

THE OCCURRENCE OF *Aedes decticus* (DIPTERA: CULICIDAE) IN CENTRAL NEW YORK¹

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ABSTRACT. Larvae and adult females of *Aedes decticus* H., D. & K. 1917, are reported for the first time from New York State. This species was found breeding in a sphagnum bog at the McLean Wildlife Reservation, Tompkins County, New York, in 1969 and 1970. Immatures were particularly abundant during April in association with *Aedes abserratus*, *A. canadensis*, *A. ex-*

crucians, and *A. punctor*. Adults were abundant in the area surrounding the bog during the third week of May at which time they attacked readily when disturbed. Although one adult male *A. decticus* was collected in Tompkins County, N.Y., in 1923, this species has not been included in any of the published check-lists of mosquitoes occurring in New York.

Aedes decticus Howard, Dyar and Knab 1917, was collected during the springs of 1969 and 1970 at the McLean Wildlife Reservation (elevation 1,100 ft.) located 4 miles north of Dryden and 1 mile east of McLean in the northeastern part of Tompkins County, New York. Although one adult male was collected in Tompkins County in 1923, this species has not been included in any of the published check-lists of mosquitoes occurring in New York State (Leonard, 1926; Barnes, Felton and Wilson, 1950; Jamnback, 1969). This paper reports the first collection of *A. decticus* larvae and adult females in New York and brings the total number of recorded species in the state to 54.

McLean Bog, in which *A. decticus* was found breeding, is situated in the west-central portion of the preserve. Evolving from a circular pond formed by a pothole in this region of irregular morainal deposits, the bog measures 60 m east to west by 46 m north to south and reaches a maximum depth of 11 m beneath the sphagnum cover. It is completely encircled by higher ground and is flooded in the spring by melting snow, having no drainage of its own. Additional water is received primarily as run-off from the surrounding wooded slopes dominated by beech and maple. Along the periphery

of the open bog is a narrow zone of common highbush blueberry (*Vaccinium corymbosum*) which in turn is surrounded by a low, wet area of red maple (*Acer rubrum*) and eastern hemlock (*Tsuga canadensis*). Extensive shallow, leaf-lined pools in this area produce large numbers of *Aedes* mosquitoes in the early spring.

The bog itself supports abundant pitcher plants (*Sarracenia purpurea*) and later in the year becomes overgrown with sedges, particularly *Rhynchospora alba*, reflecting the bog's age. Cotton-grass (*Eriophorum virginicum*) and bog rosemary (*Andromeda polifolia*) are common in the eastern half of the bog while *Dulichium arundinaceum*, a sedge, grows in the wetter, marginal areas at the western end. Other bog plants such as small cranberry (*Vaccinium oxycoccus*) and Labrador tea (*Ledum groenlandicum*) are scarce. Water may still be present in late summer forming a quaking bog mat while sufficient rainfall produces extensive puddles even during the fall.

Aedes decticus was first collected in McLean Bog as second and third instars on April 13, 1969, in association with *Aedes abserratus*, *A. canadensis* and *A. punctor*. The water temperature in the open bog at this time was 22° C. On April 28, 1970, third and fourth instars were found abundantly throughout the same bog which was then covered by 10 inches of water (24° C) with very few pitcher plants breaking the surface. Associated with *A. decticus*, although in

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fewer numbers, were third and fourth instars of *A. canadensis* and *A. excrucians*. When this site was visited again on May 21, 1970, the water level was considerably lower with the pitcher plants well exposed in 5 to 8 inches of water with a temperature of 30°C near the center and 31°C along the periphery. No mosquito immatures could be found.

On this same date, however, adults of *Aedes decticus* were exceedingly abundant in the shaded woodlands southwest of the bog. Readily disturbed from their resting places amidst the ferns, herbaceous plants and fallen trees, the females attacked in large numbers, attempting to bite. Their approach often went virtually unnoticed owing to their almost silent flight; the bite itself caused little or no pain. Of more than 200 mosquitoes taken when biting or by netting them amidst the vegetation, 73 were *A. decticus* (65 females, 8 males). The remainder consisted of *A. canadensis*, *A. cinereus*, *A. excrucians*, *A. trichurus* and at least two other species of banded-legged *Aedes*. In addition to biting in the shade of the surrounding woods, a few *A. decticus* females also attempted to bite in the bright sunlight of the open bog at 4:00 p.m.

Smith (1952) reported the occurrence of *A. decticus* under the synonym *A. pseudodiantaeus* in a sphagnum bog-swamp at Belchertown, Massachusetts, where larvae were found primarily in deep, cold sphagnum pools from late March to mid-May. Individual specimens were also collected from two other locations in Massachusetts, in a woodland pool and a permanent bog in which no sphagnum was growing. Frohne and Frohne (1954) found *A. decticus* breeding in two *Drepanocladus-Carex* quaking bogs (pH 6.5-7.3) in the Copper River Valley, Alaska. There are two records for this species in Ontario. In addition to the type-locality at White River (Howard, Dyar and Knab, 1917), Beckel and Atwood (1959) collected *A. decticus* larvae from an alder bog in Algonquin Park, Ont., during June and encountered occasional biting adults from late June to mid-August in a well-shaded,

black spruce (*Picea mariana*) bog-forest. Parous adults have been taken at Churchill, Manitoba, during July; these deposited eggs which hatched after cold-conditioning (Brust and Kalpage, 1967). More recently this species has been reported from the Pocono Mountain region of northeastern Pennsylvania, where fourth-instar larvae were collected in a sphagnum bog bordering a lake during late April (Wills and McElhattan, 1968).

