PHLEBOTOMINAE (DIPTERA) OF IRAN

I. A PRELIMINARY LIST, DESCRIPTION OF SPECIES AND THEIR DISTRIBUTIONAL DATA (*)

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Studies on sandflies of the genus **Phlebotomus** started as far back as 1943 by the Department of Parasitology of the University of Teheran, Medical School. At that time the only information concerning the sandfly fauna of Iran had been published by a limited number of Iranian and foreign workers, such as S. Adler, O. Theodor and E.M. Lourie (1930), which covered the western part of Iran and some areas of the Caspian Sea and G.R. Cheikh (1935), who studied the Teheran area. Later on D.J. Lewis (1957) described a new species and G.S. Pervomaisky (1958) treated the fauna of the northern and western parts of Iran. O. Theodor (1947, 1950) and G. Pringle (1952) provided information in general.

Due to the importance of this subject and the special interest of Dr. N. Ansari, Professor and Chairman, Department of Parasitology, University of Teheran, Medical School, the author was appointed to make a study of the status and distribution of the sandflies in Iran.

Research had begun, and was greatly facilitated with the establishment of the Institute of Parasitology and Malariology in 1952.

Survey teams sent out by this Institute during the preparatory phase of the malaria eradication program or for study of parasitic diseases were utilized also for the compilation of data on the sandflies.

This paper covers all of the information collected by the staff

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of the Department of Parasitology, and later by the staff of Institute of Parasitology and Malariology of the University of Tehran, Medical School. It includes:

A - The list of Phlebotominae of Iran.

B - Description of each species and respective map of distribution in Iran known to date.

C - Key to the Phlebotominae of Iran.

Seven out of 17 species and varieties known to occur in Iran, namely **Phlebotomus alexandri, Ph. mongolensis, Sergentomyia baghdadis, S. dentata, S. squamipleuris, S. sintoni** and **S. theodori,** have been found for the first time in this country.

The author hopes that this paper will be of use to his colleagues and to others interested in this particular subject.

A . THE LIST OF PHLEBOTOMINAE OF IRAN (*)

1 - Phlebotomus (Phlebotomus) papatasi Scopoli, 1786
(3675 M 3182 F)

2 - Phlebotomus (Paraphlebotomus) caucasicus Marzinowsky, 1917
(1280 M 1016 F)

3 - Phlebotomus (Paraphlebotomus) sergenti Parrot, 1917
(985 M 364 F)

4 - Phlebotomus (Paraphlebotomus) mongolensis Sinton, 1928
(7 M)

5 - Phlebotomus (Paraphlebotomus) alexandri Sinton, 1982
(32 M 36 F)

6 - Phlebotomus (Synphlebotomus) ansarii Lewis, 1957
(270 M 694 F)

7 - Phlebotomus (Adlerius) chinensis halepensis Theodor, 1958
(42 M 372 F)

8 - Phlebotomus (Laroussius) kandelakii Schourenkova, 1929
(70 M 332 F)

9 - Phlebotomus (Laroussius) wenyoni Adler & Theodor, 1930
(6 M)

10 - Phlebotomus (Laroussius) perniciosus tobbi Adler & Theodor, 1930
(64 M 139 F)

11 - Sergentomiva (Sergentomvia) sintoni Pringle, 1953
(321 M 2586 F)

12 - Sergentomyia (Sergentomyia) palestinensis (Adler & Theodor), 1927
(9 F)

13 - Sergentomyia (Grassomyia) squamipleuris (Newstead), 1912
((1 M) (**)

(*) In parenthesis are given the numbers of specimens of Males=M and Females=F collected by and kept in the Institute of Parasitology and Malariology and studied for the preparation of this report.

(**) These specimens have been sent to Dr. D.J. Lewis and are kept in the British Museum of Natural History.

14 - Sergentomyia (Rondanomyia) pawlowskyi (Perfiliew), 1933
(1 F) (**)

15 - Sergentomyia (Sergentomyia) baghdadis (Adler & Theodor), 1929
(2 F)

16 - Sergentomyia (Sergentomyia) dentata (Sinton), 1933
(167 M 350 F)

17 - Sergentomyia (Sergentomyia) theodori (Parrot), 1942
(5 M 41 F)

B - DESCRIPTION OF SPECIES AND RESPECTIVE MAPS OF DISTRIBUTION IN IRAN KNOWN TO DATE.

B-1- Phlebotomus (Phlebotomus) papatasi Scopoli, 1786

Male

Colour - Pale yellow.

Size - Mean size 1.54 mm.

Antenna - Geniculated spines short; present on segments III-XV. III > IV+V

Palpi - Formula: 1.4.2.3.5.
Relative length of palpi to epipharynx: $\frac{P}{E} = 3.1$

Wing - Slender; arching of posterior margin similar to anterior. First longitudinal vein covers $\frac{1}{3}$ of anterior branch of vein. Anterior branch of second longitudinal vein longer than the distance between two points of bifurcation and slightly shorter than the distance between the point of posterior befurcation and middle cross vein. $\alpha < \gamma$
Posterior bifurcation of second longitudinal vein (O) is nearer to the base of the wing than the branching of fourth longitudinal vein (O')

Genitalia - Coxite and style long; coxite is slightly longer than style. Two sides of style are longitudinally parallel and bearing five short spines (3 spines on the distal extremity and 2 spines on $\frac{2}{3}$ from the base of style.) Inferior clasper narrow and slender with two short weakly developed spines. Intermediate appendage very short widening in its middle. Submedian fringed; pair of long concave appendages bearing a row of the hairs on its concave side. Digiti from appendage can be seen between the intermediate and submedian fringed appendages. Whole genitalia is covered with hairs specially $\frac{1}{3}$ of distal extremity of coxites which have long hairs. $\frac{F}{p} = 1.7-2.8$.

Female

Size - Mean size 2 mm.

Wing - Broader than in males.

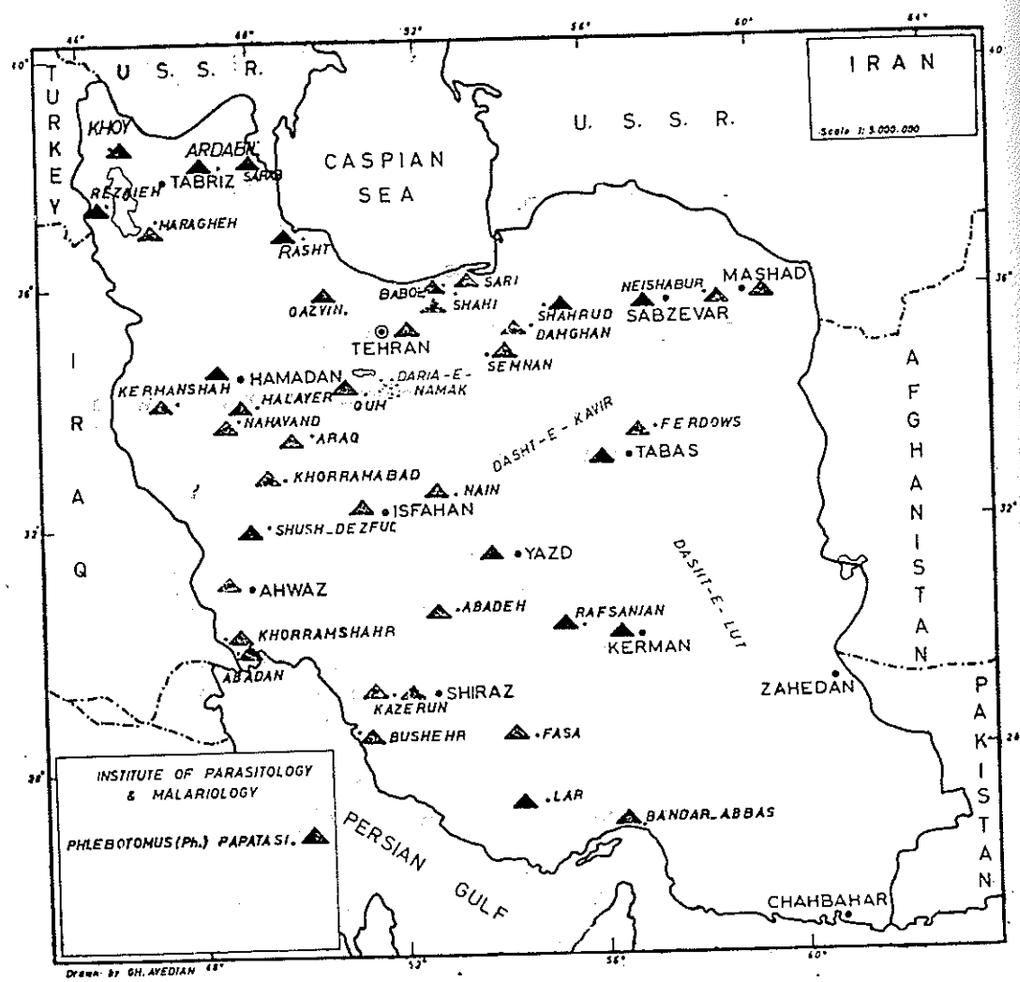
Pharynx - Pharyngeal armature appearing as a network or fine wavy lines.

Spermatheca - Showing more than 9 segments or striations when in extended condition; segments of equal size but ending in a large and broad head.

