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First record of *Deilephila elpenor* L. moth from Chakwal Punjab Pakistan

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Abstract

Deilephila elpenor Linnaeus is a species of hawk moths belonging to family Sphingidae of order Lepidoptera. These moths are also called as the Sphingid moths. A study was conducted during January 2013 to December 2103 in Chakwal Punjab Pakistan. The adult Hawk moths were collected during the year 2013 from 5 localities of the Chakwal district. The specimens were identified with the help of specific literature and identification key. This paper presents one specie *Deilephila elpenor* L. these Hawk moths species have been recorded for the first time in Chakwal, Pakistan. Another moth species *Deilephila rivularis* is very similar to *Deilephila elpenor* is well distributed in Chakwal so description characters are also given for the identification of both species.

Keywords: First record, Pakistan, *Deilephila*, Hawk moths, Chakwal

Introduction

Order Lepidoptera includes scaly winged insects and it is the third largest insect order after Coleoptera and Hymenoptera. Sphingid moths like all lepidopterans are holometabolous, and their life cycle is very uniform. In general hawk moth feeding on young leaves having low tannin except some species [2]. Bell and Scott monographed the Sphingidae of British India, and it still remains the widest account for the Sub continent. They are distributed all over the world, except Greenland and Antarctica [14]. Adults are polyphagous- nectarivorous generalists, which forage on flowers of many species [13]. Hawkmoths are the common representatives of the family *Sphingidae* [4], high metabolic demand and with powerful hovering flight [9, 10]. The family *Sphingidae* is most diverse and considered as fast flying moths throughout the world [7]. They are one of the few lepidopteran groups to have been recorded on all continents [12] and they comprise about 1300 species and 200 genera [12] From which about 75% hawk moth species occur in tropical regions [17]. Sphingid moth are also recognized as major pollinators of the flowering plants [3, 8]. The elephant hawk moth, *Deilephila elpenor* is one of the common sphingid moths of Europe and it is distributed throughout the Palearctic region [5].

Materials and Methods

The specimens of *Deilephila* were collected with the help of placing light traps from different locations of the district Chakwal, Punjab, Pakistan. Collection of moths was done through the light traps, using 160 watt mercury bulb. For collecting moths a cloth was spread on the ground, with a strong source of light placed over it. Collections of the moths were done from January to December 2013. Hawk moths were killed by putting them in cyanide bottle. Species of Hawk moths were identified with the help of standard identification key and relevant literature and two internet sites Sphingidae of the Western Palearctic [15] and Sphingidae of the Eastern Palearctic [16].



Fig 1: Distribution of *Deilephila elpenor* in the Chakwal District

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Results

According to Boisduval *Deilephila elpenor* is a very distinct species and difficult to confuse with any other in the region except *Deilephila rivularis* [6]. In Pakistan *Deilephila rivularis* is widely distributed all over the country so description or identification of both species is crucial. Identifying characters of both the species are given here,

***Deilephila elpenor* Linnaeus 1758 (Fig.2.)**

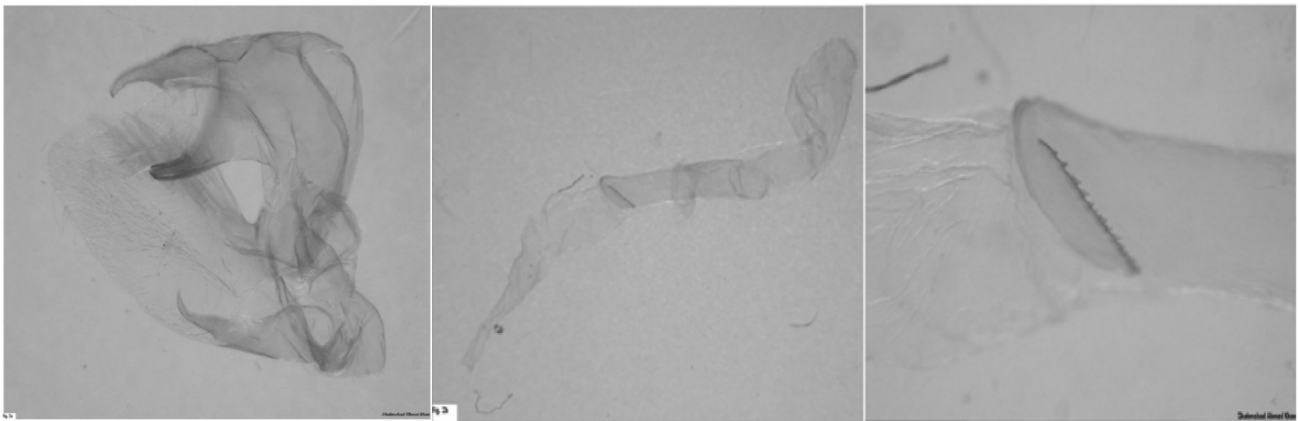
Two large dark brown eyes; Head ground colour from upper side, pink from lower side; ocelli are not visible; head is covered with scales found as tuft on frons or vertex or frons; thickened antennae, white scales underside the proboscis, brown proboscis. Diffused olive-brown bands on the thorax; pink inner edges and median line of the tegulae, pink posterior margin of thorax. Adult *Deilephila elpenor* has a wing span of about 42 to 60mm; khaki upper side of forewing, pink costa, pink narrow median band extending from the inner margin to Medial vein 3, basal half of the hindwing upper side is black, distal half pink. Two prominent stripes on the abdomen, alternating with pale rose, khaki abdomen, pink inner edges and median line of the tegulae, pink base of abdomen. Adult moths hiding away amongst the foliage during day time and do not take flight. The larvae of the *Deilephila elpenor* have two prominent eyes marking at the front of the body which

