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## New Record of *Sergentomyia mervynae* Pringle (1953) from Pakistan (Diptera, Psychodidae, Phlebotominae)

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**Abstract:** During entomological surveys conducted by the author in the whole of Balochistan Province *Sergentomyia* (*Sergentomyia*) *mervynae*, Pringle, 1953 was collected ( $N=19$ ) from four localities. These localities appear to be the new record of this species in the literature to-date. This is to the author's knowledge the first record of this species from Pakistan. Taxonomic characters not described by earlier workers are described and illustrated. Results are compared with the data available in the existing literature. Differential diagnosis of this species is also given.

**Key words:** Sandfly, *Sergentomyia mervynae*, taxonomic characters

### INTRODUCTION

*Sergentomyia mervynae* was first reported from Karbala City, Iraq by Pringle (1953). Two ♀ and one ♂ were taken in Karbala city in October 1950. Pringle (1953) while describing female specimens did not supply morphometric measurements of cibarium and pharynx and figures of mouthparts, antennal segments, palps and wings. Similarly, morphometric measurements of cibarium and pharynx and illustrations of antennal segments, wings, palps, coxite, surstyle, genital filament and pump of ♂ fly were also not supplied. Lewis (1967) while discussing sandflies of Pakistan did not record this species. In view of the insufficient description by Pringle (1953) and Artemiev (1978), this species is redescribed.

### MATERIALS AND METHODS

During 1996-2001, a taxonomic study of the species of sandflies prevalent in Balochistan province was conducted by the present author and 2013 sandflies comprising genera *Phlebotomus*, *Sergentomyia* and *Grassomyia* were collected (Kakarsulemankhel, 2001). Flies were collected, processed, preserved, dissected and mounted according to the conventional methods especially those adopted by Johnson *et al.* (1963), Lewis (1973), Killick-Kendrick (1983), Lawyer *et al.* (1991) and Killick-Kendrick *et al.* (1994). For species identification, keys furnished by Pringle (1953) and Artemiev (1978) were consulted. All the diagrams were drawn with the help of camera lucida and are to the given scales. Measurements are in millimeter unless otherwise indicated.

*Sergentomyia* (*Sergentomyia*) *mervynae* Pringle (1953)  
(Fig. 1 and 2 and Table 1)

**Female:** (2 specimens measured). (Fig. 1) Wing (Fig. 1A) 1.20-1.30 mm long, 0.264-0.28 mm broad,  $\alpha=0.12$ -0.15 mm long,  $\beta=0.20$ -0.26 mm long,  $\delta=0$ ,  $\gamma=0.24$ -0.28 mm long,  $\pi=0.04$ -0.05 mm, alar index=0.576-0.6. Proboscis 0.16-0.18 mm long. Palps (Fig. 1B) total length 0.45-0.5 mm, palpal ratio 1:2.46:3.84:3.84:8.07, palpal ratio 1,2,3-4,5. A3 (Fig. 1C) 0.09-0.10 mm long, 0.555-0.562x length of proboscis, 0.818-0.877x length of A4+5, 0.818-0.909 x length of labrum, ascoid on A3 0.02 mm long and situated at 0.56 of A3, 1 papilla situated at 0.84 of A3. A4 (Fig. 1D, lower) 0.052-0.054 mm long, ascoid on A4 0.2 mm long and was 0.37-0.384 of the length of segment, ascoid situated at 0.38 of A4, 1 papilla situated at 0.74 of A4. A5 (Fig. 1D, upper) 0.058-0.06 mm long, ascoid on A4 0.02 mm long and was 0.33-0.34 of the length of the segment, ascoid was at 0.344 of A5. Ascoid formula 2/3-15. Papilla formula 1/3-4, mostly tip of the papilla reaches up to the tip of the ascoid, papilla on A3 and A4 are at one side. Labrum (Fig. 1E) 0.11 mm long, with 4 short and thin apical sensilla, sensilla depth 0.024 mm, hypopharynx (Fig. 1F) with smooth teeth, apex 0.004 mm broad and a dental depth of 0.024 mm, mandible (Fig. 1G) broad (0.008 mm), with sharp re-curved teeth, 5 teeth per 0.004 mm, a dental depth of 0.052 mm. Cibarium (Fig. 1H) 0.04 mm broad, with about 16 rather indistinct teeth obscured by a large darkly pigmented patch and has a markedly tapering extension which is produced forwards in the form of a long anterior process. The posterior margin of pigmented area appear like a curve with convexity posteriorly. Central teeth are shorter than the lateral teeth, chitinous arch absent. Pharynx (Fig. 1I) 0.14-0.15 mm long and 2.41-2.58 times of the posterior width, pharynx hind with 3.62 times fore width, armature 0.026 mm height and was 0.173-0.185 of the length of pharynx. The anterior edge of pharyngeal teeth forms an almost convex line. The antero-central and lateral armature

