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Ceratopogonidae (*Diptera*) from Algeria. VI. *Culicoides* Latr.

Ceratopogonidae (*Diptera*) Algerii. VI. *Culicoides* Latr.

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Abstract. The author recorded 31 species of the genus *Culicoides* from Northern Algeria. They are distributed amongst subgenera as follows: *Pontoculicoides* Remm — 2 species, *Avaritia* Fox — 3, *Culicoides* (s. str.) — 3, *Oecacta* Poey — 20, *Beltranmyia* Vargas — 2, and *Monoculicoides* Khalaf — 1 species. For. *C* (*Oe.*) *griseidorsum* Kieff., 1921, *C.* (*Oe.*) *sahariensis* Kieff., 1923, *C.* (*Oe.*) *sergenti* Kieff., 1921, and *C. citrinellus* Kieff., 1923, neotypes are designated. Some new synonyms are proposed. They are: *C. griseidorsum* Kieff. (= *C. saevanicus* s. Callot, Kremer et Hommel), *C. kingi* Aust. (= *nilotes* Kieff.), *C. leucostictus* Kieff. (= *C. pharao* Kieff.), *C. puncticollis* (Beck.) (= *C. distigma* Kieff., *C. griseovittatus* Vimm., *C. luteosignatus* Vimm.), *C. sahariensis* Kieff. (= *C. baghdadensis* Khalaf), *C. sergenti* Kieff. (= *C. citrinellus* Kieff.). The name *C. numidicus* used by Mayer (1955) is a nomen nudum. Algerian species of the genus *Culicoides* seem to represent five zoogeographic elements.

For the present study about 900 specimens of the genus were explored. General notes on the *Ceratopogonidae* collection from Algeria have been given in a previous paper (Szadziewski, 1983). Only synonyms which were used in papers concerning North Africa and Mediterranean subregion are mentioned in the present paper.

I wish to express my deepest thanks to Professor M. Kremer and Mr. J. C. Delecolle, Faculté de Médecine, Strasbourg, France, as well as to Dr. H. Remm, University of Tartu, USSR, for their valuable suggestions and discussion on some *Culicoides* species.

REVIEW OF THE SPECIES RECORDED

1. *C.* (*Pontoculicoides*) *saevus* Kieffer, 1922

C. micromaculithorax Khalaf, 1957.

Kherrata, Akbou, Tazmalt, Beni Mansour, Grarem near Constantine, Ras Isly near Sala Bey, Barika, Oumache near Biskra, Chegga near Biskra, 37 ♂, 102 ♀. Males and females were collected from flowers of *Umbelliferae* in Grarem, Ras Isly, Barika and from flowers of olive-trees in Barika.

Palaearctic species characteristic of steppes and semideserts recorded from North Africa, Middle East, Iran, Afghanistan, Caucasus, Middle Asia, China. In Europe the species recorded from Bulgaria, Hungary, Czechoslovakia, Moldavia and South Ukraine. From Algeria recorded by Kieffer (1922, 1923), and Goetghebuer (1939).

2. *C.* (*Pontoculicoides*) *sejfadinei* Dzhafarov, 1958

30 km north of Biskra, 1 ♀.

Mediterranean species recorded from Yugoslavia, Morocco, Iran, Transcaucasus, Middle Asia. From Algeria recorded for the first time.

3. *C.* (*Avaritia*) *imicola* Kieffer, 1913

C. pallidipennis Carter, Ingram et Macfie, 1920.
C. iraqensis Khalaf, 1957.

Akbou, 1 ♀.

Widespread Afrotropical species. In Palaearctic Region recorded from Morocco, Israel, Iraq and Cyprus. From Algeria recorded for the first time.

4. *C.* (*Avaritia*) *obsoletus* (Meig., 1818)

C. kabyliensis Kieff., 1922.

Béjaia, Tichi near Béjaia, Aokas near Souk El Tenine, Ziama Mansouria near Jijel, Les Falaises near Jijel, 7 ♂, 30 ♀.

Widespread Holarctic species (except for tundra and deserts). From Algeria recorded by Kieffer (1922), Clastrier (1958, 1961), Goetghebuer (1939).

5. *C.* (*Avaritia*) *scoticus* Downes et Kettle, 1952

Tichi near Béjaia, 3 ♂.

Widespread arboreal Palaearctic species known from West Europe and Morocco to Far East of USSR. From Algeria recorded for the first time.

6. *C.* (*Culicoides*) *newsteadi* Austen, 1921

Chegga near Biskra, about 550 specimens.

Mediterranean species known from North Africa, Middle East, Cyprus, Iran, Caucasus, Middle Asia, South and West Europe. From Algeria recorded for the first time.

7. *C.* (*Culicoides*) *pulicaris* (L., 1758)

C. stephensi Carter, 1916.

Ziama Mansouria near Jijel, 1 ♀.

Widespread arboreal Palaearctic species (except for tundra and deserts). From Algeria recorded for the first time.

8. *C.* (*Culicoides*) *punctatus* (Meig., 1804)

Ziama Mansouria near Jijel, Sétif, 1 ♂, 4 ♀.

Widespread arboreal Palaearctic species (except for deserts). From Algeria recorded for the first time.

9. *C.* (*Oecacta*) *azerbajdzhanicus* Dzhafarov, 1962

30 km north of Biskra, 2 ♂, 1 ♀.

Mediterranean species known from Morocco, Israel, Cyprus, Iran, Caucasus and Middle Asia. Lastly recorded from Kenya (Boorman, 1978). From Algeria the species is recorded for the first time.

10. *C.* (*Oecacta*) *cataneii* Clastrier, 1957

Souk El Tenine, Beni Mansour, Sétif, 4 ♂, 1 ♀.

Mediterranean species recorded from Morocco, Israel, Cyprus, Spain, South France, Italy, Yugoslavia. From Algeria recorded by Clastrier (1957).

11. *C.* (*Oecacta*) *dzhafarovi* Remm, 1967

Oumache near Biskra, 1 ♂.

Mediterranean species known from Morocco, Iran, Yugoslavia, Caucasus and Middle Asia. From Algeria recorded for the first time.

12. *C.* (*Oecacta*) *faghihi* Navai, 1971

Ras Isly near Sala Bey, 1 ♂.

The species known from Iran and Morocco. From Algeria recorded for the first time. Most probably it is Mediterranean species.

13. *C.* (*Oecacta*) *gejgelensis* Dzhafarov, 1964

Tazmalt, Souk El Tenine, 2 ♂.

Mediterranean species known from South Europe, North Africa, Middle East, Crimea, Caucasus and Middle Asia. From Algeria recorded by CALLOT et al. (1968).

