiology in twelve parts. Parts I–XII. São Paulo.

Yellow pan traps for collecting Tachinidae – further results (by H.-P. Tschorsnig)

Some particulars on the use of yellow pan traps (YPT) were already given by Tschorsnig (2002). The present short contribution gives further results and thoughts on this useful collection method for Tachinidae.

Table 1 lists results of systematic yellow pan trap collections made by me at a Spanish locality (Prov. Salamanca, Villar de Ciervo, Las Coronas). The collection site on which the traps have been placed is about a hectare large. It is situated on a large gentle hill (720 m altitude) which is covered by patchy wood of holm oak (*Quercus ilex rotundifolia*) with shrubs of broom (*Cytisus multiflorus*) and grassy areas. Between 15 and 27 yellow pan traps were placed on the ground between the trees or shrubs over a period of 4–10 days per each excursion from 1999 on. The traps were emptied every day (or – in rare cases – every two or three days).

Table 1. Tachinidae collected in Western Spain (Villar de Ciervo, Las Coronas) in yellow pan traps.

Date	Exposure period (days)	Average number of specimens per YPT per day of exposure		Number of species collected in YPTs		Estimated temperature in relation to the average seasonal condition
		First half of exposure period	Second half of exposure period	First half of exposure period	Second half of exposure period	
May 1999	4	0.2	0.1	5	2	very warm
Febr. 2001	4	5.1	0.7	7	5	cold
April 2001	10	4.4	2.5	15	16	“normal”
March 2002	4	15.6	6.8	20	14	cold
April 2002	4	18.0	12.7	20	17	cold
June 2003	10	0.7	0.3	15	11	warm
May 2005	6	2.0	1.0	19	15	“normal”
May 2007	6	3.3	1.5	29	23	cool

Table 2. Number of tachinid specimens collected in combined YPT-MTs on La Palma (Canary Isles).

Altitude	YPT (specimens)	MT (specimens)	Percentage of specimens in YPTs in relation to the total number of specimens
750 m	63	253	20 %
1068 m	70	208	25 %
1277[–1297] m	63	76	45 %
1377 m	149	151	50 %
2250 m	334	111	75 %

Table 1 shows considerable differences in the average number of collected specimens (0.1–18.0 specimens per YPT per day of exposure). Those differences are due to the species composition and the population density of the single species, which vary seasonally and from year to year, and they are of course also influenced by the weather conditions during the exposure. It is impossible to isolate the different ecological factors in a field investigation, but there are two relations which I feel can nevertheless be inferred from Table 1:

1) It is obvious that distinctly fewer specimens are collected in the second half of the exposure period than in the first half; this is not quite as evident with the number of species, but still remarkable. An explanation is perhaps not so difficult: “stationary” specimens are collected first and are not so quickly replaced by subsequent migrating specimens, so after a certain time there are less specimens available which can enter a trap (in most cases this effect was already noticeable after one or two days of exposure).

2) It seems that YPTs work better in cold or cloudy weather than on warm sunny days. My best results were in March/April when the weather was so cold that the water of the dishes was frozen on the surface in the early morning hours. A trial with YPTs on two days on “Las Coronas” during warm and sunny weather in August 2000 was very disappointing, and I know many other frustrating results from YPTs which were tried by me at other European places during warm and dry weather.

The following, different case shows how YPTs work in direct comparison with Malaise traps (MTs). Insects were systematically collected in five combined YPT-MTs on La Palma (Canary Islands) during 1999–2001. The corresponding YPT was placed directly under the middle wall of each MT. The material was collected by T. Domingo-Quero, and the tachinids from this investigation were recently identified by H.-P. Tschorsnig (see Tschorsnig et al. 2007). Table 2 gives the number of specimens in relation to the altitude of the localities, as well as the percentage YPT-specimens/total number of specimens. It is obvious at first glance the YPTs were clearly more effective than Malaise traps in high altitudes. A possible explanation would be that YPTs are more efficient in cold weather (which prevails in high altitudes).

So my advice for optimizing the yellow pan trap method for collecting Tachinidae is as follows:

1) When collecting at a given locality it would be more effective to choose a different place for the traps after an exposure of 1–3 days. This should yield better results than a long-time investigation with the traps in exactly the same place.

2) Yellow pan traps should preferably be operated during cold or cloudy weather, spring is better than summer (because there are more cold days), and their placement on colder mountains is possibly more effective than on warm plains.

References

Tschorsnig, H.-P. 2002. How effective are yellow pan traps for collecting Tachinidae? Tachinid Times **15**: 4–6.

Tschorsnig, H.-P., Domingo-Quero, T. and Alonso-Zarazaga, M.A. 2007. Tachinidae (Diptera) from the Caldera de Taburiente National Park, La Palma (Canary Islands). Graellsia **63**: 43–51.

Lixadmontia franki **Wood and Cave released to control the Mexican bromeliad weevil (by R.D. Cave)**

The Mexican bromeliad weevil, *Metamasius callizona* (Chevrolat), has been destroying 12 of south Florida's 16 native species of bromeliads since 1989. In 1993, a tachinid fly parasitizing the bromeliad-eating weevil *Metamasius quadrilineatus* Champion was found in the montane forests of Honduras. It turned out that the fly was a new species, and was recently described and named *Lixadmontia franki* Wood & Cave in honor of University of Florida Professor J. Howard Frank. Early observations in the laboratory indicated that the fly readily parasitizes the larvae of the Mexican bromeliad weevil, thus becoming the focal point of a biological control program directed against the "evil weevil".

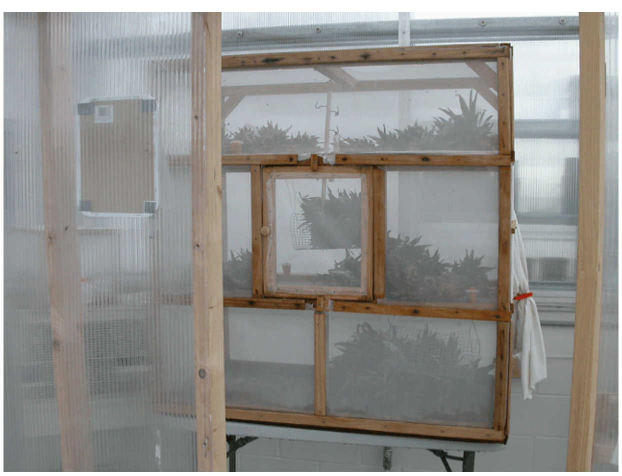


Figure 1. Cage for exposing weevil-infested pineapple crowns to *Lixadmontia franki* in the laboratory. Photo by R. Cave.

Female *L. franki* are ready to find hosts approximately eight days after mating. It is unclear yet whether the female fly deposits mature eggs or neonate larvae deep among the bases of the leaves of a weevil-infested plant. Whichever the case, the young maggot burrows through the macerated plant tissue and frass to contact and penetrate the host to live as an endoparasitoid. Preferred hosts are attacked while in the 3rd to 5th instar. Parasitized weevils continue to feed and often advance to the next instar; they may even construct a pupal chamber made of macerated plant tissue and saliva. However, parasitized weevils always die before pupating. Usually, only one mature *L. franki* larva emerges from a parasitized host, but it is not uncommon to see two or three larvae come out of a cadaver. On occasion, as many as 5–9 maggots may emerge from a single host; in these cases, the resulting adult flies are much smaller than their solitary counterparts. One to two days after emerging from its host, the fly larva will pupate. Total time from penetration of a host to pupation is 2–3 weeks at 21°C; pupal incubation time is 3 weeks.

The technology for producing large numbers of *L. franki* in the laboratory was initially developed at the Escuela Agrícola Panamericana in Honduras. Larvae of *M. quadrilineatus* were placed inside pieces of bromeliad stem set in plastic cups. Weevil feeding on the plant material was necessary for successful parasitism. Most final instars of the parasitoid exited their host 13–16 days after initial exposure of hosts to the parental flies. This technology was subsequently refined and expanded in the quarantine facility at the University of Florida's Hayslip Biological Control Research and Containment Laboratory at the Indian River Research and Education Center in Ft. Pierce. Pineapple crowns obtained from local grocery stores are exposed to *M. callizona* females for 1 week. The pineapple crowns are held at 25°C for 3 weeks, at which time the weevil larvae inside the crowns should be in the 3rd instar. Twelve infested crowns are placed five days per week in a large parasitization cage (Fig. 1) containing 150–300 adult *L. franki* of mixed ages. Because the parasitization cage is located in a greenhouse with temperature (18–23°C) and relative humidity (>80%) controlled, natural sunlight enters the cage. We have noticed flies mating more frequently on sunny days than cloudy days and more often during the afternoon hours. The pineapple crowns remain in the cage for 10 days. Afterwards, the crowns are placed in a smaller cage to monitor the emergence of any adult flies that were hiding in the crowns at the time of their removal from the parasitization cage. Weevil larvae are collected from the pineapple crowns, placed in plastic cups and fed fresh pineapple leaves twice weekly. Puparia of maggots that emerge from hosts are held in cups with moistened paper towel and held in a rearing room at 21°C and with >70% RH. As adult flies emerge, they are sexed and either placed in the breeding colony or accumulated in a small portable cage to await release in the field.

From June 2007 to January 2008, 13 field releases of *L. franki* adults were made at six sites throughout south Florida. A total of 313 flies were released on June 29, September 21 and December 14 at Lake Rogers State Park (Hillsborough Co.) (Fig. 2). At Loxahatchee National Wildlife Refuge (Palm Beach Co.), 333 flies were released on July 20, October 12 and January 11. A total of 350 flies were released at the Enchanted Forest (Brevard Co.) on August 3, October 26 and January 18. At the Big Cypress National Preserve (Collier Co.), 209 flies were released on August 29 and November 21 (Fig. 3). Additional releases include 105 flies on October 5 at Highlands Hammock State Park (Highlands Co.) and 51 flies at Savannas Preserve State Park-Miller Tract (St. Lucie Co.) on November 16. The number of flies released on a date varied from 51–164 with an equal sex ratio or slight female bias. Total number of flies released during the period was 1,359. The tree vegetation at these sites varies from mixed pine-oak to oak-palm to cypress. Flies taken to the release sites were 5–10 days old as adults. Releases always took place at about 9:00 am in an area where a large weevil population was known to exist.

Figure 2. Ron Cave and Howard Frank releasing *Lixadmontia franki* at Lake Rogers State Park, 29 June 2007. Photo by Celia Branch.

Evaluation of establishment of *L. franki* is conducted by University of Florida graduate student Teresa Cooper and begins 6 weeks following a release. The procedure uses sentinel pineapple crowns infested with 3rd instar weevils. These are placed at the release site in 0.6 x 0.6 x 0.1 m trays. Six crowns are placed in each tray and six trays are placed in the site each evaluation period. The trays are suspended in trees with at least five medium to large bromeliads and marked off to each cardinal direction from the center of where the fly was released. Two trays are suspended near the central point of the release site.

The sentinel pineapple crowns are collected after they have been in the field for 2 weeks, and then taken to the laboratory where they are held in cages for emergence of adult flies. Once the sentinel plants reach an advanced stage of decomposition, they are dissected and all weevil larvae are removed and placed in plastic cups with food. The larvae are monitored daily for pupation (= unparasitized) or emergence of fly larvae (= parasitized). Establishment is determined by the presence of the fly's F_2 generation in the exposed weevil hosts in the sentinel pineapple crowns.

Figure 3. Mike Burton (behind cage) and Teresa Cooper releasing *Lixadmontia franki* in a cypress swamp in the Big Cypress National Preserve, 29 August 2007. Photo by Heidi Rhoades.

So far, *L. franki* has only been recovered at one site in one evaluation period, at the Lake Rogers Park following the first release on June 29. Two adult females emerged from the sentinel pineapple crowns and host cadavers were found in the decomposed plant material. Since *L. franki* originates from cool, shady, moist, high elevation tropical forests, there has been concern about the fly's ability to adapt to a hot, sea level, subtropical environment. This recovery confirms that released *L. franki* females are able to find hosts in native bromeliads during the humid but hot Florida summer, their adult progeny are able to find mates in subtropical oak hammocks, and the F_1 females are able to locate infested pineapple crowns to produce a second generation. As additional releases continue, establishment may be aided by the cooler but drier winter and spring months.

The ultimate goal of the project is to reduce the populations of the Mexican bromeliad weevil such that it is no longer a significant ecological pest of an important part of Florida's natural heritage, its native bromeliads. Once this goal has been achieved, a program for repopulating devastated areas with small plants grown from seed specifically collected from a number of hard-hit areas can begin.