Distribution in Iran: (Fig. I) *

Central Ostan: - Tehran (8 places.), Varamin (4 pl.), Karaj (2 pl.), Dasht Abi (7 pl.), Qum (1 pl.), Qazvin (1 pl.)
Ostan 1: - Rasht (1 pl.), Araq (1 pl.)
Ostan 2: - Sari (1 pl.), Damghan (2 pl.), Babolsar (1 pl.), Chahi (1 pl.), Shahrud (1 pl.), Semnan (1 pl.),
Ostan 3&4: - Ardabil (2 pl.), Maragheh (2 pl.), Rezaiyeh (1 pl.), Julfa (1 pl.), Khoy (1 pl.), Sarab (1 pl.),
Ostan 5: - Malayer (48 pl.), Nahavand (7 pl.), Songhor (3 pl.) Kermanshah (1 pl.), Hamadan (1 pl.),
Ostan 6: - Ahwasz (2 pl.), Shush-Dezful (7 pl.), Khoramabad (1. pl), Khoramshahr (1 pl.), Abadan (1 pl),
Ostan 7: - Bushehr (1 pl.), Lar (3 pl.), Fasa (2 pl.), Abadan (1p pl.) Shiraz (1 pl.), Kazerun (1 pl.)
Ostan 8: - Rafsanjan (2 pl.), Kerman (5 pl.), Bandar-Abbas (2 pl.)
Ostan 9: - Sabzevar (22 pl.), Neishabur (2 pl.), Tabbas (1 pl.), Ferdows (1 pl.), Mashad (1 pl.), Birjand (1 pl.)
Ostan 10: - Isfahan (1 pl.), Yazd (2 pl.), Nain (2 pl.)

(*) pl. = places of collection.



(Fig. 1) Approximate range of distribution and collecting localities of Phlebotomus (Ph.) papatasi in Iran.

B - 2 - Phlebotomus (Paraphlebotomus) caucasicus Marzinowsky, 1917

Male

Colour - Pale yellow.

Size - Mean size - 1.55 mm.

Antenna - Geniculated spines present on III - XV segments. Third antennal segment is shorter than epipharynx. III=IV+V.

Palpi - Formula 1. (2.4). 3.5.

Relative length of palpi to epipharynx $\frac{P}{E} = 2.5$.

Wing - Arching of posterior margin is slightly more than anterior. First longitudinal vein covers little less than $\frac{1}{3}$ of anterior branching of second longitudinal vein.

Anterior branching of second longitudinal vein is longer than the distance between two points of bifurcation..

($\frac{\alpha}{\gamma} = 1.5$) and slightly longer than the distance between the point of posterior bifurcation and middle cross vein.

$\alpha > \gamma$; Posterior bifurcation of second longitudinal vein (O) is nearer to the base of wing than the branching of fourth longitudinal vein (O').

Genitalia - Usually larger than that of Ph. sergenti. Style slightly extended in form of a pear, bearing four long and curved spines, the position of those spines is like in Ph. sergenti; Base of coxite bearing a process with brush of long and well developed hairs, those heavy hairs are placed apically and ventrally on the process; Process short and broad. Penis small and triangular. $\frac{F}{p} = 1.3 - 1.4$.

Female

Size - Larger than the male; mean size - 1.7 mm.

Antenna - Geniculated spines present on III - XV segments. III=IV+V

Palpi - Formula: 1.4.2.3.5.

Relative length of palpi to epipharynx : $= 2.5\,\gamma\frac{P}{E}$.

Wing - First longitudinal vein covers $\frac{1}{2}$ to $\frac{1}{3}$ of anterior branch of second longitudinal vein. $\frac{\alpha}{\gamma} = 2$, $\alpha > \gamma$

Pharynx - Armature with coarse teeth mixed with dotted and crenelated lines.

Spermatheca - Showing less than 9 segments or striations (usually less than in Ph. sergenti). Segments of spermatheca slightly fitting each other.

Distribution in Iran: **(Fig. 2)**

Central Ostan: - Tehran (5 places), Varamin (1 pl.), Dashte Abi (2 pl.)

Ostan 2: - Damghan (3 pl.), Semnan (1 pl.), Shahrud (1 pl.)

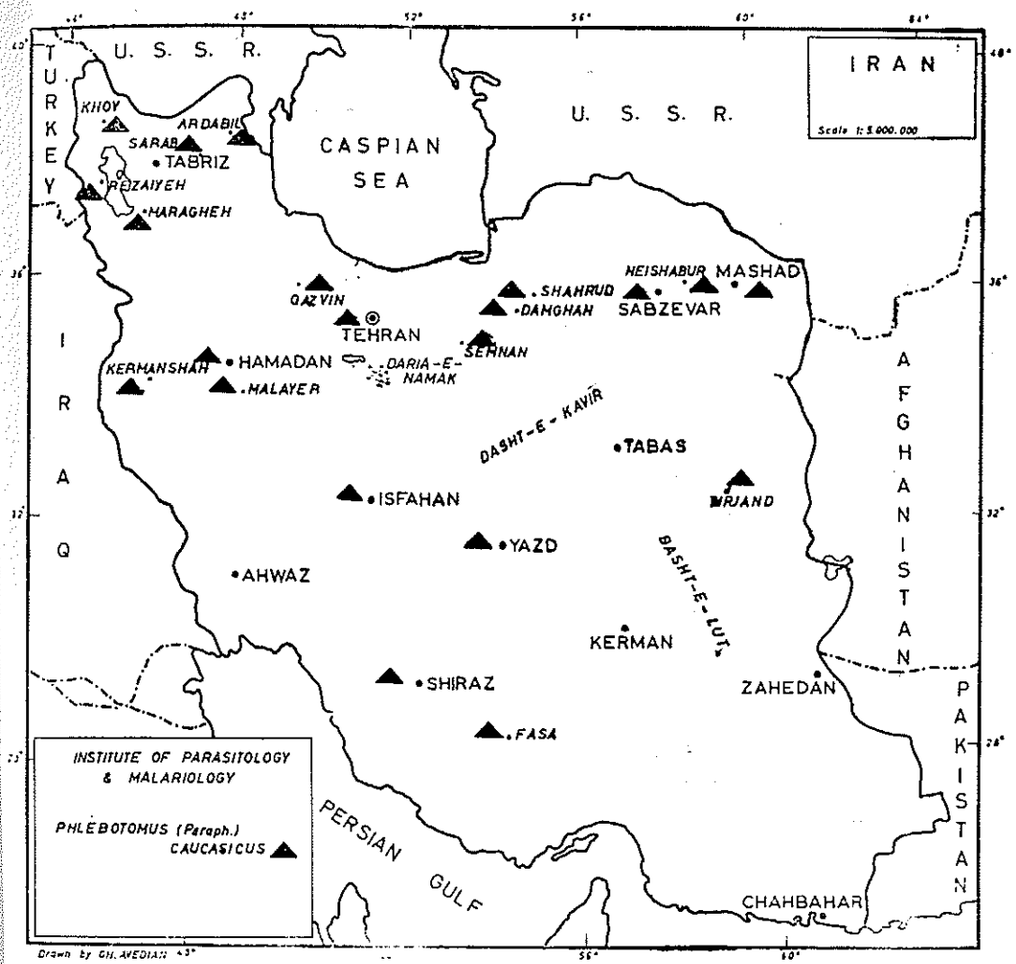
Ostan 3&4: - Ardabil (3 pl.), Maragheh (2 pl.), Khoi (1 pl.). Sarab (1 pl.)

Ostan 5: - Malayer (30 pl.), Kermanshah (1 pl.)

Ostan 7: - Fasa (1 pl.), Shiraz (1 pl.)

Ostan 9: - Sabzevar (16 pl.), Neishabur (3 pl.), Mashad (1 pl.), Birjand (1 pl.).

Ostan 10: - Isfahan (1 pl.) Yazd (2 pl.),



(Fig. 2) Approximate range of distribution and collecting localities of Phlebotomus (Paraph.) caucasicus in Iran.

B - 3 - Phlebotomus (Paraphlebotomus) sergenti Parrot, 1917

Male

Colour - Pale yellow.

Size - Mean size 1.53 mm.

Antenna - Geniculated spines present on segments III—XV.: III=IV.+.V

Palpi - Formula: 1. (2. 4). 3. 5.; II=IV; V=II+III+IV.
Relative length of palpi to epipharynx: $\frac{P}{E}$ =2. 8.

Wing - Wing length 2. 2—2. 4 mm. Arching of posterior margin is similar to anterior. First longitudinal vein covers $\frac{1}{5}$ of anterior branch of second longitudinal vein. Anterior branching of second longitudinal vein is longer than the distance between two points of bifurcation $\frac{\alpha}{\beta}$ =1.5, but almost equal to the distance between the points of posterior bifurcation and middle cross vein $\alpha = \beta$. Posterior bifurcation of second logitudinal vein (O) is nearer to the base of wing than the branching of fourth longitudinal vein (O').

Genitalia - Style and coxite both short. Style shorter than coxite, stout and in a form of a pear, bearing four long and slightly curved spines.
3 stout spines (one on the tip, second spine slightly above the first on the dorsal side, and the third one on the ventral side $\frac{1}{3}$ from the base of style) and fourth spine being thinner and is found on the inner side in the middle of style. Base of coxite bearing a process with brush of long hair. Brush not so well developed, thinner with hairs placed aplically on the process. Process long and narrow. $\frac{F}{P}$ = 1.4–1.7.

Female

Size - Larger than the male, mean size 2.1 mm.

Antenna - Geniculated spines longer than in males and present on segments III—XV. III > IV+V; III < IV+V+VI
Relative length of palpi to epipharynx: $\frac{P}{E}$ =2.8

Pharynx - Armature with large cone-shaped teeth occupying the entire width of the plate and bordered posteriorly by fine dotted lines.

Spermatheca - Spermatheca without a well developed terminal process or "neck" and ending in a knob-like "head" showing less than 9 segments or striations when in extended condition (usually between 4 and 7); segments of inequal size with an enlarged head.