14. *C.* (*Oecacta*) *griseidorsum* Kieffer, 1918

(Figs 1–4)

Culicoides griseidorsum KIEFFER, 1918: 46 (♀, Tunesia).

C. saevanicus: KREMER, CALLOT and HOMMEL, 1973: 65 (diagnosis, key, figs) nec DZHAFAROV, 1960.

DESCRIPTION

♀. Close to other species of the *pictipennis* group.

Flagellum 580–672 μm long, antennal ratio (AR) 1.15–1.17, sensilla coeloconica present on all flagellomeres except for last one. Palpus 208–244 μm long, third palp segment measuring 88×36 μm and 76×29 μm, palpal ratio 2.44–2.62; sensory pit broad and shallow (fig. 1), proximal margin well sclerotized, irregular, distal margin not developed. Eyes bare, moderately separated (fig. 2).

Scutellum pale. Wing dark with pale patches as on fig. 3, membrane including basal cell covered with macrotrichia; tip of second radial cell pale; wing length 1.25–1.29 mm.

Spermathecae (fig. 4) almost spherical without necks, measuring 30×30 μm, 40×40 μm and 34×34, 34×38 μm.

MATERIAL EXAMINED

Algeria: Aokas at Béjaia, 6 May 1981, 1 ♀, leg. R. Szadziewski, a neotype of *C. griseidorsum*. The neotype is deposited in the Institute of Zoology, Polish Academy of Sciences, Warsaw.

Poland: Ustrzyki Górne, Bieszczady Mts., 23–30 July 1980, 1 ♀, leg. R. Szadziewski.

DISTRIBUTION

Algeria, Tunesia; Israel (BRAVERMAN et al., 1976), Great Britain (KLOET and HINCKS, 1976), Poland.

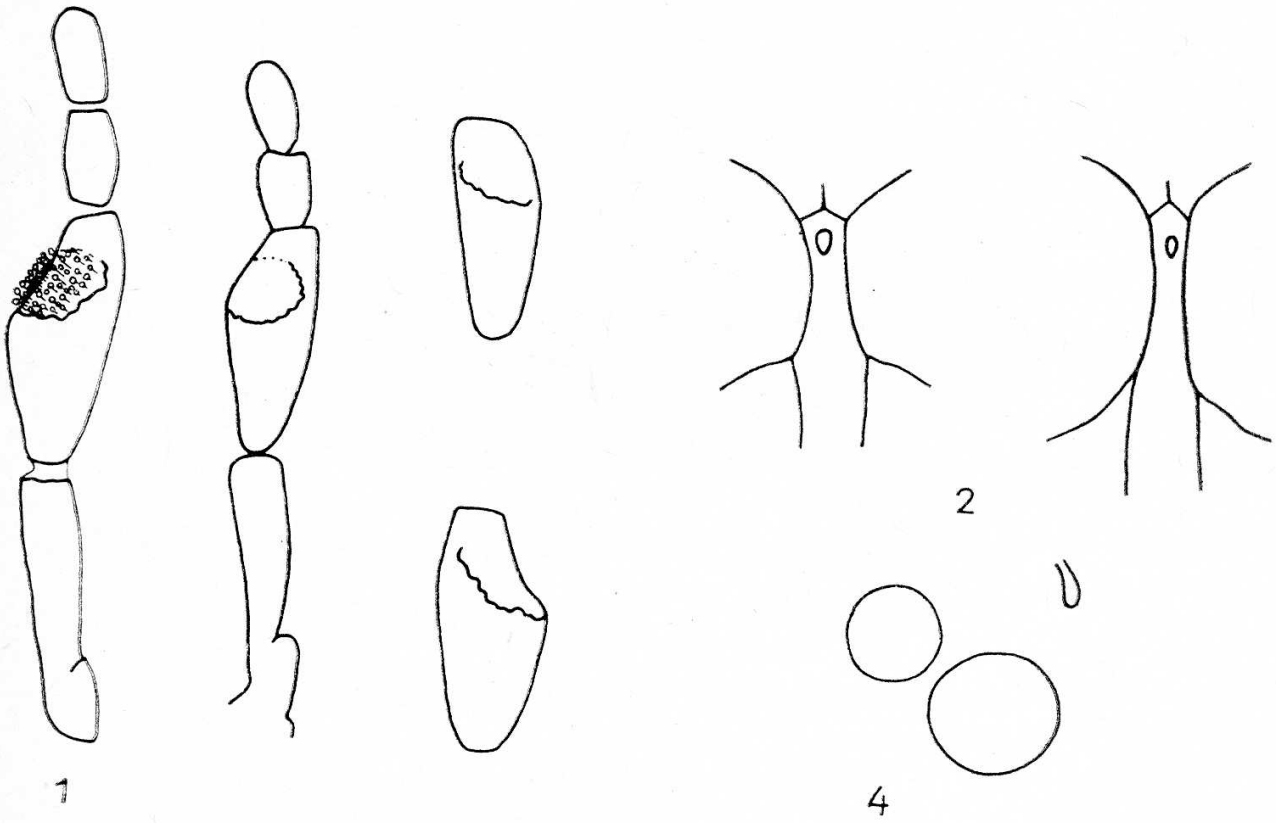
DISCUSSION

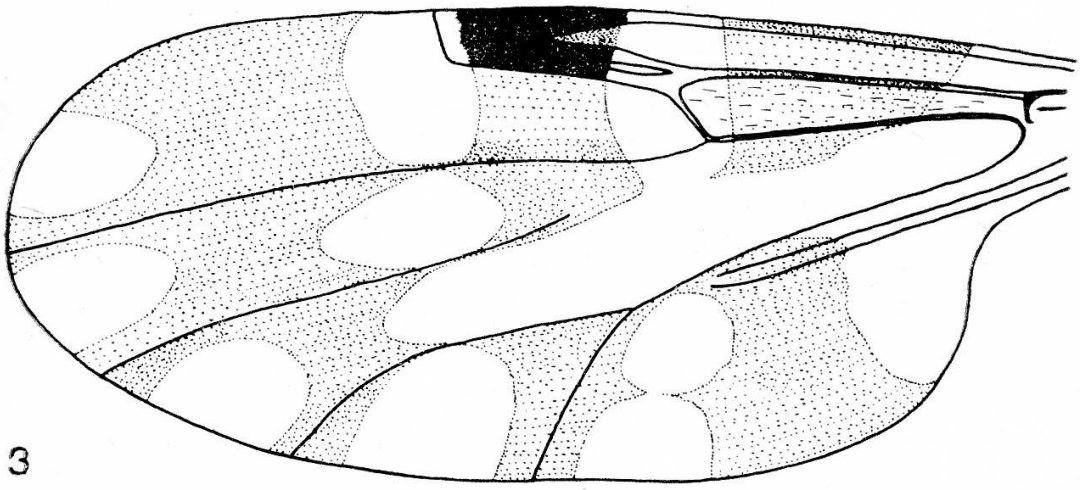
Female now recorded from the seaside of Algeria generally is in agreement with the KIEFFER's description of *C. griseidorsum* female from Tunesia (AR more than 1, scutellum pale, eyes separated, wing dark with

pale patches as in many species of the *pictipennis* group). For use the old name I designate the neotype.

