

TWO NEW SPECIES OF DRYINIDAE (HYMENOPTERA: CHRYSIDOIDEA)
FROM NANLING NATIONAL NATURE RESERVE, CHINAZAIFU XU¹, MASSIMO OLMI² AND JUNHUA HE³¹College of Natural Resources and Environment, South China Agricultural University Guangzhou, Guangdong 510642, P. R. China²Corresponding author. Department of Plant Protection, University of Tuscia, Via San Camillo de Lellis, I-01100 Viterbo, Italy³Institute of Insect Sciences, Zhejiang University, Hangzhou 310029, P. R. China

ABSTRACT

Anteon nanlingense **sp. nov.** and *Anteon longum* **sp. nov.** are described from Nanling National Nature Reserve (Guangdong, P.R. China). A check-list of Dryinidae from Nanling National Nature Reserve is presented.

Key Words: Dryinidae, *Anteon nanlingense*, *Anteon longum*, new species, Nanling Nature Reserve, China

RESUMEN

Se describen por primera vez a *Anteon nanlingense* sp. nov. y *Anteon longum* sp. nov. ambos colectados en la Reserva Natural Nanling (Guangdong, P.R. China); asimismo, se realiza un listado de los Dryinidae presentes en dicha reserva.

Translation provided by the authors.

Dryinidae (Hymenoptera: Chrysidoidea) are parasitoids of Hemiptera: Auchenorrhyncha (Guglielmino & Olmi 1997, 2006, 2007). The species of Dryinidae inhabiting China have been studied in the last 10 years mainly by He & Xu (2002), Xu, He & Olmi (2001) and Xu, Olmi & He (2006a, 2006b, 2006c, 2007, 2008, 2009a, 2009b, 2009c, 2010, 2011). With approximately 126 described species, *Anteon* Jurine, 1807, is 1 of the largest genera of the Oriental region. Two additional new species of *Anteon* are described herein. They were collected in 1 of the most interesting protected areas of P.R. China, i.e., Nanling National Nature Reserve. This large park includes the highest mountain of Guangdong Province, Mt. Shikengkong (1902 m). This paper presents a revised check-list of Dryinidae inhabiting Nanling National Nature Reserve.

MATERIALS AND METHODS

The descriptions follow the terminology used by He & Xu (2002) and Olmi (1984, 1994, 1999). The measurements reported are relative, except for the total length (head to abdominal tip, without the antennae), which is expressed in mm. In the descriptions, POL is the distance between the inner edges of the lateral ocelli; OL is the distance between the inner edge of a lateral ocellus and the

median ocellus; OOL is the distance from the outer edge of a lateral ocellus to the compound eye; OPL is the distance from the posterior edge of a lateral ocellus to the occipital carina; TL is the distance from the posterior edge of an eye to the occipital carina.

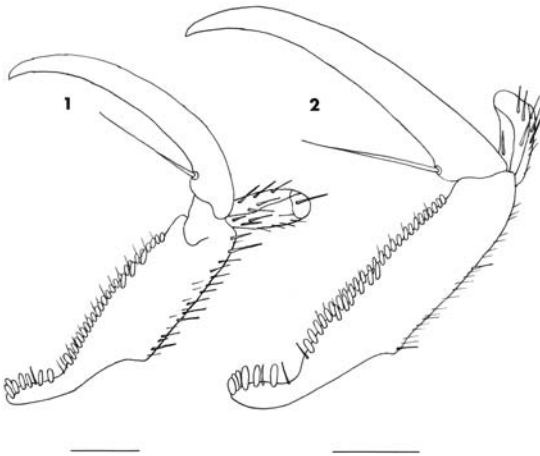
The material studied in this paper is deposited in the Hymenoptera Collection of South China Agricultural University, Department of Entomology, Guangzhou, Guangdong, P. R. China (SCAU).

SYSTEMATIC ACCOUNTS

Anteon nanlingense **sp. nov.** (Fig. 1)

Material examined: Holotype: Female, P.R. CHINA, Guangdong Prov., Nanling National Nature Reserve, 4-5.X.2004, Zaifu Xu (SCAU).

