A KEY TO THE ANOPHELINES OF IRAN (*)

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Up to 1950 different Iranian and foreign scientists reported the existence of 16 anopheline species for Iran, of which one A. (M) rhodesiensis was probably misidentified since it has never been confirmed later. On that time the only available key specifically prepared for their determination was the key of T. Macan for anophelines of Iran and Iraq, to which, in addition to 15 known anophelines, a new species for Iran A. (A) marteri was added.

Since the establishment of the Institute of Parasitology & Malariology in 1951, a great many research-teams were sent to various parts of the country to investigate the anopheline fauna and their distribution in Iran.

The results of these intensive studies enabled the author in 1952 to revise the anopheline fauna of Iran and to work-up a key for 20 collected species and varieties i.e., an addition of A. (A) hyrcanus var. pseudopictus, A. (A) hyrcanus var. hyrcanus, A. (A) hyrcanus var. nigerrimus, A. (A) sogdianus (***) and A. (M) subpictus to the already known fauna. The key was, in a way, a modification of the key of T. Macan.

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(***) A. (A) marteri and A. (A) sogdianus were reduced by the author (1956) to two sub-species i.e., A. (A) marteri ssp. marteri and A. (A) marteri ssp. sogdianus. Only the second variety is present in Iran.

The same year, R.P. Dow published a report regarding the control of Malaria in Iran, where he gave an account of mosquitoes collected during his survey in 1949 in Iran. This report contained a key to the adult anopheline females of Iran (19 species and varieties), which was principally based on a key to the species of Europe, North Africa and the Near East compiled by C.B. Worth and Alan Stone, and included all the species known from Iran and a few others reported from nearby areas, which may possibly occur in this country.

The key for the adults presented here is the second revision of the author's first key for adult females. The key to the fourth instar larvae is the first complete revision of the key to the anopheline larvae for which the keys written by Macan, T.T., (1942), Russell, P.F., Rozeboom, B.S., & Alan Stone, (1943) and Mattingly, P.F. & Knight K.L. (1956), were used as the sources of information. They cover 22 anopheline species, sub-species and varieties, known hitherto in this country and are based purely on material collected by the staff of the Institute of Parasitology and Malariology and kept in its museum.

Part I : Adult females

KEY TO THE SPECIES OF ANOPHELES FEMALES OCCURRING IN IRAN

1. Fore margin of the wing with a conspicuous pattern of at least four dark and four light bands alternative.....11
   -Fore margin of wing uniformly dark or with less than four light and four dark bands alterning.....2
2. Light and dark scales on the wing; fore margin of the wing with two small white spots, one near the tip, the other about two thirds of the way from the root of the wing.....3
   -Only dark scales on the wings.....5
3. Tarsal banding narrower; hind tarsus with apices of segments only pale (if segment 4 is involved the whole segment may be diffused pale). Subcostal spot larger, and involving vein 1 equally with the costa.....4
   -Tarsal banding broader; hind tarsus very commonly shows also base of segment 4 pale. Subcostal spot smaller, not involving or only incompletely involving vein 1. Wing dark, stems of 2 and 4 dark; a fringe-spot at 5.2 unusual. Dark area

at base of vein 5 usually long.....
..... A. hyrcanus var. nigerrimus

4. Hind tarsal segment 4 all white or whitish.....
.....A. hyrcanus var. pseudopictus

-Hind tarsal segment 4 dark except at tip.....
.....A. hyrcanus var. hyrcanus

5. Wings with distinct dark spots visible to the naked eye.....6
-Wings without dark spots.....7

6. At the tip of the wing the fringing hairs are light in colour and form a distinct spot; dark spots on the wing conspicuous
..... A. maculipennis

-All fringing hairs of the wing dark in colour, dark spots on wings less conspicuous.....A. sacharovi

7. Upper surface of thorax unicolour, white frontal tuft absent.8
-Upper surface of thorax dark at the sides with a broad lighter stripe down the middle; white frontal tuft present.....9

8. Hairs on thorax and scales on wing very pale; branching of fourth wing vein nearer wing base than branching of second vein.....A. apoci

-Hairs on thorax red-brown or dark-brown; branching of fourth wing vein further from wing base than branching of second vein.....A. algeriensis

9. Proboscis of female uniformly brown.....10
-Proboscis of female brown with tip of the wing light or greyish in colour.....A. marteri ssp. sogdianus
.....A. marteri ssp. marteri (*)

10. Larger brownish species (wing 5.5 to 6 mm long); last segment of female palpus less than half as long as the penultimate.....A. claviger
-Smaller blackish species (wing 5mm long); last segment of female palpus more than half as long as the penultimate.....
.....A. plumbeus