In the recent literature there are several interpretations of *Culicoides saevanicus* DZHAFAROV, 1960:

1. *C. saevanicus* s. CALLOT, KREMER, RIOUX and JUMINER, 1964 —





1–4. *Culicoides griseidorsum*, female. 1 — palpi, 2 — eyes separations, 3 — wing, 4 — spermathecae

Džafarov (1964, pro parte), Kremer (1965); described later as *C. jumineri* Callot et Kremer, 1969.

2. *C. saevanicus* s. Gucevič, 1973.

3. *C. saevanicus* s. Kremer, Callot and Hommel, 1973; sometimes cited as *C. saevanicus* s. Kremer or s. Callot and Kremer.

The last interpretation is synonymous with *C. griseidorsum* now redescribed. *C. griseidorsum* is very close to *C. jumineri* and *C. saevanicus* s. Gucevič (1973) but females can be easy recognized using the following characters:

C. griseidorsum	*C. saevanicus*	*C. jumineri*
Last flagellomere without sensilla coeloconica.	All flagellomeres with sensilla coeloconica.	Some proximal and distal flagellomeres without sensilla coeloconica.
AR = 1.15–1.17.	AR = 1.2–1.4.	AR = 1.09–1.15.
Sensory pit very shallow, proximal margin irregular, well sclerotized; distal margin not developed.	Sensory pit shallow with well sclerotized margin.	Sensory pit shallow with well sclerotized margin.
Wing length 1.25–1.29 mm.	Wing length 1.5–1.7 mm.	Wing length 0.84–1.12 mm.

15. *C.* (*Oecacta*) *heteroclitus* Callot et Kremer, 1964

Akbou, Grarem near Constantine, Ras Isly near Sala Bey, 30 km north of Biskra, 5 ♂, 6 ♀.

Mediterranean species known from South France, Italy, Morocco. From Algeria recorded by Callot et al. (1968).

16. *C.* (*Oecacta*) *jumineri* Callot et Kremer, 1969

Oumache near Biskra, 1 ♀.

Mediterranean species known from Spain, Morocco, Tunesia, Israel and Caucasus. From Algeria the species is recorded for the first time.

17. *C.* (*Oecacta*) *kingi* Austen, 1912

Culicoides kingi Austen, 1912: 104 (♀, Sudan).
C. nilotes Kieffer, 1925: 257 (♂, ♀, Egypt), **n. syn.**

30 km north of Biskra, Oumache at Biskra, Chegga at Biskra, 31 ♀.

Widespread Afrotropical species. In Palaearctic Africa recorded from Morocco, Tunesia and Egypt. From Algeria recorded for the first time.

DISCUSSION

The new synonymy is established by comparison of the original KIEFFER's description of *C. nilotes* with the original description of *C. kingi* and redescriptions of the latter species by KHAMALA et al. (1971), CHAKER (1981), and with females now collected.

18. *C.* (*Oecacta*) *langeroni* Kieffer, 1921

C. judaeae MACFIE, 1933.

Oumache near Biskra, Chegga near Biskra, 30 km north of Biskra, 5 ♂, 10 ♀.

Mediterraean species known from Morocco, Tunesia, Israel. From Algeria recorded for the first time. *C. langeroni* s. GUCEVIČ (1973) is an other species — *C. pseudolangeroni* KREMER et al., 1981.

19. *C.* (*Oecacta*) *marcleti* Callot, Kremer, Basset, 1968

Akbou, 1 ♂.

Mediterranean species known from Morocco to Tunesia. From Algeria recorded by CALLOT et al. (1968).

20. *C.* (*Oecacta*) *maritimus* Kieffer, 1924

Tichi near Béjaia, 1 ♀.

Mediterranean species known from South, West and Central Europe, North Africa, Middle East, Caucasus, and Middle Asia. From Algeria recorded for the first time.

21. *C.* (*Oecacta*) *odiatus* Austen, 1921

C. lailae KHALAF, 1961.

Akbou, Beni Mansour, Grarem near Constantine, 4 ♂, 6 ♀.

An arid Afro-Euroasian species known from South France, Corsica, Cyprus, Morocco, Tunesia, Israel, Iraq, Iran, Caucasus, Crimea, Middle Asia and Mongolia. From Algeria recorded for the first time.

22. *C.* (*Oecacta*) *pictipennis* (Staeg., 1839)

Aokas near Souk El Tenine, 1 ♀.

Widespread arboreal Palaearctic species known from West Europe and Morocco to Siberia. From Algeria is recorded for the first time.

23. *C.* (*Oecacta*) *poperinghensis* Goetghebuer, 1953

Kherrata, Sétif, 1 ♂, 2 ♀.

Probably mediterranean species, known from West Europe (Great Britain, Belgium, France), Romania and Caucasus. From North Africa and Algeria recorded for the first time.

24. *C.* (*Oecacta*) *pseudopallidus* Khalaf, 1961

Souk El Tenine, Grarem near Constantine, 30 km north of Biskra, Oumache near Biskra, Chegga near Biskra, 18 ♂, 6 ♀.

Mediterranean species known from South France, Morocco, Israel, Iraq. From Algeria recorded by Callot et al., (1968).

25. *Culicoides* (*Oecacta*) *sahariensis* Kieffer, 1923

(Figs 5–9)

Culicoides sahariensis Kieffer, 1923: 678 (♀, Biskra, Algeria).
C. sahariensis: Clastrier, 1957: 409 (♂, ♀, Algeria).
C. similis baghdadensis Khalaf, 1957: 341 (♂, ♀, Iraq), **n. syn.**
C. flavisimilis Dzhafarov, 1964: 291 (♂, ♀, Caucasus).
C. coluzzii Callot, Kremer, Bailly-Choumara, 1970 (♂, ♀, Tunesia, Morocco, Italy).
C. similis: Gucevič, 1973: 125 (pro parte).
C. baghdadensis: Boorman, 1974: 615 (= *C. coluzzii*).
C. baghdadensis: Remm, 1981: 29 (= *C. flavisimilis*).

Description

♀. Sensilla coeloconica on flagellomeres I, III, V–VIII, sometimes on IV, antennal ratio (AR) 1.26–1.44. Third palp segment with broad and shallow sensory pit (fig. 5). Eyes narrowly separated (fig. 6).

