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## The Hawkmoth Fauna of Pakistan (Lepidoptera: Sphingidae)

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### Abstract

This study represents the first complete modern account of the Sphingidae of Pakistan and takes the form of an annotated checklist, based on several national collections and those of a number of individuals. Of the 60 species and subspecies found, 14 are new records to the fauna of Pakistan, namely *Agnosia orneus*, *Langia zenzeroides* subsp. *zenzeroides*, *Polyp-tychus trilineatus* subsp. *trilineatus*, *Dolbina inexacta*, *Ambulyx sericeipennis* subsp. *sericeipennis*, *Thamnoecha uni-formis*, *Macroglossum belis*, *Macroglossum stellatarum*, *Cechetra scotti*, *Hippotion boerhaviae*, *Hyles euphorbiae* subsp. *euphorbiae*, *Rhagastis olivacea*, *Rethera brandti* subsp. *euteles* and *Theretra latreillii* subsp. *lucasii*. *Anambulyx elwesi* subsp. *kitchingi* and *Clanis deucalion* subsp. *thomaswitti* are not recognised as valid subspecies and are synonymized with their respective nominotypical subspecies. An additional list is given of 30 taxa which may yet be found in Pakistan as they are present in neighbouring countries close to the border. Of the species/subspecies found, 24 are part of the Palae-arctic fauna, 27 are part of the Oriental fauna and nine are Palaeo-Oriental/Palaeotropical. This reconfirms the transitional biogeographical position of the Pakistan fauna.

**Keywords:** Lepidoptera, Sphingidae, hawkmoths, Pakistan, geographical distribution, biogeography, fauna, checklist

### Introduction

The Sphingidae of British India were monographed by Bell & Scott (1937), and this still remains the most comprehensive account for the sub-continent. However, two internet sites—*Sphingidae of the Eastern Palaearctic* (Pittaway & Kitching, 2013) and *Sphingidae of the Western Palaearctic* (Pittaway, 2013)—cover part of this region and provide additional information on the taxonomy and biology of those species of Palaearctic origin.

Additionally, there are also a number of ad-hoc records of hawkmoths occurring in Pakistan, made in the main by workers conducting broader insect faunal surveys. Chaudhry *et al.* (1966) surveyed the forest insect fauna of Pakistan and reported *Macroglossum nycteris*, an unidentified *Macroglossum* sp., *Theretra oldenlandiae* and *Daphnis nerii*. Later, *Acherontia lachesis*, *Clanis phalaris* and *Sataspes scotti* were recorded by Chaudhry *et al.* (1970). Mohyuddin (1987) reported *Acherontia lachesis*, *Hippotion celerio*, *Hyles euphorbiae*, *Hyles livornica* (as *Hyles lineata*), *Nephele hespera* (as *Nephele didyma*), *Theretra alecto* and *T. oldenlandiae*. Mehmood *et al.*, (1996) studied the hawkmoth fauna of the Punjab and reported fifteen species from thirteen genera.

Although most sphingids are benign and interesting members of the fauna, some species are of economic importance, utilizing apple, pear, cherry, soybean, camphor, sugarcane, walnut, pistachio, sesame, peanut, chilli, tomato, potato, eggplant, teak, sweet potato, Jerusalem artichoke, pea, jaman, coffee, taro, tobacco, sugar-beet, buckwheat, olives and grapes as larval host plants. When larvae occur in great numbers they can cause serious damage (Fletcher, 1920; Aherkar *et al.*, 1993).

This study confirms the accepted transitional position of the Pakistani sphingid fauna between the Palaearctic and Oriental biogeographical regions, a result also supported by the study of the tiger beetle fauna (Coleoptera, Carabidae, Cicindelinae) of Pakistan by Rafi *et al.* (2010). The Sindian refuge, found almost wholly in Pakistan, has also played a major role in the evolution of several regionally endemic temperate species.

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