Distribution in Iran: (Fig. 3)

Central Ostan: Tehran (4 places), Karaj (1 pl.), Varamin (3 pl.), Dashte Abi (3 pl.), Qazvin (1 pl.)
Ostan 1: Rasht (1 pl.)
Ostan 2: Damghan (1 pl.)
Ostan 3&4: Ardabil (1 pl.), Rezaiyeh (1 pl.), Sarab (1 pl.)
Ostan 5: Malayer (3 pl.), Nahavand (1 pl.), Songhor (3 pl.)
Ostan 6: Abadan (1 pl.)
Ostan 7: Bushehr (1 pl.), Kazerun (1 pl.)
Ostan 9: Sabzevar (11pl.), Torbate-Heidaryeh (1 pl.), Birjand (1 pl.), Mashad (1 pl.), Sarakhs (1 pl.), Neishabour (1 pl.)
Ostan 10: Yazd (1 pl.) Nain (3 pl.)

B - 4 - Phlebotomus (Paraphlebotomus) mongolensis Sinton, 1928

Syn: Phlebotomus (Paraphlebotomus) sergenti var. mongolensis Sinton, 1928

Male:

Colour - Pale yellow.

Size - 1.9—2.5 mm.

Antenna - Third antennal segment, A3=0.26—0.33 mm. longer than epipharynx; E=0.174—0.80; III > IV + V.

Related length of A3 to epipharynx $\frac{A3}{E}$ =1.2—1.43; Geniculated spines present on segments 3—15. Ascoid 4= $\frac{2}{5}$ to $\frac{1}{2}$ of the segment.

Palpi - Formula: 1.4.2.3.5. or 1.(2.4).3.5.

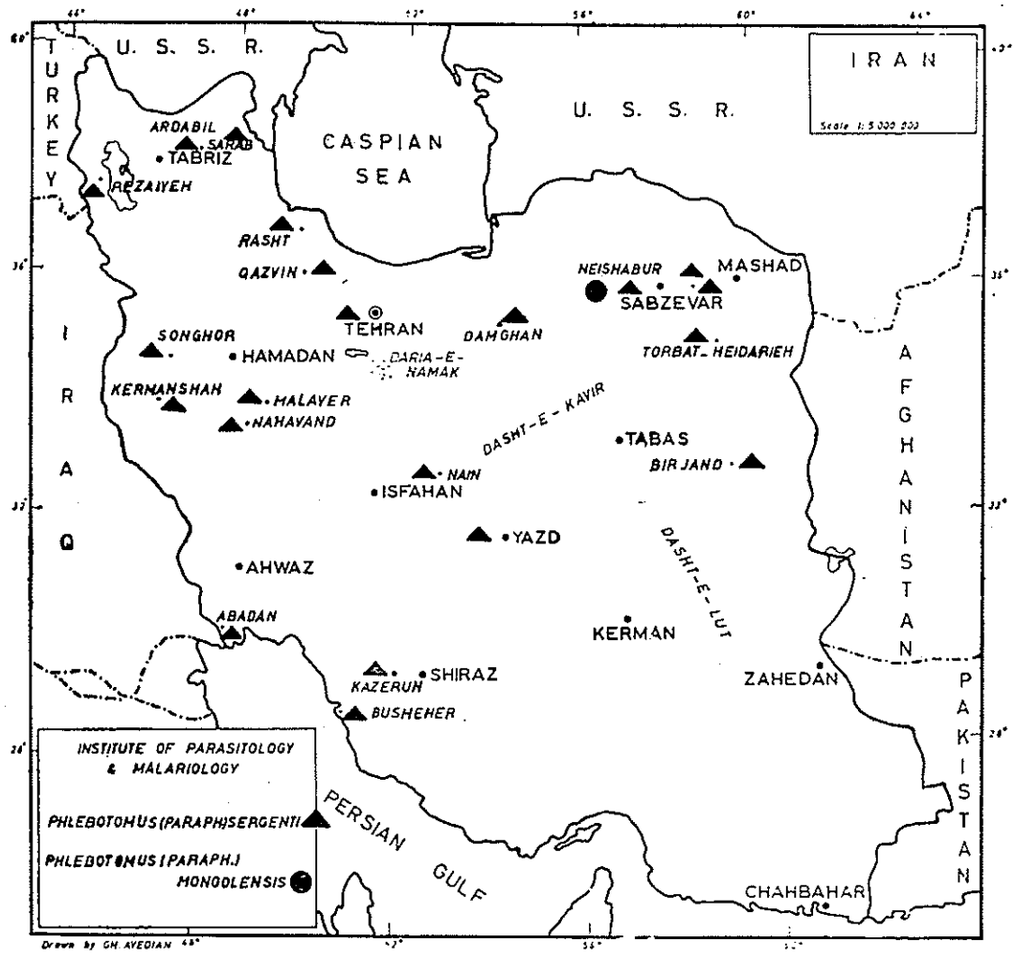
Pharynx - Similar to that of the Ph. caucasicus, with undeveloped teeth mostly oblique. Toothed area about $\frac{1}{7}$ to $\frac{1}{8}$ of the lenght of pharynx.

Genitalia - Coxite 0.26—0.33 mm. Style long, and is about $\frac{1}{2}$ of coxite; length of style 0.16—0.22 mm. Style with 4 spines which three of them are well developed; one at tip of style, the second one at about 0.7, the third one is small and non-developed the 4th is placed near the base. Coxite is as Ph. alexandri and penis as Ph. sergenti. Inferior gonapophysis is longer than coxite. Sperm pump is large and long (0.18 mm).

$\frac{F}{p} = 1.5 - 1.7$.

Distribution in Iran: (Fig. 3).

Ostan 9: Khoramabad (Sabzevar).



(Fig. 3) Approtimate range or distribution and collecting localities of Phlebotomus (Paraph.) sergenti and Phlebotomus (Paraph.) mongolensis in Iran.

B - 5 - Phlebotomus (Paraphlebotomus) alexandri Sinton, 1928

Syn: Ph. sergenti var. alexandri Sinton, 1928

Male

Colour - Darker than Ph. sergenti

Size - Smaller than Ph. sergenti, size 1.35—1.4 mm.

Palpi - Formula: 1.(2.4).3.5. Shorter than in Ph. sergenti; fifth palpal segment shorter than that in Ph. sergenti.

Antenna - Third antennal segment about half the length of epipharynx and is shorter than the 3rd antennal segment of Ph. sergenti; each segment bears two geniculated spines.

Wing - First longitudinal vein covers $\frac{1}{5}$ of anterior branch of second longitudinal vein.
Anterior branching of second longitudinal vein is equal to the distance between two points of bifurcation ($\alpha = \beta$ and is about half the distance between the point of posterior bifurcation and middle cross vein $\frac{\alpha}{\gamma} = \frac{1}{2}$.
Posterior bifurcation of second longitudinal vein (O) is nearer to the base of the wing than the branching of fourth longitudinal vein (O').

Genitala - The only difference with Ph. sergenti is, that in this species the style is longer than the half of coxite. The process is shorter and less hairy than of Ph. sergenti.
$\frac{F}{P} = 1.3 - 1.5$.

Female

Size - Slighty larger than male. Mean size 1.46 mm.,

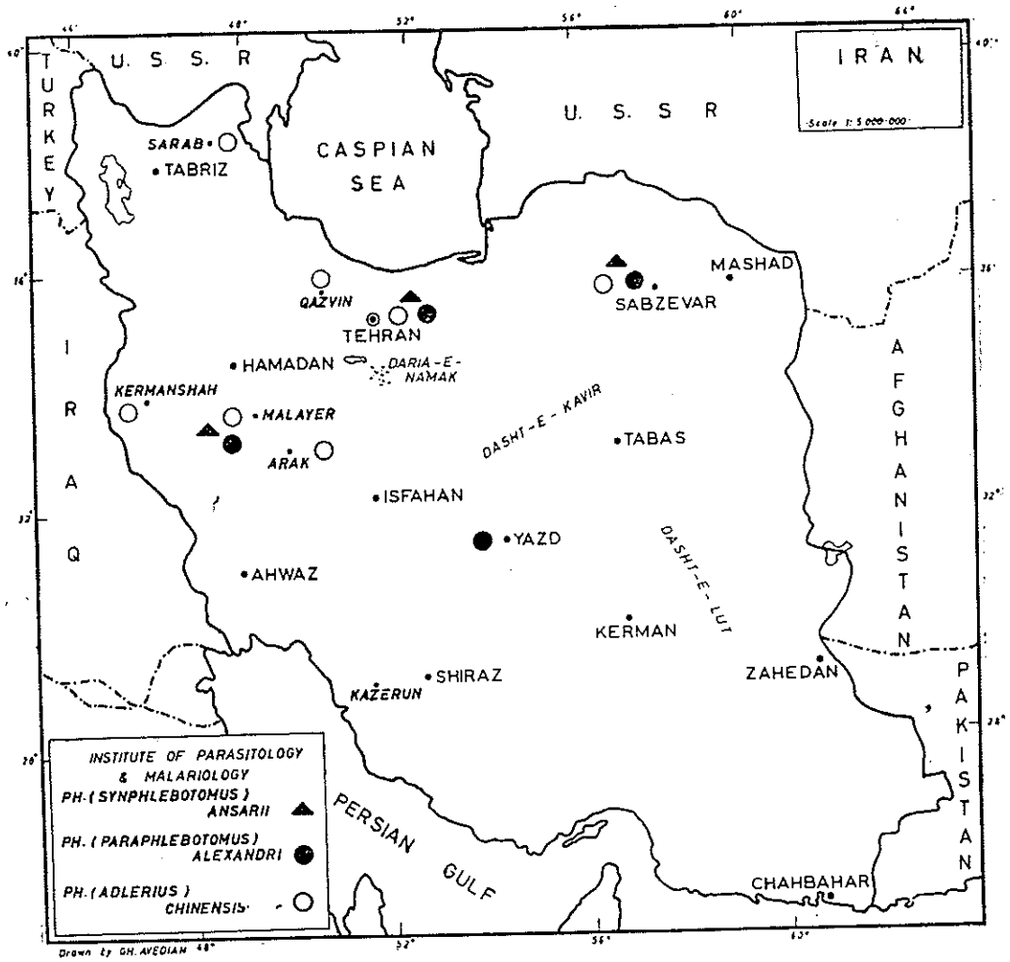
Palpi - Fifth palpal segment longer than in male.

