

MOSQUITO RECORDS FROM THE CHUKCHI SEA COAST OF NORTHWESTERN ALASKA

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This study was made in order to advance our knowledge concerning the geographic distribution and ecology of mosquitoes in Alaska. All of the field work was done by the junior author and the identifications by the senior author. The field work was done from June 15 to July 1, 1956 at which time the succession of species was in a later state than is normal for the locality. This was due to the unusually warm weather during the spring as shown by the local climatological data of the United States Weather Bureau for Kotzebue, Alaska.

COLLECTION RECORDS, KOTZEBUE, ALASKA. Kotzebue is a small town located on a spit projecting into Kotzebue Sound, an arm of the Chukchi Sea. There is no spruce forest within ten miles of Kotzebue, and the locality appears to be typical of the arctic tundra. There are, however, substantial growths of dwarf alder and willow near the town. The average altitude is about 10 feet above sea level.

A pool which had formed in a depression left by the removal of sod was examined on June 15. The pool was about 36 square feet in area and was polluted with drainage from garbage. Fifty larvae taken were all *Aedes fitchii*. From another lot, eleven adults were reared of which one was *A. fitchii* and the remainder *A. excrucians*.

On June 16 a large accumulation of water perhaps a quarter of an acre in area was examined. Larvae were found in

shallow, shaded portions of the pool and were less abundant than pupae. Eight larvae were taken, of which four were *A. excrucians* and four *A. fitchii*. Eight pupae were reared of which seven were *Mochlonyx velutinus* and one *A. fitchii*.

A third breeding-place examined was part of an extensive fresh water slough. On June 23, pupae were more abundant than larvae and were found among emergent grasses. This slough is probably the principal source of mosquitoes in Kotzebue. Twenty-six larvae were taken, of which 20 were *A. excrucians* and six *A. fitchii*. Five hundred twenty-seven adults were reared of which 477 were *A. fitchii*, 47 *A. excrucians*, 1 *A. cinereus*, and 2 *Mochlonyx velutinus*.

TUNDRA AREAS NEAR KOTZEBUE. On June 18 a pool was sampled in the tundra about four miles south of Kotzebue. The altitude of the area is about 100 feet above sea level. Of three larvae taken, two were *Mochlonyx velutinus* and one *Aedes excrucians*. Fourteen adults were reared of which seven were *A. excrucians* and seven *A. nigripes*. Nine females were taken biting on June 20 and of these, eight were *A. nigripes* and one was *A. implicatus*. A single female was taken on June 23 which appeared to be *A. nigripes* as did six taken on June 27. On June 28, 108 females were taken which also appeared to be mostly, if not entirely, this species.

KIVALINA. This is a village about 80 miles northwest of Kotzebue. It is a treeless locality on an exposed spit projecting into the Chukchi Sea and is about six feet above sea level. It was visited on June 21, at which time five larvae and many pupae were found. Of the larvae, two were *A. fitchii*, one *A. nigripes*, one *A. pionips* and the other has been tentatively identified as *A. pullatus*. Thirty-five adults were reared, of which one was *A. nigripes* and the remainder *A. impiger*.

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NOATAK. This locality, which is inland on the Noatak River 50 miles north northwest of Kotzebue, was visited on June 21. It is in an area of spruce forest. No immature mosquitoes were found but nine adult females were taken biting. Of these, six were *A. excrucians* and the remaining three appeared to be *A. nigripes*.

SHISHMAREFF. Immature mosquitoes were collected at Shishmareff, a treeless locality about 110 miles west southwest of Kotzebue at the north end of the Bering Strait (on the north side of the Seward Peninsula). The collections were made in a slough about 50 yards from the beach on June 24. Two *A. nigripes* larvae were taken. Seventeen adults were reared which were also *A. nigripes*.

DEERING. This locality is approximately 65 miles south of Kotzebue on Kotzebue Sound. It is also a treeless locality. Immature mosquitoes were collected on June 25 in a slough 40 yards from the beach. Thirty-eight adults were reared, of which 31 were *A. nigripes* and 4 *A. impiger*. The other three specimens could not be identified with certainty but were of the *punctator* subgroup of *Aedes*, possibly *hexodontus*.

NOTES ON THE SPECIES. *Aedes fitchii* (Felt and Young). The record from Kivalina is probably the northernmost one for *fitchii*. This species is considered to be one of the taiga rather than of the tundra and its presence at Kotzebue and Kivalina shows the presence of taiga elements in these treeless localities.

The identification of the species in northern Alaska presents no difficulties since the only other species in the area with white bands on the legs is *Aedes excrucians* which is easily recognized by the peculiar tarsal claws of the females. Biting females were not taken.