Pattern of mesonotum developed but not visible in mounted specimens. Wing dark with pale patches as on fig. 7, length 1.09–1.19 mm.

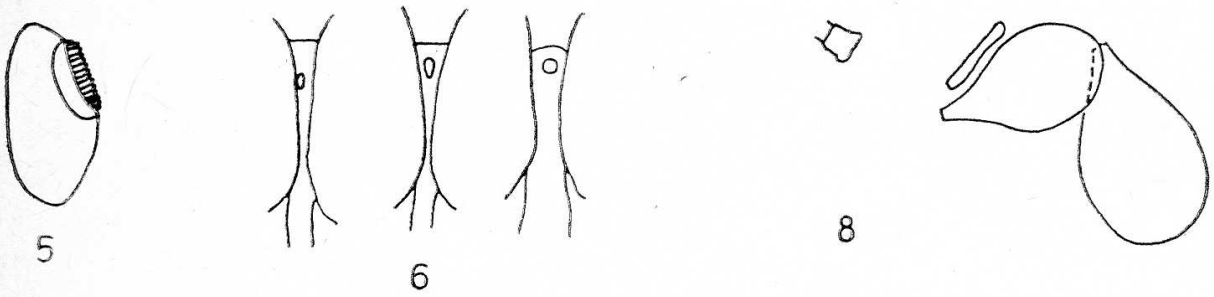
Spermathecae (fig. 8) measuring 40–44×68–72 μm and 34–40×60–64 μm.

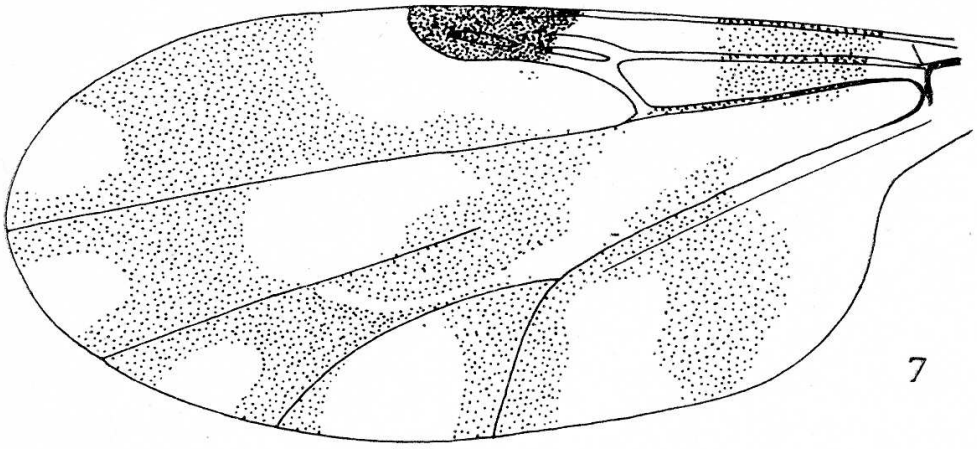
♂. Similar to female with the usual sexual differences. Wing length 0.87–0.90 mm. Male genitalia (fig. 9); sternum IX with shallow caudomedian excavation, membrane with or without several short setae; ventral root of gonocoxite foot-shaped.

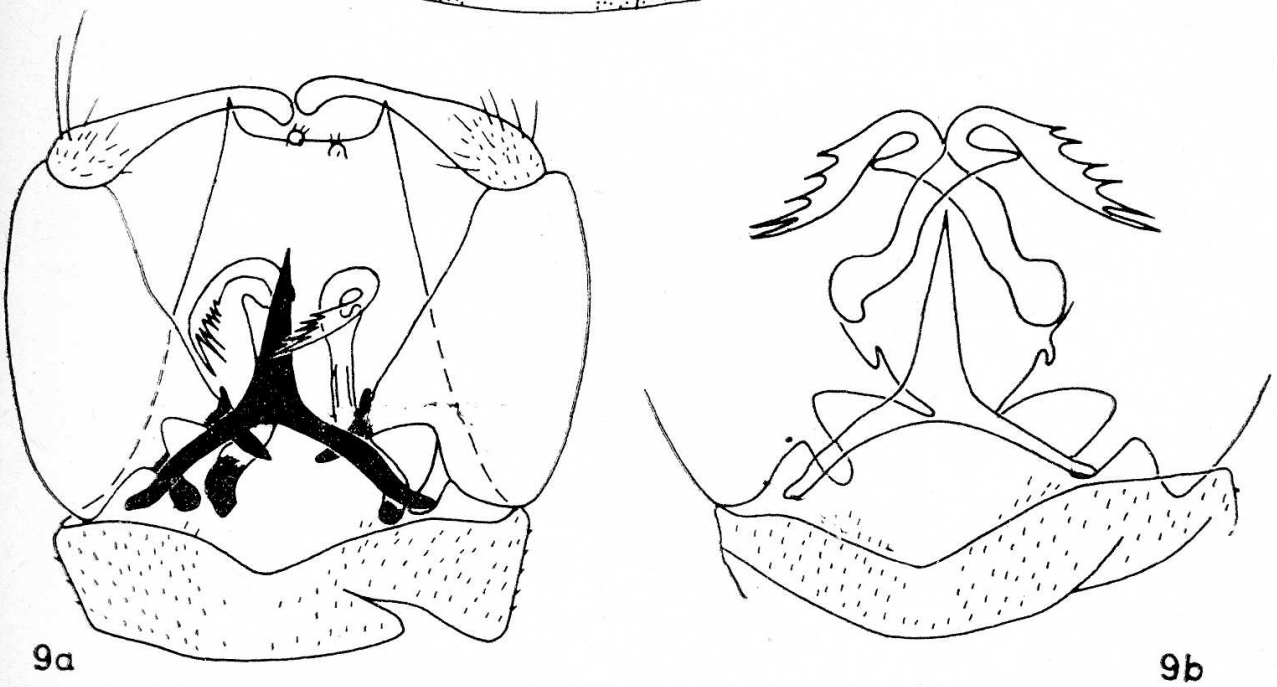
Material examined

Grarem near Constantine, 19 April 1981, 1 ♀ on *Umbelliferae*; Tazmalt, 14 May 1981, 1 ♀; 30 km north of Biskra, 27 April 1981, 1 ♀, 1 ♂, female is a neotype of *C. sahariensis* Kieff.; Chegga at Biskra, 2 May 1981, 2 ♂.

The neotype is deposited in the Institute of Zoology, Polish Academy of Sciences, Warsaw.







