

SCIENTIFIC RESULTS OF THE KATMAI EXPEDITIONS OF THE
NATIONAL GEOGRAPHIC SOCIETY.

XIII. BEES AND WASPS.

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Through the kindness of Prof. Jas. S. Hine, I have been given the opportunity to examine the Aculeate Hymenoptera obtained by him during his two trips to Alaska in the summers of 1917 and 1919. The following list of the species collected includes also a few specimens taken at Seattle, Wash. Mr. Viereck has kindly confirmed the identification of *Andrena frigida*.

A general account of the Hymenoptera of Alaska was given by Ashmead in 1902.* Some additional data has been published since, the most important contribution in this respect being F. W. L. Sladen's list of the wasps and bees obtained by the Canadian Arctic Expedition.†

APOIDEA.

The bee fauna of Alaska is exceptionally rich in bumble bees, comprising as many as 19 species of *Bombus* and 4 of *Psithyrus*. It seems rather strange that only one other bee, *Andrena frigida* Sm., is thus far known from that region.

BOMBIDÆ.

I have followed in the main Franklin's arrangement in his Monograph of this family (1913), but have added for convenience the synonyms used by Ashmead in 1902.

*W. A. