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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 été également 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 varlipennis* (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 bezzii.* 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. Midges were sorted under a stereomicroscope 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 representing at least three additional species remain to be identified. The *Culicoides* species taken were *circumscriptus* KIEFFER, *dzhafarovi* REMM, *gejgelensis* DZHAFAROV, *ibericus* DZHAFAROV, *imicola* KIEFFER, *kurensis* DZHAFAROV, *lailae* KHALAF, *longipennis* KHALAF, *maritimus* KIEFFER, *newsteadi* AUSTEN, *obsoletus* MEIGEN, *odibilis* AUSTEN, *parroti* KIEFFER, *punctatus* MEIGEN, *puncticollis* GOETGHEBUER, *saevus* KIEFFER, *schultzei* ENDERLEIN, *subfasciipennis* KIEFFER, and *vidourlensis* CALLOT, KREMER, 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 1 : Culicoides species collected at light in Turkey during October 1981

SPECIES	LOCATION									TOTAL COLLECTED	
	ETLIK	KONYA	ANTALYA			AYDIN	NAZILI	SALIHAGA	CAKMAK	♂	♀
			Cattle	Sheep	House						
C. circumscriptus	3	7	44	73	12	-	-	2	-	46	95
C. dzhafarovi	-	-	-	10	3	-	-	1	-	13	1
C. gejgelensis	-	-	-	2	-	-	-	-	-	2	-
C. ibericus	-	-	-	1	-	-	-	-	-	-	1
C. imicola	-	-	19	76	-	13	13	479	16	4	612
C. kurensis	-	-	5	336	7	-	-	1	-	5	344
C. lailae	-	-	382	1921	1	14	27	1981	89	186	4299
C. longipennis	-	-	48	187	10	-	4	23	7	103	176
C. maritimus	1	-	18	25	8	1	-	-	1	7	47
C. newsteadi	1	2	2	61	4	-	14	68	2	12	142
C. obsoletus	-	-	-	1	-	1	1	2	-	-	5
C. odibilis	-	-	-	3	-	-	-	-	-	3	-
C. parroti	-	-	-	-	-	-	1	-	-	-	1
C. punctatus	3	1	23	15	-	1	-	9	62	7	107
C. puncticollis	-	44	3	1	-	5	1	1	-	4	54
C. saevus	-	-	-	-	-	-	-	21	-	21	-
C. schultzei	-	-	947	293	11	1	435	734	-	688	1733
C. subfascipennis	-	-	6	1	-	-	-	-	-	1	6
C. vidourlensis	-	-	-	1	-	-	-	5	-	6	-
spp. undetermined	-	-	1	4	1	-	-	2	-	1	7

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 *bulbostylus* KHALAF, *furcillatus* CALLOTT, KREMER and PARADIS, *montanus* SCHAKIRZJANOVA, *nubeculosus* MEIGEN, *odiatus* AUSTEN, *pictipennis* STAEGER, *pulicaris* LINNAEUS, and *tugaicus* DZHAFAROV. *C. odiatus* is a synonym of *C. lailae* (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.

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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 Turquía occidental en octubre 1981. Estos resultados llevan a un total de 26 especies notadas en Turquía. Se identificó *C. imicola* por primera vez y se lo consideró como el vector más probable del virus de la Lengua Azul en Turquía occidental. Tambien fueron identificados *C. obsoletus* y *C. schultzei,* considerados como vectores potenciales.

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