Tachinid collecting in southwest New Mexico and Arizona during the 2007 NADS field meeting (by J.O. Stireman III)

Introduction

The 2007 field meeting of the North American Dipterists Society (NADS) was held August 13–16 in southwestern New Mexico, centered in Silver City (at Western New Mexico University), and the surrounding Gila National Forest. This was the first NADS meeting that I have been able to attend, and I think I can speak for all in saying it was enjoyable, productive, and interesting; an overall success. A more detailed account and evaluation of this meeting is available in the 2007 *Fly Times* article (O'Hara 2007).

Although the function of the NADS field meeting is partly to encourage interaction and scientific discussion and to serve as a forum for presentation of research and updates of dipterological activities, collecting remains an integral part of the meeting. The focus of my collecting was Tachinidae, the family on which I focused ecological and systematic studies while a graduate student in Arizona. This family appears to be particularly diverse in the southwestern region of North America, perhaps due to incursion of more tropical species and genera into this region and to the diversity of habitat types. Jim O'Hara, organizer of the NADS meeting and fellow tachinid admirer, has focused considerable attention on this region, making many trips over the years and describing many new taxa (e.g., O'Hara 1984, 1993, 2002). Here I provide an overview of the species that I collected during the NADS meeting in the area of southwestern New Mexico and southeastern Arizona.

Methods

All tachinids were hand collected with an insect net from foliage, rocks, or the air, except a few species that were collected in association with carrion baits that Terry Whitworth was kind enough to separate from his calliphorids and pass on to me (see Signal Peak collection and August 13, Cherry Creek collection in Table 1). Most collecting occurred between 9 am and 3 pm, however, the Molino basin collections were between 5 and 7 pm, and the Box Canyon specimens were collected at a UV light between 9 and 11 pm. I spent only one half day on the productive Gomez peak hilltop, and this occurred after Jim O'Hara and Monty Wood had each been there at least once in preceding days collecting large numbers of tachinids. It is possible that they may have depleted the numbers of some of the rarer species on that particular hilltop.

Identifications were made with generic and species keys and descriptions from the literature (see O'Hara and Wood 2004) with particular reliance on Monty Wood's (1987) key to Nearctic genera. Specimens were also compared to previously identified material in my collection. These identifications should be considered preliminary as I have yet to verify most of them with reference to reliably identified specimens in a major collection. For many groups, I was unable to make a specific identification, or I felt uncertain about the identification made (these are indicated by question marks). Some specimens appeared to be quite similar to described taxa, but differed in one or more obvious characters. These may represent intraspecific variants (as I usually had limited specimens to examine), or distinct species. They are indicated by ("nr." species epithet).

Results and Discussion

In spite of the relatively limited collecting effort, a total of 139 individual tachinids were collected over a period of five days, representing an estimated 62 species (many of them unidentified morphospecies) (Table 1). I was only able to focus on collecting (i.e., spend at least 4 hours) on two of the five days, and these were spent at Gomez Peak (NM) and Cherry Creek (NM), (about 6 hours collecting each). Thus, these sites represented the bulk of the diversity and number of tachinids collected (44% and 28% of the total tachinids collected, respectively). Given the limited time I spent collecting and the limited number of sites I visited, along with my observations of tachinids collected by other dipterists at the meeting, this appears to be a small fraction of the local tachinid diversity in the region.

A few notable tachinid taxa included: *Euchaetogyne roederi* (Williston) (a large *Belvosia*-like dexiine tachinid that was common at the Cherry Creek site, but that I have seen nowhere else; Fig. 1), *Pararchytas apache* Woodley (described from the area by Norm Woodley, a NADS participant), the *Dolichocodia* specimen (bearing a remarkable resemblance to a calliphorid; I am uncertain whether the specimen belongs to this genus), and the attractive *Uramya* species (in which the males bear tail-like extensions of tergite 5).

Overall, there was a strong male bias in the collected specimens (72% male) as generally tends to be the case with hand collecting. As one might expect, this male bias was particularly strong for the hilltop site (Gomez Peak; 95% male), but it was also present at the creek-side site (Cherry Creek; 61% male). Interestingly, some small collections that were made in the afternoon (Molino Basin) and at a UV light (Box Canyon) were dominated by females (33% and 25% male, respectively), though the sample sizes were quite small.

Table 1. Species of Tachinidae collected during August 12–17, 2007 in southern New Mexico and Arizona. Collections are broken down by site and sex (**m**ale or **f**emale).

Species	m	f	tot	Species	m	f	tot
Signal Peak 13-viii-2007 (carrion) NM				**Cherry Creek Campground 14-viii-07 NM**			
Pararchytas apache Woodley	1	-	1	*Admontia* sp. ?	1	-	1
Protodejeania willistoni Curran	-	2	2	*Aplomya theclarum* (Scudder)	1	-	1
Gomez Peak 15-viii-2007 NM				*Archytas* nr. *aterrimus/lateralis*	-	1	1
Blondelia sp. 3	1	2	3	*Blondelia* sp. 1	6	5	11
Chetogena parvipalpis? (Wulp)	1	-	1	*Blondelia* sp. 2 (?)	1	-	1
Chrysoexorista lineatea (Wulp)	1	-	1	*Carcelia lagoae* (Tnsd.)	1	-	1
Deopalpus torosus (Rnh.)	2	1	3	*Chetogena tachinomoides* (Tnsd.)	2	-	2
Dolichocodia bivittata ? (Coquillett)	1	-	1	*Eribella polita* (Coquillett)	-	1	1
Drino sp. 1	1	-	1	*Euchaetogyne roederi* (Williston)	3	-	3
Frontiniella festinans ? (A. & W.)	1	-	1	*Frontiniella parancilla* (Tnsd.)	-	1	1
Gaediopsis setosa ? Coquillett	3	-	3	*Gnadochaeta* nr. *nigrifrons* (Tnsd.)	-	1	1
Hyphantrophaga collina (Rnh.)	-	1	1	*Leschenaultia halisidotae* Brooks	1	-	1
Leschenaultia adusta (Loew)	4	-	4	*Pararchytas apache* Woodley	-	2	2
Leschenaultia grossa Brooks	1	-	1	*Peleteria malleola* (Bigot)	1	-	1
Lespesia nr. *halisidotae* (A. & W.)	1	-	1	*Peleteria malleola* grp. (Bigot)	1	-	1
Macromya crocata Rnh.	3	-	3	*Protodejeania willistoni* Curran	-	1	1
Microphthalma disjuncta (Wiedemann)	1	-	1	*Vibrissina mexicana* (Aldrich)	1	-	1
Paradejeania rutilioides (Jaennicke)	1	-	1	*Vibrissina obscura* ? (Aldrich)	4	1	5
Patelloa specularis (A. & W.)	5	-	5	*Voria ruralis* (Fallén)	-	2	2
Patelloa nr. *specularis* (A. & W.)	2	-	2	**Molino basin, Santa Catalina Mts. 17-viii-07 AZ**			
Peleteria bryanti Curran	2	-	2	*Drino* sp. 2	1	-	1
Peleteria malleola (Bigot)	4	-	4	*Eucelatoria armigera* gp. (Coquillett)	-	1	1
Peleteria setosa Curran	1	-	1	*Euexorista* nr. *rebaptizata* Gosseries	-	1	1
Ptilodexia nr. *californica* Wilder	1	-	1	*Leskia occidentalis* ? (Coquillett)	1	-	1
Ptilodexia californica/obscura	2	-	2	*Lespesia cuculliae* (Webber)	-	1	1
Ptilodexia conjuncta (Wulp)	7	-	7	*Lespesia* nr. *westonia* ? (Webber)	-	1	1
Ptilodexia nr. *conjuncta* (Wulp)	4	-	4	**Box Canyon, Santa Rita Mts. 12-viii-07 AZ (UV-light)**			
Spallanzania sp.	5	-	5	*Austrophorocera* nr. *einaris* (Smith)	1	-	1
Uramya aldrichi/halisidotae ?	3	-	3	*Chaetoglossa picticornis* ? Tnsd.	-	1	1
				Eucelatoria (*eucelatoriopsis* grp.)	1	-	1
Cherry Creek Cmpgd. 13-viii-07 NM (carrion)				*Ormia* undescribed sp.	-	1	1
Hystricia nr. *abrupta* (Wiedemann)	1	-	1	*Zaira* sp.	-	3	3
Pararchytas apache Woodley	-	2	2	*Zizyphomyia crescentis* ? (Rnh.)	-	1	1
Peleteria malleola (Bigot)	2	-	2	**2 mi south of Cherry Creek Cmpgd 14-viii-07 NM**			
Protodejeania willistoni Curran	-	3	3	*Deopalpus torosus* (Rnh.)	1	-	1
				Peleteria malleola (Bigot)	1	-	1
Burro Mts. Powerline Cyn. 16-viii-07 NM				**Hwy 80 Hills N of Portal 13-viii-07 AZ**			
Drino sp. 2	1	-	1	*Chetogena tachinomoides* (Tnsd.)	1	-	1
Gaediopsis sp. ?	1	-	1	*Eucelatoria armigera* gp. (Coquillett)	-	1	1
Leschenaultia grossa Brooks	-	1	1	*Eucelatoria* sp. 1?	1	-	1
Ptilodexia conjuncta (Wulp)	1		1	*Lespesia stonei* Sabrosky	1	-	1
Ptilodexia nr. *conjuncta* (Wulp)	1		1	*Orasturmia vallicola* Rnh.	-	1	1
				Uramya indita (Walker)	2	-	2

Interestingly, there was relatively low overlap between the taxa collected hilltopping on Gomez Peak and those collected by sugaring and hand collecting at Cherry Creek, despite the relatively close proximity of these sites (ca. 10 km apart). In fact, only a single species was shared between the two sites (*Peleteria malleola*), resulting in a Jaccard similarity index of 2.3%. The Gomez peak site was overrepresented by hilltopping Dexiini (e.g., *Ptilodexia*), Tachinini (e.g., *Peleteria*) and Goniini (e.g., *Patelloa, Gaediopsis*), whereas at the creek side site Blondeliini were more abundant. It is unclear whether the large Tachininae found at carrion baits indicate a special attraction of those taxa to carrion, as it may be that smaller tachinids were relatively ignored by the collector who was focusing on Calliphoridae. More comprehensive sampling of these habitats would almost certainly increase this overlap, but it is likely that additional habitats not sampled would also have distinct communities with relatively little overlap. These results also reaffirm the importance of using multiple collecting strategies when seeking to maximize species diversity. It would be interesting to examine species overlap between these collections I made and those of other collectors who attended the NADS field meeting, given that we collected at many of the same sites. I suspect that there would be considerable variation in the taxa collected, attesting to the rich and varied tachinid fauna of the region.

Figure 1. *Euchaetogyne roederi* (Williston) from Cherry Creek, Gila National Forest, NM. (Photo by Steve Marshall.)

Acknowledgements

I would like to thank Jim O'Hara for doing a great job organizing the NADS field meeting in New Mexico and my lab technician Hilary Devlin for helping to compile the species lists.

References

O'Hara, J.E. 1984. *Baeomyia* n.g. (Diptera: Tachinidae): descriptions and notes about phylogenetic and zoogeographic relationships. Canadian Journal of Zoology **62**: 1387–1396.

O'Hara, J.E. 1993. Revision of the species of *Frontiniella* Townsend (Diptera: Tachinidae). Canadian Entomologist **125**: 11– 45.

O'Hara, J.E. 2002. Revision of the Polideini (Tachinidae) of America north of Mexico. Studia dipterologica. Supplement **10**. 170 pp.

O'Hara, J.E. 2007. Field meeting of the North American Dipterists Society. Silver City, New Mexico, 13–16 August 2007. Fly Times **39**: 3–5.

O'Hara, J.E. and Wood, D.M. 2004. Catalogue of the Tachinidae (Diptera) of America north of Mexico. Memoirs on Entomology, International **18**. 410 pp.

Wood, D. M. 1987. Chapter 110. Tachinidae. Pp. 1193–1269. *In*: McAlpine, J.F., Peterson, B.V., Shewell, G.E., Teskey, H.J., Vockeroth, J.R. and Wood, D.M., eds., Manual of Nearctic Diptera. Volume 2. Agriculture Canada Monograph **28**. iv + 675–1332 pp.

