



## Morphology and surface structure of eggs and first instar larvae of *Croce schmidtii* (Navás, 1927) (Neuroptera: Nemopteridae)

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### Abstract

The morphology of eggs and first instar larvae of *Croce schmidtii* (Navás, 1927) is described and figured for the first time using light and scanning electron microscopy. The females were collected from Derik, Mardin Province, Turkey and maintained in the laboratory. The eggs are elongate and cylindrical with rounded ends and bear a small terminal micropylar knob. Except for the adhesive materials, the chorion surface is smooth. The newly emerged larva of *C. schmidtii* is characterized by a slightly quadrangular head and short prothorax and has prominent pale dark brown color markings on the metatergites. The body is covered with short brown setae, which include macrotrichia and dolichasters.

**Key words:** Egg, larvae, scanning electron microscope

### Introduction

The modern higher classification of Neuroptera was established by Withycombe (1925). He proposed five superfamilies such as Ithonoidea, Coniopterygoidea, Osmyloidea, Hemerobioidea, and Myrmeleontoidea, the latter of which included Nymphidae, Myrmeleonidae, Ascalaphidae and Nemopteridae. MacLeod (1970) revealed several persuasive autapomorphies, based upon larval head structure, which delimit Myrmeleontoidea also inclusive of Psychopsidae. Henry (1978, 1982) recognized two evolutionary lines in the Neuroptera, the infraorders Hemerobiiiformia and Myrmeleontiformia, which included Nemopteridae, Psychopsidae, Nymphidae, Myiodactylidae, Ascalaphidae, Myrmeleontidae and Stilbopterygidae, based on these larval cephalic features. Nemopteridae comprises two distinct subfamilies, Crocinae and Nemopterinae (Hölzel 1975; Mansell 1986). Nemopteridae comprises 145 species in about 42 genera distributed in four main regions. The subfamily Crocinae, which includes about 50 species, is distributed in arid desert zones along the southern borders of the west Palaearctic and west Oriental Regions, as well as in dry areas of the Neotropical, Afrotropical, and Australian Regions. With crepuscular-nocturnal flying activity, their imaginal and preimaginal biology and morphology are reasonably well known. Taxonomy, biogeography, and phylogeny of the subfamily have been revised by Monserrat (1996). The development and the preimaginal stages of a number of species mainly from the Southern Hemisphere, have been investigated by Mansell (1973, 1981, 1983a, 1983b) but, there is limited information on the preimaginal stages of Crocinae in the Northern Hemisphere (Suludere *et al.* 2006). Two species of Crocinae have been recorded in Turkey, *Diolocroce ephemera* (Gerstaecker 1894) and *D. baudii* (Griffini 1895) (Gerstaecker 1894; Hölzel 1968, 1975; Şengonca 1981; Satar *et al.* 2004; Satar and Özbay 2004a, 2004b; Satar 2005).