



## Encyrtidae (Hymenoptera: Chalcidoidea) from the Kingdom of Saudi Arabia

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## Abstract

This is the first major contribution to the fauna of the family Encyrtidae (Hymenoptera: Chalcidoidea) of the Kingdom of Saudi Arabia. The following new genus and 15 new species are described: *Anagyrus azolus* Hayat, **sp. nov.**, *A. raidahensis* Hayat, **sp. nov.**, *Arabencyrtus qahtanii* Hayat, **gen. et sp. nov.**, *Cerchysiella arabia* Hayat, **sp. nov.**, *C. azeeza* Hayat, **sp. nov.**, *Cheiloneurus arabiacus* Hayat, **sp. nov.**, *Leptomastidea abyad* Hayat, **sp. nov.**, *Mahencyrtus asirensis* Hayat, **sp. nov.**, *Metaphycus albidus* Hayat, **sp. nov.**, *Microterys axonis* Hayat, **sp. nov.**, *Neastymachus bolus* Hayat, **sp. nov.**, *N. ceelus* Hayat, **sp. nov.**, *Ooencyrtus likinis* Hayat, **sp. nov.**, *O. seronis* Hayat, **sp. nov.**, *Zaomma astra* Hayat, **sp. nov.** The following 27 genera are newly recorded from Saudi Arabia: *Achalcerinys* Girault, *Aphycus* Mayr, *Apoleptomastix* Kerrich, *Callipteroma* Motschulsky, *Cerchysiella* Girault, *Cerchysius* Westwood, *Charitopus* Foerster, *Cheiloneurus* Westwood, *Coelopencyrtus* Timberlake, *Copidosoma* Ratzeburg, *Helegonatopus* Perkins, *Homalotylus* Mayr, *Lamennaisia* Girault, *Leptomastidea* Mercet, *Leptomastix* Foerster, *Mahencyrtus* Masi, *Mayridia* Mercet, *Microterys* Thomson, *Neastymachus* Girault, *Ooencyrtus* Ashmead, *Paraclausenia* Hayat, *Prionomastix* Mayr, *Prochiloneurus* Silvestri, *Rhopus* Foerster, *Syr-*

*phophagus* Ashmead, *Tyndarichus* Howard, *Zaomma* Ashmead. The following 27 species are newly recorded from Saudi Arabia: *Achalcerinys lindus* (Mercet), *Anagyrus gracilis* (Hayat), *A. shahidi* Hayat, *Aphycus secundus* (Mercet), *Apoleptomastix bicoloricornis* (Girault), *Callipteroma sexguttata* Motschulsky, *C. testacea* Motschulsky, *Cerchysius ugandensis* Kerrich, *Charitopus andalusicus* Mercet, *Cheiloneurus elegans* (Dalman), *C. quadricolor* (Girault), *Coelopencyrtus krishnamurtii* (Mahdihassan), *Comperiella aspidiotiphaga* Subba Rao, *Copidosoma floridanum* (Ashmead), *Habrolepis obscura* Compere & Annecke, *Helegonatopus formosus* (Mercet), *Homalotylus flaminus* (Dalman), *Lamennaisia ambigua* (Nees), *L. nobilis* (Nees), *Leptomastix dactylopii* Howard, *L. tsukumiensis* Tachikawa, *Mayridia pulchra* Mercet, *Paraclaussenia herbicola* Hayat, *Prochiloneurus aegyptiacus* (Mercet), *P. pulchellus* Silvestri, *Rhopus nigroclavatus* (Ashmead), *Syrphophagus aphidivorus* (Mayr). Eleven species belonging to the genera *Anagyrus* Howard, *Charitopus*, *Helegonatopus*, *Mayridia*, *Metaphycus* Mercet, *Ooencyrtus*, *Prionomastix*, *Syrphophagus*, and *Tyndarichus*, were not identified to species for the reasons given in the text. The known species treated in this paper, except for some well known species, are illustrated with suitable figures, and some species are either diagnosed or redescribed.

**Key words:** Arabian encyrtids, new records, new species

## Introduction

The chalcidoid (Hymenoptera) fauna of the Kingdom of Saudi Arabia is, to say the least, very poorly known, hitherto represented by 40 species in 31 genera and 9 families (Noyes 2013; Narendran & Ahmad 2013). During 2011 to 2013, the second and the third authors (ZA, FRK) collected a large number of chalcidoid specimens belonging to several families, and forwarded to the first author (MH) specimens belonging to the Encyrtidae and Aphelinidae. This paper deals with the family Encyrtidae.

