



NEW RECORD OF *PROTOPHORMIA* SP. (CALLIPHORIDAE: DIPTERA) FROM COLD ARID DESERT KARGIL LADAKH

MOHD HUSSAIN*, ALTAH HUSSAIN MIR AND HIDAYATULLAH TAK

Department of Zoology, University of Kashmir Srinagar, Jammu and Kashmir (UT), India

*Email: akmha168@gmail.com (corresponding author)

ABSTRACT

Protophormia is a genus of Calliphoridae well known species in the cold climatic areas of the Holarctic region. In the present study, *Protophormia terraenovae* (Robineau-Desvoidy) has been documented as new record from the trans-Himalayan region of cold arid desert Kargil Ladakh (UT), India. It has been found that this species is fairly distributed throughout Kargil, Ladakh.

Key words: *Protophormia terraenovae*, Calliphoridae, Kargil Ladakh, Trans-Himalaya, survey, traps, new record, diagnosis, distribution, redescription

Protophormia is a genus consisting of species commonly called northern blow flies, blue-bottle fly, blue-assed or cold climate blow fly, and is widely distributed in the Northern hemisphere (Smith, 1986). It has been found that these flies cause myiasis in man and other vertebrates in Holarctic regions (Larbcharoensub, et al., 2018; Scholl et al., 2019) and are of medical and forensic importance (Grassberger and Reiter, 2002; Stuyt et al., 2013; Martínez-Sánchez et al., 2015). So far, 119 species of family Calliphoridae (Diptera) have been identified from India (Bharti, 2011). However, only three species viz. *Musca domestica*, *Calliphora vicina* and *Calliphora vomitoria* have been reported from cold arid desert Kargil Ladakh (Bhagat, 2016; Hussain et al., 2020). Present study focused on the genus *Protophormia* which leads to a new record of a species under the family Calliphoridae (Diptera) from Ladakh. This species is redescribed herein.

MATERIALS AND METHODS

The present survey was conducted in the Trans-Himalayan region of the cold arid desert Kargil Ladakh. To ease the survey, based on geography, topography, and climatic condition; the study area was divided into eight main sites viz. Drass, Kargil city, Batalik, Chiktan, Wakha (Shargole), Trespone, Sankoo and Panikhar. Fly species were trapped by using modified plastic bottle traps, baited with unwashed goat/sheep stomach (Khoobdel et al., 2013). Three traps were installed in all the above mention study sites with a distance of about 100 m, during the fly active period from May to July 2020. After three hours of installation, the trap was collected and the trapped flies were killed with chloroform. Based on morphology,

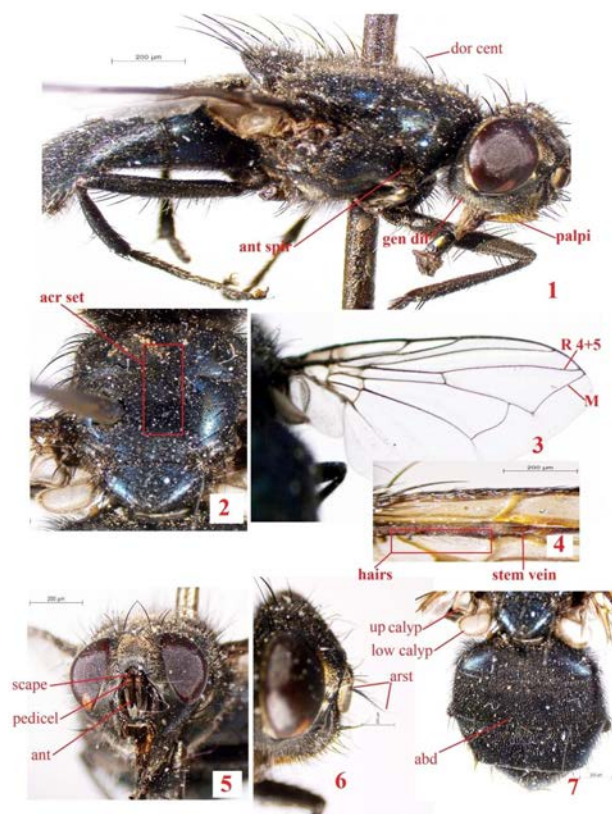
the *Protophormia* were sorted out, counted and were identified up to species level using available keys (Rognes, 1991; Whitworth, 2006; Akbarzadeh et al., 2015). Photographs were captured using Leica S9D stereozoom microscope fitted with a camera and edited with Adobe Photoshop 7.0.

RESULTS AND DISCUSSION

Protophormia terraenovae (Robineau-Desvoidy, 1830)

Diagnosis: Body colour dark metallic blue; genae not protruding and blackish; arista hairy above and below; tip of the pedicle and basal part of the first flagellomere reddish; occiput with 6-7 black hairs and pale hair in the middle; palpi yellow; eye larger, 3/4th of head height; humeral bristle 4-5; dorsocentral bristles long; acrostichal bristles weak or absent; presutural intraalar setae present; marginal secutellar setae 3-4 pair; anterior spiracle dark brown, smaller than humeral callus; wing venation R_{4+5} and M widely separated; stem vein with hair above and basicostae black; upper and lower calypters dark brown, especially on rim; upper calypters sprout black setae; abdomen metallic blue with uniformly distributed fine hairs on dorsal side (Figs. 1-7)

Distribution: *P. terraenovae* is well distributed in the northern hemisphere and is reported from Austria (Grassberger, 2002), Pakistan, China (Zhang et al., 2017), Turkey and north-west Iran (Akbarzadeh et al., 2015), America (Whitworth, 2006; Marshall, 2011), Europe (Sánchez et al., 2015), Thailand (Larbcharoensub et al., 2018).



Figs. 1-7. *Protophormia terraenovae*; 1. Whole body, Lateral view; 2. Thorax, dorsal view; 3. Right wing, dorsal view; 4. Stem vein, dorsal view; 5. Head, anterior view; 6. Head, lateral view; 7. Thorax and abdomen, dorsal view.

dor cen = dorsocentral bristles, gen dil = genal dilation, ant spir = anterior spiracle, aer ste = acrostichal bristles, ant = antennae, arst = arista, up calyp = upper calyptera, low calyp = lower calyptera, abd = abdomen

Remarks: In the present study, 311 specimens of *P. terraenovae* have been collected from Kargil Ladakh, viz. 38 from Drass, 43 from Kargil, 30 from Batalik, 39 from Chiktan, 39 from Wakha (Shargole) 42 from Saliskote, 41 from Sankoo and 39 from Panikhar. It was found that it was fairly distributed throughout the study area (Table 1). This is because, that Ladakh Himalaya is a part of Palaearctic (Old World), and the climatic condition is much similar to the Holarctic region of the Northern hemisphere (Akbarzadeh et al., 2015;

Whitworth, 2006). This could also be a reason for this species not been reported from Oriental region.

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Table 1. *P. terraenovae* collected from Kargil Ladakh (May-July, 2020)

	No. collected								Total
	Drass	Kargil city	Batalik	Chiktan	Wakha (Shargole)	Trespone	Sankoo	Panikhar	
No.	38	43	30	39	39	42	41	39	311
%	12.2	13.8	9.6	12.5	12.5	13.5	13.2	12.5	

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