Pharynx - Armature with fine teeth which are placed in longitudinal line. The posterior border of pharynx straight.

Spermatheca - Showing less than 9 segments or striations when in extended condition (usually 8).

Distribution in Iran: (Fig. 4)

Central Ostan: Tehran (2 places)
Ostan 5: Malayer (5 pl.)
Ostan 7: Kazerun (1 pl.)
Ostan 9: Sabzevar (2 pl.), Birjand (1 pl.)
Ostan 10: Yazd (1 pl.)



(Fig. 4) Approximate range of distribution and collecting localities of Phlebotomus (Synph.) ansarii, Phlebotomus (Paraph.) alexandri and Phlebotomus (Ad.) chinensis in Iran.

B - 6 - Phlebotomus (Synphlebotomus) ansarii Lewis, 1957

Male

Colour - Pale yellow.

Size - Mean size 2 mm.

Antenna - Geniculated spines rather short, present on III—XV segments. Third segments slightly longer than epipharynx. III=IV+V

Palpi - Formula: 1.(2.4).3.5.; V $\geqslant$ III+IV

Relative length of palpi to epipharynx $\frac{P}{E}$ =3—3.2

Pharynx - The relative lenght of pharynx to its breadth is $\frac{4}{1}$

Toothed area covers little more than $\frac{1}{4}$ of the pharynx. The fine serrated teeth are forming parallel lines. The anterior border is extended in its middle.

Wing - Long and narrow. The arching of posterior margin is slightly more than anterior. Wing length 1.9—2.1 mm., and breadth 0.4—0.46 mm. First longitudinal vein covers about $\frac{1}{4}$ of anterior branching of second longitudinal vein.

Wing index $\frac{\alpha}{\beta}$ =2.7—2.8; $\alpha < \gamma$.

(O) is nearer to the base of wing than (O').

Genitalia - Coxite long and thick. Style slender and half the size of coxite. The base of each coxite bears peniculus which has a brush of hairs arising from the tip and from the ventral surface. Style bearing 5 long and curved spines: two on its tip, one in the middle of dorsal side, one on the ventral side about its middle, and the last spine which is fine and short is on inner lateral side on $\frac{1}{3}$ from the base of style. The first long, curved and stout four spines are paddle shaped on the tip.

Penis being short and triangular. Paramere short.

Inferior clasper rather long which is longer than coxite.

$\frac{F}{p}$ 2.3.

Female

Colour - Pale yellow
Size - Mean size 2.2 mm.
Antenna - Geniculated spines rather long not extending its segments. Third segment shorter than epipharynx. III=IV+V.
Palpi Formula: 1. (2.4).3.5.
Palpi Relative lenghth of palpi to epipharynx $\frac{P}{E}$ =2.3—2.7
Pharynx - The relative length of pharynx to its breadth is slightly more than $\frac{3}{1}$.
Toothed area covers about $\frac{1}{4}$ of the pharynx. The serrated teeth forming semicircular parallel lines which have triangular shape in the middle of anterior border.
Wing - Long and narrow. The arching of posterior margin is slightly more than anterior. Wing length about 2.16 mm, and breadth 0.53 mm. First longitudinal vein covers about $\frac{1}{4}$ of anterior branching of second longitudinal vein. Wing index $\frac{\alpha}{\beta}$ =3; $\alpha=\gamma$
(O) is slightly nearer to the base of wing than (O').
Spermatheca - With 10—14 segments, without "neck" and gland not larger than the other segments.

Dis tribution in Iran: (Fig 4)

Central Ostan: Varamin (2 pl.)
Ostan 5: Haramabad (Malayer), (3 pl.)
Ostan 9: Khoramabad (Sabzevar), (2 pl.)

B - 7 - Phlebotomus (Adlerius) chinensis halepensis Theodor, 1958,

Male
Colour - Pale yellow.
Size - Mean size 2.4 mm.
Antenna - AIII IV V; third segment slightly longer than epipharynx; geniculated spines short, present on III-XV segments, two on each segment.
Palpi - Formula: 1.4.2.3.5. or 1.4. (2.3.). 5 .
V < IV+III.
Relative length of palpi to epipharynx =2. 8—3.1.
Pharynx - Teeth not fully grown; length to breadth=5.
Wing - Length 1.8.—1.9 mm.; breadth about 0.5. mm.; first longitudinal vein covers $1\frac{1}{4}$ of anterior branching of second longitudinal vein. Wing index: $\frac{\alpha}{\beta}$ =1.4. —1.6. Posterior bifurcation of second longitudinal vein (O) is nearer to the base of the wing than branching of fourth longitudinal veing (O').
Genitalia - Base of coxite without peniculus and brush of long hairs; 5 spines on style, two on tip, two on ventral side from the tip, the last one in the middle on latero-ventral side. Penis long, with well notched tip (one being long and other slightly shorter). Genital filaments about nine times the length of the pump.
Paramere without a tubercle, gradually constricted in its middle.

Female
Size - 1.9.—2.1 mm.
Wing - Length about 2.1 mm., breadth 0.5.—0.6 mm.
Pharynx - Large and flask-shaped, bearing an armature of teeth forming continous semi-circular lines at base, a triangular area of larger teeth in the middle and some smaller

teeth laterally.

Spermatheca - Incompletely segmented or striated.

Distribution in Iran: (Fig. 4)

Central Ostan: Tehran (1 place), Kazvin (1 pl.), Qazvin (1 pl.)
Ostan 2: Araq (1 pl.)
Ostan 3 & 4: Sarab (1 pl.)
Ostan 5: Malayer (13 pl.), Kermanshah (1 pl.)
Ostan 7: Kazerun (1 pl.)
Ostan 9: Sabzevar (1 pl.)

B - 8 - Phlebotomus (Laroussius) kandelakii Schourenkova, 1939

Male

Colour -Dark yellow

Size -Mean size 2 mm.

Antenna -Geniculated spines short, present on III - XV segments. III > IV + V.

Palpi -Formula: 1.4.2.3.5. or 1.4. (2.3).5. V > III + IV.

Relative length of palpi to epipharynx $\frac{P}{E} = 3.3$

Pharynx -Armature is different from that of Ph. chinensis. On the ventral side of pharynx a number of irregular lines of teeth can be seen. Relative length of pharynx to its breadth is about 4.

Wing -Wing length 1.9 - 2 mm. Breadth 0.5 mm.

Wing index $\frac{\alpha}{\beta} = 1.4 - 1.7$; $\alpha > \gamma$, $\alpha > \beta$

Posterior bifurcation of second longitudinal vein (0) is nearer to the base of wing than the branching of fourth longitudinal vein (0').

Genitalia -Style shorter than coxite and bearing 5 equal size spines: two on the tip, one on the middle and two $\frac{1}{3}$ to $\frac{1}{4}$ from the base of style. One of the spines on the tip and the one on the middle are slighty narrower than the others.

Paramere with a well developed ventral tubercle which bears 6 - 7 stout hairs. Penis long, narrow with blunt point. In its middle small teeth are present at its ventral side.

$\frac{F}{P} = 4 - 4.3$.

Female

Size -Mean size 2 mm.

Antenna -Geniculated spines as in male. III $\leqslant$ IV + V

Palpi -Formula: 1.4. (2.3).5.

Wing -Wing length 2 - 2.3 mm., breadth 0.6 mm.

Wing index $\frac{\alpha}{\beta} = 1.6 - 1.8\ \alpha > \gamma$

(O) is nearer to the base of the wing than (O').

Pharynx -On the ventral side of pharynx the armature is forming parallel lines of teeth (dotted or in short lines).

Toothed area of pharynx not extending beyond posterior third. The middle teeth are stouter than lateral.

Spermatheca -With a long terminal process or "neck" and ending in a knob-like "head".

Number of segments is 30 - 35.

Posterior ones not clearly defined.

Distribution in Iran: (Fig. 5)

Central Ostan:- Tehran (1 place), Qazvin (1 pl.)

Ostan 3&4: - Sarab (1 pl.)

Ostan 5: - Malayar (6 pl.), Nahavand (1 pl.)

-Hamadan (1 pl.), Kermanshah (1 pl.)

B - 9 - Phlebotomus (Laroussius) wenyoni Adler & Theodor, 1930

Male

Colour -Yellow with brownish shade

Size -Mean size 2.1 mm.

Antenna -Third antennal segment longer than epipharynx.

Palpi -Formula 1.4. (2.3.). 5. V $<$ IV+III.

The length of palpi is slightly over twice as long as epipharynx.

Pharynx -Armature with teeth extended to the middle of pharynx.

Wing -Broad; arching of posterior margin is more than that of anterior. First longitudinal vein covers $\frac{1}{3}$ to $\frac{1}{4}$ of anterior branch of second longitudinal vein $\frac{\alpha}{\beta} = 1.5$, $\alpha = \gamma$

The branching of fourth longitudinal vein (O') is nearer to the base of the wing than posterior bifurcation of second longitudinal vein (O).

Genitalia -Extended; coxite twice as long as style, style irregular and bears five strong and curved spines: two on the tip, one in the middle of ventral side, one on the dorsal side about 2/3 from the base of style and the last spine on same line but laterally.

Paramere without tubercle or with a slightly developed one. Penis long with rounded tip. $\frac{F}{p} = 3$.

Female

Pharynx -Armature well developed, occupying nearly all the dilated basis of pharynx;

teeth scale-like and placed semi-circularly.

Spermatheca -With a long terminal process or "neck" before the knob-like head.