Description. Holotype female; Macropterous; length 2.4 mm; head black, except mandibles, clypeus and anterior half of face are testaceous; ventral side of head black, except a median testaceous stripe; antenna testaceous; prothorax testaceous; rest of mesosoma black; petiole black; gaster testaceous, except some brown areas on dorsal side; legs testaceous-whitish. Antenna clavate; antennal segments in following proportions: 10:4:10:7:6.5:7:7:6:6:8.5. Head shiny, smooth, punctate, without sculpture among punc-



Figs. 1 and 2. Chelae of holotypes of *Anteon nanlingense* sp. nov. (1) and *Anteon longum* sp. nov. (2). Scale bars 0.10 mm for 1 and 0.11 mm for 2.

tures; anterior half of face rugose; frontal line complete; face with 2 lateral longitudinal keels around orbits and directed towards antennal toruli; POL = 5; OL = 4; OOL = 5; OPL = 3.5; TL = 3; greatest breadth of posterior ocellus much shorter than OPL (2:3.5); occipital carina complete. Pronotum shiny, smooth, with anterior surface weakly rugose; posterior surface smooth, finely punctate, without sculpture among punctures; posterior surface shorter than scutum (8:12.5), more than twice as broad as long (18:8); pronotal tubercles reaching tegulae. Scutum shiny, finely punctate, without sculpture among punctures. Notauli incomplete, reaching approximately 0.9 length of scutum. Scutellum and met-

- 11 Scutellum testaceous-reddish *A. subdignum* Olmi
- Scutellum black 11'
- 11' Anterior half of face dull, rugose, posterior half punctate, without sculpture among punctures; prothorax testaceous; notauli reaching approximately 0.9 length of scutum *A. nanlingense* **sp. nov.**
- Face completely finely punctate, smooth; prothorax black; notauli reaching approximately 0.6- 0.7 length of scutum *A. xuexini* Xu, He & Olmi

Anteon longum sp. nov. (Fig. 2)

Material examined: Holotype: female, P.R. CHINA, Guangdong Prov., Nanling National Nature Reserve, 4-5.X.2004, Zaifu Xu (SCAU).

Description. Holotype female, Macropterous, length 3.1 mm; head black, except mandibles testaceous; antenna testaceous; mesosoma black; gaster brown; legs testaceous. Antenna clavate; antennal segments in following proportions: 12:6:10:8:7:8:7:7:10. Head shiny; face rugose, mainly on lateral regions, with a large area in front of anterior ocellus smooth, punctate and without sculpture among punctures;

anotum shiny, without sculpture. Propodeum reticulate rugose, with a strong transverse keel between dorsal and posterior surface; posterior surface with 2 longitudinal keels and median area shiny, as rugose as lateral areas, with some smooth areas. Forewing hyaline, without dark transverse bands; distal part of stigmal vein much shorter than proximal part (5:9). Fore tarsal segments in following proportions: 8:2.5:2.5:4:16; fore tarsal segment 2 curved into a hook. Segment 5 of fore tarsus (Fig. 1) with basal part slightly longer than distal part (10:7). Enlarged claw (Fig. 1) with a proximal prominence bearing a long bristle. Segment 5 of fore tarsus (Fig. 1) with 2 rows of 3 + 24 lamellae; distal apex with a group of 8 lamellae.

Male. Unknown.

Hosts. Unknown.

Etymology. This species is named after its occurrence in Nanling National Nature Reserve, China.

Remarks. *Anteon nanlingense* resembles *A. xuexini* Xu, He & Olmi, 2001, from P.R. China, Zhejiang Prov. However, in *A. nanlingense* the prothorax is testaceous, the notauli reach approximately 0.9 length of scutum and the anterior half of the face is dull and rugose, whereas in *A. xuexini* the prothorax is black, the notauli reach 0.6-0.7 length of scutum and the anterior half of the face is smooth and punctate. Following the above description of *A. nanlingense*, the key to the females of Oriental *Anteon* presented by Xu, He & Olmi (2001) can be modified by replacing couplet 11 as follows:

