

**AN UPDATED CHECKLIST OF *Aleiodes* AND *Heterogamus* SPECIES
(Hymenoptera, Braconidae, Rogadinae) IN VIETNAM, WITH NEW RECORDS**

**Khuat Dang Long^{1,*}, Pham Quynh Mai^{1,2}, Pham Thi Nhi^{1,2},
Nguyen Duc Hiep¹, Tran Dinh Duong¹, Dang Thi Hoa¹**

¹Institute of Ecology and Biological Resources, VAST, Vietnam
²Graduate University of Science and Technology, VAST, Vietnam

Received 6 October 2022; accepted 5 March 2023

ABSTRACT

This is the most complete list of *Aleiodes* species of the subfamily Rogadinae from Vietnam, and of the total seventy five species of this genus reported, sixty three species of the subgenus *Aleiodes*, five of *Arcaleiodes*, three of *Chelonorhogas*, and four species of the genus *Heterogamus*. There are thirty species newly recorded from the Rogadinae fauna of Vietnam.

The information on valid names, the published papers of the first record of *Aleiodes* species in Vietnam and the distribution of *Aleiodes* species were also provided. Additionally, there are three species listed with information about their hosts, being agricultural pests controlled to some degree by these parasitoids.

Keywords: Ichneumonoidea, *Arcaleiodes*, *Chelonorhogas*, *Heterogamus*, *Hyperstemma*, biological control, new record, parasitoid.

Citation: Khuat Dang Long, Pham Quynh Mai, Pham Thi Nhi, Nguyen Duc Hiep, Tran Dinh Duong, Dang Thi Hoa, 2023. An updated checklist of *Aleiodes* and *Heterogamus* species (Hymenoptera, Braconidae, Rogadinae) in Vietnam, with new records. *Academia Journal of Biology*, 45(1): 1–9. <https://doi.org/10.15625/2615-9023/17562>

*Corresponding author email: khuatdanglong@gmail.com

©2023 Vietnam Academy of Science and Technology (VAST)

INTRODUCTION

Rogadinae is one of the most diverse subfamilies of the Braconidae, however, to date the family Braconidae of Vietnam generally and the subfamily Rogadinae particularly are hardly studied yet. The subfamily Rogadinae comprises representatives known as koinobiont endoparasitoids of mainly macrolepidopteran caterpillars, and pupating within the mummified host caterpillar remains is their characteristic behavioral trait (Shaw & Huddleston, 1991).

For several years braconid wasps were collected from all over Vietnam to get a first understanding of the fauna of Vietnam and to date we have published some papers on Rogadinae of Vietnam with descriptions of new species (Long, 2014; Long & van Achterberg, 2007, 2008a, 2008b, 2015, 2018; Long et al., 2018). *Aleiodes* Wesmael is the largest genus in the subfamily Rogadinae. Recently, the available information on *Aleiodes* species in Vietnam was summarized by Long (2003, 2011, 2017), Long & Belokobylskij (2003), Long & van Achterberg (2014), and there are forty five species of this genus previously recorded in Vietnam. We deal here with seventy five species, most of which are included because they have been recorded in Vietnam by the above mentioned authors, and the relevant specimens of the newly recorded for Vietnams's fauna were examined by us. Most species listed here have been described from the Oriental region (Chen & He 1997; Butcher et al., 2012).

MATERIALS AND METHODS

This study is based on specimens deposited in the Parasitic Hymenoptera Collection at the Institute of Ecology and Biological Resources (IEBR), Vietnam Academy of Science and Technology (VAST). The distribution of *Aleiodes* species within Vietnam is indicated in the order of areas, provinces (in brackets) from north to south, and outside Vietnam distribution (countries and/or regions) of species follows in alphabetical order (Yu et al., 2016). For

every species in this list we included the page citing species for Vietnam, except for thirty species indicated by an asterisk ‘(*)’ recorded for the first time from Vietnam, we mentioned the page of the original description.

Specimens of *Aleiodes* were collected mainly in Malaise traps, additional specimens have been collected principally in light traps and by net sweeping. To date the biology is only known for two species of the genus recorded from Vietnam that were reported as parasitoids, viz. *Aleiodes mythimnae*, a parasitoid of paddy armyworm, *Mythimna separata* (Noctuidae), a pest of maize and rice and *Aleiodes narangae*, a parasitoid of rice green semilooper, *Naranga aenescens* (Noctuidae), one of the pests of rice in Vietnam (Long & Belokobylskij, 2003; Long & van Achterberg, 2014; Long, 2017).

