



## A new species of *Trisecodes* from the Afrotropics (Hymenoptera, Eulophidae)

ALEX GUMOVSKY

Schmalhausen Institute of Zoology, 15 Bogdan Khmelnytsky St., 01601 Kiev MSP, Ukraine.

E-mail: [gumovsky@izan.kiev.ua](mailto:gumovsky@izan.kiev.ua), [entedon@gmail.com](mailto:entedon@gmail.com)

### Abstract

The first Afrotropical species of *Trisecodes* Delvare & LaSalle, 2000, *T. africanum* Gumovsky, **sp. n.**, is described from localities in Uganda, Guinea and Cameroon. The new species differs from the type species of the genus, *T. agromyzae*, which was described from the Neotropical region in Belize, mostly by having longitudinally strigate sculpture on the mesosoma dorsally and by the fore wing being somewhat darkened in its basal three-fifths. A possible Gondwanan origin of the genus is postulated.

**Key words:** Afrotropical region, new species

### Introduction

*Trisecodes* was described by Delvare and LaSalle (2000) from a single species, *T. agromyzae*, reared from larvae of Agromyzidae (Diptera) leaf-miners in the Neotropical region (Belize). The genus was assigned to the subfamily Entedoninae of Eulophidae (Hymenoptera: Chalcidoidea) because of the possession of some characteristic features of this subfamily, but uniquely possessing three- rather than four-segmented tarsi (Delvare and LaSalle, 2000). Three-segmented tarsi are diagnostic of the chalcidoid family Trichogrammatidae, which also share many habitus features with *Trisecodes*, such as a reduced number of antennal segments and similar fore wing venation. The only other occurrence of three-segmented tarsi in Eulophidae was reported later for males of *Melittobia* Westwood (Tetrastichinae) (Gumovsky, 2011). However, apart from Trichogrammatidae and Eulophidae, three-segmented tarsi also occur in some other groups of Chalcidoidea, including *Pteroptrix* Westwood (Aphelinidae: Coccophaginae), *Kikiki* Huber & Beardsley and *Enneagmus* Yoshimoto (Mymaridae), and in males of some fig-associated pteromalids of the subfamily Otitesellinae (Heraty *et al.* 2013).

Recent molecular and combined (morphological and molecular) studies have demonstrated an unexpected position of *Trisecodes* in Chalcidoidea—outside of Eulophidae (Burks *et al.* 2011), and as sister group either to Tetracampidae (Munro *et al.* 2011), or Trichogrammatidae (Heraty *et al.* 2013). However, no strong support was obtained for the relationships of *Trisecodes* with the two latter families, so the genus remains provisionally an unplaced taxon within Eulophidae as proposed by Burks *et al.* (2011).

This report describes the first Afrotropical species of *Trisecodes*. This species was previously recorded, but remained undescribed because the record was based on a single specimen collected in 1980 in Cameroon (Gumovsky *et al.* 2006). Recent studies and field surveys in Africa (A.V. Gumovsky, unpublished) produced a series of additional specimens, which enable a reliable comparative description of this new species of the enigmatic genus *Trisecodes*.

### Material and methods

The following abbreviations are used for depositories: BMNH, The Natural History Museum (London, UK), and RMCA, The Royal Museum of Central Africa (Tervuren, Belgium).

presumed to have taken place in the Late Cretaceous or soon after (Heraty *et al.* 2013). Phylogenetic analyses (Burks *et al.* (2011), Munro *et al.* (2011) and Heraty *et al.* (2013) suggest a sister-group relationship of *Trisecodes* with either Tetracampinae or Trichogrammatidae, or as the sister group to most or all other Eulophidae. This may support a presumption that the common ancestor of the mentioned groups branched off in Gondwana (ca. 120–60 Mya), and that *Trisecodes* diversified when modern Africa and South America were not yet separated. Further studies (paleontological, in particular) are required to test such a hypothesis.

## Acknowledgements

This paper represents a part of the revisionary research on Afrotropical Entedoninae of the author, supported by the Belgian Science Policy (BELSPO) and Marie-Curie Actions. The author thanks Eliane De Coninck, Mark De Meyer, Arnaud Hernard and Didier Van den Spiegel for their assistance during the author's stay in RMCA, Natalie Dale-Skey Papilloud and John Noyes for the access to the BMNH comparative collection, and Fredrick Kizza (Uganda Wildlife Authority) for the help while working in Uganda.