Distribution records for *A. decticus* now include Massachusetts, New Hampshire, New York, Pennsylvania, Michigan, Labrador, Ontario, Manitoba, and Alaska. (Figure 1). Prior to the collections reported here from McLean Bog, the occurrence of *A. decticus* in New York State was based on a single adult male collected at Ringwood, Town of Dryden, in Tompkins County on June 11, 1923. This specimen is deposited in the Cornell University collection and is a paratype of *Aedes pseudodiantaeus* Smith 1952, a junior synonym of *A. decticus*.

It is interesting to note the failure of this species to appear in the extensive collections of mosquitoes taken at McLean Bog from 1920 to 1945 by Robert Matheison and his students at Cornell. However, comparatively little serious collecting has been done in this immediate area for the last two decades. Apparently *A. decticus* did not begin breeding at McLean Bog until the mid-1940's or later. This may reflect either of two possibilities: (1) a change in the nature of the bog, as represented by a marked difference in its floral and faunal characteristics from that described in 1926 (Cornell University), thus providing a more suitable breeding site, or (2) an expansion of the range of this species.

Although primarily a boreal species breeding in sphagnum and other acid-bog areas in Canada, *A. decticus* may be gradually extending its range from scattered localities in New England into adjacent states such as New York and Pennsylvania where sphagnum bogs still persist. The scarcity of such bogs farther south will probably preclude its spread in

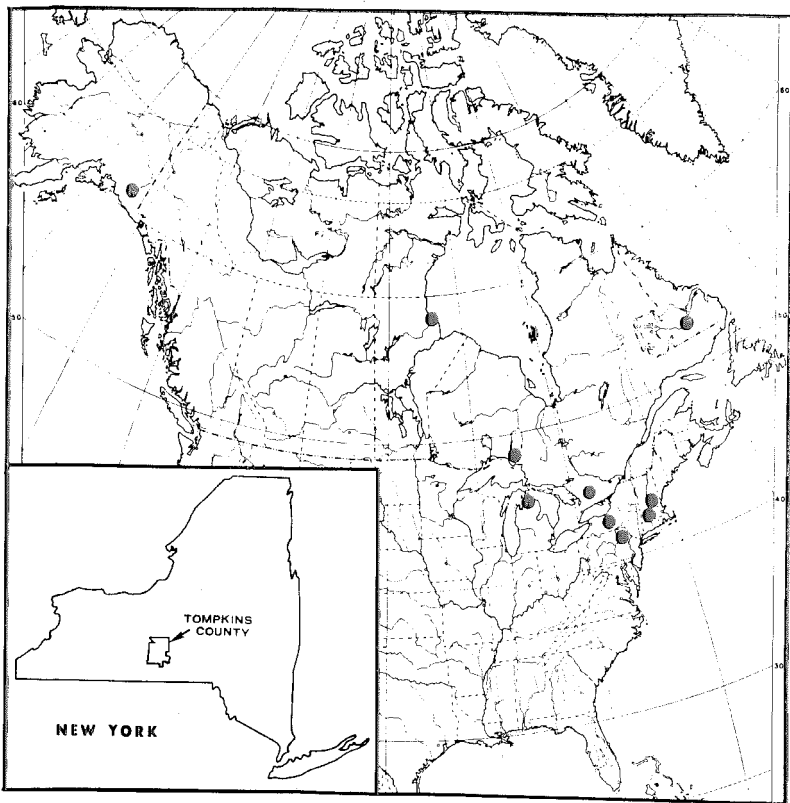


FIG. 1.—Map of North America showing distribution records for *Aedes decticus*. Insert map of New York shows the location of Tompkins County where this species was found breeding in 1969 and 1970.

that direction. *A. decticus* may be locally common throughout its range but rarely collected because of such possible factors as short flight range, failure to be attracted to light traps, or non-anthropophilic feeding habits. Although specimens have been taken biting man, such collections have been made only following the adult emergence peak and may simply reflect increased competition for normal hosts within the restricted flight range. None of these behavioral aspects has thus far been investigated.

Based on the studies cited above and observations made in central New York during 1969 and 1970, the following in-

ferences may be drawn concerning the bionomics of *Aedes decticus*. Oviposition normally occurs in bogs during June and July. Females probably deposit the eggs in sphagnum or other bog mats which have been submerged during the previous spring by snow-melt and rain water. After overwintering, the eggs hatch in late March or early April as the ice begins to clear. Development may require 4 to 6 weeks, depending upon the weather. Pupation takes place during the first part of May, and adults emerge about mid-May. Development may lag by a month or more in the northern part of its range where larvae appear in mid-May and

adults in the latter part of June. Neither swarming nor mating has been observed.

Three other species of mosquitoes commonly associated with larvae of *A. decticus* are *Aedes abserratus*, *A. canadensis* and *A. excrucians*. Less frequent associates include *A. cinereus*, *A. communis*, *A. diantaeus*, *A. punctor*, *Culex territans*, *Culiseta melanura*, *Culiseta morsitans dyari* and *Anopheles* spp. In addition, *Wyeomyia smithii* is generally found in the pitcher plants.

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