**Culicoides** from Western Turkey in relation to bluetongue disease of sheep and cattle

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**RÉSUMÉ**

*Culicoides* en Turquie occidentale par rapport à la fièvre catarrhale ovine et bovine

A l’occasion d’une courte mission effectuée en 1981 en Turquie occidentale, dix-neuf espèces de *Culicoides* ont été capturées à l’aide de pièges lumineux, ce qui porte à 26 le nombre total des espèces de *Culicoides* identifiées en Turquie. *C. imicola* qui a été identifié pour la première fois en Turquie occidentale est considéré comme le principal vecteur de la fièvre catarrhale (BTV). *C. obsoletus* et *C. schultzei* considérés comme de possibles vecteurs de ce même virus ont également été identifiés.

**INTRODUCTION**

In October 1977, an outbreak of bluetongue disease occurred in sheep in Aydin province, Western Turkey, spreading to flocks in adjacent provinces in 1978 and 1979 (14). Bluetongue virus (BTV) is known to be transmitted by species of *Culicoides* biting midges : in North America by *Culicoides varlippines* (6) and in Africa by *C. imicola* (5). In Israel, the vector is also *C. imicola* (4). In Cyprus, *C. imicola* or *C. obsoletus* are thought to transmit the virus (10). In the Sudan, the vector is considered to be either *C. imicola* or species of the *C. schultzei* group (3). The vector in Turkey is unknown.

*Culicoides* have not been extensively studied in Turkey. MIMIOGLU (12) recorded *Culicoides* sp. among several other genera of biting flies. LECLERQ (7) collected in 21 provinces and recorded three species of Ceratopogonidae : *Culicoides punctatus, Forcipomyia bipunctata* and *Leptoconops bezzi*. NAVAI (13) described collections from eight localities and recorded 18 species of *Culicoides*; these included *C. obsoletus* and *C. schultzei* but not *C. imicola*.

In October 1981, a short visit was made to Turkey to collect *Culicoides* in western areas where outbreaks of disease had occurred to discover whether confirmed or potential BTV vectors were present, and it is with the results of these catches that the present paper is concerned. This work formed part of the field studies on BTV carried out at AVRI in conjunction with the Director and staff of the Etlik Veterinary Control and Research Institute in Ankara.

**MATERIALS AND METHODS**

Insects were collected using two Monks Wood light traps, each powered by a 12-volt car battery, and operated from dusk until dawn. Insects were collected in a weak
detergent solution and preserved in 5% formalin. Midge were sorted under a stereo-

microscope and slide-mounted in phenol-

balsam where necessary. Identifications were

made by comparison with specimens in the

collections of the AVRI or the British Museum

or, where necessary, by reference to types. No

attempt was made to isolate virus from any

midges captured.

Collections were made in the following

localities: Etlik, Ankara province (Veterinary

Control and Research Laboratory, sheep and
cattle, pens, two trap-nights (TN)); Konya,

Konya province (Konya State Farm, sheep and
cattle pens, four TN); Cihanbeyli, Konya

province (sheep pens in villages approximately

20 km east of Cihanbeyli, two TN); Antalya,

Antalya province (garden, Veterinary Research

Institute, one TN); Boztepe State Farm, 15 km

east of Antalya, Antalya province (cattle pens,

three TN, sheep pens, three TN, house two

TN); Nazili, Aydin province (cattle shed on

farm on outskirts of town, one TN); Aydin,

Aydin province (small-holding/dairy in town,

one TN); Salihaga, Denizli province (cattle,
sheep and goat pen in village, two TN); Cakmak,

Denizli province (goat pen in village, one TN);
Pendik, Istanbul (Veterinary Control

and Research Institute, cattle, sheep and goat

pen, one TN).

**RESULTS**

A total of 8,674 Culicoides were taken

belonging to 19 species; 8 specimens represent-

ing at least three additional species remain to

be identified. The Culicoides species taken were
circumscriptus KIEFFER, dzhafarovi REMM,
gejgelensis DZHAFAROV, ibericus DZHA-

FAROV, imicola KIEFFER, kurensis DZHA-

FAROV, lailae KHALAF, longipennis KHA-

LAF, maritimus KIEFFER, newsteadi AUS-

TEN, obsoletus MEIGEN, odibilis AUSTEN,

parroti KIEFFER, punctatus MEIGEN,
puncticollis GOETGHEBUER, saevus KIEF-

FER, schultzei ENDERLEIN, subfascipennis

KIEFFER, and vidourlensis CALLOT, KRE-

MER, MOLET and BACH. The results of

catches from the various localities are given in

Table 1; three puncticollis only were taken at
Cihanbeyli, five newsteadi only at Pendik and

no Culicoides from the garden at Antalya. In

addition to the Culicoides, members of four

other genera of Ceratopogonidae were taken:

8,813 Forcipomyia, 94 Dasyhelea, 11 Atricho-


<table>
<thead>
<tr>
<th>TABLE 1 : Culicoides species collected at light in Turkey during October 1981</th>
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<tr>
<td><strong>SPECIES</strong></td>
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<tr>
<td><strong>ETLIK</strong></td>
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<tr>
<td>C. circumscriptus</td>
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<tr>
<td>C. dzhafarovi</td>
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<td>C. gejgelensis</td>
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<td>C. ibericus</td>
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<td>C. imicola</td>
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<td>C. kurensis</td>
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<td>C. longipennis</td>
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<td>C. maritimus</td>
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<td>C. newsteadi</td>
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<td>C. obsoletus</td>
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<td>C. odibilis</td>
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<td>C. parroti</td>
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<td>C. punctatus</td>
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<td>C. puncticollis</td>
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<tr>
<td>C. saevus</td>
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<tr>
<td>C. schultzei</td>
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<tr>
<td>C. subfascipennis</td>
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<tr>
<td>C. vidourlensis</td>
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<td>spp. undetermined</td>
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pogon and 4 Bezzia. These remain to be identified.

**DISCUSSION**

The catch from Konya, on the central Anatolian plateau, was small, possibly owing to the onset of colder weather in October when the catches were made. In western provinces the weather is still warm at this time of the year; extensive irrigation combined with an equable climate in these areas provides ideal conditions for *Culicoides* to breed for most of the year.

* C. imicola * was present in Antalya, Denizli and Aydin, where the 1977-1979 outbreaks of bluetongue occurred, and was collected in close association with sheep and cattle. From these catches it must be considered as the most likely vector of BTV (and other midge-borne virus diseases of livestock) in Turkey. Its presence here extends the previously recorded northern boundary of this species. Its most northerly limit previously recorded was Cyprus (1) but it has recently been found in similar latitudes in Spain (11). * C. obsoletus * and * C. schultzei *, both potential BTV vectors, were also found in these areas, the latter in large numbers. * C. puncticollis * and * C. nubeculosus * (recorded by NAVAI (13)), although closely related to * C. variipennis the vector in North America, are not considered likely vectors here as they are normally not susceptible to oral infection with virus (8, 9).

Of the 19 species recorded in the present study, 10 were recorded by NAVAI (13), who in addition recorded * bulboestylus * KHALAF, * furcillatus * CALLOT, KREMER and PARADIS, * montanus * SCHAKIRZHANOVA, * nubeculosus * MEIGEN, * odiatus * AUSTEN, * pictipennis * STAEGER, * pulicaris * LINNAEUS, and * tugaicus * DZHAFAROV. * C. odiatus * is a synonym of * C. talaiae * (2). None of these other species is sufficiently common or widespread, or sufficiently closely associated with livestock, to be considered as a potential vector of BTV.

The present study brings the total *Culicoides* species recorded from Turkey to 26.

**ACKNOWLEDGEMENTS**

We thank the General Director, General Directorate of Veterinary Sciences, Ankara, for his interest in this work. Our sincere thanks are also due to Dr. NABI EMRE, Director, Etlik Veterinary Control and Research Institute for all his help and support. Finally we thank the staff of the Etlik Veterinary Control Research Institute and the provincial institutes and state farms who assisted us with this study.

**SUMMARY**

Nineteen species of *Culicoides* were recorded from light trap collections made during a short visit to Western Turkey in October 1981. These results bring the total number of species so far recorded from Turkey to 26. * C. imicola * was recorded for the first time and is considered to be the most likely vector of Bluetongue virus (BTV) in Western Turkey. * C. obsoletus * and * C. schultzei *, considered to be potential BTV vectors, were also present.

**RESUMEN**

*Culicoides* relacionados a la enfermedad de la lengua azul del ganado bovino y lanar en Turquia occidental

Diecinueve especies de *Culicoides* fueron identificadas, luego de recolecciones con trampa de luz, durante una corta misión a Turquia occidental en octubre 1981. Estos resultados llevan a un total de 26 especies notadas en Turquia. Se identificó * C. imicola * por primera vez y se lo consideró como el vector más probable del virus de la Lengua Azul en Turquia occidental. También fueron identificados * C. obsoletus * y * C. schultzei *, considerados como vectores potenciales.

**REFERENCES**