Number of segments not reaching 30 (usually 12 to 16).

Distribution in Iran: (Fig. 5)

Central Ostan: Teheran (1 place)
Ostan 5: Malayer (2 pl.), Hamadan (1 pl.), Kermanshah (1 pl.)
Ostan 8: Kerman (1 pl.)
Ostan 9: Birjand (1 pl.)
Ostan 10: Yazd (1 pl.)

B - 10 - Phlebotomus (Laroussius) perniciosus tobbi
Adler & Theodor, 1930

Male

Colour	-Darker than all previous species.
Size	-2.1 - 2.5. mm.
Antenna	-Geniculated spines on III-XV segments; two spines on each segment. III $\geqslant$ IV+V –
Palpi	-Formula is not constant but usually is 1.4.2.3.5 or 1.4.-(2.3).5. Relative length of palpi to epipharynx $\frac{P}{E}$ =3.4-3.7.
Pharynx	- Pharyngeal armature less developed and restricted with small teeth appearing as short and dotted fine lines.
Wing	- Wing length, 1.7-2. mm. First longitudinal vein covers $\frac{1}{6}$ to $\frac{1}{4}$ of anterior branch of second longitudinal vein. Anterior branch of second longitudinal vein is longer than the distance between two points of bifurcation; $\frac{\alpha}{\beta}$ = 1.3-1.6 and also longer than or equal to the distance between the point of bifurcation and middle cross vein, $\alpha \geqslant \gamma$ posterior bifurcation of second longitudinal vein (O) is slightly nearer to the base of the wing than the branching of the fourth longitudinal vein (O').
Genitalia	-Extended; Coxite twice as long as style. Style irregular and bears five strong and curved spines: two on the tip, one finer at about the middle of the segment, and slightly distally to its two spines, one thinner and one coarser. Paramere without process. is rather stout having a broad club-shaped head with a well-marked short neck. Penis, long with a broad base and tapes toward the end, without teeth and bifurcated, one fork is much broader

than the other.

The inferior clasper is longer than the superior one.

Female:

Colour - Slightly brownish.

Size - Longer than the male, 2.2-.9. mm.

Antenna -Geniculated spines on III-XV segments; two spines on each segment.

III $\geqslant$ IV+V

Palpi -Similar to that of the male.

Relative length of palpi to epipharynx $\frac{P}{E}$ =3-3.2 .

Pharynx -Pharyngeal armature is similar to that of the male.

Wing -Wing length, 2-2.1 mm. First longitudinal vein covers $\frac{1}{4}$ to $\frac{1}{3}$ of anterior branch of second longitudinal vein;

$\frac{\alpha}{\gamma}$ = 1.1 - 1.6, $\alpha > \gamma$

(O) is sligthly nearer to the base of the wing than the (O')

Spermatheca -Segmented, with complete striations; with long terminal process or "neck" and wide ducts. Number of segments between 12-15.

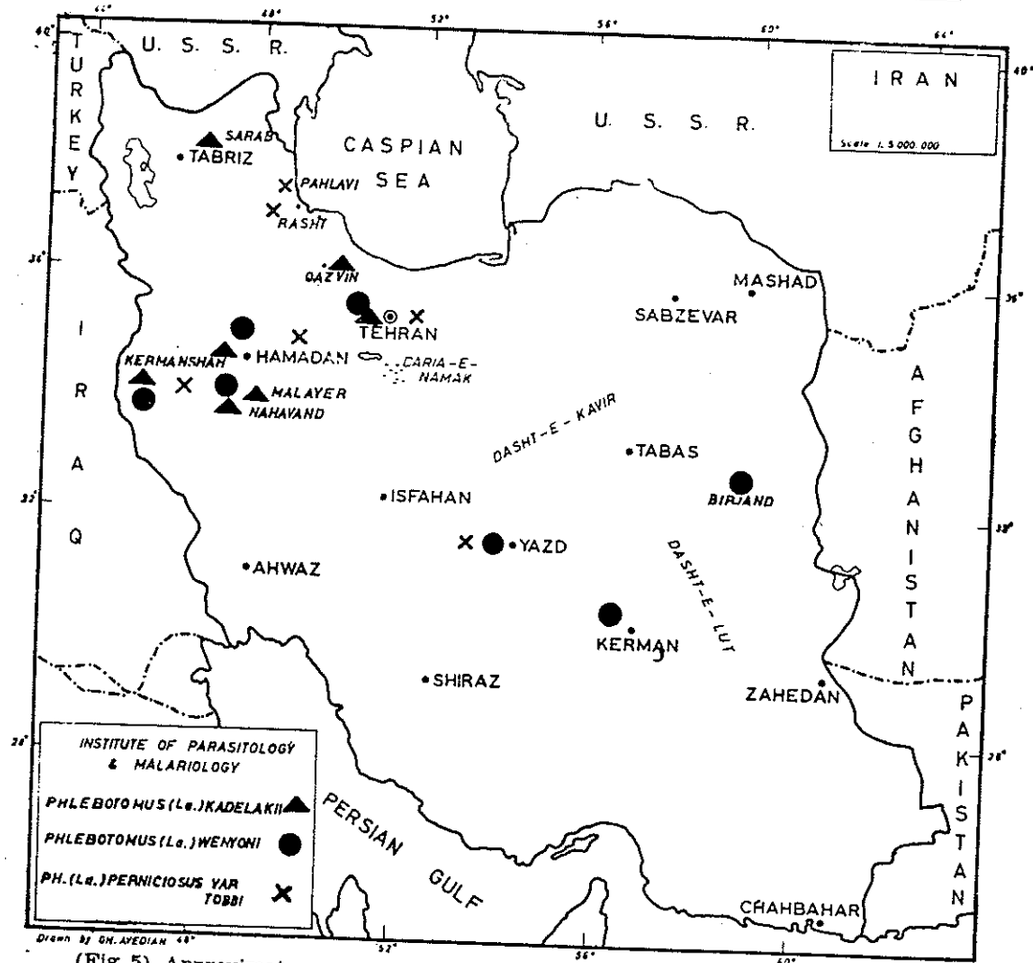
Distribution in Iran: (Fig. 5)

Central Ostan: Dezashib (1 place), Yousseff Abad (Tehran) (1 pl.), Varamin (3 pl.)

Ostan 5: Malayer (4 pl.). Hamadan (1 pl.)

Ostan 8: Shahdad (1 pl.), Kerman (1 pl.)

Ostan 10: Yazd (1 pl.)



(Fig. 5) Approximate range of distribution and collecting localities of Phlebotomus (La.) kandelakii, Phlebotomus (La.) wenyoni and Phlebotomus (La.) perniciosus tobbi in Iran.

B - 11 - Sergentomyia (Sergentomyia) sintoni Pringle, 1935

Male

Colour - - Dark yellow

Size - 1.9-2.1 mm.

Antenna - The length of third segment (140 μ) as long as epipharynx. Geniculated spines about 18.5 μ on the segment III and gradually elongating till it is about 24 μ on segment XV. One on each segment. III < IV+V

Palpi - - Formula 1. (2.4). 3.5.
Relative length of segments: 1,2,3. 6,3. 6,7. 6
Relative length of palpi to epipharynx $\frac{P}{E}$ = 3. 5-3. 9

Buccal cavity - Armature consists of 12 easily definable teeth which are placed on a line with convexity anteriorly. Pigmented area small and of elliptical shape.

Pharynx - Armature length to breadth=3.5 Toothed area about the length of pharynx. The minute teeth forming fine lines. The teeth are slightly longer in the middle.

Wing - Length 1.3.-1.5. mm.; breadth 0.28 mm.;
Wing long narrow and lanceolate. Anterior arching as posterior; first longitudinal vein sometimes covers 10 μ anterior branching of second longitudinal vein and sometimes is about 45 μ behind the point of first bifurcation. Wing Index: $\frac{\alpha}{\beta}$ = 0.36-0.52; $\alpha < \gamma$;
(O) is nearer to the base of the wing than (O').

Genitalia - Coxite elongated; length to breadth=4.; length 234 μ 257 μ breadth 58 μ— 60 μ. Style smooth, cyllindrical and $\frac{1}{3}$ of coxite; longer of style 81 μ — 93 μ. Style with 4 long and curved spines: 2 terminal, one of which is slightly longer than the style, and two sub-terminal spines which are about the length of style.

The seta is well developed, its length is about 31-37 μ, and its place is about $\frac{1}{5}$ of distal extremity of the style on a level with the roots of sub-terminal spines. Penis long with dorsal sub-terminal notch. Paramere gradually narrowing and finger-shape, slightly club like on the tip. $\frac{F}{P} = 4$.

Female

Colour -Dark yellow.

Size 2 - 2.3. mm.

Antenna - Mean length of third autennal segment 102 μ which is shorter than epipharynx. III < IV + V.
Geniculated spines present from III - XV, two on each segment and are gradually elongating. The length of geniculated spine on segment III is about 20 μ and on segment XV - 26 μ. One of geniculated spines of each segment is slightly finer than the other.

Palpi - Formula: 1.2.4.3.5.
Relative length of segments: 1-2-3.7-3.3-6.6; relative length of palpi to epipharynx $\frac{P}{E}$ = 3.6 - 3.7

Buccal cavity -Armature consists of 14-16 well definable teeth which are placed on convex line. The teeth which are in the middle are slightly smaller than the lateral ones.
Dark pigmented area triangular and its posterior side is concave.

Pharynx -Armature flask shaped. Length of pharynx to its brea- concave posteriorly. The teeth are elongated, dark and blunt.

Wing -Length is 1.6-1.9. mm.; breadth $\frac{1}{3}$ of mm.
First longitudinal vein covers $\frac{1}{3}$ to $\frac{1}{4}$ of anterior branching of second longitudinal vein. $\frac{\alpha}{\beta}$ 0.6-0.7; $\alpha < \gamma$
(O) is nearer to the base of the wing than (O').

