

A REVISED LIST OF THE MOSQUITOES OF NORTH DAKOTA, INCLUDING NEW ADDITIONS TO THE FAUNA

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ABSTRACT. An up-to-date list of the mosquitoes known to occur in North Dakota is given. It includes 38 species in 8 genera. *Aedes hendersoni*, *Ae. melanimon*, and *Culiseta minnesotae* are being reported for the first time. In addition, 6 other species that probably belong to the state's fauna are discussed.

INTRODUCTION

The species of mosquitoes occurring in North Dakota have been mentioned by Howard et al. (1917), Dyar (1928), Mail (1934), Philip (1943), Matheson (1944), Barr (1958), Knight and Wonio (1969), Zavortink (1972), and Arnell (1976). Munro and Saugstad (1939) published results of a preliminary survey that included 5 genera and 11 species. Additional notes on the fauna were given by Telford and Wester (1941), Munro and Telford (1943), and Post et al. (1947). The most complete report of North Dakota mosquitoes was given by Post and Munro (1949), in which 31 species in 8 genera were registered as well as detailed locality information. Subsequently, Carpenter and LaCasse (1955) and Darsie and Ward (1981) recorded the species from North Dakota, but few additions were realized.

In 1975, an extensive flooding of the Red River Valley and succeeding outbreak of western equine and St. Louis encephalitis prompted the collection of large numbers of mosquitoes. As a follow-up to that disaster, a disease surveillance system was put into action, and the mosquito fauna has since been annually sampled, identified, and tested for the presence of arboviruses. As a consequence, the process emphasized the necessity to know the state's mosquitoes and resulted in adding new records. This account, then, is to record an accurate list of the species of Culicidae known to occur in North Dakota and to give some locality data and comments on several indigenous species and on species that probably belong to the state's entomofauna (Table 1, Fig. 1).

COMMENTS OF SPECIES INDIGENOUS TO NORTH DAKOTA

Aedes hendersoni

First Report in North Dakota

Collection records: Cass Co., VI-24-67, 1F; Fargo, VII-27-78, 1F; Wild Rice, VII-9-68, 1F; VII-19-68 1F; VIII-7-68, 1F; Golden Valley Co., Beach Farm, VIII-8-78, 1F; Cavalier Co., Munich, VII-18-79, 1F; Pembina Co., Cavalier, VII-19-79, 7F; Hettinger Co., Mott East, VIII-7-79, 2F; Billings Co., Medora, VIII-8-79, 5F.

Aedes melanimon

First Report in North Dakota

Collection records: Barnes Co., Valley City, VII-26-78, 1F; Bowman Co., Bowman, VIII-8-78, 1F; VIII-9-79, 3F; Cass Co., VI-5-56, 1F; VI-11-56, 1F; VI-22-56, 1F; VII-2-56, 1F; Golden Valley Co., Beach Farm, VIII-8-78, 1F; VIII-9-79, 1F; Hettinger Co., Mott East, VIII-9-79, 6F; Slope Co., Marmarth, VIII-9-79, 1F; Walsh Co., VI-5-56, 1F. In older records, it was undoubtedly combined with *Ae. dorsalis*, from which it was resurrected from synonymy by Barr in 1955.

A synonym of this species, *Ae. (Och.) mediolineata*, was described by Ludlow (1907), from specimens sent to her from Fort Lincoln, Bismarck, Burleigh Co., the type-locality. *Ae. mediolineata* has been listed as a synonym of *Ae. dorsalis* (Knight and Stone, 1977) but was transferred to synonymy under *Ae. melanimon* by Wood (1977) after he studied the lectotype adult female.

Culiseta minnesotae

First Report in North Dakota

Collection records: Cass Co., Fargo, VII-2-56, 1F; VIII-1-56, 1F; IX-1-56, 1F; Wild Rice, VII-2-68, 1F; VIII-13-68, 1F; VIII-20-68, 1F. It is not surprising to find *Cs. minnesotae* in North Dakota since the type-locality, Virginia, St. Louis Co., MN, is only 322 km. to the east (Barr 1957) and it is distributed from coast to coast along the northern tier of states (Darsie and Ward 1981).

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Culex territans

Neither Carpenter and LaCasse (1955) nor Darsie and Ward (1981) listed this species from North Dakota, but Post and Munroe (1949) first recorded it (as *Cx. apicalis* Adams) from Valley City, Barnes Co. Other collections have been made subsequently, e.g., Cass Co., Fargo, VII-5-56, 2F.

