

Notes on the Geographical Distribution of

Aedes canadensis mathesoni

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ABSTRACT. More than 1400 specimens of *Aedes canadensis canadensis* and *Ae. canadensis mathesoni* in the U. S. National Museum of Natural History, Smithsonian Institution, were studied. There are 15 intergrades, but the subspecies, *mathesoni*, is not represented in material collected north of Georgia.

Aedes (Ochlerotatus) mathesoni was described by Middlekauff (1944) who stated that it differed from *Ae. canadensis* (Theobald) by having black scales on the mesonotum and more extensive white areas on the legs. Rings and Hill (1946) described the larva of *Ae. mathesoni* and reported that larvae of *mathesoni* and *canadensis* possess no differences of specific rank. The same authors (1948) provided "evidence that *mathesoni* is a melanistic, geographical variation of *A. canadensis*." They regarded the 2 forms as subspecies and reported that *canadensis mathesoni* occurs exclusive of *canadensis canadensis* in southern Florida, and that both subspecies are found in northern Florida, and southern Alabama, Georgia, and South Carolina. In Newfoundland, Pickavance et al. (1970) found a female with hindtarsal white rings like those of *mathesoni* and assigned it to that subspecies. However, Wood et al. (1979), because the specimen was so widely separated from the known geographical range of *mathesoni*, stated that it is hardly likely to represent a subspecies but "could represent anything from a rare recessive allele to another species."

Reported here are results of a study undertaken to determine whether or not the range of *Ae. canadensis mathesoni* extends northward from Alabama, Georgia, and South Carolina.

For the separation of the 2 subspecies Darsie and Ward (1981) have relied on the pale rings on the hindtarsal segments (hindtarsomeres) and on scutal scale color. These criteria conform with the conclusions of Rings and Hill (1948) who provided excellent illustrations. The hindtarsi of the nominal subspecies have broad pale rings basally and apically on all segments except 5 which is entirely pale. The hindtarsi of *mathesoni* have narrow pale rings basally and apically on segments 3 and 4; and segment 5 is dark scaled. Rings and Hill (1948) figured the tarsi of the 2 subspecies and 3 intergrades which have fewer pale scales than *canadensis* but generally more than *mathesoni*. Because of individual variation it is virtually impossible to define broad as compared with narrow tarsal rings; those of *mathesoni* are ca. half or less than half the width of *canadensis* rings.

I examined the holotype specimen, the allotype (which lacks legs), and a paratype from MacDill Field, Tampa, Florida. I also examined 28 specimens from Camp Blanding, Florida, some of which were studied by Rings and Hill (1946). Five of the 28 specimens are clearly *mathesoni*, but the others can be considered intergrades on the basis of their tarsal markings. One specimen from Camp Gordon (Augusta), Georgia, may be considered *mathesoni*, but all other specimens in the U. S. National Museum of Natural History are *canadaensis*. Intergrades are recorded below. In the list that follows the number of adults examined follows the name of the state or Canadian province:

United States: Alabama 2, Alaska 24, Arkansas 1, Connecticut 29, Delaware 5, Florida 34 (including 23 intergrades), Georgia 85 (including 7 intergrades), Idaho 4, Indiana 1, Iowa 12, Kentucky 17, Louisiana 41, Maine 17, Maryland 220 (including 4 intergrades), Massachusetts 61 (including 2 intergrades), Michigan 14, Minnesota 69, Montana 73, Nebraska 4, New Hampshire 62, New Jersey 29, New York 45, North Carolina 19, North Dakota 1, Ohio 17, Oklahoma 1, Pennsylvania 9 (including 1 intergrade), Rhode Island 19, South Carolina 34, Tennessee 2, Texas 5, Vermont 18, Virginia 78, Washington 4, West Virginia 2, Wisconsin 5 (including 1 intergrade), Wyoming 3.

Canada: Alberta 57, British Columbia 52, Manitoba 29, Ontario 62, Quebec 1, Saskatchewan 67.

The scuta of all 1334 adults were observed, and it became obvious that the scale color and/or pattern cannot be used as a means for distinguishing the subspecies. There are many specimens from the southern part of the geographic range which have golden scales rather than the typical dark brown scales. Stripes and patches of paler scales form no consistent patterns. Some of the specimens from Camp Blanding, Florida, and from Georgia, may have been identified as *mathesoni* on the basis of scutal color and/or patterns, but possibly there has been appreciable fading during the last 35 or more years.

According to Rings and Hill (1946) the only apparent difference between *mathesoni* and *canadensis* larvae is the degree of branching in the head hairs and antennal tufts. They examined 89 *canadensis* larvae and reported that the number of upper head hair (seta 5-C) branches ranged from 4 to 10 with an average of 6.77 and that the average number of lower head hair (seta 6-C) branches was 5.06 (range not given). I examined 142 *canadensis* larvae and found that the number of seta 5-C branches ranged from 5 to 10 with an average of 6.9 and that the number of seta 6-C branches ranged from 3 to 8 with an average of 5.1. All of the *canadensis* larvae which I studied had been collected outside the known geographical range of *mathesoni* - from Louisiana to Minnesota and from Georgia to Maine.

Rings and Hill (1946) reported that in *mathesoni* the average numbers of seta 5-C branches and seta 6-C branches were 9.8 (range 6-14) and 7.1, respectively (n=33). I observed 13 larvae from Camp Blanding, Florida, and Fort Gordon, Georgia, which are undoubtedly part of the material studied by Rings and Hill. The average numbers of branches of seta 5-C and seta 6-C were 8.9 (range 7-12) and 6.9 (range 6-9), respectively. Although the average number

of head hair branches of *mathesoni* larvae exceeds the average for *canadensis*, overlapping of ranges (4-10 vs 6-14, and 3-8 vs 6-9) casts doubt on the reliability of this character.

It is difficult or impossible to observe the number of branches of the antennal tufts. A detailed study of this character on several specimens suggested that it cannot be used to separate the 2 subspecies. It should be noted that Darsie and Ward (1981) have not separated the larvae of the 2 subspecies.

From the survey described here, involving specimens from 43 North American states and provinces, it may be concluded that the geographical range of *Ae. canadensis mathesoni* does not extend northward from southern Georgia and South Carolina. Only 1 character, the narrow pale rings on the hindtarsomeres, is available as a means of recognizing this rare subspecies, the validity of which is certainly complicated by the existence of intergrades. If appreciable numbers of *mathesoni* were collected in Florida, or elsewhere, the validity of the subspecies would be less questionable.

ACKNOWLEDGMENTS

I thank Dr. Ronald A. Ward and Mr. Tom Gaffigan of the Medical Entomology Project, Smithsonian Institution, for making available facilities and specimens. Dr. Ward suggested the investigation and reviewed the manuscript. Major Edward S. Saugstad gave me the privilege of examining specimens, under his curatorship, from Kentucky and Ohio.

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