Some interesting Tachinidae from Israel (by C. Bystrowski and T. Zeegers)

The tachinid fauna of Israel is relatively well known due to the many contributions by J. Kugler. However, during the last twenty years little attention has been paid to the Israelian tachinid fauna.

In 2006, the first author together with Krzysztof Szpila from Nicolaus Copernicus University in Toruń (Poland) (Fig. 1) collected flies during a 20-day expedition to Israel (8–28 May 2006).

The Golan Heights region, numerous localities in the Negev Desert and some places near Eliat were visited. The most interesting place in Negev Desert seems to be En Avedat National Park (Fig. 2) near Sede Boqer, where we spent more than two weeks.

In addition to our collecting, the first author studied the Tachinidae collection in the National Collection of Insects at Tel Aviv University (TAU). During the two days of investigation two new species for the fauna of Israel were found: *Graphogaster buccata* and *Zeuxia tricolor* (see below).

In this contribution, we mention some of the more interesting species found or recorded as new for the fauna of Israel.

Figure 1. Cezary Bystrowski (left) and Krzysztof Szpila, southern Dead Sea area (16.v.2006). (Photo by K. Szpila.)

Metacemyia aartseni Zeegers, 2007

2♀♀: Israel, En Avedat, near Sede Boqer, Negev, st. 1, 24.v.2006, leg C. Bystrowski.

Only very recently described by Zeegers (2007) from Yemen. First record for Israel. It now seems that *M.*

aartseni might occur much wider on the Arabian Peninsula. The species is quite similar to *M. calloti* (Séguy, 1936). In direct comparison, the head profile is different (Fig. 3); in *M. aartseni* the height to width ratio in lateral view is even higher than in *M. calloti*. Other structural differences can be found in the key by Zeegers (2007).

Figure 2. Vadi Nahal Zin in En Avedat National Park near Sede Boqer. (Photo by C. Bystrowski.)

Cestonia grisella Mesnil, 1963
1♀: Israel, En Avedat, near Sede Boqer, Negev, 17.v.2006, leg C. Bystrowski.
2♂♂: Israel, En Avedat, near Sede Boqer, Negev, 24.v. 2006, leg C. Bystrowski. Originally described from Tadzikistan. First record for Israel, as far as we are aware.

Amphicestonia dispar Villeneuve, 1939
1♂: Israel, "Granica Egipska" near Los Cistern, Negev, "most" [= bridge], 12.v.2006, leg C. Bystrowski.
1♀: Israel, Negev, En Avedat National Park, 15–18.v.2006, leg K. Szpila.
Already mentioned for Israel by Herting (1984).

Figure 3. Heads of females of *Metacemyia* in profile. Left: *M. aartseni* from Yemen. Right: *M. calloti* from Yemen. (Photo by T. Zeegers.)

Steleoneura czernyi Stein, 1924
9♂♂: Israel, Hazeva, Negev, "punkt widokowy" [= scenic point], 14.v.2006, leg C. Bystrowski.
Specimens were collected on the typical "hilltopping" place – the stones and walls of a scenic point near Hazewa. Already mentioned for Israel by Herting (1984).

Opesia grandis (Egger, 1860)
1♂: Israel, Ramot Naftali "ule" [= beehives], 10.v.2006, leg C. Bystrowski.

Cestonioptera mesnili Villeneuve, 1939
1♀: Israel, Vadi Nizzana, Negev, 18.v.2006, leg. C. Bystrowski.
First record for Israel. Species known from North Africa (Tunisia).

Zeuxia tricolor Portshinsky, 1881
1♀: Israel, Qnaitva, 19.v.1983, leg. I. Yarom (col. TAU).
First record for Israel. Species known from Europe: Bulgaria; Asia: Turkey, Armenia.

Graphogaster buccata Herting, 1971
1♀: Israel, Keshet, 18.v.1983, leg A. Freidberg (col. TAU).
First record for Israel. Species known from Europe: Finland, France, Germany, Switzerland, Italy and Greece.

Acknowledgements

The first author would like to express special thanks to Dr. Amnon Freidberg (Curator of the National Collection of Insects, Tel Aviv University) for all of his help during the visit and study of the Tachinidae collection and to Prof. Yoram Ayal, Mitrani Department for Desert Ecology, Ben-Gurion University of the Negev, for access to excellent facilities and for providing a base for field research.

Expeditions was supported by Grant no. 272-05-0431 from the Danish Natural Science Research Council to Thomas Pape, and the Forest Research Institute in Sękocin Stary (Poland).

References

Herting, B. 1984. Catalogue of Palearctic Tachinidae (Diptera). Stuttgarter Beiträge zur Naturkunde Serie A (Biologie) **369**: 1–228.

Zeegers, T. 2007. A first account of the Tachinidae (Insecta: Diptera) of Yemen. Fauna of Arabia **23**: 369–419.

Internet as a source of tachinid faunistics (by T. Zeegers*)

*With the assistance of R. Andrade (Portugal), L. Bouwmans (The Netherlands) and A. Wet (Israel).

The Internet is now well established as a relevant source of scientific information. Recently, the Internet has also become a valuable source of original data. This is mainly due to the generally good quality pictures made possible by the latest generation of digital cameras.

Dipterists and even non-dipterists post these pictures at special websites in order to get them identified by specialists.

As an example, I discuss some cases of tachinid records from the website www.diptera.info, which is based in The Netherlands and therefore is European oriented. Of course, common and conspicuous species such as *Eriothrix rufomaculata* (Degeer, 1776)*, Tachina fera* (Linnaeus, 1761) and *Epicampocera succincta* (Meigen, 1824) are often posted. It is remarkable how many Tachinidae actually can be identified with reasonable certainty, if one has thorough knowledge and experience with the given fauna. Of course, difficult groups like *Siphona* can hardly ever be identified from pictures.

Phasia aurigera (Egger, 1860) is an example of a species in which the identification is straightforward, even from pictures. In 2006, a large influx of this conspicuous species reached the eastern part of The Netherlands. It was found by several dipterists. However, the size of this influx became only apparent by the many records posted on www.diptera.info. To put it bluntly, it seemed that every entomologist with a camera photographed this species in September in the given area. The number was remarkable, since the first record of *Phasia aurigera* from The Netherlands dates back only as far as 2005. Meanwhile, in 2007 this species reached Denmark for the first time. Again, it was posted at www.diptera.info. This rapid expansion resembles the expansion by *Phasia barbifrons* (Grischner, 1887) in the early 1990s. If the same pattern is followed, then *Phasia aurigera* should reach Britain within five years. I bet the first record will be on the Internet.

Figure 1. Abdomen of the male *Campylochaeta ?inepta* from Portugal, showing distinct marginal setae on syntergite 1+2.

Picconia incurva (Zetterstedt, 1844) was reared and posted on the Internet by L. Bouwmans, and first recognized as this species by H.-P. Tschorsnig. It was the third record for The Netherlands and the second reared case of the species in that country.

Fischeria bicolor Robineau-Desvoidy, 1830 was reared twice by Assaf Wet in Israel. The host is still not recognized, but is thought to belong either to Pyralidae or Tortricidae feeding on *Chrozophora obliqua*. Hopefully, Assaf will succeed in rearing the host this year.

Rui Andrade reared a *Campylocheta* species from *Pseudoips prasinana* (Lepidoptera: Nolidae) in Portugal. In this case, a reliable identification is not possible because many new species of *Campylocheta* have been described in recent years. I had the opportunity to study this specimen. In nearly all respects, it resembles *C. inepta* (Meigen, 1824). However, it shows a feature never seen in *C. inepta* or any other *Campylocheta* for that matter: abdominal syntergite 1+2 bears rather strong marginal bristles (Fig. 1). The male genitalia also differ slightly from typical *C. inepta*. More material from the same locality is needed before reaching a final conclusion about the identity of this specimen.

Notes on the egg production of *Nemorilla pyste* (Walker) and *Nilea erecta* (Coquillett) (by N.G. Wiman)

The proportion of the total lifetime complement of eggs that are mature upon emergence to the adult stage is an important foundation of parasitoid ecology. Parasitoid egg maturation strategies vary from proovigenic, where the lifetime egg complement is developed and present at emergence, to synovigenic, where eggs are matured from basal oocytes over the course of adult life (Flanders 1950). Very few parasitoids are truly proovigenic; most species can be classified along a gradient of synovigeny, from weakly synovigenic (near proovigenic), to highly synovigenic (Jervis et al. 2001). Parasitoid longevity, expected host encounter rate, egg resorption, and nutritional needs of parasitoids are related to the rate and timing of egg production (Ellers et al. 2000, Jervis et al. 2001). Egg production also has behavioral implications because it is an important determinant of egg load, which can affect parasitoid decisions such as when to superparasitize a host (e.g., Fletcher et al. 1994).

Nemorilla pyste and *Nilea erecta* have disparate egg maturation strategies. The differences provoke some interesting questions about their ecology, and ultimately, their role and value as biological control agents of oblique-banded (*Choristoneura rosaceana*) and *Pandemis* (*Pandemis pyrusana*) leafrollers (Lepidoptera: Tortricidae) in Pacific Northwest orchards.

Nemorilla pyste is a winthemiine, and the dehiscent eggs are large (~0.7mm) relative to female flies (4.0-7.5mm, O'Hara 2005). The lack of uterine incubation in this species necessitates the allocation of substantial material into the chorion so that the eggs are durable enough to prevail through the external incubation period on the host. The size and hardiness of the eggs suggest that eggs represent substantial reproductive investment, and this may be the reason that female *N. pyste* are apparently capable of maturing only 4–8 eggs in each ovary at a time (Fig. 1). Virgins apparently have only 1 or 2 mature eggs per ovary at emergence. Average lifetime fecundity of *N. pyste* in the lab is 104 eggs per female, so this species is highly synovigenic. These results should be regarded as preliminary, and thus far, my efforts to count the basal oocytes and ovarioles have been unsuccessful.

Figure 1. Ovipositor and ovaries (arrows) of a freshly emerged *N. pyste* female stained with acid fuchsin.

By contrast, in *Nilea erecta*, an eryciine, the eggs are small (~0.2mm) relative to females (4.0-6.5mm, O'Hara 2005). The cylindrical membranous eggs are fully incubated in the uterus and are distributed onto foliage where they hatch in a short time. Each ovary of this species contains hundreds of eggs in various stages of development (Fig. 2). The developmental stages of the eggs are clearly visible along each ovariole, with the larger, more developed eggs closer to the oviduct at the base of the ovary. Clearly, *Nilea erecta* is much less synovigenic than *N. pyste*. However, lifetime fecundity has not yet been determined for this species because of the difficulties involved. The act of oviposition is rapid and therefore easy to miss. Parasitism is not a good indicator of fecundity because maggots are responsible for host penetration, and they are not always successful.

These ovigenic differences between *N. pyste* and *N. erecta* suggest that these flies are quite different ecologically and practically from an applied perspective. Based on the analysis of Jervis et al. (2001), one might predict from the degree of synovigeny that *N. pyste* is long-lived, a frequent feeder, and is probably not able to respond to increases in host density since egg production is constrained. *N. erecta* however, is probably relatively short-lived, a less frequent feeder, and may be capable of responding to increases in host density by ovipositing at a greater rate. I will be testing these predictions in the laboratory.

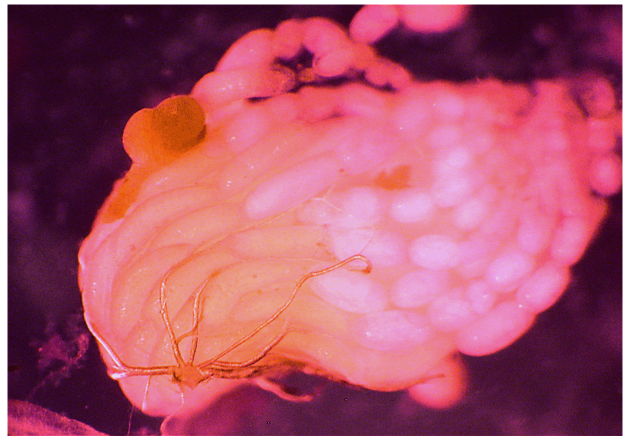


Figure 2. A single ovary of a freshly emerged *Nilea erecta* female stained with acid fuchsin.

References

Ellers, J., Sevenster, J. and Driessen, G. 2000. Egg load evolution in parasitoids. American Naturalist **156**: 650–665.

Flanders, S., 1950. Regulation of ovulation and egg disposal in the parasitic Hymenoptera. Canadian Entomologist **82**: 134–140.