Orthopodomyia signifera

This mosquito was first reported from North Dakota by a U.S. Public Health Service account

of mosquitoes from the Missouri River basin states (U.S.P.H.S. 1951). To our knowledge, additional specimens have not been taken since then. Whether it still is part of the State's fauna requires further confirmation.

COMMENTS ON SPECIES THAT
PROBABLY OCCUR IN NORTH DAKOTA

Aedes implicatus

This species has been reported from Montana, Minnesota, Nebraska and Iowa. Darsie

Table 1. List of the mosquitoes of North Dakota.**

| | |
|-------------------------------------------------------|--------------------------------------------------------------|
| <i>Aedes (Och.) campestris</i> Dyar & Knab, 1907 | <i>Aedes (Och.) trivittatus</i> (Coquillett, 1902) |
| <i>Aedes (Och.) c. canadensis</i> (Theobald, 1901) | <i>Aedes (Adm.) vexans</i> (Meigen, 1830) |
| <i>Aedes (Aed.) cinereus</i> Meigen, 1818 | <i>Anopheles (Ano.) earlei</i> Vargas, 1943 |
| <i>Aedes (Och.) dorsalis</i> (Meigen, 1830) | <i>Anopheles (Ano.) punctipennis</i> (Say, 1823) |
| <i>Aedes (Och.) excrucians</i> (Walker, 1856) | <i>Anopheles (Ano.) quadrimaculatus</i> (Say, 1824) |
| <i>Aedes (Och.) fitchii</i> (Felt & Young, 1904) | <i>Anopheles (Ano.) walkeri</i> Theobald, 1901 |
| <i>Aedes (Och.) flavescens</i> (Muller, 1764) | <i>Coquillettidia (Coq.) perturbans</i> (Walker, 1856) |
| <i>Aedes (Pro.) hendersoni*</i> Cockerell, 1918 | <i>Culex (Cux.) pipiens</i> Linnaeus, 1758 |
| <i>Aedes (Och.) intrudens</i> Dyar, 1919 | <i>Culex (Cux.) restuans</i> Theobald, 1901 |
| <i>Aedes (Och.) melanimon*</i> Dyar, 1924 | <i>Culex (Cux.) salinarius</i> Coquillett, 1904 |
| <i>Aedes (Och.) nigromaculis</i> (Ludlow, 1906) | <i>Culex (Cux.) tarsalis</i> Coquillett, 1896 |
| <i>Aedes (Och.) pionips</i> Dyar, 1919 | <i>Culex (Ncx.) territans</i> Walker, 1856 |
| <i>Aedes (Och.) punctor</i> (Kirby, 1837) | <i>Culiseta (Cus.) incidens</i> (Thomson, 1868) |
| <i>Aedes (Och.) riparius</i> Dyar & Knab, 1907 | <i>Culiseta (Cus.) inornata</i> (Williston, 1893) |
| <i>Aedes (Och.) sollicitans</i> (Walker, 1856) | <i>Culiseta (Cuc.) minnesotae*</i> Barr, 1957 |
| <i>Aedes (Och.) s. idahoensis</i> (Theobald, 1903) | <i>Culiseta (Cuc.) morsitans</i> (Theobald, 1901) |
| <i>Aedes (Och.) s. spencerii</i> (Theobald, 1901) | <i>Orthopodomyia signifera</i> (Coquillett, 1896) |
| <i>Aedes (Och.) sticticus</i> (Meigen, 1838) | <i>Psorophora (Gra.) signipennis</i> (Coquillett, 1904) |
| <i>Aedes (Pro.) triseriatus</i> (Say, 1823) | <i>Uranotaenia (Ura.) sapphirina</i> (Osten Sacken, 1856) |
| Other species that probably occur in North Dakota | |
| <i>Aedes (Och.) implicatus</i> Vockeroth, 1954 | <i>Aedes (Och.) stimulans</i> (Walker, 1848) |
| <i>Aedes (Och.) increpitus</i> Dyar, 1916 | <i>Culiseta (Cus.) impatiens</i> (Walker, 1848) |
| <i>Aedes (Och.) provocans</i> Walker, 1948 | <i>Psorophora (Gra.) discolor</i> (Coquillett, 1903) |

* First report from North Dakota.

