

NOTES ON THE OCCURENCE OF *Aedes* (OCHLEROTATUS)  
NEARCTICUS DYAR IN THE ROCKY MOUNTAINS PARK,  
ALBERTA. (CULICIDAE DIPT.)\*

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***Aedes nearcticus* Dyar.**

*Aedes nearcticus* Dyar, Rept. Can. Arct. Exped., vol. 3, pt. C, p. 32, 1919.

*Aedes parvulus* Edwards, Bull. Ent. Res., vol. 3, p. 314, 1921.

One of the more interesting details of a recent investigation of the mosquitoes of the Rocky Mountains Park, Alberta, was the finding of *Aedes nearcticus* Dyar—a mosquito hitherto considered to be restricted to the Arctic regions of Europe and North America. A few specimens were first taken at Lake Louise in 1921, when Mr. Arthur Gibson, the Dominion Entomologist, and the writer made a brief survey of mosquito conditions. In 1922 further specimens came to hand through the kindness of Mr. N. B. Sanson who sent the writer living larvae collected at Simpson's Summit at about 7000 feet. Adults were successfully reared from these. During 1924 and 1925 a number of trips were made by the writer and his assistant, Mr. A. G. Mail, to secure data on this interesting species, and several hundred specimens of larvae, and both sexes of adults were taken.

The larvae of *Aedes nearcticus* are very like those of *Aedes alpinus* Linnaeus in form, but the anal segment is not ringed and the comb scales, which in most of our specimens are 12 in number, are not bare but have a few short spinules in addition to the long central thorn. The pecten has several detached teeth in the case of *Aedes alpinus* but the teeth are evenly spaced in *Aedes nearcticus*. The upper and lower head hairs are single and very delicate as in *A. alpinus*, and the antennae are of markedly uniform width throughout and show little broadening at the base or tapering towards the tip. The lateral abdominal hairs appear to be subject to considerable variation. In some specimens they are similar to those of *Aedes alpinus*—i.e., in fours on the first segment, in threes on the second and double on the remainder, but in the majority of our specimens they are triple on the first two segments, double on segments 3 and 4, and single on 5 and 6. In some cases the laterals are triple to the 4th segment. The secondaries are small with the exception of those of the first two segments, and of single long sub-lateral hairs projecting ventrally on each side of segments 3 to 5. The anal gills are very elongated, being about 3 times as long as the anal segment. *Aedes pullatus* Coquillett breeding in the same pools have similarly lengthened gills, due doubtless to the type of water.

The mesonotum of the male has an abundance of very long black hairs and an irregular and sparse scattering of short curved yellow scales. In the female the mesonotum has numerous fairly long dark coarse hairs and there is a close covering of curved narrow bronzy brown scales. There are also some yellow scales similar to those on the male—these tend to lie along the margins of the mesonotum and also to form a pair of indistinct median spots. In a few aberrant specimens these yellow scales are greatly increased in numbers and encroach over much of the centre of the mesonotum.

In the male genitalia in most of our specimens the marginal hair of the basal lobe is slightly thickened—in some cases sufficiently so as to form a weak

\*—Contribution from the Entomological Branch, Dept. of Agric., Ottawa.

spine. This appears to be subject to considerable variation. There is no character of the hypopygium by which this species can be separated from *Aedes alpinus*.\*

In size the majority of the Alberta specimens are very similar to those from Alaska and other places in the main northern range, but some strikingly dwarfed specimens were taken on the wing at Lake Louise in 1925. Among these were the smallest *Aedes* the writer has seen; some specimens being only 3.5 mm. in length (head to end of abdomen) with the wing 2.5 mm. Average sized individuals from Banff and Lake Louise are about 5 mm. with the wing 4 mm. A few of the Alaskan specimens examined are slightly larger than this.

As might be expected from the isolated nature of the larval habitats at high elevations, this species is very localized in the Alberta mountains. It may be dominant in one place and only occur sparsely in another, similar, location. A very typical breeding place was found in Cascade mountain amphitheatre; a cold basin of some 7300 feet elevation sheltered from the sun by high cliffs. This basin is the habitat of large numbers of such typical Hudsonian animals as the hoary marmot (*Marmota caligata* Escholtz) and the pika (*Ochotona princeps* Richardson). Here the cold-loving and supposedly rare insect *Grylloblatta campodeiformis* Walker, was found to be surprisingly common. The main vegetation consists of clumps of spruce, dwarfed willows and false heather (*Phyllodoce* spp.) At the melting of the snows in early June the main meadow becomes converted into an extensive pond, which however, is extremely evanescent. No mosquito larvae were found in this sheet of water, possibly because the pond forms and disappears within a few days. At a slightly higher elevation, and cut off by a little ridge from the main pond, is a very small shallow pool which constitutes the only water in the basin that does not drain away quickly; the bottom of the pool is grassy and the water is brownish in colour. Examinations in 1924 and 1925 showed this pool to be teeming with mosquito larvae, about 90 per cent. of which were *Aedes nearcticus*. *Aedes pullatus* occurred in the proportion of about 7 per cent, and *Theobaldia alaskaensis* Ludlow in about 3 per cent. A careful examination of several hundred larvae revealed only these three species.