Fletcher, J., Hughes, J., and Harvey, I. 1994. Life expectancy and egg load affect oviposition decisions of a solitary parasitoid. Proceedings of the Royal Society of London (B) **258**: 163–167.

Jervis, M., Heimpel, G., Ferns, P., Harvey, J. and Kidd, N. 2001. Life-history strategies in parasitoid wasps: a comparative analysis of 'ovigeny'. Journal of Animal Ecology **70**: 442–458.

O'Hara, J. 2005. A review of the tachinid parasitoids (Diptera: Tachinidae) of Nearctic *Choristoneura* species (Lepidoptera: Tortricidae), with keys to adults and puparia. Zootaxa **938**: 1–46.

ANNOUNCEMENTS

Request for specimens – Theo Zeegers

I have finished my study on the Tachinid of Yemen. Now, my interest have moved to the north of the Arabian Peninsula, with my source, to the United Arab Emirates. Any material from Arabia is highly appreciated.

TACHINID BIBLIOGRAPHY

Included here are references on the Tachinidae that have been found during the past year and have not appeared in past issues of this newsletter. This list has been generated from an EndNote® 'library' and is based on online searches of literature databases, perusal of journals, and reprints or citations sent to me by colleagues. The complete bibliography, incorporating all the references published in past issues of **The Tachinid Times** and covering the period from 1980 to the present is available online at: http://www.nadsdiptera.org/Tach/Bib/biblio.htm. Articles from **The Tachinid Times** are now included in this tachinid bibliography. I would be grateful if omissions or errors could be brought to my attention.

Please note that citations in the online Tachinid Bibliography are updated when errors are found or new information becomes available, whereas citations in this newsletter are never changed. Therefore, the most reliable source for citations is the online Tachinid Bibliography.

I am grateful to Shannon Mahony for maintaining our EndNote® libraries of tachinid literature and for performing the online searches that contributed most of the titles given below.

Alcock, J. and Kemp, D.J. 2006. The hilltopping mating system of *Leschenaultia adusta* (Loew) (Diptera: Tachinidae). Journal of Insect Behavior **19**: 645–656.

Aldrich, J.R., Khrimian, A. and Camp, M.J. 2007. Methyl 2,4,6-decatrienoates attract stink bugs and tachinid parasitoids. Journal of Chemical Ecology **33**: 801–815.

Araya, K., Hosoya, T. and Shima, H. 2007. Notes on the new habitat and parasite of the larvae of coconut rhinoceros beetle, *Oryctes rhinoceros* (Coleoptera, Scarabaeidae). Kogane **8**: 39–43.

Arthur, B.J. and Hoy, R.R. 2006. The ability of the parasitoid fly *Ormia ochracea* to distinguish sounds in the vertical plane. Journal of the Acoustical Society of America **120**: 1546–1549.

Aruna, A.S. and Manjunath, D. 2006. Suitability of age of *Exorista bombycis* (Louis) for the breeding of the parasitoid, *Nesolynx thymus* Girault (Hymenoptera: Eulophidae). Indian Journal of Sericulture **45**: 149–154.

Assefa, Y., Conlong, D.E. and Mitchell, A. 2006. First records of the stem borer complex (Lepidoptera: Noctuidae; Crambidae; Pyralidae) in commercial sugarcane estates of Ethiopia, their host plants and natural enemies. P. 55. *In*: Proceedings of the 80th Annual Congress of the South African Sugar Technologists' Association, 18–20 July 2006, Durban, South Africa.

Assefa, Y., Conlong, D.E. and Mitchell, A. 2006. Status of *Eldana saccharina* (Lepidoptera: Pyralidae), its host plants and natural enemies in Ethiopia. Bulletin of Entomological Research **96**: 497–504.

Azidah, A.A. 2007. Population study of *Spodoptera exigua* (Lepidoptera: Noctuidae) larva and its affecting factors in Sekinchan, Selangor. Pakistan Journal of Biological Sciences **10**: 2152–2158.

Baghdadi, A. 2006. Cold hardiness strategy of *Phasia subcoleopterata* L. Pakistan Journal of Biological Sciences **9**: 2187–2188.

Bagnoli, B. and Lucchi, A. 2006. Parasitoids of *Lobesia botrana* (Den. & Schiff.) in Tuscany. Bulletin OILB/SROP **29**: 139–142.

Bastos Dequech, S.T., Sausen, C.D., Martins, J.D., Lima, C.G., Egewarth, R., Zumba, R.C. and Carús Guedes, J.V. 2006. Ocorrência de parasitóides e patógenos em adultos de Chrysomelidae (Coleoptera) em estufa plástica, em Santa Maria, RS. Ciência Rural **36**: 1912–1915.

Bergström, C. 2007. *Loewia erecta* n. sp. (Diptera: Tachinidae) – a new parasitic fly from Fennoscandia and Poland. Stuttgarter Beiträge zur Naturkunde Serie A (Biologie) **708**: 1–16.

Bergström, C. 2007. A new species of *Nilea* Robineau-Desvoidy (Diptera, Tachinidae) with notes on the genus and a key to the North European species. Entomologisk Tidskrift **128**: 151–161.

Berndt, L.A., Berry, J.A. and Brockerhoff, E.G. 2006. Parasitoids and predators of the endemic defoliator *Pseudocoremia suavis* (Butler) (Lepidoptera: Geometridae: Ennominae). New Zealand Entomologist **29**: 89–98.

Bharpoda, T.M., Koshiya, D.J. and Korat, D.M. 2006. Survey of insect pests and their natural enemies on aonla (*Emblica officinalis* Geartn). Insect Environment **12**: 93–94.

Boppré, M. 2008. Adult Lepidoptera are not parasitised – or are they? Antenna **32**: 26–27.

Bretman, A. and Tregenza, T. 2007. Strong, silent types: the rapid, adaptive disappearance of a sexual signal. Trends in Ecology and Evolution **22**: 226–228.

Bystrowski, C. 2006. *Ramonda latifrons* (Zetterstedt, 1844) (Diptera: Tachinidae) – a tachinid fly new to Polish fauna. [In Polish.] Wiadomosci Entomologiczne **25**: 179–182.

Cabrera Walsh, G. 2004. Field and reproductive observations on *Celatoria bosqui* Blanchard (Diptera: Tachinidae), a South American parasitoid of *Diabrotica* spp. (Coleoptera: Chrysomelidae: Galerucinae. Biological Control **29**: 427–434.

Cerretti, P. and Barraclough, D.A. 2007. *Anomalostomyia namibica*, a new genus and species of Afrotropical Tachinidae (Diptera). Italian Journal of Zoology **74**: 101–106.

Cerretti, P. and Tschorsnig, H.-P. 2007. Two new species of *Siphona* Meigen (Diptera: Tachinidae) from Sardinia and Morocco. Stuttgarter Beiträge zur Naturkunde Serie A (Biologie) **704**: 1–7.

Chandrasekharan, K. and Nataraju, B. 2006. First report on the incidence of white muscardine disease caused by *Beauveria bassiana*, in uzi fly, *Exorista bombycis*, and its significance in sericulture. Indian Journal of Sericulture **45**: 70–72.

Chao, C.-m. and Chen, X.-l. 2007. A taxonomic study on the genus *Phebllia* Robineau-Desvoidy (Diptera: Tachinidae) from China. [In Chinese.] Acta Entomologica Sinica **50**: 933–940.

Chen, H.-l., Zhou, F.-c., Lin, Z.-x. and Chen, H.-m. 2006. A preliminary report of biology in *Dysodia magnifica*. [In Chinese.] Kunchong Zhishi **43**: 718–720.

Cugala, D., Schulthess, F., Ogol, C.P.O. and Omwega, C.O. 2006. Estimation de l'impact des ennemis naturels sur l'infestation par les foreurs et les pertes de rendement du maïs au Mozambique en utilisant des insecticides. Annales de la Société Entomologique de France **42**: 503–510.

d'Aguilar, J. 2007. J.W. Meigen, le père de la diptérologie. Insectes **144** (1): 21–22.

De Somviele, B., Lyytikäinen-Saarenmaa, P. and Niemelä, P. 2007. Stand edge effects on distribution and condition of Diprionid sawflies. Agricultural and Forest Entomology **9**: 17–30.

Demirel, N. and Cranshaw, W. 2006. Relative attraction of color traps and plant extracts to the false chinch bug *Nysius raphanus* and its parasitoid, *Phasia occidentis*, on *Brassica* crops in Colorado. Phytoparasitica **34**: 197–203.

Denton, J. 2006. *Lophosia fasciata* Meigen (Diptera, Tachinidae) at light in North Hampshire. Dipterists Digest (2nd series) **13**: 102.

Dindo, M.L., Marchetti, E. and Baronio, P. 2007. *In vitro* rearing of the parasitoid *Exorista larvarum* (Diptera: Tachinidae) from eggs laid out of host. Journal of Economic Entomology **100**: 26–30.

Dittrich, G., Mitchell, A. and Conlong, D. 2006. Diversité génétique de *Sturmiopsis parasitica* Curran (Diptera: Tachinidae). Annales de la Société Entomologique de France **42**: 325–329.

Elzinga, J.A., Zwakhals, K., Harvey, J.A. and Biere, A. 2007. The parasitoid complex associated with the herbivore *Hadena bicruris* (Lepidoptera: Noctuidae) on *Silene latifolia* (Caryophyllaceae) in the Netherlands. Journal of Natural History **41**: 101–123.

Evenhuis, N.L. 2004. [Book review.] O'Hara, J.E. & Wood, D.M. 2004. Catalogue of the Tachinidae (Diptera) of American north of Mexico. Memoirs on Entomology, International. Volume 18. Associated Publishers, Gainesville, Florida. iv + 410 pp. ISBN 1-56665-078-X. US $75.00. Studia dipterologica **10** (2003): 607–608.

Evenhuis, N.L. 2007. On a little-known work by A.H. Haliday containing nomenclatural notes on Diptera genus-group names (Insecta: Brachycera). Zootaxa **1407**: 65–66.

Feinstein, J., Mori, S. and Berkov, A. 2007. Saproflorivory: a diverse insect community in fallen flowers of Lecythidaceae in French Guiana. Biotropica **39**: 549–554.

Figueiredo, M. de L.C., Martins-Dias, A.M.P. and Cruz, I. 2006. Associação entre inimigos naturais e *Spodoptera frugiperda* (J.E. Smith, 1797) (Lepidoptera: Noctuidae) na cultura do milho. Revista Brasileira de Milho e Sorgo **5**: 340–350.

Figueiredo, M. de L.C., Martins-Dias, A.M.P. and Cruz, I. 2006. Efeito do insecticida chlorpyrifos e sua interação com inimigos naturais na suppressão de *Spodoptera frugiperda* (J.E. Smith, 1797) (Lepidoptera: Noctuidae) na cultura do milho. Revista Brasileira de Milho e Sorgo **5**: 325–339.

Fischer, M., Tormos, J., Pardo, X., Asís, J.D., Gayubo, S.F., López, E. and Selfa, J. 2006. Descriptions of adults, immature stages and venom apparatus of two new species of *Eudinostigma* Tobias (Hymenoptera, Braconidae), hyper-parasitoids of *Phryxe caudata* (Rondani) (Diptera, Tachinidae). Revue Suisse de Zoologie **113**: 829–839.

Fraval, A. 2007. Une tachinaire trop zélée. Insectes **144** (1): 18.

Gammelmo, Ø. and Sagvolden, B.A. 2007. The tachinid fly *Phasia hemiptera* (Fabricius, 1794) (Diptera, Tachinidae) in Norway. Norwegian Journal of Entomology **54**: 51–54.

Gariepy, T.D., Kuhlmann, U., Gillott, C. and Erlandson, M. 2007. Parasitoids, predators and PCR: the use of diagnostic molecular markers in biological control of arthropods. Journal of Applied Entomology **131**: 225–240.

Ge, Z.-p., Zhi, Y. and Zhang, C.-t. 2007. PCR amplification in 28S rRNA gene fragment of four tachinid flies (Diptera: Tachinidae). [In Chinese.] Pp. 65–67. *In*: Li, D.-m., Wu, C.-s., Wu, Y.-j. and Meng, X.-x., eds., Entomological Research Issues. Proceedings of the 8th Congress of the Entomological Society of China, 2007. China Agricultural Science and Technology Press, Beijing. 629 pp.

Gounou, S. and Schulthess, F. 2006. Effect of traditional rice/maize intercropping on population densities, crop damage and parasitism of stem-borers in the Ivory Coast. African Plant Protection **12**: 93–102.

Gratton, C. 2006. Interactions between a native silkmoth *Hemileuca* sp. and an invasive wetland plant, *Lythrum salicaria*. Annals of the Entomological Society of America **99**: 1182–1190.

Gray, D.A., Banuelos, C., Walker, S.E., Cade, W.H. and Zuk, M. 2007. Behavioural specialization among populations of the acoustically orienting parasitoid fly *Ormia ochracea* utilizing different cricket species as hosts. Animal Behaviour **73**: 99–104.

Grayson, A. 2006. Additions and corrections to the Yorkshire Diptera list (part 2). Naturalist (Sheffield) **131**: 83–93.

Hardwick, L.W. 2004. Additional records of *Lophosia fasciata* Meigen (Diptera: Tachinidae) from Cheshire. Journal of the Lancashire & Cheshire Entomological Society **128**: 30.

Harvey, M.C. 2006. *Catharosia pygmaea* (Fallen, 1815) (Diptera, Tachinidae) in Buckinghamshire. Dipterists Digest (2nd series) **13**: 122.

Hedrick, A.V. and Kortet, R. 2006. Hiding behaviour in two cricket populations that differ in predation pressure. Animal Behaviour **72**: 1111–1118.

Herre, E.A. 2006. Barcoding helps biodiversity fly. Proceedings of the National Academy of Sciences of the United States of America **103**: 3949–3950.

Hirai, N. and Ishii, M. 2007. A danaid butterfly, *Ideopsis similis*, overcomes parasitization by a tachinid fly, *Sturmia bella*. Entomological Science **10**: 35–43.

Howe, M.A. and Howe, E.A. 2006. Recent records of scarce tachinid flies (Diptera, Tachinidae) from England and Wales. Dipterists Digest (2nd series) **13**: 95–96.

Hua, L.-z. 2006. List of Chinese insects. Vol. 4. Sun Yat-sen University Press, Guangzhou. 540 pp.

Hubenov, Z. 2007. Tachinidae (Insecta: Diptera) from the Western Rhodopes (Bulgaria). Pp. 689–697. *In*: Beron, P., ed., Biodiversity of Bulgaria. 3. Biodiversity of Western Rhodopes (Bulgaria and Greece) I. Pensoft & National Museum of Natural History, Sofia. (2006), 974 pp.

Ichiki, R., Nakahara, Y., Kainoh, Y. and Nakamura, S. 2007. Temperature-sensitive eye colour mutation in the parasitoid fly *Exorista japonica* Townsend (Dipt.: Tachinidae). Journal of Applied Entomology **131**: 289–292.

Ichiki, R. and Nakamura, S. 2007. Oviposition and immature development of the parasitoid fly *Compsilura concinnata* (Meigen) (Diptera: Tachinidae). Japan Agricultural Research Quarterly **41**: 227–232.

Ichiki, R., Nakamura, S., Takasu, K. and Shima, H. 2006. Oviposition behavior of the parasitoid fly, *Bessa parallela* (Meigen) (Diptera: Tachinidae), in the field. Applied Entomology and Zoology **41**: 659–665.

Javaregowda, N. 2006. Tachinid parasitoids of the defoliator, *Hyblaea puera* Cramer from Karnataka, South India. Insect Environment **11**: 162–163.

Jenkins, D.A., Mizell, R.F., III, Shapiro-Ilan, D., Cottrell, T. and Horton, D. 2006. Invertebrate predators and parasitoids of plum curculio, *Conotrachelus nenuphar* (Coleoptera: Curculionidae) in Georgia and Florida. Florida Entomologist **89**: 435–440.

Jones, R.A. 2006. Another record of *Catharosia pygmaea* (Fallen, 1815) (Diptera, Tachinidae) in Kent. Dipterists Digest (2nd series) **13**: 100.

Kang, A.-g., Zhang, L.-p., Shen, C., Li, Q., Zhang, Y.-h. and Zhao, Z.-y. 2006. Control effects of tachinid flies on the meadow moth, *Loxostege sticticalis*. [In Chinese.] Kunchong Zhishi **43**: 709–712.

Kang, A.-g., Zhang, L.-p., Shen, C., Li, Q., Zhang, Y.-h. and Zhao, Z.-y. 2006. Study on parasite characteristics of parasitic fly of *Loxostege sticticalis* Linnaeus and control effects of its parasites. [In Chinese.] China Plant Protection **26** (8): 8–10.

Kang, X.-x., Chen, J., Wang, C.-c. and Yang, Y.-z. 2006. Identification and behaviors of parasitoids of *Sylepta derogata* in the Yangtze River and Huihe Valley. [In Chinese.] Kunchong Zhishi **43**: 663–666.

Kankare, M., Stefanescu, C., Van Nouhuys, S. and Shaw, M.R. 2005. Host specialization by *Cotesia* wasps (Hymenoptera: Braconidae) parasitizing species-rich Melitaeini (Lepidoptera: Nymphalidae) communities in north-eastern Spain. Biological Journal of the Linnean Society **86**: 45–65.

Kara, K., Gozuacik, C. and Mart, C. 2007. Tachinid parasitoids (Diptera: Tachinidae) of *Mythimna (Acantholeucania) loreyi* in the southeast Anatolian Region of Turkey. Phytoparasitica **35**: 136–139.

Karimpour, Y., Fathipour, Y., Talebi, A.A. and Moharramipour, S. 2006. Biology of *Hyles euphorbiae* (Lep., Sphingidae) on weedy spurges and determination of its parasitoids in west Azerbaijan, Iran. [In Farsi.] Iranian Journal of Agricultural Sciences **37**: 727–735.

Karimpour, Y., Fathipour, Y., Talebi, A.A. and Moharramipour, S. 2007. Biology of *Chamaesphecia schizoceriformis* (Lep.: Sesiidae), a biocontrol agent of *Euphorbia boissieriana* (Euphorbiales: Euphorbiaceae) in north west of Iran. Journal of Entomological Society of Iran **26**: 35–45.

Karimpour, Y., Fathipour, Y., Talebi, A.A., Moharramipour, S. and Tschorsnig, H.-P. 2006. Report of *Bithia glirina* and *Masicera sphingivora* (Diptera: Tachinidae) from Iran. [In Farsi.] Journal of Entomological Society of Iran **25**: 85–87.

Kendrick, A.P., Raffa, K.F., Krauth, S.J. and Woodley, N.E. 2005. Notes on incidence and biology of the predominant parasitoids attacking the cottonwood leaf beetle in Minnesota. Great Lakes Entomologist **38**: 203–208.

Kenis, M., Herz, K., West, R.J. and Shaw, M.R. 2005. Parasitoid assemblages reared from geometrid defoliators (Lepidoptera: Geometridae) of larch and fir in the alps. Agricultural and Forest Entomology **7**: 307–318.

Kofler, A. and Tschorsnig, H.-P. 2006. Zum Vorkommen von Raupenfliegen in Osttirol und Kärnten (Diptera: Tachinidae). Berichte des Naturwissenschaftlich-Medizinischen Vereins in Innsbruck **93**: 121–146.

Köhler, G., Roth, S., Thein, S. and Reinhardt, K. 2007. Ökologische Charakteristik einer Hybridzone von *Chorthippus parallelus parallelus* (Zetterstedt, 1821) und *Ch. p. erythropus* Faber, 1958 in den französischen Ostpyrenäen. Articulata Beiheft **12**: 1–57.

Krivolutsky, D.A. 2004. Changes in trophic relationships and parasite-host interreactions under conditions of environment radioactive contamination. [In Russian.] Trudy Institut Parazitologii Rossiiskaya Akademiya Nauk **44**: 157–163, 468.

Lakshmi, G.V. 2003. Redescription of *Peribaea orbata* (Wied.) (Diptera: Tachinidae) a larval parasitoid of *Spodoptera litura* (Fab.) (Lepidoptera: Noctuidae). Bulletin of Pure & Applied Sciences A (Zoology) **22A**: 73–79.

Lawrence, L., Tann, C. and Baker, G. 2007. Refuge crops provide refuge for more than *Helicoverpa*. Australian Cottongrower **28**: 26–27.

Lee, H.-s. and Han, H.-y. 2007. A redescription of *Pseudogonia rufifrons* (Wiedemann) (Diptera: Tachinidae): the first recording of the genus and species in Korea. Journal of Asia-Pacific Entomology **10**: 103–107.

Lee, J.-h. and Pemberton, R.W. 2007. Seasonal phenology and stage-specific parasitism of the apple ermine moth, *Yponomeuta malinellus*, in Korea. Entomological Research **37**: 54–59.

Li, Y.-q. and Zhang, D.-x. 2007. Fly pollination of *Antidesma montanum* (Euphorbiaceae) in Hainan, China. [In Chinese.] Acta Phytotaxonomica Sinica **45**: 217–226.

Liu, J.-y., Yao, Z.-y., Song, W.-h. and Zhang, C.-t. 2007. Taxonomic study of the genus *Medina* (Diptera: Tachinidae) of China. [In Chinese.] Pp. 61–64. *In*: Li, D.-m., Wu, C.-s., Wu, Y.-j. and Meng, X.-x., eds., Entomological Research Issues. Proceedings of the 8th Congress of the Entomological Society of China, 2007. China Agricultural Science and Technology Press, Beijing. 629 pp.

Liu, J.-y. and Zhang, C.-t. 2007. A new species of genus *Meigenia* from China (Diptera, Tachinidae). Acta Zootaxonomica Sinica **32**: 121–123.

López-Sebastián, E., Tschorsnig, H.-P., Pujade-Villar, J., Guara, M. and Selfa, J. 2007. Sobre los parasitoides asociados a las fases de larva y pupa de la procesionaria del pino en cuatro bosques mediterráneos (España). Boletín de Sanidad Vegetal-Plagas **33**: 53–60.

Martinez, M., Coutinot, D., Hoelmer, K. and Denis, J. 2006. Suitability of European Diptera tachinid parasitoids of *Lobesia botrana* (Denis & Schiffermüller) and *Eupoecilia ambiguella* (Hübner) (Lepidoptera Tortricidae) for introduction against grape berry moth, *Paralobesia viteana*

(Clemens) (Lepidoptera Tortricidae), in North America. Redia **89**: 87–97.

Miller, S.E. 2007. DNA barcoding and the renaissance of taxonomy. Proceedings of the National Academy of Sciences of the United States of America **104**: 4775–4776.

Mills, N.J. 2006. Accounting for differential success in the biological control of homopteran and lepidopteran pests. New Zealand Journal of Ecology **30**: 61–72.

Mückstein, P. 2006. Contribution to knowledge of tachinids (Diptera: Tachinidae) of the Protected Landscape Area Zdarske vrchy Hills. Acta Universitatis Carolinae Biologica **50**: 95–104.

Mückstein, P., Tschorsnig, H.-P., Vaňhara, J. and Michalková, V. 2007. New host and country records for European Tachinidae (Diptera). Entomologica Fennica **18**: 179–183.

Nakamura, S. 2006. Seasonal prevalence of *Helicoverpa armigera* (Lepidoptera: Noctuidae) and its natural enemies in Kenya. JIRCAS Newsletter for International Collaboration, No. **44–45**: 3.

Nakanura, H. and Chavez, F.G. 2007. Report of the investigation on *Epilachna varivestis* defoliation in Guatemala high land. [In Japanese.] Bulletin of the Shinshu University Alpine Field Center **5**: 77–82.

Oberhauser, K., Gebhard, I., Cameron, C. and Oberhauser, S. 2007. Parasitism of monarch butterflies (*Danaus plexippus*) by *Lespesia archippivora* (Diptera: Tachinidae). American Midland Naturalist **157**: 312–328.

O'Hara, J.E. 2007. A new species of *Myiopharus* Brauer & Bergenstamm (Diptera: Tachinidae) parasitic on adults of the sunflower beetle, *Zygogramma exclamationis* (Fabricius). Zootaxa **1521**: 31–41.

Olson, D.M. and Wäckers, F.L. 2007. Management of field margins to maximize multiple ecological services. Journal of Applied Ecology **44**: 13–21.

Palnikova, E.N., Sviderskaya, I.V. and Soukhovolsky, V.G. 2002. The pine looper in Siberian forests: ecology, population dynamics, impact on forests. [In Russian.] Nauka, Novosibirsk. 232 pp.