11. Tip of hind les at least 3 last serment white; addominal

(*) Not found in Iran.

segments with a tuft of erect black scales at the distal corners
..... A. pulcherrimus

-Tip of hind leg dark; abdominal segments without a tuft of erect scales at the distal corners.....12

12. Femora and tibiae speckled with white spots.....A. stephensi

-Femora and tibiae not speckled.....13

13. Contrasting black and white pattern only found along front margin (costa, subcosta and first vein) of wing, rest of wing covered with uniformly grey scales; female palp with a light tip and three pale bands which may be so obscure that the palp appears unbanded.....A. dthali

-Contrasting black and white pattern on all wing veins; female palp with at least three conspicuous white bands.....14

14. Tip of female palp dark 15
-Tip of female palp light.....16

15. Base of costa light, 5th vein pale at point of bifurcation; 6th vein with three dark spots; thorax with narrow scales on mesonotum and broad scales on fossae; third vein light.....
.....A. multicolor

-Base of costa dark; 5th vein dark at point of bifurcation ; 6th vein apical half and spot near base dark; thorax without scales; third vein sometimes dark.....A. turkhudi

16. Frontal tuft poorly developed; third vein usually dark; thorax unicolour 17
-Frontal tuft well developed; third vein usually light; thorax grey on top, darker at sides.....18

17. Only two fringe spots; no tuft of scales on anterior margin of mesonotum; first vein with a dark spot opposite the light spot at the base of costa.....A. culicifacies

-More than two fringe spots; tuft of scales present on front margin of mesonotum; first vein uniformly pale opposite the pale spot at the base of costa.....A. sergenti

18. Tarsi unbanded with a most indistinct pale marking on one or two segments at the joints.....19
-Tarsi with conspicuous pale bands.....20

19. Larger, paler species with unusually long palps, sometimes apical pale segment with dark band; no dark spot at point of

bifurcation of 5th vein, one or two pale spots at the base of costa; anterior forked cell (vein 2) rather short, the cell about the same lenght as its petiole.....A. superpictus

-Smaller, darker species with palps of usual lenght, a dark spot at the point of bifurcation of the 5th vein; usually no pale spots at the base of costa; anterior forked cell very long;twice or more lenght of petiole.....A. fluviatilis

20. Tarsi with narrow but distinct white apical bands; usually no pale spots at the base of costa.....A. moghulensis

-Tarsus of front legs with broad pale bands; pale spots at the base of costa.....A. subpictus

Part II : Fourth instar larvae

KEY TO THE 4th INSTAR LARVAE OF ANOPHELES OCCURRING IN I R A N

1. Lateral hairs on abdominal segments IV-VI distinctly feathered; frontal hairs simple.....A. plumbeus

-Lateral hairs on abdominal segments IV-VI branched but not feathered; frontal hairs feathered.....2

2. Inner clypeal hairs approximate, much closer to one another that they are to the outer clypeals; antennal shaft hair branched.....3

Inner clypeal hairs widely separated, as far as they are from the outer clypeals; antennal shaft hair unbranched 7

3. Outer clypeal hairs densely branched.....4

-Outer clypeal hairs simple or at most frayed or split at tip...5

4. Antennal hair relatively long, branched and arising near middle of antenna; inner clypeal hairs usually simple..... .....A. hyrcanus /complex/

-Antennal hair relatively short, branched and arising at basal fourth of antenna; inner clypeal hairs branched at tip.....A. sacharovi

.....A. maculipennis/complex/

5. Leaflets of abdominal palmate hairs abrutly narrowed before

apex; posterior clypeal hairs long and usually simple..... .....A. marteri sogdianus

-Leaflets of adbominal palmate hairs uniformly tapering to apex, posterior clypeal hairs short and branched.....6

6. Fronto-clypeal markings consisting of separate spots; saddle hair based on/or just outside the margin of saddle; tergal plates as wide as gut; inner clypeal hairs usually simple..... .....A. claviger

-Fronto-clypeal markings forming a dark transverse band behind the bases of the frontal hairs; saddle hair based well within margin of saddle; tergal plates wider than gut; inner clypeal hairs lightlty feathered.....A. algeriensis

7. Outer clypeal hairs branched; (a dark transverse band across head behind bases of frontal hairs).....A. pulcherrimus

-Outer clypeal hairs simple, occasionally bifid or lightly feathered.....8

8. Anterior (main) tergal plates of abdominal segments III-VII exceptionally large, their posterior borders usually enclosing the posterior tergal plate; width of main plate on segment V at least three-quarters of the distance between the palmate hairs .....A. fluviatilis

-Anterior (main) tergal plates narrower; posterior tergal plates always entirely free; width of main plate on segment V not more than two-thirds of the distance between the palmate hairs; usually less than this.....9