In this paper, all the *Aleiodes* species from Vietnam were checked using the most recent available works by Chen & He (1997) and Butcher et al. (2012). The outside country distribution data and some host data are taken from Yu et al. (2016). This is the first updated list of Vietnam's *Aleiodes* and *Heterogamus* fauna, but many specimens remained to await to be described.

Abbreviations used in this paper are as follows:

- C:** Central;
- CH:** Central Highlands;
- N:** North;
- NC:** North Central;
- NE:** Northeastern;
- NW:** Northwestern;
- S:** South.

RESULTS

Checklist and distribution of *Aleiodes* species

1. *Aleiodes* (A.) *abditivus* (Long & van Achterberg, 2008)

Long & van Achterberg, 2008: 316; Long & van Achterberg, 2014: 408

- Distribution: S Vietnam (Tay Ninh).
2. *Aleiodes* (A.) *aciculodeum* Quicke & Butcher, 2012
Butcher et al., 2012: 33; Long & van Achterberg, 2014: 408
Distribution: NW Vietnam (Lao Cai); Thailand.
3. *Aleiodes* (A.) *agagg* Quicke & Butcher, 2012
Butcher et al., 2012: 36; Long & van Achterberg, 2014: 408
Distribution: NE (Vinh Phuc), NW Vietnam (Phu Tho, Hoa Binh); Thailand.
4. *Aleiodes* (A.) *albigenus* Chen & He, 1997
Chen & He, 1997: 44; Long & van Achterberg, 2014: 408.
Distribution: NE Vietnam (Ha Giang, Thai Nguyen), NW Vietnam (Hoa Binh); China; Thailand.
- 5^(*). *Aleiodes* (A.) *anguaee* Quicke & Butcher, 2012
Butcher et al., 2012: 38.
Distribution: NE Vietnam (Tuyen Quang), NW Vietnam (Lao Cai), NC Vietnam (Ha Tinh); Thailand.
- 6^(*). *Aleiodes* (A.) *antescutum* Quicke & Butcher, 2012
Butcher et al., 2012: 40.
Host: Cabbage looper, *Trichoplusia ni* (Noctuidae).
Distribution: NW Vietnam (Lao Cai); Thailand.
7. *Aleiodes* (A.) *areelucki* Quicke & Butcher, 2012
Butcher et al., 2012: 43, 44; Long & van Achterberg, 2014: 408.
Distribution: Vietnam NE (Ha Giang, Thai Nguyen, Vinh Phuc); Thailand.
8. *Aleiodes* (A.) *ascrobi* Quicke & Butcher, 2012
Butcher et al., 2012: 44, 45; Long & van Achterberg, 2014: 409.
Distribution: NW Vietnam (Hoa Binh); Thailand.
9. *Aleiodes* (A.) *bachma* (Long, 2008)
Long & van Achterberg, 2008: 314; Long & van Achterberg, 2014: 409; Quicke et al., 2012: 47.
Distribution: NC Vietnam (Thua Thien-Hue).
10. *Aleiodes* (A.) *bachmaduplus* Quicke & Butcher, 2012
Butcher et al., 2012: 48; Long & van Achterberg, 2014: 409.
Distribution: N Vietnam (Ha Noi), NE Vietnam (Ha Giang), NW Vietnam (Hoa Binh), NC Vietnam (Thua Thien-Hue); Thailand.
- 11^(*). *Aleiodes* (A.) *brevimediis* Quicke & Butcher, 2012
Butcher et al., 2012: 55.
Distribution: NE Vietnam (Cao Bang, Ha Giang, Tuyen Quang, Vinh Phuc), NW Vietnam (Hoa Binh), CH Vietnam (Dak Lak); Thailand.
12. *Aleiodes* (A.) *buzurae* He & Chen, 1990
He & Chen, 1990: 202, 204; Quicke et al., 2012: 57; Long & van Achterberg, 2014: 409.
Distribution: NW Vietnam (Lai Chau); China; Thailand.
13. *Aleiodes* (A.) *buzuriquadruplus* Quicke & Butcher, 2012
Butcher et al., 2012: 58, 59; Long & van Achterberg, 2014: 409.
Distribution: N Vietnam (Ninh Binh), NC Vietnam (Thua Thien-Hue); Thailand.
14. *Aleiodes* (A.) *caprinus* Quicke & Butcher, 2012
Butcher et al., 2012: 64, 65; Long & van Achterberg, 2014: 409.
Distribution: NE Vietnam (Ha Giang, Thai Nguyen, Ninh Binh), NW Vietnam (Hoa Binh), S Vietnam (Tay Ninh); Thailand.