Table 1: Comparative taxonomic characters (in mm) of *Sergentomyia mervynae* Pringle (1953)

♀	Taxonomic Characters	Balochistan (SW Pakistan) (present study)	Iraq (Pringle 1953 : 716)	Afghanistan (Artemiev, 1978: 26)
Wing	length	1.20-1.30	1.47-1.57	-
	length / breadth	4.54-4.642	4.4	-
	$\alpha / \beta$	0.576-0.6	0.47	-
A3	length	0.09-0.10	0.098-0.114	-
	A3 / labrum	0.818-0.909	0.64-0.66	-
Ascoïd 4 / A4		0.37-0.384	About one quarter the length segment.	-
Labrum	length	0.11	0.153-0.166	-
Palps	formula	1,2,3-4,5	1,2,3,4,5	-
	Ratio	1:2.46:3.84:3.84:8.07	1:2.3.7:4:7.5	-
Cibarium		With 16 rather indistinct teeth obscured by a large darkly pigmented patch with a long anterior process.	With 16 long teeth, indistinct and somewhat obscured by a large pigmented area which has a clearly marked tapering extension which is produced forwards in the mid line.	With 16-22 teeth in concave row, central teeth are shorter than the lateral ones, pigment patch with long anterior process.
Pharynx		About 2.41-2.58 times as long as broad pharynx with posterior membranous part with lateral constriction	About 3 times as long as broad, the armature consists of a group of long, brown spines bunched centrally so that their posterior margin presents a strong curve with the convexity posteriorly, the remainder of the pharynx posterior to these spines is scarcely armed.	Pharynx rather broad with lateral constriction, membranous base and convex hind border of the pharyngeal armature.
Spermatheca		Simple, tubular with less wide duct	The terminal umbilication is almost absent and the duct is narrower than in the other species examined.	

Table 1 (continued)

♂	<i>S. mervynae</i> Taxonomic Characters	Balochistan (SW Pakistan) (present study)	Iraq (Pringle 1953 : 716)	Afghanistan (Artemiev, 1978: 26) (in micron)
Wing	length	1.04-1.12	1.46-0.27	-
	length / breadth	3.88-.93		-
	$\alpha / \beta$	0.517-0.521		-
A3	length	0.09-0.10	0.142	96-124
	A3 / labrum	0.9-0.91		0.74-0.91
Ascoïd 4 / A4		0.33-0.35	1/9 <sup>th</sup>	0.29-0.36
Palps	formula	1,2,4,3,5 and 1,2,3-4,5	1,2,3-4,5	-
	Ratio	1,2,6,4,6,4,5,9,0,	1:3:5:5:11	-
Cibarium		With 15-18 weak blunt teeth arranged on a concave, central teeth smaller than the laterals, pigment patch present at the center of cibarial teeth	With about 20 weakly chitinated blunt teeth, there is an irregular shaped, grayish, brown, pigmented area in the center of the armature.	With concave row of 15-22 teeth, the central teeth shorter than the lateral ones.
Pharynx		Length is 2.5-2.7 times as long as broad.	Length just over three times the maximum breadth.	-
Coxite	length	0.2-0.21,	0.26	236-284
	breadth	0.08 broad	0.059	
	Coxite / style	2.63-2.76	2.28	
	Coxite / A3	2.1-2.22		2.11-2.79
	Coxite / labrum	1.90-2.0		1.88-2.1
Style	length	0.076	0.114	-
	Seta	0.03 mm long, at 0.86 of the style.	0.02 mm long, at 1/5 <sup>th</sup> of the style.	-
Paramere	length	0.11-0.12, paramere with rounded ends	0.153	Paramere with rounded ends
Aedeagus	length	0.076-0.09, aedeagus straight.	0.093	Aedeagus straight.

was composed of group of long spines pointing towards center, the posterior margin appears like a curve with convexity posteriorly. The remainder of the pharynx posterior to the armature consists of membranous part which is 0.02 mm broad and scarcely armed, the lateral-posterior margins of pharynx with a lateral constriction, base of the pharynx without a median notch. Spermatheca (Fig. 1J), simple, tubular 0.024 mm long, 0.016 mm broad, with less wide duct, furca (Fig. 1K) 0.072 mm long, genital atrium (Fig. 1L) 0.04 mm broad.