enlarged in alarming condition to the predator as two very large pairs of eyes.



Male genitalia (Fig 2a)

Male genitalia of the *Deilephila elpenor* are similar to those of porcellus while the uncus is more slenderical, more rounded Gnathos. Apical dentate process of aedeagus longer (fig.2b). More numerous Stridulatory scales of the valve



***Deilephila rivularis* Boisduval, 1875 (Fig. 3)**

The Chitral elephant hawk moth (*Deilephila rivularis*) is a moth of the Sphingidae family. Adult *Deilephila rivularis* have wingspan 64-82mm. The moth completes two generations in one year. It looks very similar to *Deilephila*

elpenor but the rose- red areas of the body and the wings are cinnamon coated. The red color on the wings is much less bright than the *Deilephila elpenor*. The rear wings have wide marginal area. The caterpillar feeds on spring herbs and *Arisaema*.



Male genitalia (Fig. 3a)

In male genitalia the extension of the sacs are curved claws and greatly sclerotized. The Aedeagus carries remarkably strong,

subapical, serrated ridge (fig. 3b).

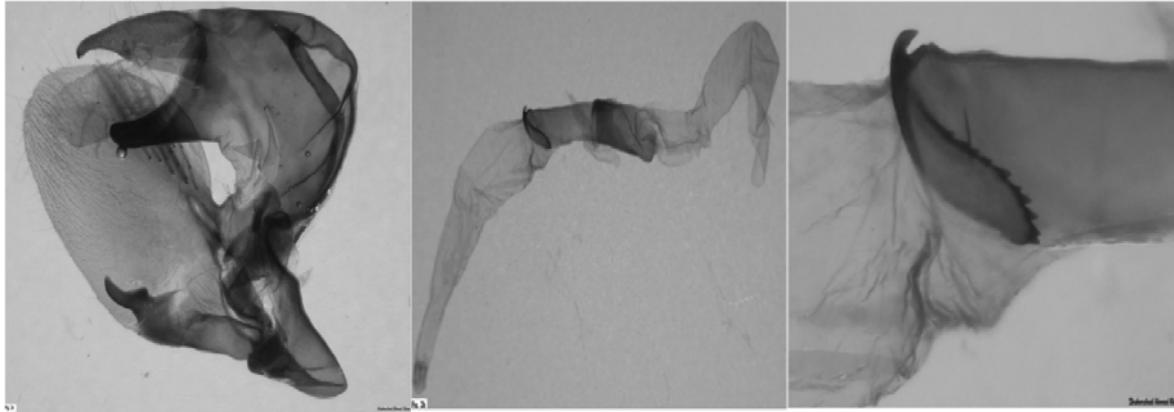


Table 1: Measurements of larvae, pupae and wingspan of male and females *Deilephila elpenor* (ranges in mm)

Locality	Larvae	Pupae	Female wing span	Male wing span
1	58-68	25-31	41-59	41-59
2	63-66	29-37	40-58	41-62
3	65-69	28-35	42-60	39-61
4	61-66	27-38	41-61	41-59
5	60-71	28-36	42-62	42-61

Table 2: Hawkmoth (Lepidoptera: Sphingidae) species recorded at the Chakwal

Sr.no.	Specie	Collection place	Male	Female
1	<i>Agnosia orneus</i>	Chakwal, Balkasar	5	7
2	<i>Mimas tiliae</i>	BARI, Choa sadin shah, Odharwal	7	9
3	<i>Macroglossum belis</i>	Balkasar, BARI, Chakwal,	14	6
4	<i>Deilephila rivularis</i>	BARI, Choa sadin shah, Odharwal	7	17
5	<i>Acherontia styx</i>	Chakwal	2	6
6	<i>Sphinx ligustri</i>	BARI, Odharwal, Balkasar	5	3
7	<i>Deilephila elpenor</i>	Chakwal, Balkasar, BARI, Choa sadin shah, Odharwal	3	9

Discussion

Deilephila elpenor is distributed in Britain, Ireland, Russia, China, Indian sub-continent (Nepal, Bhutan, and Sri Lanka) [1], Japan, Korea and British Colombia. According to [4] In India the moths *Deilephila elpenor* were caught when feeding at flowers after dusk. They were among the most common Sphingids entering lighted bungalows at night.