Papp, L. 2006. New records of Diptera species from Hungary, with the list of the Hungarian Scathophagidae. Folia Entomologica Hungarica **67**: 221–228.

Park, Y.-s., Rabinovich, J. and Lek, S. 2007. Sensitivity analysis and stability patterns of two-species pest models using artificial neural networks. Ecological Modelling **204**: 427–438.

Perry, I. 2006. *Opesia grandis* (Egger, 1860) (Diptera, Tachinidae) new to Britain. Dipterists Digest (2nd series) **13**: 93–95.

Piekarska-Boniecka, H., Wilkaniec, B., Trzciński, P. and Borowiak-Sobkowiak, B. 2006. Natural control of abundance of rose tortrix moth (*Archips rosana* L.) occurring in an apple orchard at Tarkowo in the environs of Inowroclaw. [In Polish.] Progress in Plant Protection **46**: 495–497.

Pont, A.C. and Xue, W.-q. 2007. The publication date of "Flies of China". Studia dipterologica **14**: 159–160.

Prasad, K.S., Shekhar, M.A., Vinod, K. and Kariappa, B.K. 2006. Comparative field efficacy of different management packages against the uzi fly, *Exorista bombycis* (Louis) (Diptera: Tachinidae), a parasitoid of the silkworm, *Bombyx mori* L. Indian Journal of Sericulture **45**: 51–54.

Predovnik, Ž. and Tschorsnig, H.-P. 2007. Tachinidae (Diptera) reared from clearwing moths (Lepidoptera: Sesiidae) in Slovenia. Acta Entomologica Slovenica **15**: 47–50.

Reichholf, J.H. 2006. Phasenverschobene Haeufigkeit der Raupenfliege *Tachina grossa* (Linnaeus, 1758) und des Eichenspinners *Lasiocampa quercus* (Linnaeus, 1758) im Wald an der Isar suedlich von Muenchen (Diptera: Tachinidae/ Lepidoptera: Lasiocampidae). Entomofauna **27**: 412–415.

Richter, V.A. 2007. On the tachinid fauna (Diptera, Tachinidae) of the southeast of European Russia. [In Russian.] Entomologicheskoe Obozrenie **86**: 960–972.

Richter, V.A. 2007. On the type locality of *Tachina zaqu* Chao & Arnaud (Diptera: Tachinidae). Zoosystematica Rossica **16**: 280.

Robertson, I.C. and Klemash Maguire, D. 2005. Crab spiders deter insect visitations to slickspot peppergrass flowers. Oikos **109**: 577–582.

Salvatore, V. and Roberto, V. 2007. Interessante acquisizione di reperti entomologici da parte del Museo Naturalistico (Corleto Monforte: SA): *Aplomya confinis* (Fallen) (Dipt.: Tachinidae) primo parassitoide larvale europeo di *Cacyreus marshalli* (Butler) (Lep.: Lycaenidae). Il Naturalista Campano **2**: 1–3.

Sarma, A.K., Gupta, M.K. and Singh, K.M. 2006. New record of a dipteran endoparasitoid of *Cricula trifenestrata* Helfer on Som, *Machilus bombycina*. Journal of Plant Protection and Environment **3**: 143–144.

Sarvary, M.A., Nyrop, J. and Reissig, H. 2007. Assessment of three techniques for measuring natural enemy inflicted mortality of leafroller larvae in commercial orchards. Biological Control **41**: 312–320.

Sarvary, M.A., Nyrop, J., Reissig, H. and Gifford, K.M. 2007. Potential for conservation biological control of the obliquebanded leafroller (OBLR) *Choristoneura rosaceana* (Harris) in orchard systems managed with reduced-risk insecticides. Biological Control **40**: 37–47.

Simov, N. and Antonov, A. 2006. First data of the true bugs (Heteroptera) in the diet of the second brood of the pallid swift (*Apus pallidus* (Shelley)) in Bulgaria. Entomologist's Monthly Magazine **142**: 243–245.

Smith, M.A., Wood, D.M., Janzen, D.H., Hallwachs, W. and Nebert, P.D.N. 2007. DNA barcodes affirm that 16 species of apparently generalist tropical parasitoid flies (Diptera, Tachinidae) are not all generalists. Proceedings of the National Academy of Sciences **104**: 4967–4972.

Soma, D., Mayukh, S., Damayanti, D. and Ananda, M. 2006. Exploring the potential of insect natural enemies in controlling red slug and looper caterpillars of tea in the foothills of Darjeeling. Journal of Plantation Crops **34**: 432–434.

Stumpner, A., Allen, G.R. and Lakes-Harlan, R. 2007. Hearing and frequency dependence of auditory interneurons in the parasitoid fly *Homotrixa alleni* (Tachinidae: Ormiini). Journal of Comparative Physiology A **193**: 113–125.

Tschorsnig, H.-P., Domingo-Quero, T. and Alonso-Zarazaga, M.A. 2007. Tachinidae (Diptera) from the Caldera de Taburiente National Park, La Palma (Canary Islands). Graellsia **63**: 43–51.

Urban, J. 2007. Occurrence, biology and harmfulness of *Galerucella lineola* (F.) (Coleoptera, Chrysomelidae) – Part 1. Last year's (parent) beetles. Journal of Forest Science **53**: 364–380.

Vaňhara, J., Muráriková, N., Malenovský, I. and Havel, J. 2007. Artificial neural networks for fly identification: a case study from the genera *Tachina* and *Ectophasia* (Diptera, Tachinidae). Biologia **62**: 462–469.

Vargas, G.A., Obando-Melo, V. and Gómez-Laverde, L.A. 2006. *Jaynesleskia jaynesi*: otra alternativa para el manejo de *Diatraea* spp. Carta Trimestral. Cenicaña **28** (2): 3–5.

Vélez, M.J. and Brockmann, H.J. 2006. Seasonal variation in selection on male calling song in the field cricket, *Gryllus rubens*. Animal Behaviour **72**: 439–448.

Vicidomini, S. and Pignataro, C. 2005. Check list italiana dei Ditteri, Imenotteri e Neurotteri antagonisti di *Spodoptera littoralis* e *Helicoverpa armigera*: dati bibliografici. Il Naturalista Campano **10**: 1–3.

Vijaykumar Patil, B.V. 2006. Natural enemy complex of paddy insect pests in Tungabhadra project area of Karnataka. Karnataka Journal of Agricultural Sciences **19**: 544–548.

Wang, H.-j., Shi, J.-m., Chen, Y.-c., Shu, J.-p. and Xu, T.-s. 2007. Species and population dynamics of natural enemies of prepupa of *Artona funeralis* in overwinter generation. [In Chinese.] Scientia Silvae Sinicae **43**: 69–73.

Welch, C.H. 2006. Intraspecific competition for resources by *Ormia depleta* (Diptera: Tachinidae) larvae. Florida Entomologist **89**: 497–501.

Whitehead, P.F. 2006. *Ernestia puparum* (F.) (Dipt., Tachinidae) new to Gloucestershire. Entomologist's Monthly Magazine **142**: 242.

Xu, Y.-x., Sun, X.-g., Han, R.-d. and He, Z. 2006. Parasitoids of *Dendrolimus punctatus* in China. [In Chinese.] Kunchong Zhishi **43**: 767–773.

Yao, Z.-y., Hao, J. and Zhang, C.-t. 2007. Research progress on the tribe Exoristini (Diptera: Tachinidae). [In Chinese.] Pp. 52–56. *In*: Li, D.-m., Wu, C.-s., Wu, Y.-j. and Meng, X.-x., eds., Entomological Research Issues. Proceedings of the 8th Congress of the Entomological Society of China, 2007. China Agricultural Science and Technology Press, Beijing. 629 pp.

Zeegers, T. 2007. A first account of the Tachinidae (Insecta: Diptera) of Yemen. Fauna of Arabia **23**: 369–419.

Zhang, C.-t. and Liu, J.-y. 2006. First record and taxonomic study of the genus *Dexiosoma* Rondani (Diptera: Tachinidae) from China. Entomotaxonomia **28**: 209–216.

Zhang, C.-t., Liu, J.-y., Yao, Z.-y., Liu, X.-w. and Zhang, W.-n. 2007. A list of Blondeliini (Diptera, Tachinidae) of Shanghai Entomological Museum, Chinese Academy of Sciences. [In Chinese.] Pp. 57–60. *In*: Li, D.-m., Wu, C.-s., Wu, Y.-j. and Meng, X.-x., eds., Entomological Research Issues. Proceedings of the 8th Congress of the Entomological Society of China, 2007. China Agricultural Science and Technology Press, Beijing. 629 pp.

Zhang, C.-t., Pang, Y. and Chao, C.-m. 2005. Tachinid flies of Guangdong, China (Diptera: Tachinidae). Pp. 297–306. *In*: Ren, G.-d., Zhang, R.-z. and Shi, F.-m., eds., Classification and diversity of insects in China. [In Chinese.] China Agricultural Science and Technology Press, Beijing. 402 pp.

Zhang, C.-t., Wang, M.-f. and Ge, Z.-p. 2007. First record of the genus *Atylomyia* in China with two new species (Diptera, Tachinidae). Acta Zootaxonomica Sinica **32**: 585–589.

Ziegler, J. 2007. The "Diptera stelviana" project. A dipterological perspective on a changing alpine landscape. Studia dipterologica **13** (2006): 195–202.

Zuk, M., Rotenberry, J.T. and Tinghitella, R.M. 2006. Silent night: adaptive disappearance of a sexual signal in a parasitized population of field crickets. Biology Letters **2**: 521–524.

MAILING LIST

Telephone numbers, FAX numbers and E-mail addresses are included where known.

Acquisitions Section, Department of Library Services, Natural History Museum, Cromwell Road, London, SW7 5BD, UK

Entomology Library, Peabody Museum, Yale University, New Haven, Connecticut 06511, USA

Dr. Peter Adler, Department of Entomology, Clemson University, Long Hall, Box 340365, Clemson, South Carolina 29634-0365, USA [Tel: 864-656-5044, ext. 5070; Fax: 864-656-5069; E-mail: padler@clemson.edu]

Dr. Paul H. Arnaud, Jr., Curator Emeritus, Department of Entomology, California Academy of Sciences, Golden Gate Park, San Francisco, California 94118, USA [Tel: 415-750-7233; Fax: 415-750-7106; E-mail: parnaud@calacademy.org]

Prof. Piero Baronio, Dipartimento di Scienze e Tecnologie Agroambientali, Viale Fanin, 42, I-40127 Bologna, ITALY [Tel: +39 051 2096702; Fax: +39 051 2096281; E-mail: pbaronio@agrsci.unibo.it]

Dr. David Barraclough, School of Biological and Conservation Sciences, George Campbell Building, University of KwaZulu-Natal, Durban 4041, SOUTH AFRICA [Tel: 031-260-1612; E-mail: barracloughd@ukzn.ac.za]

Dr. Robert Belshaw, Department of Biology, Imperial College at Silwood Park, Ascot, Berks SL5 7PY, UK [Tel: +44 (0)20 7594 2367; Fax: +44 (0)20 7594 2339; E-mail: r.belshaw@ic.ac.uk]

Mr. Christer Bergström, Säves väg 10, S-752 63 Uppsala, SWEDEN [E-mail: christer.bergstrom@zeta.telenordia.se]

Mr. Jeff Boettner, Department of Plant, Soil and Insect Sciences, Fernald Hall, University of Massachusetts, Amherst, Massachusetts 01003, USA [E-mail: boettner@psis.umass.edu]

Karel Bolckmans, International Production and R&D Manager, Koppert Biological Systems, P.O. Box 155, Veilingweg 17, 2650 AD, THE NETHERLANDS [Tel: +31-10-514.04.44; E-mail: kbolckmans@koppert.nl]

Prof. Valerie K. Brown, Director, Centre for Agri-Environmental Research (CAER), Department of Agriculture, The University of Reading, Earley Gate, PO Box 236, Reading RG6 6AT, UK

[Tel: +44 (0)118 931 6535; Fax: +44 (0)118 935 2421; E-mail: v.k.brown@reading.ac.uk]

Hye-Woo Byun, Department of Life Science, Yonsei University, 234 Maeji-ri, Wonju-si, Gangwon-do 220-710, KOREA [E-mail: hwbyun@yonsei.ac.kr]

Mr. Cezary Bystrowski, Forest Research Institute, ul. Bitwy Warszawskiej 1920 r. nr 3, 00-973 Warsaw, POLAND [E-mail: C.Bystrowski@ibles.waw.pl]