Spermatheca -Unsegmented and without "neck". Spermathecal duct is

bent and forming angle with the body. The hairs of spermatheca are placed in an umblication.

Distribution in Iran: (Fig. 6)

Central Ostan : -Salehabad Varamine
Ostan 5 : -Malayer (1 pl.)
Ostan9 : -Sabzevar (2 pl,)

B - 12 - Sergentomyia (Sergentomyia) palestinensis (Adler & Theodor), 1927

Female:

Colour -Dark yellow

Size -2-2,3 mm.

Antenna -Third antennal segment (195-210 μ) longer than epipharynx (174-180μ), III $<$ IV+V; geniculated spines present on segments III-XV being very short; the length of geniculated spine on segment III is about $\frac{1}{7}$ of lenght of the segment.

Palpi -Formula: 1.2.(3.4).5.
Relative length of segments: 1-3.3-4.4-4.4-9.5.
Relative length of palpi to epipharynx $\frac{P}{E}$ =3.6-3.7

Buccal cavity - Armature with 20-22 distinct teeth, with are situated on almost straight line. Pigmented area is often heart-shaped and the anterior tail is often bifid.

Pharynx - Pharyngeal armature length to breadth = 3.6-3.7
Toothed area about $\frac{1}{5}$ of the length of pharynx and loosely covered with fine and irregular teeth.

Wing -Anterior arching as posterior. Length is 1.8-2 mm.
Breadth 0,38-0. 45. mm. wing index: $\frac{\alpha}{\beta} = \frac{1}{2} : \alpha \leqslant \gamma$.
(O) is nearer to the base of the wing than (O').

Spermatheca -Rather big. Unsegmented, without the neck; and elliptical shape. With a smooth capsule. The hairs of spermatheca are short and few in number.

Distribution in Iran: (Fig. 6) ⁂

Central Ostan: Tehran (1 pl.)
Ostan 6: Abadan (1 pl.)
Ostan 7: Kazerun (1 pl.)

⁂ This species is very similar to S. sogdianus and could be differentiated only by the count of the teeth of buccal cavity.

B - 13 - Sergentomyia (Grassomyia) squamipleuris (Newstead), 1912.

Male

Colour -Dark yellow.
Size -1.4-1.7 mm.
Antenna - The length of third segment, III = 0.14-0.16 mm. III < IV+V, $\frac{A\ 3}{E}$ =1.1. Geniculated spine 4=0.3 of segments. III without geniculated spine.
Palpi -Formula 1.2.4.3.5. Relative length of segments 1-2.5-5-4-9. Newstead's spines on the second and third palpal segments. Epipharynx 0.13-0.14 mm.
Buccal cavity -Armature consists of 18-20 sharp-pointed teeth on a curved line with a posterior convexity. Dark pigmented area is circular irregularly.
Pharynx -Narrow and approximately without teeth on posterior part.
Wing -Length 1.5 mm. Breadth 0.32-0.36 mm. Wing index 0.93-1.3.
Genitalia -Coxite 0.18- 0.23 mm. Style 0.08-0.1 mm. shorter than the half of coxite, bearing 4 spines (2 terminal and 2 subterminal). Seta 0.8. Penis is short, triangular and tapers to a sharp termination. Paramere with a rounded tip. Inferior clasper as long as coxite.

Female

Colour -Dark yellow.
Size -1.4-1.7 mm.
Antenna - The length of third segment, III=0.15-0.17 mm.

III<IV+V, $\frac{A\ 3}{E}$ = I-I.I. Geniculated spine 4=0.5 of segments.

Epipharynx 0.15-0.17 mm.

Palpi -It resembles those of male.

Buccal cavity -About 36-40 parallel, short-pionted teeth in the armature. The line with a posterior convexity. One row of dotted teeth is in the base of the armature.

Dark pigmented area with a posterior convexity and anterior concavity, anterior tail is sharp.

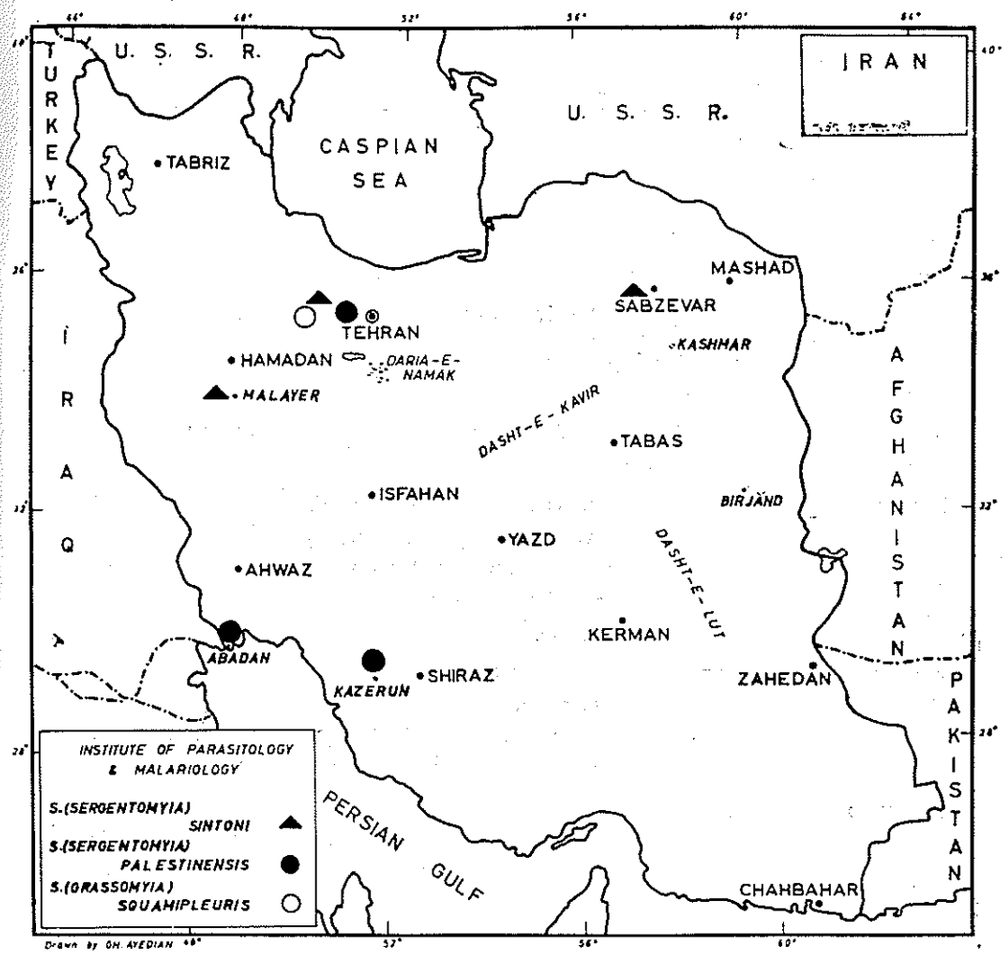
Pharynx -Enlarged posteriorly. Toothed area covered with sharp teeth on the narrower posterior end.

Wing -Length 1.5-1.9 mm. Breadth 0.36-0.45 mm. Wing index 1-1.3

Spermatheca -Rounded capsule covered with fine hairs.

Distribution in Iran: (Fig. 6)

Central Ostan: Teheran (Dezashib).



(Fig. 6) Approximate range of distribution and collecting localities of S. (S.) sintoni, S. (S.) palestinensia and S. (G.) squamipleuris in Iran.

B - 14 - Sergentomyia (Rondanomyia) pawlowskyi (Perfiliew), 1933

Male

Colour -Dark yellow.

Size -1.9-2.1 mm.

Antenna - The length of third segment, III=0.15 mm. III<IV+V $\frac{A3}{E}$ = 0.85. Geniculated spine 4=0.2 of segment. Epipharynx 0.17 mm.

Palpi -Formula 1.2.4.3.5. Relative length of segments 1-2.5-5-4.4-9.

Buccal cavity - Armature consists of a row of parallel and short-pointed teeth which are placed on a line with the posterior convexity, and 1-2 rows of dotted teeth on the base of the armature. Dark pigmented area horizontal and of elliptical shape.

Pharynx -Narrow and horizontally wrinkled bearing the minute teeth on posterior part.
- Length 1.6 mm. Breadth 0.32 mm. Wing index=0.5.
- Tergite VI is obviously longer than tergite V.

Genitalia -Coxite 0.25 mm. Style 0.12 mm. bearing 4 spines (2 terminal and 2 subterminal). The seta is well developed 0.5-0.6 mm. Paramere hooked at the tip with ventral tubercle bearing a brush of hairs.
Penis 0.11 mm. gradually tapers and ending to a blunt tip. $\frac{F}{p}$ =4.

Female

Colour -Dark yellow.

Size -2.1 mm.

Antenna - The length of third segment, III=0.14 mm. III< IV+V $\frac{A3}{E}$ = 0.7. Geniculated spine 4= 0.3 of segments. Epipharynx 0.19 mm.

Palpi -Formula 1.2.4.3.5. Relative length of segments 1-2.3-4.3-3.5-8.

Buccal cavity -Armature consists of 50-60 parallel, comb-like and short-pointed teeth which are placed on a line with the convexity posteriorly. The teeth are 2 times longer than those of male. 3 rows of dotted teeth on the base of the armature. The teeth of anterior rows are shorter than the posterior ones. Dark pigmented area triangular.

Pharynx -Narrow, slightly enlarged on posterior part with the transversal fine lines bearing the inconspicuous minute teeth on posterior end.
Wing index 0.5- 0.6.

Spermatheca - Tubular with the transversal fine striation and narrow ducts.

Distribution in Iran: (Fig. 7)

Ostan 10: Yazd (Mehriz).