5–9. *Culicoides sahariensis*, 5–8 female, 9 — male. 5 — third palp segment, 6 — eyes separations, 7 — wing, 8 — spermathecae, 9a — male genitalia, 9b — aedeagus and parameres

DISTRIBUTION

Mediterranean species known from Italy, Morocco, Tunesia, Israel, Iraq, Iran and Caucasus. From Algeria recorded by KIEFFER (1923) and CLASTRIER (1957).

DISCUSSION

Females of *C. sahariensis* now collected in Algeria are in agreement with the KIEFFER's description of females collected in Algerian Sahara in May. Type material of this species does not exist, and because of this I designate the neotype female. My specimens, females and males, are also in agreement with the redescription of the species by CLASTRIER (1957). According to the CLASTRIER's redescription male genitalia of *C. sahariensis* have gonocoxites with simple ventral root. Through the courtesy of dr. J. CLASTRIER I re-examined this male in the Paris Museum. In my opinion the ventral root is foot-shaped as in other species of the group *similis*, but not simple.

CALLOT et al. (1970) basing on the uncontrast figure of wing and simple ventral root of the male genitalia in the CLASTRIER's redescription described another species of the group *similis*, i.e., *C. coluzzii* which was synonymized with *C. baghdadensis* (BOORMAN, 1974).

26. *C.* (*Oecacta*) *santonicus* Callot, Kremer, Rault, Bach, 1966

Les Falaises near Jijel, Kherrata, Grarem near Constantine, Sétif, 7 ♂, 7 ♀.

Mediterranean species known from West France and Morocco. From Algeria recorded for the first time.

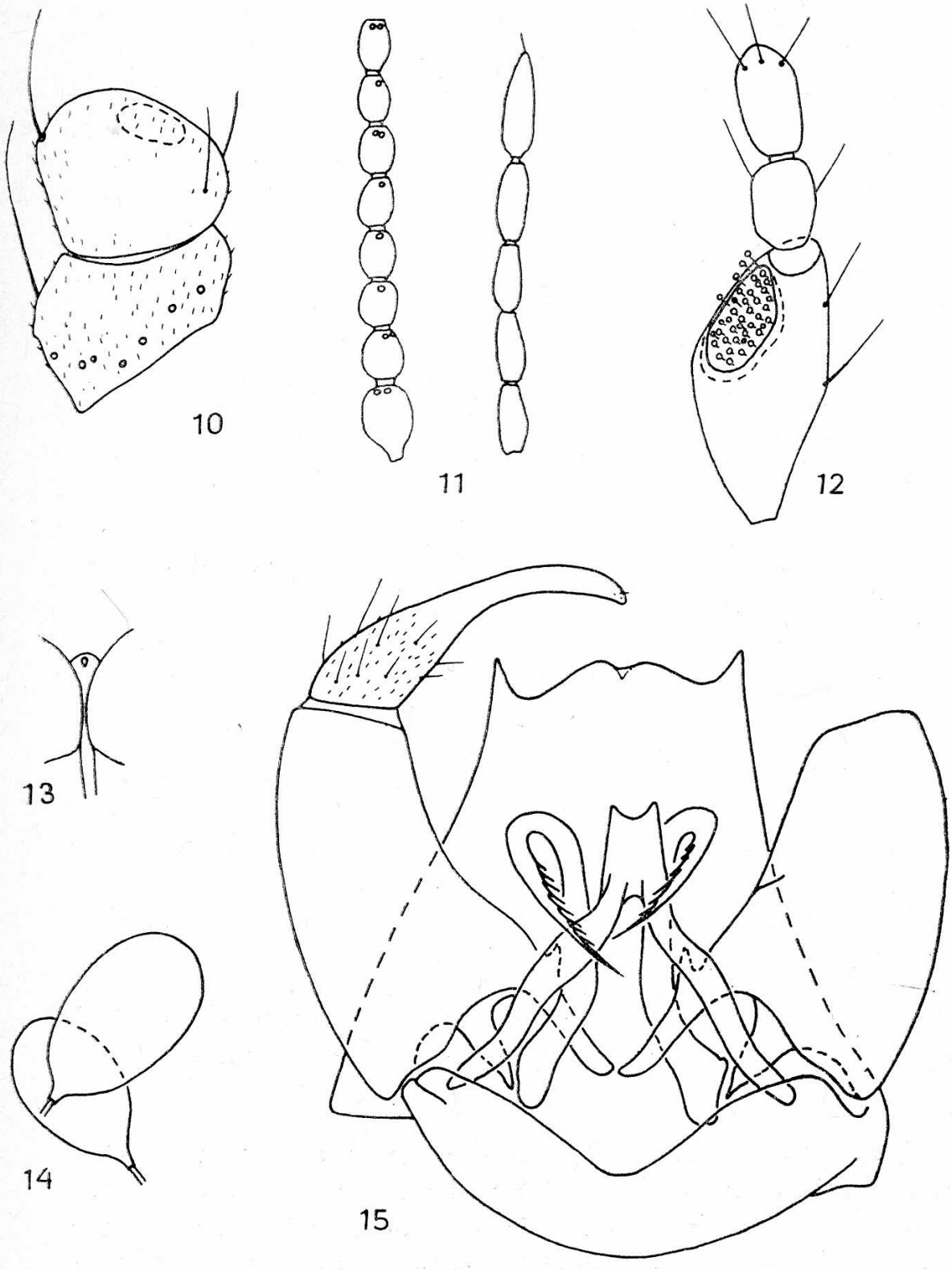
27. *Culicoides* (*Oecacta*) *sergenti* Kieffer, 1921

(Figs 10–15)

Culicoides (*Diplosella*) *sergenti* KIEFFER, 1921: 113 (♀, Algeria).
C. citrinellus KIEFFER, 1923: 674 (♂, ♀, Algeria), **n. syn.**
C. mosulensis KHALAF, 1957: 339 (♂, Iraq).
C. turkmenicus GUCEVIČ, 1959: 678 (♂, ♀, Turkmenia).
C. mosulensis: GUCEVIČ, 1973: 185 (♂, ♀, = *C. turkmenicus*, Iraq, Turkmenia).
C. citrinellus: BOORMAN, 1974: 615 (= *C. mosulensis*).

DESCRIPTION

♀. Head pale ochrous, three last palp segments darker. Antenna with large scape (fig. 10), flagellum 520 μm long, antennal ratio (AR) 0.91, all proximal flagellomeres with sensilla coeloconica (fig. 11). Palpus five



10–15. *Culicoides sergenti*, 10–14 — female, 15 — male. 10 — scapus and pedicellus, 11 — flagellum, 12 — three last palp segments, 13 — eyes separation, 14 — spermathecae, 15 — male genitalia

segmented, third palp segment 92 μm long, palpal ratio 2.3, sensory pit broad and shallow (fig. 12). Eyes bare, narrowly separated (fig. 13).