Dr. Bryan K. Cantrell, 3 Wingarra Street, Yeerongpilly, Queensland, 4105 AUSTRALIA [Tel: 61 7 3848 7904; E-mail: bjlcantrell@ozemail.com.au]

Dr. Ronald D. Cave, Indian River Research & Education Center, University of Florida, 2199 South Rock Road, Ft. Pierce, Florida 34945, USA [Tel: 772-468-3922 x 145; Fax: 772-460-3673; E-mail: rdcave@ifas.ufl.edu]

Dr. Pierfilippo Cerretti, Dipartimento di Biologia Animale e dell'Uomo, Università degli Studi di Roma "La Sapienza", Viale dell'Università, 32, 00185, Roma, ITALY [E-mail: pierfilipp ocerretti@yahoo.it]

Dr. D.E. Conlong, SASA Experiment Station, Private Bag X02, Mount Edgecombe, 4300, Natal, SOUTH AFRICA [Tel: (031) 593205; Fax: (031) 595406; E-mail: xentdc@sugar.org.za or conlong@iafrica.com]

Dr. Joan Cossentine, Summerland Research Centre, Agriculture and Agri-Food Canada, Highway 97, Summerland, British Columbia VOH 1ZO, CANADA [E-mail: cossentinej@agr.gc.ca]

Dr. Roger W. Crosskey, Department of Entomology, Natural History Museum, Cromwell Road, London, SW7 5BD, UK [Tel: 071-938-9123; Fax: 071-938-8937; E-mail: rwc@nhm.ac.uk]

Dr. Michael L. Cox, CAB International Institute of Entomology, c/o Department of Entomology, Natural History Museum, Cromwell Road, London, SW7 5BD, UK

Dr. Maria Luisa Dindo, Dipartimento di Scienze e Tecnologie, Agroambientali, via Fanin, 42, 40127 Bologna, ITALY [Tel: +39 051 2096280 2096288; Fax: +51 051 2096281; E-mail: ldindo@agrsci.unibo.it]

Dr. Agnieszka Draber-Monko, Instytut Zoologii, Polska Akademia Nauk, 00-679 Warszawa, ul. Wilcza 64, P.O. Box 1007, POLAND [Tel: 29-32-21; E-mail: draber@miiz.waw.pl]

Mr. John S. Dugdale, c/o Landcare Research, Private Bag 6, Nelson, NEW ZEALAND 7001 [Tel: 03 54 50 676; Fax: 03 54 50 671; E-mail: dugdalej@landcare.cri.nz]

Professeur Claude Dupuis, Entomologie, Muséum National d'Histoire Naturelle, 45, rue de Buffon, 75005 Paris, FRANCE [Tel: 40.79.34.05]

Dr. Astrid Eben, Departamento de Ecologia Vegetal, Instituto de Ecologia, A.C., Km 2.5 carretera antigua a Coatepec, Apartado Postal 63, 91000 Xalapa, Veracruz, MEXICO [Tel: +52 / 28 / 42 18 00 ext. 3503; Fax: +52 / 28 / 18 78 09; E-mail: astrid@ecologia.edu.mx]

Ms. Stephanie Erb, Lethbridge Research Centre, Agriculture and Agri-Food Canada, P.O. Box 3000, Lethbridge, Alberta T1J 4B1, CANADA [E-mail: erbs@agr.gc.ca]

Dr. Neal L. Evenhuis, Department of Natural Sciences, Bishop Museum, 1525 Bernice St., P.O. Box 19000A, Honolulu, Hawaii 96817-0916, USA [Tel: 808-848-4138; Fax: 808-847-8252; E-mail: neale@bishopmuseum.org]

Dr. Sheila Fitzpatrick, Agriculture and Agri-Food Canada Research Station, 6660 N.W. Marine Drive, Vancouver, British Columbia, V6T 1X2, CANADA [Tel: 604-224-4355; Fax: 604-666-4994; E-mail: fitzpatricks@agr.gc.ca]

Mr. John P. Flynn, 274 Hainton Avenue, Grimsby, North East Lincolnshire, DN32 9LS, UNITED KINGDOM [E-mail: jpf@sheltie.co.uk]

Dr. Serge Gaponov, Voronezh State University, Universitetskaya pl. 1, 394000 Voronezh, RUSSIA [Tel: (0732) 566595; Fax: (0732) 566551; E-mail: gaponovs@hotmail.com]

Mr. David J. Girling, Information Officer, IIBC, Silwood Park, Buckhurst Road, Ascot, Berks SL5 7TA, UK

Dr. Simon Grenier, Directeur de Recherche INRA, UMR INRA/INSA de Lyon, Biologie Fonctionnelle, Insectes et Interactions (BF2I), INSA, Bât. L. Pasteur - 20, av. A. Einstein, 69621 Villeurbanne Cedex, FRANCE [Tel: +33 (0)4 72 43 79 88; FAX +33 (0)4 72 43 85 34; E-mail: Simon.Grenier@jouy.inra.fr]

Dr. Horacio Grillo Ravelo, Laboratorio de Taxonomía, Centro de Investigaciones Agropecuarias, Universidad Central de Las Villas, Santa Clara, Villa Clara, CUBA [Tel: 53 042 281520; E-mail: hgrillo@agronet.uclv.edu.cu]

Dr. Ho-Yeon Han, Department of Life Science, Yonsei University, 234 Maeji-ri, Wonju-si, Gangwon-do 220-710, KOREA [E-mail: hyhan@yonsei.ac.kr]

Mr. Daniel E. Hansen, Minneapolis, Minnesota, USA [E-mail: genbirch@aol.com]

Dr. Zdravko Hubenov, Institute of Zoology, Bulgarian Academy of Sciences, Boul. "Tsar Osvoboditel" 1, 1000 Sofia, BULGARIA [E-mail: zhubenov@zoology.bas.bg]

Dr. Ryoko Ichiki, Japan International Research Center for Agricultural Sciences, 1-1, Ohwashi, Tsukuba, Ibaraki 305-8686, JAPAN [E-mail: richiki@jircas.affrc.go.jp]

Dr. Daniel H. Janzen, Department of Biology, University of Pennsylvania, Philadelphia, PA 19104, USA [Tel: 215-898-5636; Fax 215-898-8780; E-mail: djanzen@sas.upenn.edu]. When in Costa Rica, Dan can be reached at Guanacaste Conservation Area: tel and Fax 506-695-5598, best to call at night or on weekends.

Dr. Kenan Kara, Gazi Osman Pasa University, Ziraat Fakültesi Bitki, Koruma Bölümü, Tokat, TURKEY [E-mail: kkara@gop.edu.tr]

Dr. Ulrich Kuhlmann, Head Agricultural Pest Research, CABI Bioscience Centre Switzerland, Rue des Grillons 1, CH-2800 Delémont, SWITZERLAND [Tel: +41-32-421 4882; Fax: +41-32-421 4871; E-mail: u.kuhlmann@cabi.org]

Mr. A.R. Lahiri, Asst. Zoologist, Diptera Section, Zoological Survey of India, Prani Vigyan Bhavan, 'M' Block, New Alipur, Calcutta - 700 053, INDIA

Dr. Gerlind U.C. Lehmann, Freie Universität Berlin, Institut für Zoologie, Königin-Luise-Straße 1-3, D-14195 Berlin, GERMANY [E-mail: gerlind.lehmann@t-online.de]

Dr. Gerardo Liljesthröm, Museo de La Plata, Paseo del Bosque S/N, 1900 La Plata, ARGENTINA [E-mail: gerardo@cepave.edu.ar]

Dr. Richard L. Lindroth, Department of Entomology, 1630 Linden Drive, University of Wisconsin, Madison, Wisconsin 53706, USA [Tel: 608-263-6277; Fax: 608-262-3322 [E-mail: lindroth@entomology.wisc.edu]

Dr. Rolando López, USDA-ARS vegetable laboratory & CREC-Clemson University, 2700 Savannah Hwy., Charleston, South Carolina 29414, USA [Tel: 843-402-5392; E-mail: rgutier@clemson.edu]

Dr. Jean-Michel Maes, Museo Entomologico, AP 527, Leon, NICARAGUA [Tel: 505-3116586; Fax: 505-3110126; E-mail: jmmaes@ibw.com.ni]

Shannon Mahony, Invertebrate Biodiversity, Agriculture and Agri-Food Canada, 960 Carling Avenue, Ottawa, Ontario K1A 0C6, CANADA [Tel: 613-759-1794; Fax: 613-759-1927; E-mail: mahonys@agr.gc.ca]

Dr. Steve Marshall, Department of Environmental Biology, University of Guelph, Guelph, Ontario N1G 2W1, CANADA [Tel: 519-824-4120, ext. 2720; Fax: 519-837-0442; E-mail: samarsha@uoguelph.ca]

Dr. Peter G. Mason, Invertebrate Biodiversity, Agriculture and Agri-Food Canada, 960 Carling Avenue, Ottawa, Ontario K1A 0C6, CANADA [Tel: 613-759-1908; Fax: 613-759-1927; E-mail: masonp@agr.gc.ca]

Dr. Bernhard Merz, Département d'Entomologie, Muséum d'Histoire naturelle, C.P. 6434, CH-1211 Genève 6, SWITZERLAND [Tel: ++41 (0)22 418 6312; Fax: ++41 (0)22 418 6301; E-mail: bernhard.merz@ville-ge.ch]

Dr. Andrew Mitchell, Agricultural Scientific Collections Unit, OAI, NSW Department of Primary Industries, Forest Road, Orange, New South Wales 2800, AUSTRALIA [Tel: +61 (0)2 6391 3848; Fax: +61 (0)2 6391 3899; E-mail: andrew.mitchell@dpi.nsw.gov.au]

Dr. Kevin Moulton, Department of Entomology and Plant Pathology, University of Tennessee, 2431 Joe Johnson Drive, 205 Ellington Plant Sciences Bldg., Knoxville, Tennessee 37996-4560, USA [Tel: 865-974-7950; Fax: 865-974-4744; E-mail: jmoulton@utk.edu]

Dr. Satoshi Nakamura, Japan International Research Centre for Agricultural Sciences, 1-2 Ohwashi, Tukuba, Ibaraki, 305, JAPAN [Tel: 0298-38-8318; Fax: 0298-38-6316; E-mail: tachinid@jircas.affrc.go.jp]

Dr. Vincent Nealis, Pacific Forestry Centre, Forestry Canada, 506 West Burnside Road, Victoria, British Columbia V8Z 1M5, CANADA [Tel: 250-363-0663; Fax: 250-363-0775; E-mail: vnealis@pfc.cfs.nrcan.gc.ca]

Dr. Fathi H. Negm, Plant Protection Research Institute, Nadi El Seid St., Dokki-Giza, EGYPT

Dr. William C. Nettles, Jr., 25 Admiral Lane, Salem, South Carolina 29676, USA [Tel: 864-944-8401; E-mail: bill29676net@yahoo.com or wcnettles@earthlink.net]

Dr. Silvio S. Nihei, Departamento de Zoologia, Instituto de Biociências, Universidade de São Paulo, Rua do Matão, trav. 14, nº 321, Cidade Universitária, São Paulo-SP, CEP 05508-900, BRAZIL [E-mail: silvionihei@gmail.com]

Mr. Enio Nunez, Departamento de Entomologia, Museu Nacional do Rio de Janeiro, 20940-040, Rio de Janeiro, BRAZIL [E-mail: enionunez@mn.ufrj.br]

Dr. James E. O'Hara, Invertebrate Biodiversity, Agriculture and Agri-Food Canada, 960 Carling Avenue, Ottawa, Ontario K1A 0C6, CANADA [Tel: 613-759-1795; Fax: 613-759-1927; E-mail: oharaj@agr.gc.ca]

Dr. Michael Oraze, National Biological Control Institute, USDA, APHIS, OA, 4700 River Road, Unit 5, Riverdale, Maryland 20737-1229, USA [Tel: 301-734-4329; E-mail: moraze@aphis.usda.gov]

Dr. Imre Otvos, Pacific Forestry Centre, Forestry Canada, 506 West Burnside Road, Victoria, British Columbia V8Z 1M5, CANADA [Tel: 250-363-0620; Fax: 250-363-0775; E-mail: iotvos@pfc.cfs.nrcan.gc.ca]

Marcelo Pansonato, Coleção de Entomologia – Diptera, Museu de Zoologia, Universidade de São Paulo, Avenida Nazaré, 481, Ipiranga, São Paulo-SP, CEP 04263-000, BRAZIL [E-mail: marcelopansonato@hotmail.com]