15. *Aleiodes (A.) centralis* Quicke & Butcher, 2012
Butcher et al., 2012: 67; Long & van Achterberg, 2014: 409.
Distribution: NW Vietnam (Lai Chau, Hoa Binh); Thailand.
16. *Aleiodes (A.) champa* Quicke & Butcher, 2012
Butcher et al., 2012: 67, 68; Long & van Achterberg, 2014: 409.
Distribution: NE Vietnam (Ha Giang); Thailand.
- 17^(*). *Aleiodes (A.) chenduplus* Quicke & Butcher, 2012
Butcher et al., 2012: 69.
Distribution: NE Vietnam (Vinh Phuc); Thailand.
- 18^(*). *Aleiodes (A.) conpectenus* Quicke & Butcher, 2012
Butcher et al., 2012: 77.
Distribution: NE (Vinh Phuc), NW Vietnam (Lai Chau, Phu Tho); Thailand.
- 19^(*). *Aleiodes (A.) definus* Quicke & Butcher, 2012
Butcher et al., 2012: 88.
Distribution: NW Vietnam (Lao Cai); Thailand.
- 20^(*). *Aleiodes (A.) deyoyoi* Quicke & Butcher, 2012
Butcher et al., 2012: 88, 89.
Distribution: NE Vietnam (Cao Bang), NW Vietnam (Lai Chau, Son La); Thailand.
- 21^(*). *Aleiodes (A.) divergenus* Quicke & Butcher, 2012
Butcher et al., 2012: 91, 92.
Distribution: NW Vietnam (Lao Cai); Thailand.
22. *Aleiodes (A.) drymoniae* Watanabe, 1937
Long, 2017: 509.
Distribution: NE Vietnam (Ha Giang); China, Japan, Korea, Russia.
23. *Aleiodes (A.) earias* Chen & He, 1997
Chen & He, 1997: 48; Long & van Achterberg, 2014: 409.
Distribution: N Vietnam (Hai Phong); Thailand.
24. *Aleiodes (A.) etvalinus* Quicke & Butcher, 2012
Butcher et al., 2012: 96; Long & van Achterberg, 2014: 409.
Distribution: NW Vietnam (Hoa Binh); Thailand.
25. *Aleiodes (A.) flavostriatus* Quicke & Butcher, 2012
Butcher et al., 2012: 100; Long & van Achterberg, 2014: 409
Distribution: N Vietnam (Ha Nam), NC Vietnam (Ha Tinh); Thailand.
26. *Aleiodes (A.) fruhstorferi* (Cameron, 1910).
Cameron, 1910b: 2; Shenefelt, 1975; Long & Belokobylskij, 2003: 396; Long & van Achterberg, 2014: 408.
Distribution: Vietnam (Tonkin); Oriental.
27. *Aleiodes (A.) gastritor* (Thunberg, 1822)
Chen & He, 1997: 52; Long & van Achterberg, 2014: 409
Distribution: N Vietnam (Ha Noi, Ninh Binh), NW Vietnam (Lao Cai, Son La); Eastern Palearctic; Europe; Nearctic; Oceanic; Oriental; Western Palearctic.
28. *Aleiodes (A.) glabribasalis* Quicke & Butcher, 2012
Butcher et al., 2012: 105, 106; Long & van Achterberg, 2014: 409
Distribution: NE Vietnam (Ha Giang), NW Vietnam (Hoa Binh); Thailand
29. *Aleiodes (A.) glutinum* Quicke & Butcher, 2012
Butcher et al., 2012: 107, 108; Long & van Achterberg, 2014: 409
Distribution: NW Vietnam (Hoa Binh); Thailand.