A study was conducted to develop a list of hawk moth species (Lepidoptera: Sphingidae) of India, Nepal, Bhutan and Sri Lanka, including their common names. The list showed the presence of *Deilephila elpenor* in this region [11].

According to David V. Alford adult wing span of *Deilephila elpenor* (Elephant hawk moth) is about 60 to 70 mm collected from Europe [1] and moth mainly active during May- June, deposit eggs singly and larvae active during July and August. Size of larvae and pupa are upto 85 mm and 40 to 45mm long. In this study, about 100 specimens were collected, from which 12 belonging to the genus *Deilephila*. All the twelve specimens are *Deilephila elpenor*. Identification of the specimens was done on the basis of specific literature and different morphological characters [4]. In previous no study has been conducted to investigate the *Deilephila* fauna of Pakistan.

This paper presents one *Deilephila* Hawk moths of Chakwal, Pakistan.

According to present study adult wing span on an average of *Deilephila elpenor* is 42 to 60mm collected from the District Chakwal, Punjab, Pakistan, and the moth mainly active during the March- April. Female moths lay their eggs singly and the larva active during May and June. Size of larva and pupa on an average was 62-68mm to 28-35mm.

So according to present study the size of *Deilephila elpenor* (Large elephant hawk moth) is about the size of *Deilephila porcellus* (Small elephant hawk moth). Reduction in size of *Deilephila elpenor* is may be the adoption of this specie to warm weather because in Pakistan summer is longer than the Europe. Several other unknown reasons are also may be involved in the reduction of size of this specie.

References

- Alford DV. Pest of ornamental Trees, shrubs and flowers. Taylor & Francis group, Second edition, 2012.
- AR P. The hawkmoths of the Western Palaearctic. London: Harley Books, and <http://tpittaway.tripod.com/sphinx/list.htm>, 1993, 240.
- Baker HG. The adaptation of flowering plants to nocturnal and crepuscular pollinators. Quarterly Review of Biology, 1961; 36:64-73.
- Bell TRD, Scott FB. The Fauna of British India including Ceylon and Burma, Moths Sphingidae, 1937; 5:1-537.
- Bestmann HJ, Erler J, Garbe W, Kern F, Martischonok V, Schäfer D *et al.* Pheromone components of the female elephant hawk-moth, *Deilephila elpenor*, and the silver-striped hawk-moth, *Hippotion celerio*. Experientia, 1992; 48(6):610-613.
- Boisduval JBAEd. Sphingides, Sésiides, Castnides. In: Boisduval, J. B. A. E. de & Guenée, A. (Eds.), Histoire naturelle des insectes. Species général des Lépidoptères Hétérocères. Librairie Encyclopédique de Roret, Paris, 1874, 1875; (1):1-568+561-564.
- Daly HV, Doyen JT, III AHP. Introduction to Insects Biology and Diversity, Oxford University Press, New York, 1998.
- Gregory DP. Hawkmoth pollination in the genus *Oenothera*. Aliso, 1963; 5-6:357-419.
- Heath J, Adams P. Temperature regulation in the sphinx moth during flight. Nature, 1965; 208:309-310.
- Heinrich B. Temperature regulation of the sphinx moth, *Manduca sexta* I. Flight energetics and body temperature during free and tethered flight. Journal of Experimental Biology. 1971; 54:141-152.

- 11 Ian Kitching J, Kendrick R, Smetacek P. A List Of Hawkmoth Species (Lepidoptera: Sphingidae) Of India, Nepal, Bhutan And Sri Lanka, Including Their Common Names.
- 12 Kitching IJ, JC. Hawkmoths of the world: an annotated and illustrated revisionary checklist. London: The Natural History Museum; Ithaca, NY: Cornell Univ. Press, 2000, 1-226.
- 13 ME K, ZK, JL. A study of hawkmoth pollination by a palynological analysis of the proboscis. *Isr J Bot.* 1972; 21:57-75.
- 14 Moré M, Kitching IJ, Cocucci, AA. Sphingidae: Esfingídeos de Argentina. Hawkmoths of Argentina. Buenos Aires: L.O.L.A. (Literature of Latin America). 2005, 184.
- 15 Pittaway AR. Sphingidae of the Western Palaearctic. Available from: <http://pittaway.tripod.com/sphinx/list.htm>, accessed 1 December, 2013.
- 16 Pittaway AR, Kitching IJ. Sphingidae of the Eastern Palaearctic. Available from: <http://pittaway.tripod.com/china/china.htm>, (accessed 1 December, 2013).
- 17 WA H. Checklist of insects. Checklist of Sphingidae. In: JANZEN DH (Ed), *Costa Rican Natural History*, Chicago and London. University of Chicago Press, 1983, 645-650.