vertex weakly rugose behind posterior ocelli and on temples; frontal line complete; face with 2 lateral keels near orbits directed towards antennal toruli; anterior third of face and clypeus densely hairy; rest of head almost hairless; POL = 5; OL = 4; OOL = 4; OPL = 5; TL = 5; greatest breadth of posterior ocellus shorter than OPL (3:5); occipital carina complete. Pronotum shiny, with anterior surface rugose; posterior surface shiny, punctate, without sculpture among punctures, shorter than scutum (9:16), more than twice as broad as long (22:9); pronotal tubercles reaching tegulae. Scutum, scutellum and metanotum shiny, smooth, finely punctate

tate, without sculpture among punctures. Notauli incomplete, reaching approximately 0.7 length of scutum. Propodeum with a strong transverse keel between dorsal and posterior surface; dorsal surface reticulate rugose; posterior surface with 2 complete longitudinal keels and median area as rugose as lateral areas. Forewing hyaline, without dark transverse bands; distal part of stigmal vein much shorter than proximal part (5:11). Fore tarsal segments in following proportions: 8:2.5:2.5:6:19. Enlarged claw (Fig. 2) with a proximal prominence bearing a long bristle. Segment 5 of fore tarsus (Fig. 2) with basal part slightly longer than distal part (11:8), with 2 rows of approximately 6 + 27 lamellae; distal apex with a group of about 7 lamellae.

Male. Unknown.

Hosts. Unknown.

Etymology. This species is named after the conspicuous length of the holotype.

Remarks. *Anteon longum* resembles *A. acre* Olmi, 1991, from Vietnam and Taiwan. However, in *A. longum* the posterior surface of pronotum is longer than half of scutum and OPL is longer than OOL, whereas in *A. acre* the posterior surface of pronotum is shorter than half of scutum and OPL is much shorter than OOL. Following the above description of *Anteon longum*, the key to the females of Oriental *Anteon* presented by Xu, He & Olmi (2001) can be modified by replacing couplet 56 as follows:

- 56 Segment 4 of fore tarsus as long as segment 1 *A. insertum* Olmi
- Segment 4 of fore tarsus shorter than segment 1 56'
- 56' Posterior surface of pronotum shorter than half of scutum; head with OPL much shorter than OOL *A. acre* Olmi
- Posterior surface of pronotum longer than half of scutum; head with OPL longer than OOL *A. longum* **sp. nov.**

CHECK-LIST OF DRYINIDAE OF NANLING NATIONAL NATURE RESERVE

This check-list is the result of many years of research by 1 of the authors (Prof. Zaifu Xu) in Nanling National Nature Reserve. The following 28 species were found:

Aphelopinae

- Aphelopus maculiceps* Bergman, 1957
- Aphelopus nepalensis* Olmi, 1984
- Aphelopus taiwanensis* Olmi, 1991
- Aphelopus zhaoi* Xu, He & Olmi, 1998

Conganteoninae

- Fiorianteon rugosum* Olmi, 1991

Anteoninae

- Anteon bauense* Olmi, 1984
- Anteon borneanum* Olmi, 1984
- Anteon chaoi* Xu & He, 1997
- Anteon fidum* Olmi, 1991
- Anteon hirashimai* Olmi, 1993
- Anteon insertum* Olmi, 1991
- Anteon lankanum* Olmi, 1984
- Anteon lini* Olmi, 1996
- Anteon longum*, new species
- Anteon nanlingense*, new species
- Anteon songyangense* Xu, He & Olmi, 1998
- Anteon thai* Olmi, 1984
- Anteon wengae* Xu, Olmi & He, 2006b
- Anteon yasumatsui* Olmi, 1984

Dryininae

- Dryinus adgressor* Xu, Olmi & He, 2006c

Dryinus chenae Xu, Olmi & He, 2007

Dryinus indianus (Olmi, 1984)

