

## SCIENTIFIC NOTE

### NEW NEBRASKA MOSQUITO DISTRIBUTION RECORDS

JAMES P. MOORE

PO Box 724, Omaha, NE 68101-0724

**ABSTRACT.** Larval collections in Nebraska during 2000 established 2 new state distribution records for *Ochlerotatus epactius* and *Anopheles perplexens* and confirmed the presence of *Culiseta melanura*, bringing the total number of mosquito species reported from Nebraska to 50. Fifteen new county records for 10 species are noted, including the 1st report of *Aedes albopictus* from Lancaster County, marking its westernmost collection in Nebraska to date.

**KEY WORDS** Culicidae, mosquito, distribution, Nebraska, *Aedes albopictus*, *Ochlerotatus epactius*, *Anopheles perplexens*, *Culiseta melanura*

The mosquito fauna of Nebraska has been reported previously by Tate and Gates (1944), Rapp (1958), Rapp and Harmston (1965), Lunt and Rapp (1981), Janousek and Kramer (1999), and others, listing 47 mosquito species found in the state. During 2000, incidental culicid collections were made by the author, resulting in several new state and county faunal records.

Larval and pupal specimens were collected by dipper or siphon from their larval habitat. Larval specimens were slide-mounted with CMC-10 media (Masters Chemical Co., Bensenville, IL) and identified to species with the works of Darsie and Ward (1981), Ward and Darsie (1982), Darsie (1986), and Reinert et al. (1997). Selected larvae and pupae were reared to adults in captivity, mounted on paper points, and identified to species with the same taxonomic references.

*Aedes albopictus* (Skuse) was 1st collected in Nebraska in 1992 from tire habitats in Cuming and Douglas counties in the eastern extreme of the state (Moore 1999). In September 2000, 3rd- and 4th-stage larvae were collected from tires at a commercial tire business in Cushman, west of Lincoln, in Lancaster County (40°48'44"N, 96°46'45"W). Several of the specimens were identified as *Ae. albopictus*, with cohabitants *Ochlerotatus epactius* (Dyar and Knab), *Culex pipiens* complex, and *Culex restuans* Theobald. The tires, approximately 3,000 in number, were in full sunlight, and contained clear fluids of 2- to 20-cm depth and vegetative debris.

*Anopheles perplexens* Ludlow, according to the geographic distribution described by Darsie and Ward (1981), is normally found in several foci in the eastern USA. In July, September, and October 2000, late larval instars of *An. perplexens* were collected from a spring-fed drainage ditch in Papillion, Sarpy County (41°09'01"N, 96°01'38"W), thus extending the range of the species northward by 875 km and establishing the 1st record of the species in Nebraska. The larval habitat, 60 m<sup>2</sup> in area

with depths up to 10 cm, was in full sunlight with *Typha latifolia* L. (Typhaceae) and algal growth, including *Spirogyra* and *Hydrodictyon*. Water movement in the drainage ditch was not apparent. Larval cohabitants during July included *Aedes vexans* (Meigen), *Anopheles punctipennis* (Say), *Culex tarsalis* (Coquillett), *Culex territans* Walker, and Odonata. Larval cohabitants during September included *Cx. tarsalis* and Odonata. Larval cohabitants during October included *Ae. vexans*, *An. punctipennis*, *Cx. restuans*, *Cx. tarsalis*, *Cx. territans*, *Culiseta inornata* (Williston), and Odonata. From May to November 2000, when *An. perplexens* was not present, the site also produced *Cx. pipiens* complex, *Culex salinarius* Coquillett, *Culiseta impatiens* (Walker), *Culiseta melanura* (Coquillett), *Psorophora ciliata* (Fabricius), *Psorophora cyanescens* (Coquillett), and *Mochlonyx* sp. (Chaoboridae). Several larval specimens were raised to adults in captivity and identified as female *An. perplexens*. The wing morphology of the reared adults exhibited subcostal pale spots measuring a mean 0.29 times the length of the dark-scaled area between the subcostal and apical pale spots. This feature was used to distinguish adult *An. perplexens* from *An. punctipennis*, a related species also found in Nebraska. Janousek and Kramer (1999) reported the 1994-95 light trap collections of *An. punctipennis* in Bellevue, Sarpy County, but did not report the collection of other anophelines from Sarpy County.

*Anopheles quadrimaculatus* Say s.l. has been reported in the eastern half of Nebraska for many years (Lunt and Rapp 1981); however, extensive collecting has not been conducted in several counties in the state. The collection of *An. quadrimaculatus* s.s. from a tire habitat in Sutton, Clay County (40°35'51"N, 97°51'22"W), in September 2000 represents a county record for the species. Larval cohabitants were identified as *Cx. pipiens* complex. The tires, approximately 50 in number, were in full sunlight, and contained clear fluids 2-10 cm in depth and vegetative debris.