Alaskan specimens of *Aedes fitchii* are very similar to material from Minnesota both in the larval and adult stages. Females which have a white mesonotum with a brown median stripe are easily recognized although some females departed from this characteristic pattern. Usually there were white or yellowish-white scales

on the mesonotum but occasionally the scales were yellow or golden, in which cases the females could be mistaken for other species of the *simulans* group. In all of the material at hand, however, the tarsal claws are different from those of *excrucians* and the adults average considerably smaller in size. The colorational divergence mentioned above is likewise found in specimens from Minnesota which makes identification of females from that area almost impossible, since other species in this group are also present.

On the abdomen there are small to large, basal bands on the terga. These are usually white, rarely yellow. There are often narrow, apical, pale bands on the more posterior terga. The white bands are very distinct and there are no pale scales intermixed with the dark ones. Minnesota specimens, on the other hand, frequently have a sprinkling of pale scales among the darker ones.

Aedes excrucians (Walker). This species, like *fitchii*, is considered to be one of the taiga but its range is thought to extend further north than that of *fitchii*. The presence of the species at Kotzebue again demonstrates the presence of taiga elements there.

Specimens of larvae and adults of this species from Alaska are not noticeably different from Minnesota specimens. The females have yellow scales on the mesonotum and there may or may not be a distinct darker, median stripe. The abdominal terga have large, basal bands which are yellow, rarely whitish. There are also fairly large apical, pale bands on some of the terga and there is an intermingling of pale scales on the darker portions. Sometimes the dorsum of the abdomen is almost entirely yellow. All females are easily identifiable by the peculiar tarsal claws.

Aedes nigripes (Zetterstedt). This species is close to *impiger* as well as several other northern *Aedes*, and females are difficult to identify. Males and larvae, however, are more distinct. The species is most commonly found in tundra areas and is thus characteristically arctic.

Females have a dark golden brown mesonotum which lacks distinct stripes. The abdominal terga have broad, white, basal bands which are often very large. Occasionally the entire dorsum of the abdomen is covered with pale scales in which case the more apical scaling of the tergum is usually greyish rather than white. The shape of the tarsal claws appears not to be distinctive. Adults of this species are considerably larger than those of *impiger*, on the average.

Aedes cinereus Meigen. A single female of this species was reared from a pupa collected in Kotzebue. The species is holarctic and occurs as far south as the gulf coast in North America. It has been taken as far north as Dawson, Yukon Territory. The species is primarily found in the taiga, which again shows the presence of relatively southern elements at Kotzebue.

The one female taken lacked basal pale bands on the abdominal terga. The scutum was darker than in Minnesota specimens. This female was rather different from typical Minnesota specimens; the Alaskan form should be studied further.

Aedes implicatus Vockeroth. A single female of this species was taken while biting in the tundra near Kotzebue. The species is typically found in the taiga and its presence at Kotzebue reconfirms the presence of such elements there.

The one female taken was quite different from Minnesota females. In the latter there are two brown stripes on a coppery patch on the mesonotum. The sides of the mesonotum are covered with white scales. In the one Alaskan female taken there is a single, narrow, brown stripe on the mesonotum. The author has examined several hundred Minnesota specimens but has not seen this variation. The Alaskan form warrants further study.

Aedes impiger (Walker). This species is characteristically found in tundra areas.

The adults are smaller, on the average, than those of *nigripes*. The coloration is similar but the mesonotum is usually not so reddish as in *nigripes*. There are distinct white bands on the terga and the sternopleuron is less extensively scaled than in *nigripes*. Fresh, unrubbed females of these two species can usually be separated, but doubtful females are common. The tarsal claws of the female appear to be useless in this separation.

Aedes pullatus (Coquillett) and *Aedes pionips* Dyar. A single larva of each of these species was identified tentatively. They were taken at Kivalina. The records are not improbable but must remain doubtful.

Aedes punctor subgroup. One male and two females of this group were reared from pupae. The adults cannot be identified with certainty in this group. These specimens are either *Aedes punctor* (Kirby), *A. hexodontus* Dyar, or *A. abserratus* (Felt and Young). On the basis of known distributions, *A. abserratus* is unlikely and *A. hexodontus* is somewhat more probable than *A. punctor*. The genitalia of the male were not those of *abserratus* but could have been either *punctor* or *hexodontus*.

Mochlonyx velutinus (Ruthe). Larvae and adults of this non-biting mosquito were taken at Kotzebue. It again is characteristically found in the taiga.

DISCUSSION. It had been expected that only species characteristic of the tundra would be found near Kotzebue but, although tundra species were present, several species not ordinarily taken in tundra areas were also found. Collections of Lepidoptera made at Kotzebue confirmed the impression that although the area is superficially arctic tundra (treeless), there are strong Hudsonian elements in the fauna. The occurrence here of *Erebia disa* Thunberg (a satyrid butterfly), which is almost universally associated with spruce woods, is an example.