Dryinus irregularis Olmi, 1984

Dryinus punctulatus Xu, Olmi & He, 2008

Dryinus pyrillivorus Olmi, 1986

Dryinus sinicus Olmi, 1987

Dryinus stantoni Ashmead, 1904

Gonatopodinae

- Neodryinus grandis* Xu, Olmi & He, 2011

CONCLUSIONS

Nanling National Nature Reserve is a large mainly mountainous area covered with dense forests. This range, separating Guangdong and Hunan Provinces, hosts populations of temperate and tropical species. This environment explains why the above check-list is composed mainly of 3 genera of Dryinidae: *Aphelopus* Dalman, 1823, *Anteon* Jurine, 1807, and *Dryinus* Latreille, 1804. Notably These genera include species with macropterous females that parasitize mainly forest leafhoppers and planthoppers. Cicadellidae: Typhlocybinae are parasitized by *Aphelopus*; Cicadellidae: Deltocephalinae, Eurymelinae, Iassinae, Idiocerinae, Ledrinae, Macropsinae and Tartessinae are parasitized by *Anteon*; many families of Fulgoromorpha (Acanaloniidae, Cixiidae, Flatidae, Fulgoridae, Issidae, Lophopidae, Ricaniidae and Tropiduchidae) are parasitized by *Dryinus* (Guglielmino & Olmi 1997, 2006, 2007). The subfamily Gonatopodinae, characterized mainly

by apterous females, parasitizes Hemiptera feeding on herbaceous plants, so that the species usually do not live in forests and prefer grasslands. Among the few genera of Gonatopodinae with macropterous females, *Neodryinus* Perkins, is better adapted to live in forests, because the species parasitize Flatidae, Nogodinidae and Ricanidae, which feed both on herbaceous plants and on shrubs and trees. Currently Nanling National Nature Reserve is known to host 28 of the 193 dryinid species listed in China by He & Xu (2002).

ACKNOWLEDGMENTS

We thank Mr. Zhongrun Zhang, Mr. Desong Ruan, Mr. Jingxian Liu, Mr. Jujian Chen, Mr. Bin Xiao, Mr. Hanjian Huang, Mr. Wuqing Fan, Mr. Huayan Chen, Mr. Bo Qiu, Miss Liqiong Weng, Miss Jieming Yao, Miss Juanjuan Ma, Miss Zeng Jie, Miss Chundan Hong, Miss Yali Cai, from South China Agricultural University for their assistance with fieldwork.