*Culex pipiens* complex mosquitoes were collected in August 2000 from tire habitats in Ainsworth, Brown County (42°32'55"N, 99°51'29"W), and in Neligh, Antelope County (42°07'32"N, 98°01'43"W), establishing county records. The specimens were collected at commercial tire businesses, with approximately 300–1,000 tires in full sunlight, with fluid depths of 6–10 cm and accumulations of vegetative debris and trash. Larval cohabitants at both sites included *An. punctipennis/perplexens* and *Cx. restuans*.

*Culex restuans*, a species probably found throughout the state, has not been previously collected in some counties. During July and August 2000, the species was collected from larval sites in Antelope (42°07'32"N, 98°01'43"W), Colfax (41°43'42"N, 97°00'14"W), Dodge (41°44'05"N, 96°30'38"W), and Polk (41°06'44"N, 97°35'48"W) counties, establishing new records for those counties. In Dodge County, a drainage ditch habitat in full sunlight with emergent vegetation (*T. latifolia*), vegetative debris, a depth of 80 cm, and no noticeable flow produced *Cx. restuans*, *Cx. salinarius*, *Cx. tarsalis*, and Dysticidae. At commercial tire businesses in Antelope, Colfax, and Polk counties, tire accumulations, 20–1,000 in number, produced *Cx. restuans*, *Cx. pipiens* complex, and *An. punctipennis/perplexens*. In each case, tires were in full sunlight and contained vegetative debris.

*Culex salinarius* and *Cx. tarsalis* are commonly collected throughout the state (Lunt and Rapp 1981). The July 2000 collection of these species from a drainage ditch in Uehling, Dodge County (41°44'05"N, 96°30'38"W), established county records for these species. This drainage ditch habitat is further described in the previous paragraph.

*Culiseta impatiens* and *Cs. melanura* have been reported previously in Nebraska collections (Olson and Keegan 1944, Rapp and Harmston 1965, Lunt and Rapp 1981). In October 2000, these species were collected as larvae from a spring-fed drainage ditch in Papillion, Sarpy County (41°09'01"N, 96°01'38"W), representing county records for both species. In the case of *Cs. melanura*, this collection confirms the presence of the species in the state, previously discounted by Lunt and Rapp (1981). The larval habitat, varying from 2 to 400 m<sup>2</sup> in area, 2 to 20 cm deep, in full sunlight, with *T. latifolia* and algal growth, also produced *Ae. vexans*, *An. punctipennis/perplexens*, *Cx. pipiens* complex, *Cx. restuans*, *Cx. tarsalis*, *Cx. territans*, and Odonata as cohabitants.

*Ochlerotatus epactius* is normally found in the southwestern United States, but not north of central Kansas (Darsie and Ward 1981). During August and September 2000, late-stage larval and pupal specimens of *Oc. epactius* were collected from tire piles at 2 commercial tire businesses in Grand Island, Hall County (40°56'23"N, 98°23'01"W and 40°55'06"N, 98°22'29"W), and at another commercial tire business in Cushman, Lancaster County

(40°48'44"N, 96°46'45"W), thus extending the range of the species northward by 250 km. The tires, from 500 to 3,000 in number, were located in full sunlight and contained clear fluids, 2–20 cm deep, with accumulations of vegetative debris. Larval cohabitants at the 1st collection site in Grand Island in August 2000 were *Cx. tarsalis* and *Cx. restuans*. Larval cohabitants at the 2nd site in Grand Island in September 2000 were *Cx. pipiens* complex. Larval cohabitants at the 3rd site in Cushman during September 2000 were *Ae. albopictus*, *Cx. pipiens* complex, and *Cx. restuans*. The primary larval habitat for *Oc. epactius* is water accumulated in rock holes (O'Meara and Craig 1970). Although the species may also be found in tires, it has not often been reported from tree holes. The observation of *Oc. epactius* in Nebraska is likely the result of tires imported from locations to the south of Nebraska. Whether the species is permanently established in Nebraska, or if it is reintroduced annually with the tire trade, is unknown. Janousek and Kramer (1999) reported the 1994 light trap collection of *Ochlerotatus atropalpus* (Coquillett), a species closely related to *Oc. epactius*, at 4 locations in Nebraska, including Grand Island, but did not report the collection of *Oc. epactius* during their study. No voucher specimens from the 1994 effort were available for study.

During 2000, larval mosquito collections in Nebraska established 2 new state distribution records for *Oc. epactius* and *An. perplexens* and confirmed the presence of *Cs. melanura*, bringing the total number of mosquito species reported from Nebraska to 50. Fifteen new county records for 10 species are noted, including the 1st report of *Ae. albopictus* from Lancaster County, marking its westernmost collection in Nebraska to date. Specimens have been retained in the personal collection of the author.

Grateful appreciation is expressed to L. Nielsen, Salt Lake City, UT, for the taxonomic confirmation of larval *Oc. epactius* specimens, review of the manuscript, and his continuing encouragement; and to W. Kramer, Nebraska Department of Health and Human Services, Regulation and Licensure, and T. Janousek, Omaha, NE, for their review of the manuscript.

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