B - 15 - Sergentomiya (Sergentomyia) baghdadis (Adler & Theodor), 1929

Female

Colour -Dark yellow.
Size -1.8 mm.
Antenna -The length of third segment, A3=0.18 mm. III=IV+V $\frac{A3}{E}$= 1.1. Geniculated spine 4= 0.37 of segment. Epipharynx 0.16 mm.
Palpi -Formula 1.2 (3.4).5. Relative length of segments 1-2.6-4.6-4.6-8.3
Buccal cavity -Armature consists of short-pointed teeth on an arc with the convexity anteriorly. The medial teeth are smaller than the lateral ones. Ventral plate of cibarium having a distal deep cavity. Pigmented area is hardly distinguishable.
Pharynx -Relative length to breadth = 2.6. Toothed area bearing small and pointed teeth on posterior part.
Wing -Length 1.7 mm. Breadth 0.42 mm. Wing index 0.84.
Spermatheca -Elliptical shape approximately twice as long as broad. Capsule of spermatheca chitinised in distal two-thirds. Duct wide.

Distribution in Iran: (Fig. 7)

Ostan 7: Kazerun.
Ostan 9: Bandar Abbas.

B - 16 - Sergentomyia (Sergentomyia) dentata (Sinton) 1933

Male

Colour -Dark yellow.
Size -1.5-1.8 mm.
Antenna - The length of third segment, III=0.13-0.15 mm. III$<$IV+V, $\frac{A3}{\omega}$= 0.9-1.1 mm. Geniculated spine 4=0.2 of segment. Epipharynx 0.13- 0.14 mm.
Palpi -Formula 1.2.(3.4).5. Relalive length of segments 1-2.6-4-4-8.
Buccal cavity -Armature consists of about 18 sharply pointed teeth on a deep arc with concavity posteriorly. The medial 6-8 teeth are weaker and shorter than the lateral ones. Pigmented area of irregular elliptical shape.
Pharynx -Relative length to breadth = 3. Toothed area is about $\frac{1}{4}$ of the length, bearing the minute teeth on posterior part. There are also a few teeth in the antero-medial portion of the toothed area.
Wing -Length 1.3-1.5 mm. Breadth 0.23- 0.26 mm. Wing index = 0.3 - 0.5.
Genitalia -Coxite 0.23- 0.26 mm. Style 0.10- 0.11 mm. bearing 4 spines (2 terminal and 2 subterminal). The seta 0.8. Paramere is club shaped. Penis 0.78- 0.96 mm. finger-like and stout. Inferior clasper 0.21. Pump 0.75 mm. $\frac{F}{P}$ = 3.5

Female

Colour -Dark yellow.
Size -1.6-1.7 mm.

Antenna -The length of third segment, A3= 0.10- 0.12 mm. III < IV+V, III=0.66-0.78. Geniculated spine 4=0.31-0.35 of segment. Epipharynx 0.15- 0.17

Palpi -Formula 1.2. (3.4).5 or 1.2.3.4.5.
Relative length of segments: 1-2.6-4-4-7.2 or 1-2.6-4-4.5-7.2.

Buccal cavity -Armature consists of 18-20 pointed teeth which are on a deep arc with the concavity posteriorly. The medial 6-8 are reduced in size and laterally condensed.
Pigmented area large, semi-circular and conical.

Pharynx -Relative length to breadth = 2.5. Toothed area bearing strong, blunt and pigmented teeth. The posterior margin of pharynx is approximately straight.

Wing -Length 1.4-1.5 mm. Breadth 0.26- 0.35 mm.
Wing index 0.4- 0.5

Spermatheca -Tubular and bent on its duct.

Distribution in Iran: (Fig. 7)

Ostan 3&4: Garah. Malek (Tabriz).
Ostan 7: Kazerun.

B-17

[redacted] - **Sergentomyia (Sergentomyia) theodori (Parrot), 1942**

Male

Colour -Dark yellow.

Size -1.5- 1.7 mm.

Anetnna - The length of third segment, III=0.14-0.15, III < IV+V. $\frac{A\,3}{E}$ = 0.106- 0.110. Geniculated spine 4= 0.20- 0.23 of segment. Epipharynx 0.12- 0.13 mm.

Palpi -Formula 1.2.(3.4).5. Relative length of segments 1-2.1-3.9-3.9-8.

Buccal cavity -Armature consists of about 16-18 sharply pointed teeth on a line with the convexity anteriorly. The medial 2-4 teeth are unobviously weaker than the lateral ones.
Pigmented area small and of elliptical shape.

Pharynx -Relative length to breadth = 4. Toothed area is about $\frac{1}{5}$ of the length, bearing the minute teeth on transverse rows.
There are also a few weak teeth in the antero-medial part of the armature.

Wing -Length 1.6-1.7 mm. Breadth 0.24- 0.26 mm.
Wing index 0.3- 0.6

Genitalia - Coxite 0.23-0.25 mm. Style 0.85-0.92 mm., bearing 4 spines (2 terminal and 2 subterminal). The seta 0.8.
Paramere club-shaped. Penis about 0.9- 0.99 mm.
Inferior clasper 0.20-0.21. $\frac{F}{P}$ =4

Female

Colour -Dark yellow.

Size -1.5-1.7 mm.

Antenna - The length of third segment, III=0.11 mm. III < IV.+V $\frac{A\,3}{E}$ = 0.77. Geniculated spine 4 = 0.40 of segment.
Epipharynx 0.14 mm.

Palpi -Formula 1.2. (3.4).5. Relative length of segments 1-2.3-4-4-8.

Buccal cavity -Armature consists of 18-22 pointed teeth which are placed on a deep arc with convexity anteriorly.
The medial 4 teeth are weaker and shorter than the lateral ones. Pigmented area is rounded and triangular shape.

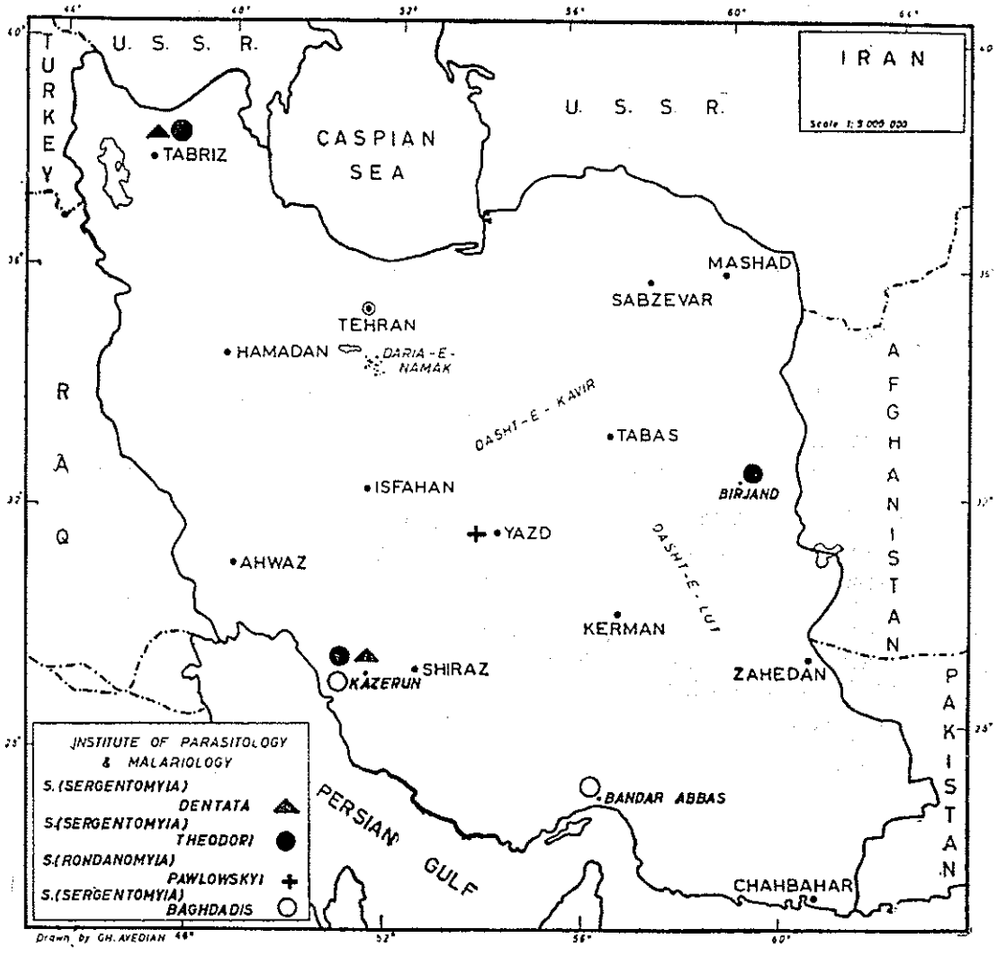
Pharynx -Heart or funnel shaped. Relative length to breadth = 2
The armature consists of teeth which are on rows slightly parallel to the deeply concave posterior margin.

Wing -Length 1.5- 1.7 mm. Breadth 0.26- 0.30 mm.
Wing index 0.4- 0.6.

Spermatheca -Tubular and bent on its duct.

Distribution in Iran: (Fig. 7)

Ostan 3&4: Gerah-Malek (Tabriz).
Ostan 7: Kazerun.
Ostan 9: Birjand (Tabas, Golshan).



(Fig. 7.) Approximate range of distribution and collecting localities of S. (S.) dentata, S. (S.) theodori, S. (R.) pawlowskyi and S. (S.) baghdadis in Iran.