Thorax pale brown (or ochrous) with darker postscutellum, middle stripe on mesonotum, preepisternum and some other pleural sclerites. Scutellum pale with 9 setae. Wing yellowish, 1.15 mm long, membrane with macrotrichia, especially in distal part, basal cell without macrotrichia. Legs pale yellow, knees and apices of tibiae dark; tibial comb with four spines, first spine longer than other three.

Abdomen rather yellow. Two ovoid spermathecae with short necks (fig. 14); slightly unequal, measuring 64×34 μm and 54×31 μm.

♂. Similar to female with the usual sexual differences.

Flagellum 572–616 μm long, AR 0.56–0.62. Wing length 0.94–1.06 mm.

Genitalia (fig. 15). Ventral root of gonocoxite foot-shaped. Sternum IX with V-shaped caudomedian excavation, ventral membrane bare. Apicolateral processes of tergum IX short, caudomedian margin convex with small emargination. Aedeagus with high basal arch, distal process short with deeply emarginate tip. Parameres separate, each with strong basal knob, stem moderately slender, distally narrowed and recurved to slender, pointed tip with lateral fringing spines.

Material examined

Oumache at Biskra: 30 April 1981, attacking after sunset in desert, 1 ♀, a neotype of *C. sergenti* Kieff., 1921; 2 ♂, one male is a neotype of *C. citrinellus* Kieff., 1923. The neotypes are deposited in the Institute of Zoology, Polish Academy of Sciences, Warsaw.

Distribution

Mediterranean desert species known from Algerian Sahara, Iraq, Iran, Cyprus and Turkmenia. Record from Vosges, France (Huttel and Huttel, 1951; after Kremer, 1965) is not confirmed.

Discussion

Female now collected is in agreement with the Kieffer's description of *C. sergenti* female collected on camel in Algerian Sahara. Even antennal scape is well developed what is stressed in the original description. This character is rather unusual in *Culicoides* where the scape is usually reduced to a ring covered by a pedicel. Kieffer basing on this character erected new subgenus for this species which was generally synonymized with the genus *Culicoides*. Now when the type species of the subgenus is recognized, *Diplosella* Kieff., 1921, is a junior synonym of the subgenus *Oecacta* Poey, 1851.

Male of *C. sergenti* is the same as of *C. citrinellus* described and figured by KIEFFER (1923) from Algerian Sahara also. To cut the eventual discussion on the correct use of the KIEFFER's names I designate the neotypes for *C. sergenti* and for *C. citrinellus*.

28. *C.* (*Oecacta*) *subfasciipennis* Kieff., 1919

Tichi near Béjaia, Aokas near Souk El Tenine, Kherrata, Sétif, 3 ♂, 15 ♀.

Widespread arboreal Palaearctic species known from West Europe and Morocco to Far East of USSR. From Algeria recorded for the first time.

29. *C.* (*Beltranmyia*) *circumscriptus* Kieff., 1918

C. nadayanus KIEFF., 1918.
C. kirovabadicus DZHAFAROV, 1964.

Aokas near Souk El Tenine, Tazmalt, Barika, 2 ♂, 4 ♀.

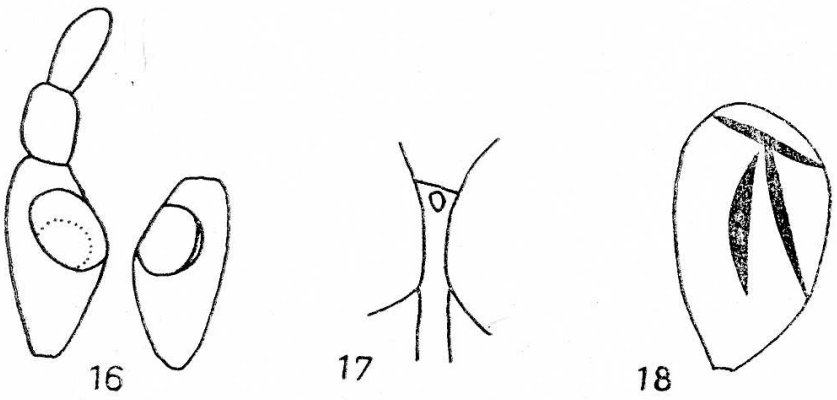
Widespread Palaearctic species. From Algeria recorded by CLASTRIER (1957).

30. *C.* (*Beltranmyia*) sp. indet. aff. *homochrous* Remm in Remm and Žogolev, 1968

(Figs 16–18)

Sensilla coeloconica on flagellomeres I–II and IX–XII, antennal ratio (AR) 1.1. Third palp segment 68 μm long, sensory pit broad and shallow (fig. 16). Eyes bare, separated (fig. 17).

Thorax pale brown, pleura with pale patches, scutellum yellow, legs yellowish. Wing uniformly yellowish, without patches; membrane covered



16–18. *Culicoides* sp. indet. aff. *homochrous*, female. 16 — three last palp segments, 17 — eye separation, 18 — spermatheca

with macrotrichia, basal cell of one wing with 3 macrotrichia, on other wing not visible; wing length 0.96 mm.

Abdomen pale with brownish terga. Only one spermatheca without neck (fig. 18) measuring 88×52 μm.

MATERIAL EXAMINED

Oumache at Biskra, 30 April 1981, 1 ♀ attacking the man.

DISTRIBUTION

Algeria.

DISCUSSION

The female from Algeria with one spermatheca and uniformly yellowish wing is similar to females of *C. homochrous* REMM, 1968, known from Crimea and Middle Asia (REMM and ŽOGOLEV, 1968; GUCEVIČ, 1973). Male of the latter species is unknown. *C. homochrous* differs in having basal cell of the wing densely covered with macrotrichia and spermatheca with distinct neck. Dr. H. REMM suggested (personal communication) that this female from Sahara is unnormal and should be rather ranked with the subgenus *Oecacta*.

31. *C.* (*Monoculicoides*) *puncticollis* (Beck., 1903)

Ceratopogon puncticollis BECKER, 1903: 75 (♀, Egypt).
Culicoides impressus KIEFFER, 1918: 47 (♂, ♀, Tunesia, Hungary).
C. distigma KIEFFER, 1922: 502 (♀, Algeria), **n. syn.**
C. donatieni KIEFFER, 1922: 504 (♀, Algeria).
C. sciniphes KIEFFER, 1925: 261 (♀, Egypt).
C. bipunctatus VIMMER, 1932: 133 (♀, Israel).
C. flavitarsis VIMMER, 1932: 137 (?♀, Israel).
C. griseovittatus VIMMER, 1932: 133 (?♀, Israel), **n. syn.**
C. luteosignatus VIMMER, 1932: 140 (♀, Israel), **n. syn.**
C. tripunctatus VIMMER, 1932: 137 (♀, Israel).
C. vavrai VIMMER, 1932: 140 (♀, Israel).
C. wenigi VIMMER, 1932: 138 (♀, Israel).
C. puncticollis: EDWARDS, 1939: 133 (= *C. impressus*, *C. donatieni*, *C. sciniphes*, ?*C. flavitarsis*, ?*C. bipunctatus*, ?*C. vavrai*).
C. puncticollis: KREMER et al., 1981: 2 (= *C. tripunctatus*, *C. vavrai*, *C. wenigi*).