- 30^(*). *Aleiodes* (A.) *griseimaculus* Quicke & Butcher, 2012
Butcher et al., 2012: 108, 109.
Distribution: NC Vietnam (Quang Tri), C Vietnam (Quang Nam); Thailand.
- 31^(*). *Aleiodes* (A.) *klopfsteinae* Quicke & Butcher, 2012
Butcher et al., 2012: 117, 118.
Distribution: N Vietnam (Ha Noi), NW Vietnam (Hoa Binh); Thailand.
- 32^(*). *Aleiodes* (A.) *lemniscus* Quicke & Butcher, 2012
Butcher et al., 2012: 119, 120.
Distribution: NE Vietnam (Vinh Phuc); Thailand.
- 33^(*). *Aleiodes* (A.) *lipwigduplicitus* Quicke & Butcher, 2012
Butcher et al., 2012: 121, 122.
Distribution: N Vietnam (Ninh Binh), NE Vietnam (Cao Bang, Lang Son, Thai Nguyen), NW Vietnam (Hoa Binh), NC (Quang Binh: Phong Nha-Ke Bang); Thailand.
- 34^(*). *Aleiodes* (A.) *mediomaculatus* Quicke & Butcher, 2012
Butcher et al., 2012: 132, 133.
Distribution: NE Vietnam (Cao Bang); Thailand.
- 35^(*). *Aleiodes* (A.) *morti* Quicke & Butcher, 2012
Butcher et al., 2012: 138, 139.
Distribution: NW Vietnam (Lao Cai); Thailand.
36. *Aleiodes* (A.) *mythimnae* He & Chen, 1991
Chen & He, 1988: 354, 359; Chen & He, 1997: 55; Long, 2017: 515
Host: Paddy armyworm, *Mythimna separata* (Walker) (Noctuidae), a pest of maize and rice in Vietnam.
Distribution: N Vietnam (Ha Noi), NE (Cao Bang, Ha Giang), NW Vietnam (Hoa Binh); China.
37. *Aleiodes* (A.) *naevius* Chen & He, 1997
Chen & He, 1997: 55; Long & van Achterberg, 2014: 410
Distribution: NE Vietnam (Vinh Phuc); China.
38. *Aleiodes* (A.) *narangae* Rohwer, 1921
Chen & He, 1997: 56; Long 1998: 35; Long & Belokobylskij, 2003: 396; Long & van Achterberg, 2014: 408; Long, 2017: 518.
Host: Rice green caterpillar (semilooper) *Naranga aenescens* (Moore) (Noctuidae), one of the pests of rice in Vietnam.
Distribution: Throughout Vietnam; China; India; Japan; Malaysia; Philippines; Thailand.
- 39^(*). *Aleiodes* (A.) *necsubson* Quicke & Butcher, 2012
Butcher et al., 2012: 142.
Distribution: NW Vietnam (Lao Cai); Thailand.
- 40^(*). *Aleiodes* (A.) *niveni* Quicke & Butcher, 2012
Butcher et al., 2012: 143, 144.
Distribution: N Vietnam (Ninh Binh), NE Vietnam (Vinh Phuc), NW (Hoa Binh), NC Vietnam (Ha Tinh); Thailand.
- 41^(*). *Aleiodes* (A.) *opus* Quicke & Butcher, 2012
Butcher et al., 2012: 148.
Distribution: N Vietnam (Ninh Binh: Trang An); Thailand.
- 42^(*). *Aleiodes* (A.) *pallidinervis* Quicke & Butcher, 2012
Chen & He, 1997: 57.
Distribution: NE Vietnam (Cao Bang); China; Japan; Korea; Russia.
43. *Aleiodes* (A.) *paulmarshi* Quicke & Butcher, 2012
Butcher et al., 2012: 158; Long & van Achterberg, 2014: 410
Distribution: NW Vietnam (Lao Cai); Thailand.

