

THE NEARCTIC *CHALYBION ZIMMERMANNI* (HYMENOPTERA: SPHECIDAE) REAPPEARS IN EUROPE: A NEW RECORD OF AN ALIEN SPECIES IN GREECE

Jakovos Demetriou^{1, 2}, George Kakiopoulos³ & Evangelos Koutsoukos^{1, 2}

¹ Section of Ecology and Systematics, Department of Biology, National and Kapodistrian University of Athens, 15784 Athens, Greece, e-mails: jakovosdemetriou@gmail.com & vag18000@gmail.com

² Museum of Zoology, National and Kapodistrian University of Athens, 15784 Athens, Greece

³ Ilidos 60-62 street, 11527 Athens (Ampelokipi), Greece, e-mail: strepens@yahoo.com

Published online: March 4, 2021

Genus *Chalybion* Dahlbom, 1843 is represented by 51 species, distributed across the globe (Pulawski 2020). In the European fauna it is represented by six native species, namely: *Ch. flebile* (Lepeletier, 1845), *Ch. femoratum* (Fabricius, 1781), *Ch. klapperichi* (Balthasar, 1957), *Ch. minos* (de Beaumont, 1965), *Ch. omissum* (Kohl, 1889) and *Ch. walteri* (Kohl, 1889) (Pulawski 2020), all present in Greece (Hensen 1988, Standfuss & Standfuss 2006, Dollfuss 2016). In addition, three species alien to the European continent have been identified, the Oriental *Ch. bengalense* (Dahlbom, 1845) established in Italy (Mei et al. 2012), the Nearctic *Ch. californicum* (Saussure, 1867) reported from Croatia (Mei & Bošćik 2016) and the Nearctic *Ch. zimmermanni* Dahlbom, 1843 intercepted until now only once in Belgium (Leclercq 1994). In this publication we report the first alien species of the genus *Chalybion* from Greece.

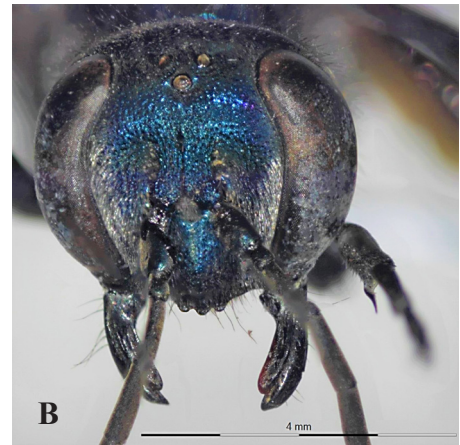
Examined material: Greece, Thessaly, Karditsa Province, Magoulitsa, 39.42°N 21.76°E, 1♀, alt. 120 m, 10.vii.2020, leg. G. Kakiopoulos (Fig. 1). The specimen is deposited at the Museum of Zoology of the National and Kapodistrian University of Athens (ZMUA, voucher code: ZMUA HYM 041). The female specimen is identified as *Ch. zimmermanni* following the identification keys and species descriptions of Hensen (1988). The black erect pubescence covering the head and thorax as well as the dark brown wings can be used to set this species apart from others, within the *bengalense* species group (Hensen 1988). In addition, the specimen is distinguished from the similar *C. californicum* by the presence of a mandibular subapical tooth (absent in *Ch. californicum*), the presence of three clypeal teeth of equal width (narrower median tooth in *Ch. californicum*), the absence of an angular carina (characteristic of the monotypic *californicum* species group) and the absence of tarsal plantulae (present in *Ch. californicum*) (Hensen 1988, Mei & Bošćik 2016). This finding constitutes the first record of *Ch. zimmermanni* from Greece and only the second reported introduction incident of the species in the European Continent.

As only one individual was collected from a building wall, in a rural area, no remarks concerning the species ecology or the presence of an established population can be made. Ward & Cole (1975) stated that captive individuals were attracted to *Conium maculatum* L. and *Pastinaca sativa* L. Both plant species are widely distributed in the Greek mainland (Dimopoulos et al. 2013, Strid et al. 2020) and their flowering period coincides with the specimen's collection date.

The alien *Chalybion zimmermanni* new to Greece



Fig. 1. *Chalybion zimmermanni* Dahlbom, 1843, ♀ (ZMUA). **A.** dorsal view, forewing length = 13 mm; body length = 20mm. **B.** head, anterior view, mandibles with subapical tooth, clypeus with 3 teeth of equal width (scale bar: 4 mm).



Chalybion zimmermanni is known to utilize old nests belonging to species of the genus *Sceliphron* Klug, 1801 and pre-existing cavities in wood (Bohart & Menke 1976, Ward 1971). According to Ward & Ode (1984) the majority of the species active nests were built in wood while only a small proportion (9%) accounted for used nests of *Sceliphron caementarium* (Drury, 1773), used nests of *Trypoxylum politum* Drury, 1773, or other material. The species accidental introduction in Greece may have been mediated by the transport of utilized old *Sceliphron* spp. nests, which are easily carried throughout great distances via international trade. The Nearctic *S. caementarium*, whose nesting habits have been closely associated with human settlements (Bohart & Menke 1976), may have acted as a mediator of this transport. Alien to Europe, it has been identified in Greece only recently (Demetriou et al. 2020) and its range expansion in Europe may have well facilitated the dispersal of *Ch. zimmermanni*. Alternatively, the species may have reached the Greek mainland by emerging from imported cargo including timber, ornamental or horticultural trees.