REFERENCES CITED

- ASHMEAD, W. H. 1904. Descriptions of new genera and species of Hymenoptera from the Philippine Islands. Proc. U.S. National Museum 28(1387): 127-158.
- BERGMAN, B. H. H. 1957. A new Dryinid Parasite of Leafhoppers in Java. Entomol. Ber. 17: 9-12.
- DALMAN, J. W. 1823. *Analecta entomologica. Typis Lyndhianis, Holmiae*: 104 pp.
- GUGLIELMINO, A., AND OLMI, M. 1997. A host-parasite catalog of world Dryinidae (Hymenoptera: Chrysidoidea). *Contrib. Entomology, International* 2(2): 165-298.
- GUGLIELMINO, A., AND OLMI, M. 2006. A host-parasite catalog of world Dryinidae (Hymenoptera: Chrysidoidea): first supplement. *Zootaxa* 1139: 35-62.
- GUGLIELMINO, A., AND OLMI, M. 2007. A host-parasite catalog of world Dryinidae (Hymenoptera: Chrysidoidea): second supplement. *Boll. Zool. Agr. Bachic., Ser. ii*, 39: 121-129.
- HE, J., AND XU, Z. 2002. Hymenoptera Dryinidae. *Fauna Sinica* 29. Science Press, Beijing: 464 pp.
- JURINE, L. 1807. Nouvelle méthode de classer les Hyménoptères et les Diptères, I. Hyménoptères. Paschoud, Genève: 320 pp.
- LATREILLE, P. A. 1804. *Nouveau dictionnaire d'Histoire naturelle* 24. F. Dufart, Paris: 104 pp.
- OLMI, M. 1984. A revision of the Dryinidae (Hymenoptera). *Mem. Am. Entomol. Inst.* 37: 1-1913.
- OLMI, M. 1986. New species and genera of Dryinidae (Hymenoptera Chrysidoidea). *Frustula Entomol.* (1986), N.S., 7-8 (20-21): 63-105.
- OLMI, M. 1987. New species of Dryinidae (Hymenoptera, Chrysidoidea). *Fragmenta Entomol.* 19: 371-456.
- OLMI, M. 1991. Supplement to the revision of the world Dryinidae (Hymenoptera: Chrysidoidea). *Frustula Entomol.* (1989), N.S., 12(25): 109-395.
- OLMI, M. 1993. A new generic classification for Thaumatomyrinae, Dryininae and Gonatopodinae, with descriptions of new species (Hymenoptera Dryinidae). *Boll. Zool. Agr. Bachic., Ser. ii*, 25: 57-89.
- OLMI, M. 1994. The Dryinidae and Embolemidae (Hymenoptera: Chrysidoidea) of Fennoscandia and Denmark. *Fauna Entomologica Scandinavica* 30. E. J. Brill, Leiden: 100 pp.
- OLMI, M. 1996. New Anteoninae from Taiwan (Hymenoptera: Dryinidae). *Oriental Insects* 30: 171-180.
- OLMI, M. 1998. New Embolemidae and Dryinidae (Hymenoptera Chrysidoidea). *Frustula Entomol.* (1997), N. S., 20(33): 30-118.
- OLMI, M. 1999. Hymenoptera Dryinidae—Embolemidae. *Fauna d'Italia* 37. Edizioni Calderini, Bologna: 425 pp.
- PERKINS, R. 1905. Leafhoppers and their natural enemies (Pt. I. Dryinidae). *Rep. Work Exp. Station Haw. Sugar Planters' Assoc., Division of Entomology, Bull.* No. 1(1): 1-69.
- XU, Z., AND HE, J. 1997. Four new species of the genus *Anteon* Jurine from Guizhou, China (Hymenoptera: Dryinidae). *Wuyi Sci. J.* 13: 106-110.
- XU, Z., HE, J., AND OLMI, M. 1998. New species of Dryinidae from China (Hymenoptera, Chrysidoidea). *Phytophaga* 8: 21-37.
- XU, Z., HE, J., AND OLMI, M. 2001. Descriptions of new species of Dryinidae from China (Hymenoptera: Chrysidoidea). *Frustula Entomol.* (2000), N.S., 23(36): 1-22.
- XU, Z., OLMI, M., AND HE, J. 2006a. Description of a new species of *Anteon* Jurine from the People's Republic of China and of the male of *Anteon fidum* Olmi (Hymenoptera: Dryinidae). *Zootaxa* 1164: 57-61.
- XU, Z., OLMI, M., AND HE, J. 2006b. Descriptions of five new species of *Anteon* Jurine from China (Hymenoptera: Chrysidoidea: Dryinidae). *J. Kansas Entomol. Soc.* 79(2): 92-99.
- XU, Z., OLMI, M., AND HE, J. 2006c. A contribution to the knowledge of Dryininae and Gonatopodinae of China (Hymenoptera: Dryinidae). *Oriental Insects* 40: 91-96.
- XU, Z., OLMI, M., AND HE, J. 2007. Two new species of *Dryinus* Latreille (Hymenoptera: Dryinidae) from China. *Florida Entomol.* 90(3): 453-456.
- XU, Z., OLMI, M., AND HE, J. 2008. Descriptions of two new species of *Dryinus* Latreille from China (Dryinidae). *J. Kansas Entomol. Soc.* 81(1): 8-11.
- XU, Z., OLMI, M., AND HE, J. 2009a. Two new species of Dryinidae (Hymenoptera: Chrysidoidea) from China. *Florida Entomologist* 92(2): 217-220.
- XU, Z., OLMI, M., AND HE, J. 2009b. A taxonomic revision of the Oriental species of *Thaumatomyrinus* Perkins, with descriptions of two new species from P. R. China (Hymenoptera: Dryinidae). *Zootaxa* 2175: 19-28.
- XU, Z., OLMI, M., AND HE, J. 2009c. Description of a new species of *Lonchodryinus* (Hymenoptera: Dryinidae) from China. *Oriental Insects* 43: 11-14.
- XU, Z., OLMI, M., AND HE, J. 2010. Two new species of *Anteon* (Hymenoptera: Dryinidae) from China. *Florida Entomol.* 93(3): 403-406.
- XU, Z., OLMI, M. AND HE, J. 2011. Revision of the Oriental species of the genus *Neodryinus* Perkins, 1905 (Hymenoptera, Dryinidae, Gonatopodinae), with description of a new species from P.R. China. *Zootaxa* 2790: 1-22.