Grarem near Constantine, Kherrata, Chegga at Biskra, 5 ♀.

Mediterranean species known from South, West and Central Europe, steppes of Ukraine, North Africa, Middle East, Asia Minor, Caucasus and Middle Asia. From Algeria recorded by KIEFFER (1922, 1923) and CLASTRIER (1957).

Discussion

Wing pattern of *C. puncticollis* is very variable, and because of this the species was described from North Africa and Middle East under a great number of various names by old authors. New synonymy is established by a comparison of the original descriptions with the specimens now collected.

GENERAL DISCUSSION

During the short period of investigations 31 species of the genus were found, from which 20 are for the first time recorded from Algeria, and one — *C. poperinghensis* from North Africa. Thus from Algeria 40 species and from North Africa 67 species (table 1) are known now.

The following zoogeographic elements were found in Algerian biting midges of the genus *Culicoides*:

	No. (and %)
Boreal Holarctic	2 (5.0)
Boreal Palaearctic	7 (17.5)
Meridional Palaearctic	2 (5.0)
Mediterranean	24 (60.0)
Afrotropical	3 (7.5)
Undetermined	2 (5.0)
Total	40 (100.0)

The boreal Holarctic element is represented by *C. obsoletus* and *C. kibunensis*. Species of this element are common in arboreal zones of Palaearctic and Nearctic Regions.

The boreal Palaearctic element is represented by seven species: *C. scoticus*, *C. fagineus*, *C. pulicaris*, *C. punctatus*, *C. subfasciipennis*, *C. pictipennis* and *C. circumscriptus*. They are mainly distributed in the arboreal zones of the Palaearctic from West Europe and North Africa to Far East of USSR or Japan. In Algeria they were found in coastal and uplands regions, except for *C. circumscriptus* which was recorded in Sahara.

The meridional Palaearctic or the arid Afro-Euroasian faunistic element in Algeria is represented by *C. saevus* and *C. odiatus*. They are distributed in Palaearctic deserts, semideserts and steppes from North Africa to Mongolia or China.

The most numerous in Algeria is Mediterranean element represented by 24 species: *C. sejfadinei*, *C. newsteadi*, *C. faghihi*, *C. algeriensis*, *C. azerbajdzhanicus*, *C. begueti*, *C. cataneii*, *C. dzhafarovi*, *C. gejgelensis*, *C. griseidorsum*, *C. heteroclitus*, *C. jumineri*, *C. langeroni*, *C. longipennis*, *C.*

marcleti, *C. maritimus*, *C. poperinghensis*, *C. pseudopallidus*, *C. santonicus*, *C. semimaculatus*, *C. sergenti*, *C. parroti* and *C. puncticollis*. They are mainly distributed in North Africa, South Europe, Middle East, Asia Minor, Iran, Afghanistan and Middle Asia. Some species of this element are found in West and Central Europe, and *C. sejfadinei* in Afrotropical Region (Kenya).

C. imicola, *C. kingi* and *C. schultzei* represent in Algerian fauna Afrotropical element.

C. nudipennis and *C.* sp. indet. aff. *homochrous* are of unknown assignments to the distinguished zoogeographical elements.

In the coastal region 13 *Culicoides* species, in mountains and highlands of Petite Kabylie 15 species and in Sahara region 15 species were recorded (table 2). In semidesert and desert sites of Algerian Sahara were found only meridional Palaearctic and Mediterranean species except for *C. circumscriptus*. In coastal sites and in mountains and highlands of Petite Kabylie, and in Monts du Hodna the boreal (Holarctic, Palaearctic), meridional (Palaearctic, Mediterranean) and Afrotropical species were found.

Table 1. Species of the genus *Culicoides* recorded from North Africa and Algeria

North Africa	Algeria Previous records	Present record
1	2	3
1. *C.* (*Pontoculicoides*) *saevus* KIEFF., 1922	KIEFFER, 1922, 1923; GOETGHEBUER, 1939	+
2. *C.* (*P.*) *sejfadinei* DZHAFAROV, 1958	—	+
3. *C.* (*Avaritia*) *chiopterus* (MEIG., 1830)	—	—
4. *C.* (*A.*) *imicola* KIEFF., 1913	—	+
5. *C.* (*A.*) *montanus* SCHAKIRZJANOVA, 1962	—	—
6. *C.* (*A.*) *obsoletus* (MEIG., 1818)	KIEFFER, 1922; GOETGHEBUER, 1939; CLASTRIER, 1957, 1961	+
7. *C.* (*A.*) *scoticus* DOWNES et KETTLE, 1952	—	+
8. *C.* (s. str.) *fagineus* EDW., 1939	CLASTRIER, 1957, 1961	—
9. *C.* (s. str.) *milnei* AUSTEN, 1912	—	—
10. *C.* (s. str.) *newsteadi* AUSTEN, 1921	—	+
11. *C.* (s. str.) *pulicaris* (L., 1758)	—	+
12. *C.* (s. str.) *punctatus* (MEIG., 1804)	—	+
13. *C.* (*Oecacta*) *algeriensis* CLASTRIER, 1957	CLASTRIER, 1957	—
14. *C.* (*Oe.*) *azerbajdzhanicus* DZHAFAROV, 1962	—	+
15. *C.* (*Oe.*) *begueti* CLASTRIER, 1957	CLASTRIER, 1957, 1961	—
16. *C.* (*Oe.*) *calloti* KREMER et al., 1979	—	—
17. *C.* (*Oe.*) *cataneii* CLASTRIER, 1957	CLASTRIER, 1957	+

