

New Record of *Phlebotomus andrejevi* Shakirzyanova, 1953 (Diptera, Psychodidae, Phlebotominae) From Pakistan

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ABSTRACT

During entomological survey conducted by the author in the Balochistan Province of Pakistan, a single male of *Phlebotomus* (*Paraphlebotomus*) *andrejevi* Shakirzyanova (1953) was collected on 18 March 2001 from a mud wall of a ruined tomb at Dhadar, Balochistan Province. To the author's knowledge, this is a first record of this species from Pakistan. Taxonomic characters not described by earlier workers are described and illustrated. The results are compared with the data available in the existing literature. Differential diagnosis of this species with its closest allies is also given.

Key Words: Sandflies; *Phlebotomus andrejevi*; Taxonomy; Balochistan; Pakistan

INTRODUCTION

Phlebotomus andrejevi was originally described by Shakirzyanova (1953) under the name of *Ph. sergenti* var. *andrejevi* collected from burrows of *Rhombomys opimus* in a desert in the Ksil Orda and the Balkash regions of Alma-Ata Province in Kazakhstan. Later, it was found, in various regions of Central Asia by Perfiliev (1968). He described this species and supplied figure of male terminalia but other diagnostic characters like labrum, hypopharynx, cibarium, pharynx, paramere, morphometric measurements of aedeagus, genital funnel and pump and surstyle of ♂ fly were not described. Artemiev (1978) while reporting *Phlebotomus andrejevi* from northern Afghanistan did not furnish details and morphometric measurements of taxonomic characteristics of ♂ of this fly except mentioning "basal process of coxite thick and long, with symmetrical head, style longer than in *Ph. caucasicus*, with sub terminal spine at 0.81-0.97 of the style length". These characters were unknown in the literature. In view of the insufficient description of Perfiliev and Artemiev (*loc. cit.*), this species is re-described in detail.

MATERIALS AND METHODS

During entomological survey conducted by the present author in the whole of Balochistan Province in 1996-2001, the ♂ of *Phlebotomus andrejevi* was collected from the mud wall of a ruined tomb at Dhadar on 18 .iii. 2001 and in total 2013 sandflies were collected comprising of genera *Phlebotomus*, *Sergentomyia* and *Grassomyia* (Kakarsulemankhel, 2001). Flies were collected, processed, preserved, dissected and mounted according to conventional methods especially those followed by Johnson *et al.* (1963), Lewis (1973), Killick-Kendrick (1983), Lawyer *et al.* (1991) and Killick-Kendrick *et al.* (1994).

Standard keys furnished by Lewis (1967, 1978, 1982) and Artemiev (1978) were followed for identification of sandfly species. All the diagrams were drawn with a camera lucida and are to the given scale and the measurements are in millimeter.

Specimen is housed in the Author's Sandflies collections, Department of Zoology, University of Balochistan, Quetta.

RESULTS

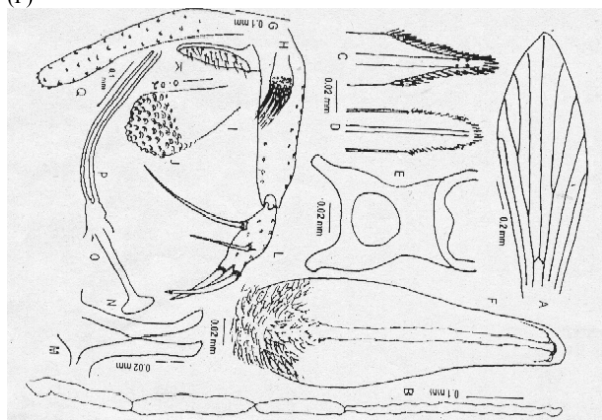
Phlebotomus (*Paraphlebotomus*) *andrejevi* Shakirzyanova (1953)

Phlebotomus sergenti var. *andrejevi*, Shakirzyanova, 1953: 103, Gaibov, 1956: 63,

Phlebotomus (*Paraphlebotomus*) *andrejevi* Shakirzyanova; Theodor and Mesghali, 1964: 286; Perfiliev, 1968: 67, 72, 249; Croset *et al.*, 1970: 867; Lewis, 1971: 535; Artemiev, 1974: 159; Artemiev, 1978: 18.

Male: 1 specimen was examined (Fig. 1). A single ♂ was captured using sticky trap on 18.iii. 2001 from a mud wall of an old and ruined tomb at Dhadar. Wing 1.7 long, 0.52 broad $\alpha=0.32$ long, $\beta=0.304$, $\delta=+0.08$, $\gamma=0.32$, $\pi=0.12$. Alar index=1.05. Palps 0.684 mm long, palpal formula 1, 2, 4, 3, 5 and palpal ratio, 1:3.1:4:3:6. Antennae missing. Labrum 0.17 long, 0.024 broad, with two long (0.01) stouter apical sensilla and attached to it there was 1 short apical sensilla at each side, lateral sensilla: 0.056 long and a sensilla depth: 0.058. Hypopharynx 0.016 board with four apical sharply pointed teeth and about 14 lateral teeth, and a dental depth of 0.04. Cibarium 0.056 broad, teeth absent, chitinous arch well developed. Pharynx 0.18 long and was about 0.8 times as long as broad. Its widest posterior portion was more than one and half as wide as the narrowest anterior part. The pharyngeal armature was developed and its anterior edge formed a convex line. The spines at the posterior part were