** Abbreviations follow Reinert (1975).

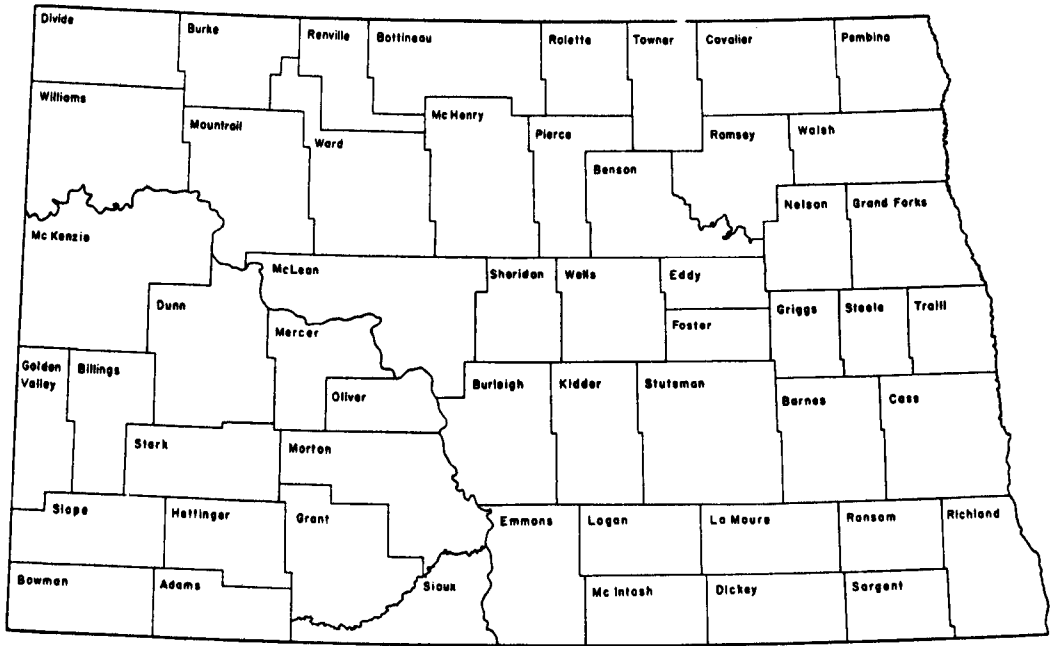


Fig. 1. Map of North Dakota showing counties.

and Ward (1981:249) believe North Dakota is within its range.

Aedes increpitus

A single female was trapped in Ashley, McIntosh Co., on VII-26-78, but the specimen was not preserved. It is recorded from Montana and South Dakota (Darsie and Ward 1981:239). In the absence of a voucher specimen, we can only list it as a probable member of the North Dakota fauna.

Aedes provocans

This unusual *Aedes* species has been reported from most of the northern tier of states, including Minnesota and Montana, by Darsie and Ward (1981:251), so it will undoubtedly be found in North Dakota.

Aedes stimulans

This species has been collected in Minnesota, South Dakota, Nebraska and Iowa and presumably will eventually be found in North Dakota. Wood (1977) considered the "*stimulans*" of western and northwestern North America (see Darsie and Ward 1981:236 for distribution map) as *Ae. mercurator* Dyar, not *stimulans*. The eastern limit of the range of *mercurator* is not known for the United States, and it may well occur in North Dakota.

Culiseta impatiens

Both Hopla (1970) and Darsie and Ward (1981:272) have shown North Dakota to be within the range of this species. It has been recorded from South Dakota, Montana, Saskatchewan, Manitoba and Wisconsin, so it is likely to turn up in North Dakota.

Psorophora discolor

Females purported to be this species were collected by CDC miniature light traps from the following counties in 1978-79: Bottineau, Bowman, Cass, Cavalier, Dickey, Golden Valley, McIntosh, McKenzie, Pembina, Ramsey, Richland, Rolette, Sargent, Stutsman and Traill. No voucher specimens are extant, so we must consider this mosquito, which is apparently at times fairly common, as a probable member of the state's fauna.

GENERAL COMMENTS

The three species new to North Dakota were captured either in New Jersey light traps or CDC miniature light traps baited with dry ice. Voucher specimens are stored with the North Dakota State University Collection. The assistance of D. M. Noetzel and R. D. Peterson in the study is acknowledged.

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