1	2	3
18. *C.* (*Oe.*) *corsicus* KREMER et al., 1971	—	—
19. *C.* (*Oe.*) *derisor* CALLOT et al., 1965	—	—
20. *C.* (*Oe.*) *dzhafarovi* REMM. 1967	—	+
21. *C.* (*Oe.*) *faghihi* NAVAI, 1971	—	+
22. *C.* (*Oe.*) *foleyi* KIEFF., 1922	KIEFFER, 1922	—
23. *C.* (*Oe.*) *gejgelensis* DZHAFAROV, 1964	CALLOT et al., 1968	+
24. *C.* (*Oe.*) *griseidorsum* KIEFF., 1918	—	+
25. *C.* (*Oe.*) *heteroclitus* CALLOT et al., 1964	CALLOT et al., 1968	+
26. *C.* (*Oe.*) *jumineri* CALLOT et al., 1969	—	+
27. *C.* (*Oe.*) *kibunensis* TOK., 1937	CALLOT et al., 1968	—
28. *C.* (*Oe.*) *kingi* AUSTEN, 1912	—	+
29. *C.* (*Oe.*) *kurensis* DZHAFAROV in GUCEVIČ, 1960	—	—
30. *C.* (*Oe.*) *langeroni* KIEF., 1921	—	+
31. *C.* (*Oe.*) *landaue* KREMER et al., 1975	—	—
32. *C.* (*Oe.*) *longipennis* KHALAF, 1957	CALLOT et al., 1968	—
33. *C.* (*Oe.*) *marcleti* CALLOT et al., 1968	CALLOT et al., 1968	+
34. *C.* (*Oe.*) *maritimus* KIEFF., 1924	—	+
35. *C.* (*Oe.*) *nudipennis* KIEFF., 1922	KIEFFER, 1922	—
36. *C.* (*Oe.*) *odiatus* AUSTEN, 1921	—	+
37. *C.* (*Oe.*) *odibilis* AUSTEN, 1921	—	—
38. *C.* (*Oe.*) *pallidus* KHALAF, 1957	—	—
39. *C.* (*Oe.*) *pictipennis* (STAEG., 1839)	—	+
40. *C.* (*Oe.*) *picturatus* KREMER et al., 1961	—	—
41. *C.* (*Oe.*) *poperinghensis* GOETGH., 1953	—	+
42. *C.* (*Oe.*) *pseudolangeroni* KREMER et al., 1981	—	—
43. *C.* (*Oe.*) *pseudopallidus* KHALAF, 1961	CALLOT et al., 1968	+
44. *C.* (*Oe.*) *pumilus* (WINN., 1852)	—	—
45. *C.* (*Oe.*) *ravus* DE MEILLON, 1936	—	—
46. *C.* (*Oe.*) *sahariensis* KIEFF., 1923	KIEFFER, 1923	+
47. *C.* (*Oe.*) *santonicus* CALLOT et al., 1966	—	+
48. *C.* (*Oe.*) *schultzei* (ENDERLEIN, 1908)	CLASTRIER, 1957	—
49. *C.* (*Oe.*) *semimaculatus* CLASTRIER, 1958	CLASTRIER, 1958	—
50. *C.* (*Oe.*) *sergenti* KIEFF., 1921	KIEFFER, 1921, 1923	+
51. *C.* (*Oe.*) *shaklavensis* KHALAF, 1957	—	—
52. *C.* (*Oe.*) *similis* C., I., M., 1920	—	—
53. *C.* (*Oe.*) *simulator* EDW., 1939	—	—
54. *C.* (*Oe.*) *subfasciipennis* KIEFF., 1919	—	+
55. *C.* (*Oe.*) *sylvarum* CALLOT et al., 1961	—	—
56. *C.* (*Oe.*) *univittatus* VIMMER, 1932	—	—
57. *C.* (*Oe.*) *vidourlensis* CALLOT et al., 1968	—	—
58. *C.* (*Oe.*) *vitreipennis* AUSTEN, 1921	—	—
59. *C.* (*Beltranmyia*) *circumscriptus* KIEFF., 1918	CLASTRIER, 1957 CALLOT et al., 1968	+
60. *C.* (*B.*) sp. indet. aff. *homochrous* REMM in REMM and ŽOGOLEV, 1968	—	+

1	2	3
61. *C.* (*Meijerehelea*) *distinctipennis* AUSTEN, 1912	—	+
62. *C.* (*M.*) *leucostictus* KIEFF., 1911*	—	—
syns. *C. praetermissus* C., I., M., 1920		
C. distinctipennis var. *egypti* MACFIE, 1924		
C. pharao KIEFF., 1925, **n. syn.**		
63. *C.* (*Monoculicoides*) *parroti* KIEFF., 1922	KIEFFER, 1922, 1923	—
64. *C.* (*M.*) *puncticollis* (BECKER, 1903)	KIEFFER, 1922, 1923;	
	CLASTRIER, 1957	+
65. *C.* (*M.*) *riethi* KIEFF., 1914	—	—
66. *C.* (*M.*) *stigma* (MEIG., 1818)	—	—
67. *C.* (sg.?) *pilosipennis* KIEFF., 1925	—	—

* KIEFFER (1925: 259) described female and male of *C. pharao* from Egypt. According to the original figure of male genitalia, aedeagus is characteristic of two closely related species: *C. distinctipennis* AUST., and *C. leucostictus* KIEFF. Both species have been recorded from North Africa and Egypt. Number of pale patches on the female wing given by KIEFFER suggests that *C. pharao* is synonymous with *C. leucostictus*.

Table 2. Distribution of the *Culicoides* species now recorded in northern-east Algeria

Region	Petite Kabylie		Monts du Hodna	Sahara
	coast	mountains and highlands		
Number of localities	6	6	1	6
1	2	3	4	5
1. *C. saevus*	—	+	+	+
2. *C. sejfadinei*	—	—	—	+
3. *C. imicola*	—	+	—	—
4. *C. obsoletus*	+	—	—	—
5. *C. scoticus*	+	—	—	—
6. *C. newsteadi*	—	—	—	+
7. *C. pulicaris*	+	—	—	—
8. *C. punctatus*	+	+	—	—
9. *C. azerbajdzhanicus*	—	—	—	+
10. *C. cataneii*	+	+	—	—
11. *C. dzhafarovi*	—	—	—	+
12. *C. faghihi*	—	—	+	—
13. *C. gejgelensis*	+	+	—	—
14. *C. griseidorsum*	+	—	—	—
15. *C. heteroclitus*	—	+	+	+
16. *C. jumineri*	—	—	—	+

1	2	3	4	5
17. *C. kingi*	−	−	−	+
18. *C. langeroni*	−	−	−	+
19. *C. marcleti*	−	+	−	−
20. *C. maritimus*	+	−	−	−
21. *C. odiatus*	−	+	−	−
22. *C. pictipennis*	+	−	−	−
23. *C. poperinghensis*	−	+	−	−
24. *C. pseudopallidus*	+	+	−	+
25. *C. sahariensis*	−	+	−	+
26. *C. santonicus*	+	+	−	−
27. *C. sergenti*	−	−	−	+
28. *C. subfasciipennis*	+	+	−	−
29. *C. circumscriptus*	+	+	−	+
30. *C.* sp. indet. aff. *homochrous*	−	−	−	+
31. *C. puncticollis*	−	+	−	+
Total	13	15	3	15

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