Fig. 1. *Phlebotomus andrejevi* (♂) showing: wing (A), palps (B), labrum (C), hypopharynx (D), cibarium (E), pharynx (F), coxite (G), basal process of coxite (H), neck (I), head (J), paramere (K), style (L), aedeagus (M), genital funnel (N), pump (O), filament (P)



transverse ridges widely scattered with punctiform small denticles, while the medians and more anterior ones formed pigmented area, were short leaf like, much stout and placed very close together. Armature occupied 0.22 of the length of pharynx. Male terminalia: Coxite 0.024 long, basal process of coxite was at 0.25 of the coxite and is 0.064 long, neck 0.03 long and 0.026 broad, head very large and symmetrical (0.036 long and 0.034 broad) and head was quite differentiated from the neck. Almost straight hairs on head formed a dark dense tuft 0.06 long. Paramere 0.08 long with elliptical surface. Style 0.1 long and 0.044 broad. Two terminal spine: each 0.1 long, apical and less curved, are of equal length and thickness, each situated at 0.02 long, similar tubercle, the first more proximal median spine was at 0.4 of the style length and was 0.15 long whereas the second proximal median spine was at 0.6 of the style and was 0.09 long, the longest median spine was slightly curved while the second proximal median short spine was almost straight. Aedeagus 0.06 long, basal breadth 0.03, with narrow slightly curved apex. Genital funnel 0.05 long, 0.02 broad, genital pump 0.18 long, genital filament 0.2 long F/P=1.11. Surstyle 0.26 long, and 1.08 times the length of coxite.

Female : Not came in present collection.

Distribution : Balochistan, New Record, Present survey: Dhadar (Coll. by present author on 18.iii.2001 using a sticky trap). This locality is an important focus of cutaneous leishmaniasis. Afghanistan (Artemiev, 1974; 1978), Iran (Theodor & Mesghali, 1964), Mongolia (Artemiev, 1978; Neronov & Guinin, 1978). Ex. USSR: Karshinskaya Steppe (Dergacheva, 1974), Mangyshlak Peninsula (Dergacheva & Turzhanova, 1977), Bayram Ali (Dergacheva & Zherikhina, 1974; Karapet'yan & Babayants, 1979), Alma-Ata Province and Kzyl-Orda (Perfiliev, 1968; Rasnitsyna, 1974).

Differential diagnosis of *Ph. andrejevi*. So far, only four species viz., *Ph. alexandri*, *Ph. nuri*, *Ph. sergenti* and *Ph.*

andrejevi (only ♂) of the subgenus *Paraphlebotomus* have been recorded (Kakarsulemankhel, 2001). The breadth of cibarium, length of coxite, morphology of the head of the basal process of coxite, position of the terminal spine of the style and dental depth of the hypopharynx at once differentiates *Ph. andrejevi* (♂) from these species.

DISCUSSION

Results of the present study are compared with the published data of *Ph. andrejevi* from central Asia (Perfiliev, 1968) (Table I).

Table I. Comparison of taxonomic characters (in mm) of *Phlebotomus andrejevi* Shakirzyanova

♂ Taxonomic Characters	Pakistan (Present study)	Ex. USSR, Central Asian Countries (Perfiliev, 1968)
Wing		
Length	1.76	1.86-1.95
Breadth	0.52	0.44-0.46
Palp formula	1,2,4,3,5	1,2,4,3,5
Labrum		
Length	0.17	-
Breadth	0.024	-
Hypopharynx		
Breadth	0.016	-
Dental depth	0.04	-
Cibarium Breadth	0.056	-
Pharynx Length	0.18, pharynx is 2.8 times as long as broad	-
Coxite		
Length	0.24	0.25-0.27
Head of basal process	0.034 broad	0.035
Neck of basal process	0.026 broad	0.024-0.026
Style		
Length	0.1	0.11-0.14
Breadth	0.044, both terminal spines are apical and stand on separate tubercles, of same length 0.02 mm long.	0.031-0.033, terminal spines usually apical, tubercles of terminal spines similar, terminal spines of almost equal length and thickness. The most proximal spine longer while the 2 nd proximal spine short thin and often almost straight.
Paramere Length	0.08	-
Aedeagus Length	0.06	Conical, tips curved.
Genital funnel		
Length	0.05	-
F/P	1.1	-
Surstyle		
Length	0.26	-

Since Artemiev (1978) reported this species from northern Afghanistan but gave no morphometric measurements of taxonomic characters, therefore, Pakistani specimens could not be compared. However, Pakistani ♂ specimen did show a slightly shorter length of wing, coxite and style, but a slightly greater breadth of wing and style, as compared with central Asian forms. Pakistani ♂ specimen was found in full accord with central Asian specimen in taxonomic characters like palp formula (1, 2, 4, 3, 5),

breadth of head of basal process (0.036 broad), breadth of neck of basal process (0.026 broad), terminal spine apical and are of the same length and thickness, tubercles of terminal spines similar, first proximal median spine longer, second proximal median spine short, thin and almost straight.

CONCLUSION

Present study reveals that *Ph. andrejevi* is a very rare species and has a localized distribution and show considerable variation in morphological characters. It is a Central Asian species and it is possible that a number of Central Asiatic species have entered Iran, Afghanistan and Pakistan from central Asia. Its distribution in Balochistan shows the southern limit of its range. In Central Asian countries, this species plays an important role in transmitting *Leishmania tropica major* (Dubrovsky, 1976; Sergiev, 1979). However, the incrimination of this species is based on the findings of female flies infected with promastigotes and on the fact that this species live in the burrows of the great gerbil (*Rhombomys opimus* Licht).

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