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Check-list of Anteoninae R. Perkins, 1912 (Hymenoptera: Dryinidae) of South Korea, with description of a new species

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Abstract

The subfamily Anteoninae (Hymenoptera: Dryinidae) was represented in South Korea by fifteen species belonging to the genus *Anteon* Jurine, 1807. In this paper, further eighteen species belonging to two genera are recognized for the first time from South Korea: *Anteon worakense* Kim & Lee, **sp. nov.**, *A. albonigrum* Olmi, 1995; *A. autumnale* Olmi, 1991; *A. devriesi* Olmi, 1998; *A. exiguum* (Haupt, 1941); *A. gaullei* Kieffer, 1905; *A. hikense* Olmi, 1995; *A. ingenuum* Olmi, 1984; *A. japonicum* Olmi, 1984; *A. metuendum* Olmi, 1987; *A. nanlingense* Xu, Olmi & He, 2011; *A. peterseni* Olmi, 1984; *A. songyangense* Xu, He & Olmi, 1998; *A. sulawesianum* Olmi, 1991; *A. wushense* Olmi, 1991; *A. yuani* Xu, He & Olmi, 1998; *Lonchodryinus infuscatus* Xu, Olmi & He, 2009; *L. ruficornis* (Dalman, 1818). *A. exiguum* (Haupt, 1941) is also recorded from Russian Far East (new record). A check-list and a key to South Korean species of Anteoninae are presented.

Key words: *Anteon worakense* **sp. nov.**, Chrysoidea, Cicadellidae, ectoparasitoids, check-list, Eastern Palaearctic, keys

Introduction

The subfamily Anteoninae R.C.L. Perkins, 1912, one of the largest subfamilies within the family Dryinidae, consists of 597 species distributed in seven genera (Xu *et al.* 2013): *Anteon* Jurine, 1807; *Anteonopsis* Olmi, Rasnitsyn & Guglielmino, 2010 (fossil); *Burmanteon* Engel, 2003 (fossil); *Deinodryinus* R.C.L. Perkins, 1907; *Janzeniola* Olmi, 2011 (fossil); *Lonchodryinus* Kieffer, 1905; *Metanteon* Olmi, 1984. One hundred and sixty species, belonging to five genera (*Anteon*, *Anteonopsis*, *Deinodryinus*, *Janzeniola*, *Lonchodryinus*) are recorded from the Palaearctic (Olmi, pers. comm.; Olmi *et al.* 2010; Olmi, 2011; Xu *et al.* 2013).

As natural enemies, members of the Anteoninae are known to be ectoparasitoids of Cicadellidae (Hemiptera: Auchenorrhyncha) (Xu *et al.* 2013). So, some species of the subfamily are important in natural control of agricultural pests.

The Oriental species of the subfamily were revised recently (Xu *et al.* 2013), but the Palaearctic members of the subfamily are in need of revision due to their diversity and not updated keys. Forty Eastern-Palaearctic species, among which fifteen species of Anteoninae have been previously studied in South Korea (Kim *et al.* 2012; Kim & Lee 2013).

In recent years, the authors have collected many specimens of Dryinidae from Eastern Asia, not only from South Korea, but also from China, Japan, Mongolia and Russian Far East. The results of their research are presented below.

Material and methods

The terminology used in the present study follows that of Olmi (1984, 1994, 1999). Photographs were taken using an AxioCam MRc5 camera attached to the stereomicroscope (SteREO Discovery.V12; Carl Zeiss, Göttingen, Germany), processed using AxioVision Rel. 4.8.2 software (Carl Zeiss), and optimized with an i-delta imaging system (i-solution; IMT i-Solution Inc., Vancouver, Canada).

- Notauli reaching approximately 0.50–0.55 length of scutum; paramere approximately as long as penis 3. *A. autumnale* Olmi
- 13. Notauli reaching approximately 0.7–0.8 length of scutum 26. *A. songyangense* Xu, He & Olmi
- Notauli reaching approximately 0.5–0.6 length of scutum 14
- 14. Paramere approximately as long as penis 20. *A. munitum* Olmi
- Paramere much shorter than penis 30. *A. yuani* Xu, He & Olmi
- 15. Metafemur completely or partly black or brown 6. *A. esakii* Yasumatsu
- Metafemur wholly testaceous 16
- 16. Paramere with inner fold provided of mosaic drawing (Fig. 7) 31. *A. worakense* **sp. nov.**
- Paramere without inner fold provided of mosaic drawing (Fig. 9) 12. *A. ingenum* Olmi
- 17. Scutum punctate, unsculptured among punctures, not granulated 18
- Scutum granulated, or with anterior half or fourth strongly reticulate rugose and with posterior region strongly punctate .. 25
- 18. Head shiny, punctate, unsculptured among punctures, at most very slightly rugose on temple and behind ocellar triangle .. 19
- Head more or less reticulate rugose, at most with smooth area in front of anterior ocellus 23
- 19. Paramere with inner fold provided of mosaic drawing (Fig. 7) 31. *A. worakense* **sp. nov.**
- Paramere without inner fold provided of mosaic drawing (Fig. 12) 20
- 20. Notauli reaching about 0.25–0.35 length of scutum 28. *A. takenoi* Olmi
- Notauli reaching about 0.4–0.8 length of scutum 21
- 21. Notauli reaching about 0.6–0.8 length of scutum; POL less than twice as long as OL 11. *A. hilare* Olmi
- Notauli reaching about 0.4–0.6 length of scutum; POL more than twice as long as OL 22
- 22. Vertex of head behind ocellar triangle not rugose 25. *A. septentrionale* Xu, He & Olmi
- Vertex of head behind ocellar triangle slightly rugose 13. *A. insertum* Olmi
- 23. Notauli reaching about 0.5–0.6 length of scutum 6. *A. esakii* Yasumatsu
- Notauli reaching about 0.25–0.30 length of scutum 24
- 24. Frontal line complete 24. *A. reticulatum* Kieffer
- Frontal line incomplete, distinct only in front of anterior ocellus 28. *A. takenoi* Olmi
- 25. Scutum granulated 15. *A. jurineanum* Latreille
- Scutum punctate, unsculptured among punctures, with anterior half, or third, or fourth, rugose 26
- 26. Scutum with anterior half rugose; remaining area punctate and unsculptured among the punctures. 14. *A. japonicum*
- Scutum with anterior third or fourth rugose; remaining area punctate and unsculptured among the punctures 28. *A. takenoi* Olmi
- 27. Distal inner process of paramere extended medially and with inner margin excavated 8. *A. flavicorne* (Dalman)
- Distal inner process of paramere extended apically and with inner margin convex or straight, rarely slightly excavated 28
- 28. Genitalia with dorsal membranous process short, reaching about 0.5 length of parameres (Fig. 14) 7. *A. exiguum* (Haupt)
- Genitalia with dorsal membranous band long, reaching about 0.6–0.8 length of parameres (Fig. 13) 28
- 29. Head more strongly punctate, unsculptured among punctures, with a short or long frontal line 9. *A. gaullei* Kieffer
- Head finely punctate, smooth, unsculpture among punctures, without frontal line 30
- 30. Head with POL as long as OOL; notauli reaching 0.5 length of scutum 5. *A. ephippiger* (Dalman)
- Head with POL much shorter than OOL; notauli reaching about 0.6–0.7 length of scutum 27. *A. sulawesianum* Olmi

South Korean Anteoninae include species of both Palaearctic (sixteen species) and Oriental (fifteen species) origin. Two species, *Anteon magnatum* Kim & Lee and *Anteon worakense* **sp. nov.**, are known only from South Korea.

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