The success of the presented introduction, through the formation of established populations, and potential adverse ecological impacts should be re-addressed after the examination of further future material, spider prey and possible nuisance to native *Sceliphron* spp. and xylophagous insects.

Acknowledgements

We are highly grateful to Dr. Maurizio Mei (Università di Roma "Sapienza", Italy) for comments on the identification of the specimen as well as for his valuable revision, corrections and comments regarding the manuscript. We would also like to thank Fanourios - Nikolaos Sakellarakis (Tour du Valat, France) for providing us literature regarding the referred plant species and for his helpful corrections on the manuscript.

Literature

- Bohart, R. M. & Menke, A. S. 1976. Sphecid wasps of the world. A generic revision. - University of California Press, Berkeley 695 pp.
- Demetriou, J., Kalaentzis, K., Kazilas, C., Georgiadis, C., Turrisi, G. F. & Koutsoukos, E. 2021. The alien black-and-yellow mud dauber *Sceliphron caementarium* (Hymenoptera: Sphecidae) continues its spread: new citizen-science records from Eastern Europe and the Balkans (in press.).
- Dimopoulos, P., Raus, T., Bergmeier, E., Constantinidis, T., Iatrou, G., Kokkini, S., Strid, A. & Tzanoudakis, D. 2013. Vascular Plants of Greece: An annotated checklist. - Berlin: Botanischer Garten und Botanisches Museum Berlin-Dahlem; Freie Universität Berlin; Athens: Hellenic Botanical Society [Englera 31] 370 pp.
- Dollfuss, H. 2016. The Chloriontinae, Sceliphrinae and Sphecinae Wasps of the "Biologiezentrum Linz"-collection in Linz, Austria including the genera *Chalybion* Dahlbom, *Chlorion* Latreille, *Dynatus* Lepeletier de Saint Fargeau, *Penepodium* Menke, *Podium* Fabricius, *Sceliphron* Klug, *Stangeella* Menke and *Trigonopsis* Perty (Hymenoptera, Apoidea, Sphecidae) and description of the new species *Chalybion ohli* from Madagascar. - Linzer Biologische Beiträge 48:1149-1185.
- Hensen, R. V. 1988. Revision of the nominate subgenus *Chalybion* Dahlbom (Hymenoptera, Sphecidae). - Tijdschrift voor Entomologie 131: 13-64.
- Leclercq, J. 1994. Un Hyménoptère Sphecidae vert bleuté *Chalybion zimmermanni* Dahlbom *aztecum* (Saussure) égaré en Belgique, à Tournai. - Lambillionea 94: 367-370.
- Mei, M. & Bošćik, I. 2016. Evidence of the introduction into Europe of the Nearctic mud-dauber wasp *Chalybion californicum* (de Saussure) (Hymenoptera, Sphecidae). - Boletín de la Sociedad Entomológica Aragonesa (S.E.A.) 58: 239-240.
- Mei, M., Pezzi, G., De Togni, R. & Devincenzo, U. 2012. The oriental mud-dauber wasp *Chalybion bengalense* (Dahlbom) introduced in Italy (Hymenoptera, Sphecidae). - Ampulex 5: 37-41.
- Pulawski, W.J. 2020. Catalog of Sphecidae sensu lato. California Academy of Sciences, Golden Gate Park, San Francisco, California, USA. Available online at: <https://www.calacademy.org/scientists/projects/catalog-of-sphecidae> [accessed on 06 October 2020].
- Standfuss, K. & Standfuss, L. 2006. Zum aktuellen Artenbestand der Pemphredoninae, Bembicinae und Sphecinae (Hymenoptera: Crabronidae p.p. et Sphecidae) der planar-kollinen Vegetationsstufe in Südost-Thessalien/Griechenland. - Entomofauna 27(26): 301-316.
- Strid, A., Bergmeier, E. & Fotiadis, G. 2020. Flora and Vegetation of the Prespa National Park. - Society for the Protection of Prespa, Greece, 527 pp.
- Ward, G. L. & Cole, K. J. 1975. Additions to the life history of *Chalybion zimmermaenni* Dahlbom (Hymenoptera: Sphecidae). - Proceedings of the Indiana Academy of Science 84:284.
- Ward, G. L. & Ode, P. 1984. Current Status of the Blue Wasp, *Chalybion zimmermanni* Dahlbom, in Southeastern Indiana. - Proceedings of the Indiana Academy of Sciences 93: 229-230.
- Ward, G. L. 1970. The occurrence of *Chalybion zimmermanni* Dahlbom (Sphecidae) in Indiana. Proceedings of the Indiana Academy of Sciences 79:231-233.
- Ward, G. L. 1971. Nest site preference of *Chalybion zimmermanni* Dahlbom. - Proceedings of the Indiana Academy of Sciences 80: 264-266.