**Male:** (6 specimens examined) (Fig. 2) Wing (Fig. 2A) 1.04-1.12 mm long, 0.264-0.288 mm broad,  $\alpha$ =0.096-0.12 mm long,  $\beta$ =0.184-0.232 mm long,  $\delta$ =Zero,  $\gamma$ =0.2-0.232 mm long,  $\pi$ =0.04 mm long, alar index=0.517-0.521. Palp (Fig. 2B) 0.42-0.46 mm long, palpal ratio 1, 2.66, 4.66, 4.5, 9.0 and palp formula 1, 2, 4, 3, 5, but also 1, 2, 3-4, 5. A3 (Fig. 2C) 0.09-0.10 mm long, ascoïd 0.018 mm long, position of ascoïd=0.655, ascoïd 3/A3=0.2, position of a papilla on A3=0.827, A3/labrum= 0.9-0.91, A3/A4+5= 0.77-0.83. A4 (Fig. 2D, lower) 0.056-0.6 mm, ascoïd 0.02 mm long,

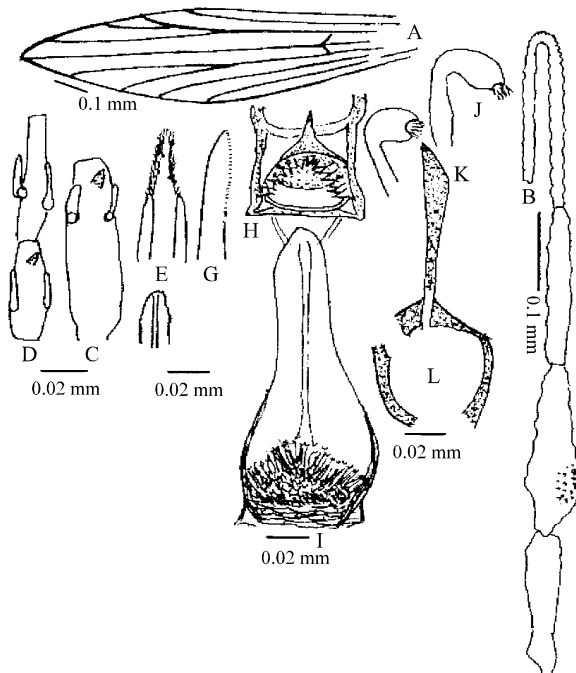


Fig. 1: Camera Lucida drawing of ♀ *Sergentomyia mervynae* showing: wing (A), palps (B), the third (C), fourth (D, lower) and fifth (D, upper) antennal segments, labrum (E), hypopharynx (F), mandible (G), cibarium (H), pharynx (I), spermatheca (J), furca (K), genital atrium (L)

position of ascoid=0.386, ascoid 4/A4=0.33-0.35, position of single papilla on A4=0.78. A5 (Fig. 2D, upper) 0.06 mm long, ascoid on A5= 0.018 mm long, ascoid 5/A5=0.3 position of ascoid on A5=0.376. Labrum (Fig. 2E) 0.10-0.11 mm long and a sensilla depth 0.036 mm. Hypopharynx (Fig. 2F) 0.016 mm broad with pointed apex and a dental depth of 0.028 mm. Cibarium (Fig. 2G) 0.044-0.05 mm broad, with 15-18 weakly chitinised but blunt teeth arranged on a concave line, central teeth appear relatively shorter than the laterals and there is an oval shaped, grayish brown pigmented area (0.012 mm long. and 0.009 mm broad) in the center of cibarial teeth. Pharynx (Fig. 2H) 0.11-0.12 mm long and is about 2.5-2.7 times as long as broad and its widest posterior portion was not quite twice as wide as the narrowest anterior part. There is no marked posterior dilation of pharynx. Anterior edge of armature forms an almost convex line. Armature is in the form of short serrated transverse ridges. Armature occupies 0.254-0.3 of the length of the pharynx. Coxite (Fig. 2I) 0.2-0.21 mm long, 0.08 mm broad, coxite/A3=2.1-2.22, coxite/labrum=1.90-2.0, coxite/style=2.63-2.76. Style (Fig. 2J) 0.076 mm long, 0.03 mm broad, with 4 terminal spine 0.1-0.11 mm long, usually spatulate, a ventral seta 0.03 mm