## References

- ArcelorMittal (2010) *Geography and Environment of Northern Nimba County, Liberia*. October 2010, Environmental and Social Studies, 29 pp. Available from: <http://liberia.arcelormittal.com/~media/Files/A/ArcelorMittal-Liberia/reports-and-presentations/introduction-to-northern-nimba-john-howell.pdf> (accessed 23 July 2014)
- Burks, R.A., Heraty, J.M., Gebiola, M. & Hansson, C. (2011) Combined molecular and morphological phylogeny of Eulophidae (Hymenoptera: Chalcidoidea), with focus on the subfamily Entedoninae. *Cladistics*, 27, 581–605. <http://dx.doi.org/10.1111/j.1096-0031.2011.00358.x>
- Chege, F., Onyango, G., Drazu, C. & Mwandha, S. (2002) *Kibale and Semuliki Conservation and Development Project End of Phase III / End-of-Project Evaluation*. IUCN/UWA, Kampala, 76 pp. Available from: [http://cmsdata.iucn.org/downloads/kscdp\\_final.pdf](http://cmsdata.iucn.org/downloads/kscdp_final.pdf) (accessed 23 July 2014)
- Delvare, G. & LaSalle, J. (2000) *Trisecodes* gen. n. (Hymenoptera, Eulophidae, Entedoninae), the first eulophid with three tarsal segments. *Journal of Hymenoptera Research*, 9 (2), 305–312.
- Eady, R.D. (1968) Some illustrations of microsculpture in the Hymenoptera. *Proceedings of the Royal Entomological Society of London, Series A (General Entomology)*, 43 (4–6), 66–72. <http://dx.doi.org/10.1111/j.1365-3032.1968.tb01029.x>
- Gibson, G.A.P. (1997) Chapter 2. Morphology and Terminology. In: Gibson, G.A.P., Huber, J.T. & Woolley, J.B. (Eds.), *Annotated Keys to the Genera of Nearctic Chalcidoidea (Hymenoptera)*. National Research Council Research Press, Ottawa, pp. 16–44.
- Gumovsky, A.V. (2011) Molecular data support the existence of four main lineages in the phylogeny of Eulophidae (Hymenoptera). *Russian Entomological Journal*, 20 (3), 273–286.
- Gumovsky, A., Bouček, Z. & Delvare, G. (2006) New genera and species of Afrotropical Entedoninae (Hymenoptera, Eulophidae). *Zoologische Mededelingen, Leiden*, 80–81 (4), 74–75.
- Heraty, J.M., Burks, R.A., Cruaud, A., Gibson, G.A.P., Liljeblad, J., Munro, J., Rasplus, J.-Y., Delvare, G., Janšta, P., Gumovsky, A., Huber, J., Woolley, J.B., Krogmann, L., Heydon, S., Polaszek, A., Schmidt, S., Darling, D.C., Gates, M.W., Mottern, J., Murray, E., Dal Molin, A., Triapitsyn, S., Baur, H., Pinto, J.D., van Noort, S., George, J. & Yoder, M. (2013) A phylogenetic analysis of the megadiverse Chalcidoidea (Hymenoptera). *Cladistics*, 29, 466–542. <http://dx.doi.org/10.1111/cla.12006>
- Munro, J.B., Heraty, J.M., Burks, R.A., Hawks, D., Mottern, J., Cruaud, A., Rasplus, J.-Y. & Janšta, P. (2011) A Molecular Phylogeny of the Chalcidoidea (Hymenoptera). *PLoS ONE*, 6 (11), e27023. <http://dx.doi.org/10.1371/journal.pone.0027023>
- Nampewo, C. (2013) Saving Mabira rainforest: using public interest litigation in Uganda to save Mabira and other rainforests. *Boston College environmental affairs law review*, 40 (2), 523–553. <http://dx.doi.org/10.2139/ssrn.2202587>
- Stamelman, A. (2006) *Contested conservation: Past and present conservation praxis in the Great Lakes Region of Africa*. Master of Arts, University of Cape Town, 106 pp. Available from: [http://uctscholar.uct.ac.za/PDF/98012\\_Stamelman\\_A.pdf](http://uctscholar.uct.ac.za/PDF/98012_Stamelman_A.pdf) (accessed 23 July 2014)