The Encyrtidae prior to our studies was represented in Saudi Arabia by only five species (Noyes 2013). These are: *Anagyrus indicus* (Subba Rao), *A. pseudococci* (Girault), *Comperiella lemniscata* Compere & Annecke, *Habrolepis rouxi* Compere, and *Metaphycus asterolecanii* (Mercet).

This is the first major contribution to the documentation of the encyrtids of Saudi Arabia. We record from Saudi Arabia 27 genera for the first time (in addition to the four already known genera) and 27 species, and describe a new genus and 15 new species. Of the 32 genera, including the new genus, the following 9 genera belong to the subfamily Tetracneminae: *Anagyrus* Howard, *Apoleptomastix* Kerrich, *Arabencyrtus* Hayat, **gen. nov.**, *Callipteroma* Motschulsky, *Charitopus* Foerster, *Leptomastix* Mercet, *Leptomastix* Foerster, *Paraclaussenia* Hayat, and *Rhopus* Foerster; remaining 23 genera belong to the Encyrtinae.

## Methods

Colour, sculpture and dimensions of various body parts were noted from card mounted specimens (including holotypes), prior to mounting some of these specimens on slides in Canada balsam. In the descriptions of new species, the relative measurements, unless noted otherwise, are from card mounted holotypes. In the 'Material examined' sections, the specimens, unless otherwise noted, are on cards.

The terminology given by Hayat (2006) is followed except for the use of the terms mesosoma for the thorax plus propodeum, and metasoma for the petiole plus gaster. Only body lengths are given in millimetres; all other measurements are relative, taken from the divisions of a linear scale of a micrometer placed in the eye piece of a stereozoom binocular microscope at 10× Zoom 8 (one micrometer division = 0.01234 mm) for carded specimens, and placed in the eye piece of a compound microscope at 100× magnification (one micrometer division = 0.00987 mm) for slide-mounted parts.

Original citations and more recent citations are given to all the already known species as these species are all newly recorded from Saudi Arabia.

The following abbreviations are used in the text:

AOL =Minimum distance between a posterior ocellus and the anterior ocellus.

(#F) =Collection number given by Dr. F.R. Khan for the material he collected. (This and two other abbreviations that indicate the method used for collecting the specimens are placed in parentheses in "Material examined".)

Metasoma (on slide) about 1.5× as long as mesosoma; TI and TV with characteristic glandular areas; ovipositor, as seen through the derm, extends from base of TII of gaster, and exerted to 0.14× gaster length. *Relative measurements* (holotype, slide)—TVII length, 28; ovipositor length, 49; third valvula length, 10.

*Male*. Unknown.

**Material examined.** Holotype (ZDAMU, registration No. HYM.CH.693), ♀ (on slide under 3 coverslips, slide No. EH.1592), labelled “KSA: AL-BAHA: Qunfudah, vi.2012, (MT), Coll. Z. Ahmad”.

**Distribution.** Saudi Arabia: Al-Baha.

**Etymology.** The species name is an arbitrary combination of letters, and may be taken as a noun in apposition.

**Comments.** The absence of a brush of setae on apical third of the scutellum, and the presence of a dark brown, sub-basal band or ring on mid tibia, exclude this new species from the species included in the keys given by Gordh & Trjapitzin (1979) and Trjapitzin (1989). In the key to the Afrotropical species by Prinsloo (1979b), the new species runs to couplet number 2 (*Z. carinae* Prinsloo, *Z. xhosa* Prinsloo), and appears similar to *Z. carinae*, but differs as follows: antenna with F1–F4 subequal in length, F5 larger and longer than F4; F5 and F6 with longitudinal sensilla present; head, in frontal view, almost rectangular in outline; scutellum with lineolate reticulate sculpture, but anteriorly with polygonal reticulate sculpture (as in *Z. xhosa*); ovipositor stylets [but only the second valvula] 1.67× as long as mid tibia length. In *Z. carinae*: antenna with F1–F5 subequal in length; only F6 with longitudinal sensilla present; head, in frontal view, almost circular in outline; scutellum completely with lineolate reticulate sculpture; ovipositor stylets about 1.5× as long as mid tibia length. The new species is also similar to *Z. xhosa* in having F5 larger than F4, and in the sculpture of the scutellum, but differs as follows: mandible with a large dorsal truncation; presence of a distinct dark brown patch on mid femur; ovipositor extending from TII of gaster; ovipositor stylets 1.67× as long as mid tibia, and third valvula slightly shorter than mid tibial spur. In *Z. xhosa*: mandible with a large pointed tooth, and two blunt teeth (Prinsloo 1979b: fig. 17); mid femur usually with a small dark brown to pale brown spot distally; ovipositor extending almost from base of gaster; ovipositor stylets 1.8–2.0× as long as mid tibia; and third valvula 1.3× as long as mid tibial spur.

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