Dr. Thomas Pape, Entomology Department, Zoological Museum, Universitetsparken 15, DK-2100 Copenhagen Ø, DENMARK [Tel: +45 3532 1106; Fax: +45 3532 1010; E-mail: tpape@snm.ku.dk]

Jaakko Pohjoismäki, Department of Molecular Biology, Institute of Medical Technology, FIN33014 University of Tampere, FINLAND [Tel: +358 50 5744745; E-mail: Jaakko.Pohjoismaki@uta.fi]

Dr. Hosagavi P. Puttaraju, Professor in Sericulture, Department of Sericulture, Bangalore University, Bangalore-560 056, INDIA [Tel/Fax: 0091-80-3301238; E-mail: puttarajuhp@hotmail.com]

Dr. F. Wolfgang Quednau, Laurentian Forestry Centre, P.O. Box 3800, 1055 PEPS Street, Sainte-Foy, Quebec G1V 4C7, CANADA [Tel: 418-648-5804; Fax: 418-648-5849; E-mail: fquednau@exchange.cfl.forestry.ca]

Dr. S. Ramani, Project Directorate of Biological Control, Hebbal, Bangalore - 560 024, INDIA [Tel: 3511982; Fax: 341 1961; E-mail: s_ramani@vsnl.net]

Mr. Chris Raper, c/o Tachinid Recording Group, http://tachinidae.org.uk/ [E-mail: chris.raper@tachinidae.org.uk]

Dr. Stuart Reitz, USDA-ARS Center for Biological Control, Florida A&M University, Tallahassee, Florida 32307, USA [Tel: 850-412-7062; Fax: 850-412-7263; E-mail: sreitz@nettally.com]

Mr. Anthony Rice, CRC For Sustainable Production Forestry, GPO Box 252-12, Hobart, Tasmania 7109, AUSTRALIA [E-mail: anthony.rice@ffp.csiro.au]

Dr. Vera A. Richter, Zoological Institute, Russian Academy of Sciences, St. Petersburg, 199034, RUSSIA [Tel: 812 218 0011; Fax: 7 812 1140444; E-mail: ciala@zin.ru]

Dr. Knut Rognes, Havørnbrautene 7a, N-4049 Hafrsfjord, NORWAY [Home tel: (+47) 51 59 06 96; Home E-mail: knut@rognes.no; Office tel: (+47) 51 83 35 43; Office Fax: (+47) 51 83 35 50; Office E-mail: knut.rognes@uis.no]

Dr. Jens Roland, Department of Biological Sciences, University of Alberta, Edmonton, Alberta T6G 2E9, CANADA [Tel: 403-492-1180; Fax: 403-492-9234; E-mail: jroland@gpu.srv.ualberta.ca]

Luiz Antonio B. Salles, EMBRAPA, Centro de Pesquisa Agropecuária de Clima Temperado, Caixa Postal 403, CEP 96001-970 Pelotas, RS, BRASIL [Tel: (0532) 212122; Fax: (0532) 212121]

Dr. Vicente Sánchez, USDA, Center for Biological Control of Northeastern Forest Insects and Diseases, Northern Research Station, 51 Mill Pond Road, Hamden, CT 06514, USA [Tel: 203-773-2021; Fax: 203-773-2183]

Mr. Rudi Schnitzler, Plants Risk Analysis, MAF Biosecurity New Zealand, Level 13, Wellington – Pastoral House, 25 The Terrace, PO Box 2526, Wellington, NEW ZEALAND [DDI: +64 (04) 894 0311; Fax: +64 (04) 894 0733; E-mail: Rudi.Schnitzler@maf.govt.nz]

Prof. Dr. Ulrich Schulz, Fachhochschule Eberswalde, Fachbereich Landschaftsnutzung und Naturschutz, Fachgebiet Angewandte Tierökologie und Zoologie, Friedrich Ebertstr. 28, 16225 Eberswalde, GERMANY [E-mail: uschulz@fh-eberswalde.de]

Mr. Peter Sehnal, Internationales Forschungsinstitut für Insektenkunde, Naturhistorisches Museum Wien, Burgring 7, A-1014 Wien, AUSTRIA [E-mail: peter.sehnal@nhm-wien.ac.at]

Ms. Lorraine Seymour, Department of Plant, Soil and Entomological Sciences, University of Idaho, PO Box 442339, Moscow, ID 83844-2339, USA [Tel: 208-885-5637; E-mail: seym6131@uidaho.edu]

Dr. Hiroshi Shima, 2-11-1-406 Kusagae, Chuo-ku, Fukuoka, 810-0045, JAPAN [E-mail: shimarcb@kyudai.jp]

Mr. Liekele E.N. Sijstermans, Buiksloterbreek 98, NL - 1034 XE Amsterdam, THE NETHERLANDS [E-mail: liekele@worldaccess.nl]

Dr. Ana Maria M. Ávila Simões, Departamento de Ciências Agrárias, Secção da Protecção das Plantas, Terra-Chã, 9702 Angra, Terceira, PORTUGAL [Tel: 351 95 31111; Fax: 351 95 32605; E-mail: asimoes@angra.uac.pt]

Dr. Mike Singer, Department of Biology, Wesleyan University, Hall-Atwater Labs, Rm.259, Middletown, Connecticut 06459, USA [Tel: 860-685-2548; E-mail: msinger@wesleyan.edu]

Dr. Jeffrey Skevington, Invertebrate Biodiversity, Agriculture and Agri-Food Canada, 960 Carling Avenue, Agriculture and Agri-Food Canada, Ottawa, Ontario K1A 0C6, CANADA [Tel: 613-759-1647. Fax: 613-759-1927; E-mail: skevingtonj@agr.gc.ca]

Dr. Cecil L. Smith, Museum of Natural History, University of Georgia, Athens, Georgia 30602, USA [E-mail: clsmith@arches.uga.edu]

Mr. Matthew Smith, 24 Allnatt Avenue, Winnersh, Berks RG41 5AU, UK; also Tachinid Recording Group, http://tachinidae.org.uk/ [Tel: 0118 979 4313; E-mail: matt.smith@tachinidae.org.uk]

Dr. Rob F. Smith, Agriculture and Agri-Food Canada, 32 Main St., Kentville, Nova Scotia B4N 1J5, CANADA [Tel: 902-679-5730; E-mail: smithr@agr.gc.ca]

Dr. John O. Stireman III, Assistant Professor, Department of Biological Sciences, 3640 Colonel Glenn Highway, 235A, BH, Wright State University, Dayton, Ohio 45435, USA [Tel: 937-775-3192; e-mail: john.stireman@wright.edu]

Dr. John Strazanac, Plant and Soil Sci. / Entomology, West Virginia University, P.O. Box 6108, Morgantown, West Virginia 26506-6108, USA [Tel: 304-293-6023, ext. 4345; Fax: 304-293-2960; E-mail: jstrazan@wvu.edu]

Dr. Xuekui Sun, 26 Courtney Cres, Richmond Hill, Ontario L4E 4B9, CANADA [Tel: 905-237-0240; E-mail: xuekuisun@hotmail.com]

Dr. Takuji Tachi, Institute of Tropical Agriculture, Kyushu University, 6-10-1 Hakozaki, Higashi-ku, Fukuoka 812-8581, JAPAN [Tel: +81-92-642-3076; Fax: +81-92-642-3077; E-mail: tachi@agr.kyushu-u.ac.jp]

Dr. Ronaldo Toma, Museu de Zoologia, Universidade de São Paulo, Caixa Postal 42694, Cep 04299-970, São Paulo, SP, BRASIL [E-mail: rtkuna@hotmail.com]

Dr. Hans-Peter Tschorsnig, Staatliches Museum für Naturkunde, Rosenstein 1, D-70191 Stuttgart, GERMANY [Tel: (0711) 8 93 60; Fax: 49 711 8936100; E-mail: tschorsnig.smns@naturkundemuseum-bw.de]

Mr. Godard Tweehuysen, Librarian, Library Netherlands Entomological Society, Plantage Middenlaan 64, NL-1018 DH Amsterdam, THE NETHERLANDS [Tel: + 31(0)20 5256246; Fax: + 31(0)20 5256528; E-mail: biblionev@science.uva.nl]

Dr. Jaromír Vaňhara, Department of Zoology and Ecology, Faculty of Science, Masaryk University, Kotlářská 2, 611 37 Brno, CZECH REPUBLIC [Tel: 420 549 497 979; Fax: 420 541 211 214; E-mail: vanhara@sci.muni.cz]

Dr. Philippe Vernon, UMR 6553, CNRS, Université de Rennes 1, Station Biologique, 35380, Paimpont, FRANCE [Tel: +33 (0)2.99.61.81.69; Fax: +33 (0)2.99.61.81.87; E-mail: philippe.vernon@univ-rennes1.fr]

Dr. Thomas J. Walker, Department of Entomology & Nematology, University of Florida, Gainesville, Florida 32611-0620, USA [Tel: 904-392-1901; Fax: 904-392-0190; E-mail: tjw@gnv.ifas.ufl.edu]

Dr. Robert A. Wharton, Department of Entomology, Texas A&M University, College Station, Texas 77843-2475, USA [Tel: 409-845-7972; Fax: 409-845-7977; E-mail: rawbaw2@tamu.edu]

Dr. Terry A. Wheeler, Department of Natural Resource Sciences, McGill University, Macdonald Campus, Ste-Anne-de-Bellevue, Quebec H9X 3V9, CANADA [Tel: 514-398-7937; Fax: 514-398-7990; E-mail: terry.wheeler@mcgill.ca]

Mr. Nik Wiman, Department of Entomology, Washington State University, Tree Fruit Research and Extension Center, 1100 N. Western Ave, Wenatchee, Washington 98801, USA [Tel: 509-663-8181, ext. 277; E-mail: nwiman@wsu.edu]

Dr. D. Monty Wood, Invertebrate Biodiversity, Agriculture and Agri-Food Canada, 960 Carling Avenue Agriculture and Agri-Food Canada, Ottawa, Ontario K1A 0C6, CANADA [Tel: 613-996-1665; Fax: 613-947-5974; E-mail: mgwood@mac.com]

Dr. Norman E. Woodley, Systematic Entomology Laboratory, SEA, U.S. Department of Agriculture, c/o U.S. National Museum NHB 168, Washington, D.C. 20560, USA [Tel: 202-382-1802; Fax: 202-786-9422; E-mail: norman.woodley@ars.usda.gov]

Mr. Nigel Wyatt, Department of Entomology, Natural History Museum, Cromwell Road, London, SW7 5BD, UK [Tel: 071-938-9123; Fax: 071-938-8937; E-mail: npw@nhm.ac.uk]

Dr. Erick Yabar L., P.O. Box 115, Cusco, PERU [E-mail: e_yabar@yahoo.com]

Dr. Stephen P. Yanoviak, Florida Medical Entomology Lab, 200 9th Street SE, Vero Beach, Florida 32962, USA [Tel: 561-778-7200; E-mail: yanoviak@gmail.com]

Mr. Dekang You, No. 58 North Yellow River Street, Shenyang, 110034, P.R. CHINA [Tel: 0086 24 6800330]

José Cola Zanuncio, Pró-Reitor de Planejamento e Orçamento, Universidade Federal de Viçosa, 36571-000 Viçosa - Minas Gerais, BRAZIL [Tel: 0XX 31 3899 2140/1476; E-mail: zanuncio@ufv.br]

Mr. Theo Zeegers, Eikenlaan 24, NL 3768 EV Soest, THE NETHERLANDS [Tel: + 35 5885858; E-mail: th.zeegers@xs4all.nl]

Dr. Chuntian Zhang, Institute of Entomology, Sun Yat-sen University, 135 West Xingang Road, Haizhu District, Guangzhou 510275, CHINA [E-mail: zhangct2003@yahoo.com.cn]

Dr. Joachim Ziegler, Humboldt-Universität zu Berlin, Museum für Naturkunde, Institut für Systematische Zoologie, Invalidenstrasse 43, 10115 Berlin, GERMANY [Tel: 049 / (0)30 / 2093-8509; E-mail: joachim.ziegler@museum.hu-berlin.de]

Mr. Manuel A. Zumbado, Unidad de Atrópodos, Instituto Nacional de Biodiversidad (INBio), 22-3100, Santo Domingo, Heredia, COSTA RICA. [Tel: 506-507-8222; Fax: 506-507-8274; E-mail: mzumbado@inbio.ac.cr]