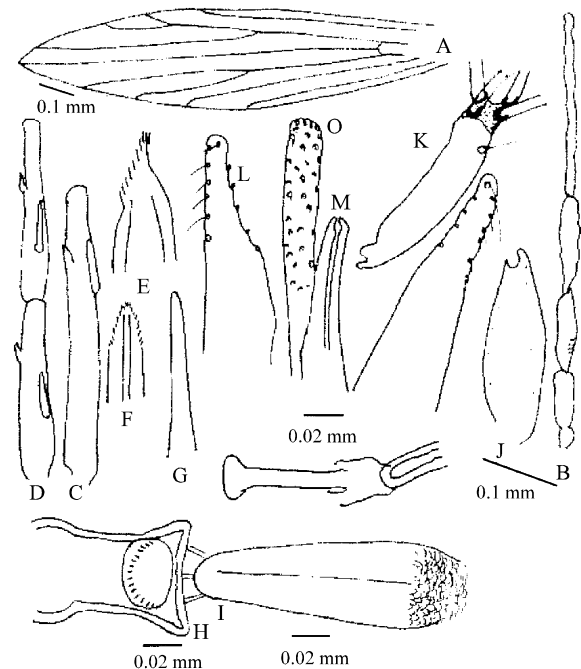


Fig. 2: Camera Lucida drawing of ♂ *Sergentomyia mervynae* showing: wing (A), palps (B), the third (C), fourth (D, lower) and fifth (D, upper) antennal segments, labrum (E), hypopharynx (F), cibarium (G), pharynx (H), coxite (I), style (J), paramere (K), aedeagus (L), genital filament (M), pump (N), surstyle (O)

long at 0.86 of the style. Paramere (Fig. 2K) 0.11-0.12 mm long (longer part is 0.07-0.08 mm long and 0.02-0.03 mm broad whereas 0.04 mm longer neck is about 0.01-0.012 mm broad) and a ventral tubercle with 4-5 short hairs. Aedeagus (Fig. 2L) 0.076-0.09 mm, each halves individually 0.01-0.012 mm broad, with pointed sub apical tubercle at 0.88 of the aedeagus. Genital filament (Fig. 2M) 0.26-0.3 mm long, smooth and pump (Fig. 2N) 0.07-0.08 mm long, with filament to pump ratio of 3.71-3.75. Surstyle (Fig. 2O) 0.17-0.18 mm long, 0.8-0.85x length of coxite.

**Distribution:** Balochistan: New Record, Present survey: Khuzdar, Nanasaheb ziarat, Panjgour, Turbat. These localities are important foci of cutaneous leishmaniasis. Flies were collected from indoors using sticky traps. Afghanistan: Southern Afghanistan (Artemiev, 1978). Iran: Kazerun (Mesghali, 1961, from Tabas a single ♀), (Theodor and Mesghali, 1964). Iraq: Karbala (Pringle, 1953).

**Differential diagnosis of *S. mervynae*:** The morphology of cibarium, pigment patch with anterior process and

morphology of pharynx with broad central and basal membranous part with no median deep notch are useful diagnostic characters in the identification of female of this species.

## DISCUSSION

Results of the present study are compared with the published data of *S. mervynae* from Iraq (Pringle, 1953) and Afghanistan (Artemiev, 1978) (Table 1). ♀ *S. mervynae* from Pakistan are found to have a slightly larger wing length/breadth,  $\alpha/\beta$ , ascoid 4/A4 and A3/labrum but are observed having a slightly shorter wing length, A3, ascoid on A4, labrum and pharynx length/breadth as compared with the published data of this species from Iraq.

However, ♀ *S. mervynae* of the present study are observed to be in full accord with the Iraqi and Afghanistan specimens in the diagnostic characters like the morphology of cibarium, pharynx and spermathecae.

Similarly, Pakistani ♂ *S. mervynae* are observed to have a relatively shorter wing, A3, ascoid on A3 pharynx length/breadth, coxite, style and paramere as compared with the Iraqi specimens. The illustrations of the structures of cibarium, pharynx, style, paramere and aedeagus produced by Pringle (1953) are observed to be in full accord with their counterparts in Pakistani specimens. However, Pakistani specimens are found to differ slightly in the shorter 3<sup>rd</sup> antennal segments and coxite as those from southern Afghanistan (Artemiev, 1978). Indeed, Pakistani specimens are observed to agree well with the type specimens from Iraq in palpal formula, morphology of cibarium and pharynx. Similarly, they are also found to agree with the Afghanistan specimens in characters like A3/Abrum, ascoid 4/A4, coxite/A3, coxite/labrum, shape of the cibarium and pharynx.

The present study revealed that *S. mervynae* is a very rare species (19/2013=0.95%) and has a localized and discontinuous distribution in Pakistan. There are no published reports incriminating *S. mervynae*, which is thought to be thermophilic and a possible vector of reptilian leishmaniasis (Artemiev, 1978) and presumably plays no part in transmitting *Leishmania* to man.

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