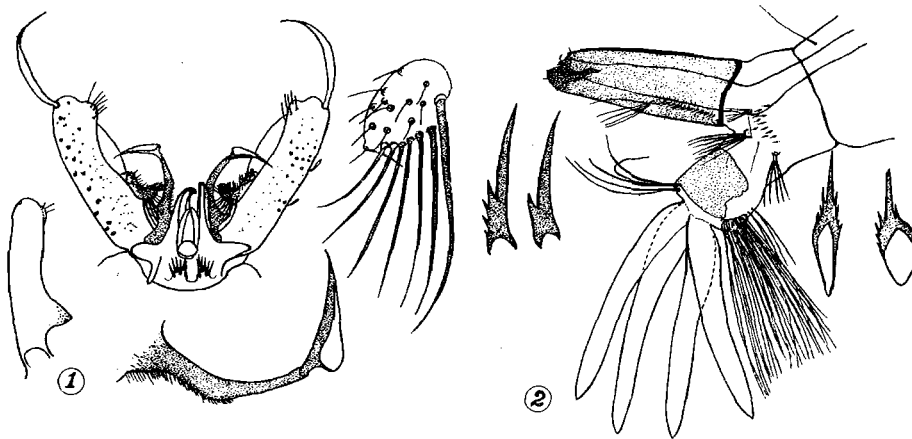
In the above pool, in 1924, nearly all the larvae had attained full growth, and a large proportion of pupae occurred by June 24th. A large number of adults from these emerged in the laboratory during the last three days of June. The pool was again examined on July 7th, and was found to still contain some pupae, but there were only a very few larvae; adults emerged from this collection shortly after the specimens were brought to the laboratory, a few, however, did not emerge until as late as July 11th.

In 1925 larvae were found to be full-grown by June 16, but few pupae were noted at this date. The majority of larvae pupated within the next two days and emergence of adults commenced on June 22nd, the main emergence occurring on June 24th. Practically all adults were out by the end of the month. A visit to Cascade basin on July 4th showed the pool to be completely dried up. A few

\*—On pp. 47-49 of this volume C. R. Twinn published an article in which he unfortunately indicated that *A. nearcticus* Dyar is a synonym of *alpinus* L. The synonymy should have been given with a query. The holotype of *nearcticus* is an adult male in the Canadian National Collection and a comparison of the genitalia of the two species shows differences which may be considered as of specific value. In view of these differences it seems advisable to illustrate the characters by which the adult males may be separated and a paper with this end in view is under preparation. C. H. Curran.

adult *A. nearcticus* were noted on the wing, some coming to bite, and others resting in willow clumps.

At Lake Louise fairly extensive collections of larvae were taken and reared in 1922, 1924 and 1925. Among the pools were some in very similar situations to that at Cascade basin. While some of these produced *Aedes nearcticus* the proportions were very small, and *Aedes pullatus* was found to be dominant in pools in mountain basins, in this vicinity, at about 7000 feet elevation. *Aedes nearcticus* was the main species on the wing on June 28th, 1925, in the Lake Agnes basin, but collections of larvae taken from snow pools at that date gave only *Aedes pullatus*. Larval collections on July 3rd, 1924, gave a few *Aedes nearcticus* among much greater numbers of the other species. Snow pools at Moraine lake, at a little over 6000 feet, gave only *Aedes pullatus*, but numbers of *Aedes nearcticus* were noted on the wing. The larvae from Simpson's summit



1.—*Aedes nearcticus* Dyar, male genitalia (preparation in centre drawing slightly flattened).  
 Portion of basal lobe with long hairs at right; normal lateral view of sidepiece at left.  
 2.—*Aedes nearcticus* Dyar, end of abdomen of larva, and pecten and comb scales.

were taken on June 22nd, pupated on the 23rd and produced adults on July 2nd. A number of larvae from Cascade basin which were reared in isolation, pupated on June 27th, 1924, and produced adults from 5 to 7 days later. Abraded adult females of what appear to be this species were noted in the Cascade basin as late as the end of August, but their condition does not allow of a definite diagnosis, as *Aedes cataphylla* Dyar is very hard to distinguish from *Aedes nearcticus*, in specimens that are not fresh.