9. Both long mesopleural bristles feathered; well developed palmate hairs on abdominal segments IV-VII only..... .....A. turkhudi

-At least one mesopleural bristle simple; palmate hairs at least on abdominal segments II-VII.....10

10. Both long mesopleural bristles simple (one may be occasionally feathered on one side of the thorax).....11

-One long mesopleural bristle feathered.....14

11. Both long metathoracic pleural bristles feathered..... .....A. subpictus

-One long metathoracic pleural bristle simple.....12

12. Inner caudal hairs with branches strongly hooked; posterior

clypeal hairs approximately equal in length to the outer clypeals; paired accessory tergal plates usually dash-like...A. dthali

-Inner caudal hairs with branches straight; posterior clypeal hairs shorter than the outer clypeals; paired accessory tergal plates usually dot-like.....13

13. Fronto-clypeal markings dark, in a form of Y-shaped pattern, with stem behind bases of frontal hairs forking forward to anterior border of clypeus.....A. culicifacies adenensis

-Fronto-clypeal markings consisting of 3 dark spots behind bases of frontal hairs.....A. culicifacies

14. One long metathoracic pleural bristle simple.....15

-Both long metathoracic bristles feathered.....16

15. Inner caudal hairs hooked; inner clypeal hairs simple; anterior (main) tergal plates wide, extending beyond the gut on either sides; fronto-clypeal markings in a shape of dark transverse band behind bases of frontal hairs.....A. sergenti

-Inner caudal hairs straigth; inner clypeal hairs usually frayed; anterior (main) tergal plates smaller not extending beyond the gut on either sides; fronto-clypeal markings in a shape of dark spots.....A. apoci

1». Metathoracic hair 1 differentiated forming distinct palmate hair; abdominal palmate hairs usually well developed on segments II - VII..... 17

-Metathoracic hair 1 undifferentiated; abdominal palmate hairs well developed on III - VII.....18

17. Prothoracic hair 1 with small unsclerotized tubercle; inner clypeal hairs rather slender with very fine lateral fraying; base of fronto-clypeus with dark spots.....A. superpictus

-Prothoracic hair 1 with well developed chitinized tubercle; inner clypeal hairs finely frayed on middle two-thirds; base of fronto-clypeus usually wholly dark.....A. moghulensis

18. Prothoracic hair 1 usually without basal tubercle; inner clypeal hairs always simple; well marked dark spots round bases of frontal hairs which may be fused to form a continuous band ..... A. multicolor

-Prothoracic hair 1 with well developed tubercle; inner clypeal hairs usually delicately frayed; no dark spots around the bases of frontal hairs.....A. stephensi

Summary

Keys for identification of adult females and fourth instar larvae of Anopheline Mosquitoes of Iran with brief review of important literature on the Iranian Anopheline Fauna are given in this paper.

Sommaire

Cet article contient des Clés de determination des adultes femelles et des larves (4eme instar) des Anopheles de l'Iran avec une revue de literature la plus importante sur la faune iranienne des Anopheles.

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Travil du Service de Sérologie
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INFLUENCE DE QUELQUES FACTEURS SUR LA REACTION DE FIXATION DE COMPLEMENT DE LA SYPHILIS.

Par H. Mirdamadi

On sait que le mécanisme exact de fixation de complément est encore mal connu et c'est probablement pour cette raison que la théorie de Bordet est considérée aujourd'hui même comme la plus satisfaisante pour expliquer ce phénomène.

Selon cette théorie, la fixation de complément sur l'immun-complexe est bien comparable avec le phénomène d'adsorption et présente une grande analogie avec la fixation d'une teinture sur une fibre végétale.

En admettant la conception de Bordet sur le mécanisme de la fixation de complément on est amené à conclure que de même que dans la teinturerie, l'agitation peut avoir une action favorable pour la fixation rapide et uniforme de complément sur l'antigène déja sensibilisé.

Voici une expérience qui montre très nettement l'effet favorable de l'agitation sur la vitesse, l'uniformité et l'intensité de coloration par l'action favorisante de l'agitation:

Versons une solution bien diluée de bleu de méthylène dans deux vases à expérience à fond plat. Plongeons dans chaque vase quelques petits carrés à dimensions et à nombres égales de papier buvard.

Plaçons maintenant l'un des vases sur un rotateur à mouvement de rotations lentes (150 - 180 révolutions par minute) et mise dans une étuve à 35° C. l'autre vase sera placé dans la même étuve sans être agitée.

Après quelques minutes, on retire les morceaux de papier buvard et on constate que les morceaux de papier buvard agités dans le bain colorant se colorent plus rapidement et sont colorés d'un façon uniforme et plus intense par comparaison aux morceaux non agités qui se

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