- 44^(*). *Aleiodes (A.) pectunguis* Quicke & Butcher, 2012
Butcher et al., 2012: 160.
Distribution: NW Vietnam (Lao Cai); Thailand.
- 45^(*). *Aleiodes (A.) phantasmatis* Quicke & Butcher, 2012
Butcher et al., 2012: 162, 163.
Distribution: NE Vietnam (Cao Bang, Tuyen Quang); Thailand.
- 46^(*). *Aleiodes (A.) ponderi* Quicke & Butcher, 2012
Butcher et al., 2012: 167.
Distribution: NE Vietnam (Cao Bang, Ha Giang); Thailand.
47. *Aleiodes (A.) postmaculus* Quicke & Butcher, 2012
Distribution: NW Vietnam (Lao Cai), C Vietnam (Quang Nam); Thailand.
Butcher et al., 2012: 168; Long & van Achterberg, 2014: 410
- 48^(*). *Aleiodes (A.) prillae* Quicke & Butcher, 2012
Butcher et al., 2012: 169.
Distribution: NW Vietnam (Hoa Binh), NC Vietnam (Ha Tinh); Thailand.
- 49^(*). *Aleiodes (A.) pronopus* Quicke & Butcher, 2012
Butcher et al., 2012: 173, 174.
Distribution: NE Vietnam (Cao Bang, Ha Giang); Thailand.
- 50^(*). *Aleiodes (A.) protocastaneus* Quicke & Butcher, 2012
Butcher et al., 2012: 177.
Distribution: NE Vietnam (Cao Bang); Thailand.
- 51^(*). *Aleiodes (A.) reticulisoma* Quicke & Butcher, 2012
Butcher et al., 2012: 183.
Distribution: NW Vietnam (Lai Chau); Thailand.
52. *Aleiodes (A.) rincewindi* Quicke & Butcher, 2012
Distribution: N Vietnam (Ninh Binh). Thailand.
Butcher et al., 2012: 186; Long & van Achterberg, 2014:
- 53^(*). *Aleiodes (A.) risaeae* Quicke & Butcher, 2012
Butcher et al., 2012: 187.
Distribution: NW Vietnam (Lao Cai); Thailand.
- 54^(*). *Aleiodes (A.) rufomediis* Quicke & Butcher, 2012
Butcher et al., 2012: 189, 190.
Distribution: NE Vietnam (Cao Bang); Thailand.
- 55^(*). *Aleiodes (A.) rugoscutus* Quicke & Butcher, 2012
Butcher et al., 2012: 190, 191.
Distribution: NE Vietnam (Cao Bang); Thailand.
56. *Aleiodes (A.) seriatus* (Herrich-Schäffer, 1838)
Chen & He, 1997: 59; Long & van Achterberg, 2014: 410.
Distribution: N Vietnam (Ninh Binh), NE Vietnam (Ha Giang, Vinh Phuc), NW Vietnam (Hoa Binh), NC Vietnam (Ha Tinh, Thua Thien-Hue), S Vietnam (Tay Ninh); Armenia; Austria; Azerbaijan; Belgium; Bulgaria; China; Croatia; Czech Republic; Finland; France; Georgia; Germany; Greece; Hungary; Iran; Ireland; Italy; Japan; Kazakhstan; Korea; Lithuania; Mongolia; Netherlands; Poland; Russia; Slovenia; Spain; Sweden; Switzerland; Tunisia; Turkey; United Kingdom; former Yugoslavia.
57. *Aleiodes (A.) sesquipunctatus* Quicke & Butcher, 2012
Butcher et al., 2012: 195; Long & van Achterberg, 2014: 410
Distribution: N Vietnam (Ninh Binh), NE Vietnam (Ha Giang, Thai Nguyen), NW