While we have no definite records of this species from British Columbia, it is certain to occur where Arctic-Alpine conditions obtain; and the writer has indirect evidence from the graphic descriptions given by various trappers and others frequenting high elevations, who were close observers of insect life.

It was thought that *Aedes alpinus*, the other species co-inhabiting the far northern range of *Aedes nearcticus*, and also possibly the Alaskan *Aedes punctodes* Dyar, might be found at high elevations in the Rocky mountains, in addition to the species under discussion, but there is no indication of them in the material so far examined.

## NOTES ON CERTAIN AGROTID GENERA AND SPECIES (LEPID.)\*

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In connection with a revision of Agrotid genera (*in sens. strict.*) which I have been working on for some time and which has involved a study of the male genitalia of all our North American species, I have come across a number of discrepancies in the placing of certain genera and species which it is the purpose of this short paper to correct.

Genus *Rhizagrotis* Sm., 1890, Bull. 38, U.S.N.M., 10, (Orthotype, *cloanthoides* Grt.).

This genus, which must be restricted to the two species *cloanthoides* Grt. and *albalis* Grt. is not Agrotid, according to genitalia, but will fall into the Acronictinae somewhere near *Andropolia*. The spining of the tibiae, which has led to the incorrect association with the Agrotids, is not at all typical of this sub-family. The hind tibiae are unspined, the mid-tibiae possess a single row of claw-like spines on the outer side, and the fore tibiae show a more or less complete row of claw-like spines on the outer side but only apical spines on the inner side, this spining varying in the two species. In Agrotids it is the spining on the inner side of the fore tibiae which persists longest, that of the outer side being replaced by hair-tufts. The other species included under *Rhizagrotis* are Agrotid and will fall into various groups which I will discuss in my complete paper.

Genus *Adita* Grt., 1874, Bull. Buff. Soc. Nat. Sci., II, 64, (Orthotype *chionanthi* A. & S.).

The genus is best placed in the Cuculliinae near *Oncocnemis*; the genitalia clearly indicate this reference and the lashed eyes, apical claw on fore tibia and general appearance bear this out. Grote, in his 1895 List, also made this association (p. 39).

Genus *Apharetra* Grote, 1901, Proc. Ent. Soc. Wash., IV, 368, (Orthotype, *dentata* Grt.).

Placed originally following *Acronicta* it was transferred to the Agrotinae by Hampson (Cat. Lep. Phal., IV, 666c) on the strength of a few spines on the distal portion of the mid and hind tibiae. The genitalia of *pyralis* Sm., which may be merely a race of *dentata*, indicate that a reference of the genus to the Cuculliinae is warranted; the lashed eyes in this case are apparently of more value in determining the correct association than the odd spine or two. It would fall into the *Oncocnemis* group.

Genus *Anytus* Grote, 1873, Bull. Buff. Soc. Nat. Sci., I, 144 (includes *sculptus* Grt. & *capax* G. & R.)

1874, op cit., II, 27 (*sculptus* Grt. = *privatus* Wlk., designated as type).

The genitalia bear out Grote's reference of the genus to the Cuculliinae or at least show a very close relationship to the *Eumichtis* group; the genotype is certainly not Agrotid. Smith figures the genitalia of *privatus* and of the other so-called species which are congeneric in a paper on the species of *Anytus* (1910, Psyche, xvii, 206, Pl. II); I have only studied the genitalia of *privatus* Wlk. and *obscurus* Sm. and these show nothing to indicate specific distinction.

Genus *Fishia* Grt., 1877, Can. Ent., ix, 21, (Orthotype, *enthea* Grt.)

On genitalia the genus seems distinct from *Anytus* but should certainly be placed next it; it will include the other species at present listed under *Anytus*.

Genus *Protogrotis* Hamp., 1903, Cat. Lep. Phal., IV, 655 (Orthotype, *vivalis* Grt. = *niveivenosa* Grt.)

Falls, on genitalia, into the Acronictinae near *Sidemia* and *Luperina*, a re-

\*—Contribution from the Division of Systematic Entomology, Entomological Branch, Dept. of Agric., Ottawa.