C — KEY TO PHLEBOTOMINAE OF IRAN

1- Large pale-coloured species; buccal armature absent or rudimentary; Wing large and broad; anterior fork long.....Genus **Phlebotomus**

2- Smaller dark-coloured species; buccal armature well developed in females, and to variable extent in males; wing elongated and narrow; fork short, ...Genus **Sergentomyia**

C - 1 — KEY TO GENUS PHLEBOTOMUS OCCURRING IN IRAN

Male

1- Style long and slender; with 3 spines at tip and 2 spines near $\frac{2}{3}$ lateral lobe with 2 or 3 shorter spines at tip; Paramere with 2 long, secondary appendages .....**Ph. (Ph.) papatasi**

- Style shorter and stout, with 2 long spines at tip and 2 or 3 near middle; lateral lobe without spines; Paramere without such appendages; sometimes with a ventral tubercle. 2

2- Base of coxite bearing a process with brush of long hairs; penis short and triangular; 4-5 spines on style 3

- Base of coxite without such a process or brush of hairs; 5 spines on style; penis long 6

3 - 5 spines on style .....**Ph. (Synph.) ansarii**

- 4 spines on style 4

4- Brush well developed, heavy, with hairs placed apically and ventrally on the process; process short and broad .....**Ph. (Paraph.) caucasicus**

- Brush not so well developed, thinner with hairs placed apically on the process 5

5- Third antennal segment longer than epipharynx; style about half the coxite .....**Ph. (Paraph.) mongolensis**

- Third antennal segment long and slightly shorter than epipharynx; style shorter than half the coxite; process long and narrow .... **Ph. (Paraph.) sergenti**

- Third antennal segment short and about half the epipharynx; style longer than half the coxite; process short and narrow .... **Ph. (Paraph.) alexandri**

6- Paramere with a ventral tubercle well developed 7

- Paramere without a tubercle or with a slightly developed one 8

7- Penis with small teeth in its middle .....**Ph. (La.) kandelakii**

- Penis without such teeth but bifurcated at tip .... **Ph. (La.) perniciosus**

8- Penis long with rounded tip .....**Ph. (La.) wenyoni**

- Penis long but bifurcated or notched at tip 9

9- Penis with well notched tip; (Paramere gradually constricted in its middle.) .....**Ph. (Ad.) chinensis**

- Penis with a bifurcated tip; (Paramere well tapered in its middle.) ..... **Ph. (La.) perniciosus tobbi**

Female

1- Spermatheca incompletely segmented or striated; Pharynx large and flask-shaped bearing an armature of teeth forming continuous semi-circular lines at base, a triangular area of larger teeth in the middle and some smaller teeth laterally ....**Ph. (Ad.) chinensis**

- Spermatheca segmented or with complete striations; Pharynx and pharyngeal armature not so 2

2- Spermatheca without a well developed terminal process or "neck", and ending in a knob-like head (gland).....3

- Spermatheca with a long terminal process or "neck" before the gland. 7

3- Spermatheca showing more than 9 segments of striations when in extended condition; segments of equal size but ending in a head (gland); pharyngeal armature appearing as a network of fine wavy lines 4

- Spermatheca showing less than 9 segments or striations when in extended condition; segments of inequal size with an enlarged head; pharyngeal armature developed with coarse teeth 5

4- Number of segments of spermatheca usually about 9-10; gland larger and broader than other segments; the breadth of wing about 650μ .....**Ph. (Ph.) papatasi**

- Number of segments of spermatheca usually about 13-14; gland not larger than the segments; the breadth of wing about 500μ..... ..... **Ph. (Synph.) ansarii**

5- Posterior margin of pharyngeal armature straight; number of segments of spermatheca usually 8 .....**Ph. (Paraph.) alexandri**

- Posterior margin of pharyngeal armature not straight 6

6- Pharyngeal armature with large cone-shaped teeth occupying the entire width of the plate and bordered posteriorly by fine dotted line: number of segments of spermatheca usually between 4 to 7..... .....**Ph. (Paraph.) sergenti**

- Pharyngeal armature with coarse teeth mixed with dotted and crenelated lines; segments of spermatheca slightly fitting each other; number of segments usually between 3 to 4...**Ph. (Paraph.) caucasicus**

7- Number of segments of spermatheca reaching or equal 30..... ....**Ph. (La.) kandelakii**

- Number of segments of spermatheca not reaching 30, usually12-16... 8

8- Pharyngeal armature well developed, occupying nearly all the dilated basis of pharynx; teeth scale-like and placed semicircularly ....**Ph. (La.) wenyoni**

- Pharyngeal armature less developed, restricted with small teeth appearing as short and dotted fine lines .....**Ph. (La.) perniciosus** ..... and **Ph. (La.) perniciosus tobbi**

The key to the genus Phlebotomus of Iran is based on preliminary keys of P. Perfiliew 1937, O. Theodor 1948, G. Pringle 1953 and personal studies of the author.

KEY TO GENUS SERGENTOMYIA OCCURRING IN IRAN

Male

1- Armature of buccal cavity consists of not less thhan 30 distinguished parallel teeth.....Sergentomyia (G.) squamipleuris

-Armature of buccal cavity with less than 30 weakly teeth.....2

2- Paramere hooked at the tip.....3

-Paramere blunt at the tip or club-shaped.....5

3- Paramere without a ventral tubercle bearing hairs..... 4

-Paramere with a ventral tubercle bearing stout hairs..... ..... Sergentomyia (R.) pawlowskyi

4- Style about 5-6 times as long as broad. Armature of buccal cavity consists of indistinguishable and week teeth standing on 1-2 deep arc with a concavity posteriorly. Pharyngeal armature without chitinous teeth .....Sergentomyia (S.) baghdadis

-Style about 4 times as long as broad. Armature of buccal cavity with 8-12 definable teeth standing on a straight line. Pharyngeal armature about 5-6 rows of minute teeth.....Sergentomyia (S.) palestinensis

5- Buccal armature of 10-14 uniform teeth on a line with concavity posteriorly .....Sergentomyia (S.) sintoni

-Buccal armature of 18-20 teeth on a deep arc with a convexity anteriorly. The medial teeth are weaker and closely set.....6

6- Style about 0.10 - 0.11 mm. Penis about 0.78 - 0.96 mm..... .....Sergentomyia (S.) dentata

-Style about 0.86-0.92 mm. Penis 0.90-0.99 mm..... .....Sergentomyia (S.) theodori

Female

1- Spermatheca tubular with minute spines 2

-Spermatheca capsular, elongated and smooth 5

-Spermatheca rounded capsule with spine, about 50 paralled teeth in buccal cavity on a line with convexity posteriorly..... .....Sergentomyia (G.) squamipleuris

2- Spermatheca with weakly transverse striation, about 50-60 long, comblike teeth in the buccal armature, on the base of armature are placed 3 rows of dotted teeth.....Sergentomyia (R.) pawlowskyi

-Spermatheca without striation.....3

3- Buccal armature consists of about 10-14 teeth uniform in size and space .....Sergentomyia (S.) sintoni

-Buccal armature consists of about 18-22 teeth, the medial ones weaker and closely set 4

4- Posterior margin of pharynx straight .....Sergentomyia (S.) dentata

-Posterior margin of pharynx concave and serrated .....
.....Sergentomyia (S.) theodori

5- Spermatheca elongated and about twice as long as broad, and heavily chitinsed in distal two-third. Buccal armature of about 16-18 teeth on a concave arc. posterior margin of buccal plat with a deep cavity..
.....Sergentomyia (S.) baghdadis

-Spermatheca rounded and relative lenght to breadth 4:3. The base of armature is a row of dotted teeth. Pigmented area heart-shaped. Anterior tail almost bifid.....Sergentomyia (S.) palestinensis

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Summary

This paper gives a list of maps of distribution and a key for identification of 17 sandfly species and varieties occurring in Iran: Phlebotomus papatasi, Ph. caucasicus, Ph. sergenti, Ph. mongolensis, Ph. alexandri, Ph. ansarii, Ph. chinensis Ph. kandelakii, Ph. wenyoni, Ph. perniciosus tobbi, Sergentomyia sintoni, S. palestinensis, S. squamipleuris, S. pawlowskyi, S. baghdadis, S. dentata, S. theodori. 7 species: Ph. alexandri, Ph. mongolensis, S. baghdadis, S. dentata, S. squamipleuris, S. sintoni and S. theodori are recorded for the first time in Iran.

The paper is strictly based on specimens collected by the entomological staff of the Institute of Parasitology and Malariology in Iran.

Sommaire

Cet article contient une liste des cartes de distribution et clés de determination de 17 espèces et variétés de Phlebotomes de l'Iran: Phlebotomus papatasi, Ph. caucasicus, Ph. sergenti, Ph. mongolensis, Ph. alexandri, Ph. ansarii, Ph. chinensis, Ph. kandeltkii, Ph. wenyoni, Ph. perniciosus tobbi, Sergentomyia sintoni, S. palestinensis, S. palestinensis, S. squamipleuris, S. pawlowskyi, baghdadis, S. dentata, S. theodori. 7 espèces: Ph. alexandri, Ph. mongolensis, S. baghdadis, S. dentata, S. squamipleuris, S. sintoni, et S. theodori ont été recordées pour le premier fois en Iran.

L'article est strictement basé sur les specimens collectés par le personnel entomologie de l'Institut de Parasitologie et Malariologie de l'Iran

ADDENDUM

During the time the present paper was in press the following species of Phlebotominae were recorded in Iran and identified as follows: Phlebotomus (Phlebotomus) bergeroti from Bander Abbas (S. Iran), Sergentomyia (Parrotomyia) graecovi from Sabzevar (N. E. Iran), Sergentomyia (Par.) sumbarica from the same place, Sergentomyia (Sintonius) clydei from Firuzabad (S. Iran), Sergentomyia (Sin.) tiberiadis from Kazerun and Firuzabad (S. Iran) and Sergentomyia (Parvidens) iranica from Kazerun (description in press). The above mentioned species will be treated more thoroughly in a subsequent paper of the present series.

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