- Vietnam (Phu Tho, Hoa Binh), NC Vietnam (Thua Thien-Hue); Thailand.
58. *Aleiodes* (A.) *stohelit* Quicke & Butcher, 2012
Butcher et al., 2012: 201; Long & van Achterberg, 2014: 410
Distribution: N Vietnam (Ninh Binh), NE Vietnam (Ha Giang), NW Vietnam (Hoa Binh); Thailand.
- 59^(*). *Aleiodes* (A.) *submarginatus* Quicke & Butcher, 2012
Butcher et al., 2012: 202.
Distribution: NE Vietnam (Cao Bang); Thailand.
- 60^(*). *Aleiodes* (A.) *subson* Quicke & Butcher, 2012
Butcher et al., 2012: 205.
Distribution: NE Vietnam (Cao Bang); Thailand.
61. *Aleiodes* (A.) *transvena* Quicke & Butcher, 2012
Butcher et al., 2012: 214; Long & van Achterberg, 2014: 410
Distribution: NE Vietnam (Ha Giang), NW Vietnam (Hoa Binh); Thailand.
- 62^(*). *Aleiodes* (A.) *vettinerii* Quicke & Butcher, 2012
Butcher et al., 2012: 222, 223.
Distribution: NE Vietnam (Cao Bang); Thailand.
63. *Aleiodes* (A.) *yalaesis* Quicke & Butcher, 2012
Butcher et al., 2012: 224, 225; Long & van Achterberg, 2014: 410
Distribution: C Vietnam (Quang Nam); Thailand.
64. *Aleiodes* (*Arcaleiodes*) *nitidus* (Chen & He, 1991)
Chen & He, 1991: 30, 32; Chen & He, 1997: 61; Long & van Achterberg, 2014: 410
Distribution: NW Vietnam (Phu Tho, Hoa Binh); China.
65. *Aleiodes* (Ar.) *hoanglienensis* Long, 2018
Long et al., 2018: 4
Distribution: NW Vietnam (Lao Cai).
66. *Aleiodes* (Ar.) *sapa* Long, 2018
Long et al., 2018: 5
Distribution: NW Vietnam (Lao Cai).
67. *Aleiodes* (Ar.) *siamensis* Quicke & Butcher, 2012
Butcher et al., 2012: 228; Long et al., 2018: 8.
Distribution: NW Vietnam (Phu Tho, Hoa Binh); Thailand.
68. *Aleiodes* (Ar.) *simulatus* Long, 2018
Long et al., 2018: 7.
Distribution: S Vietnam (Lam Dong).
69. *Aleiodes* (*Chelonorhogas*) *cariniventris* (Enderlein, 1912)
Chen & He, 1997: 31, 38; Long, 2017: 504, 521.
Distribution: NW Vietnam (Hoa Binh); China.
70. *Aleiodes* (Ch.) *coronarius* Chen & He, 1991
Chen & He, 1991: 30, 33; Chen & He, 1997: 39; Long & van Achterberg, 2014: 410; Long, 2017: 504, 523.
Distribution: N Vietnam (Ha Noi), NE Vietnam (Ha Giang), NW Vietnam (Lai Chau, Hoa Binh), NC Vietnam (Ha Tinh), CH (Gia Lai); China.
71. *Aleiodes* (Ch.) *convexus* van Achterberg, 1991 [= *A. rufithorax* (Enderlein, 1920)]
Chen & He, 1997: 39; Belokobylskij & Tobias, 2000: 30; Long & Belokobylskij, 2003: 396; Quicke et al., 2012: 80.
Distribution: N Vietnam (Ha Noi), NW Vietnam (Hoa Binh), CH (Gia Lai); China; Japan; Thailand.
72. *Heterogamus* *crassinervis* (Chen & He, 1997)

Chen & He, 1997: 46; Long & van Achterberg, 2014: 409.

Distribution: NC Vietnam Vietnam (Quang Tri); China.

73. *Heterogamus dispar* (Haliday, 1833)

van Achterberg, 1985: 181; 1991: 24; Chen & He, 1997: 47; Long & van Achterberg, 2014: 410

Distribution: NW Vietnam (Hoa Binh); Eastern Palaearctic; Europe; Oriental; Western Palaearctic.

74. *Heterogamus excavatus* Telenga, 1941

van Achterberg, 1984: 184; Chen & He, 1997: 51; Long & van Achterberg, 2014: 309

Distribution: N Vietnam (Ninh Binh); Belgium; Bulgaria; China; Croatia; Czech Republic; France; Georgia; Hungary; Ireland; Italy; Kazakhstan; Kyrgyzstan; Lithuania; Netherlands; Romania; Russia; Slovakia; Switzerland; United Kingdom; former Yugoslavia.

75. *Heterogamus takasuae* (van Achterberg, 1985)

Long & van Achterberg, 2014: 410; Long, 2017: 503, 526.

Distribution: NE Vietnam (Ha Giang); China, Japan, Russia.

DISCUSSION

Checking the rogadine specimens based on the original descriptions of all the known *Aleiodes* species from the Oriental region in Chen & He (1997) and Butcher et al. (2012) revealed thirty species newly recorded from the rogadine fauna of Vietnam. A combination of main morphological features, i.e. occipital and propodeal carinae, measurements of wing veins and the colour patterns of metasomal tergites, seem to be the best characters for distinguishing between *Aleiodes* and *Heterogamus* species from Vietnam.

Acknowledgements: This research is mainly supported by the two projects No. NVCC 09.01/22-23 and UQĐTCB.07/22-24 funded by the Vietnam Academy of Science and

Technology, thanks are due to Phia Oac National Park and its staffs for setting traps and collecting specimens in 2022. The authors wish to thank Dr Kees van Achterberg, Naturalis Biodiversity Center, Leiden (RMNH), the Netherlands for his comments and corrections to improve the manuscript.

REFERENCES

- Butcher B. A., Smith M. A., Sharkey M. J., Quicke D. L. J., 2012. A turbo-taxonomic study of Thai *Aleiodes* (*Aleiodes*) and *Aleiodes* (*Arcaleiodes*) (Hymenoptera: Braconidae: Rogadinae) based largely on COI barcoded specimens, with rapid descriptions of 179 new species. *Zootaxa*, 3457: 1–232.
- Chen X-X., He J-H., 1991. Seven new species of the genus *Aleiodes* Wesmael with pale antennal segments from China (Hymenoptera: Braconidae: Rogadinae). (in Chinese with English summary), *Entomotaxonomia*, 13: 29–38.
- Chen X-X., He J-H., 1997. Revision of the subfamily Rogadinae (Hymenoptera: Braconidae) from China. *Zoologische Verhandelingen*, 308: 1–187.
- Long K. D., 1998. A complementary list of Braconid wasps (Hymenoptera, Braconidae) from Vietnam. *Academia Journal of Biology (Tap chi sinh hoc)*, 20(4) 32–36 (in Vietnamese with English summary).
- Long K. D., 2011. (Monograph). Parasitic wasps of the family Braconidae (Hymenoptera) and their use for biological control in Vietnam. Publishing House for Science and Technology, Ha Noi, 2011: 1–368 (in Vietnamese).
- Long K. D., 2014. New records of the genus *Iporhogas* Granger (Hymenoptera: Braconidae: Rogadinae) from Vietnam, with description of new species. *ZooKeys*, 428: 79–96. <https://doi.org/10.3897/zookeys.428.7729>
- Long K. D., 2017. Fauna of Vietnam, vol. 27, Insecta, Hymenoptera, Braconidae: Alysiinae, Aphidiinae, Betylobraconinae,

- Brachistinae, Doryctinae, Euphorinae, Exothecinae, Microgastrinae and Rogadinae. Publishing House for Science and Technology, Ha Noi, 2017: 1–698. ISBN 978049136757.
- Long K. D., Hiep N. D., Nhi P. T., Hoa D. T., 2018. New records of rare genera of the subfamily Rogadinae (Hymenoptera: Braconidae), with description of nine new species from Vietnam. *Academia Journal of Biology*, 40(3): 1–22. <https://doi.org/10.15625/0866-7160/v40n3.1-22>
- Long K. D., Belokobyskij S. A., 2003. A preliminary list of the Braconidae (Hymenoptera) of Vietnam. *Russian Entomological Journal*, 12(4): 385–398.
- Long K. D., van Achterberg C., 2008a. Four new species of the genus *Conspinaria* Schulz (Hymenoptera: Braconidae: Rogadinae) from Vietnam. *Zoologische Mededelingen Leiden*, 82(31): 303–312.
- Long K. D., van Achterberg C., 2008b. One new genus and seven new species of Rogadinae (Hymenoptera: Braconidae) from Vietnam. *Zoologische Mededelingen, Leiden*, 82: 313–329.
- Long K. D., van Achterberg C., 2014. An additional list with new records of Braconid wasps of the family Braconidae (Hymenoptera) from Vietnam. *Academia Journal of Biology (Tap chi sinh hoc)*, 36(4): 397–415. <https://doi.org/10.15625/0866-7160/v36n4.5979>
- Long K. D., van Achterberg C., 2015. Review of the genus *Canalirogas* van Achterberg & Chen, 1996 (Hymenoptera: Braconidae: Rogadinae) with description of ten new species from Vietnam. *ZooKeys*, 506: 27–59. <https://doi.org/10.3897/zookeys.506.9247>
- Long K. D., van Achterberg C., 2018. New record of the genus *Darnilia* van Achterberg, 1989 (Hymenoptera: Braconidae: Rogadinae) from Vietnam, with description of three new species. *Zootaxa*, 4457 (3): 455–464. <https://doi.org/10.11646/zootaxa.4457.3.7>
- van Achterberg C., Pentead-Diaz A. M., 1995. Six new species of the *Aleiodes dispar* group (Hymenoptera: Braconidae: Rogadinae). *Zoologische Mededelingen, Leiden*, 69: 1–18.
- Yu D. S., van Achterberg K., Horstmann K., 2016. Biological and taxonomical information: Ichneumonoidea 2016. Taxapad Interactive Catalogue, Ottawa. Database on flash drive.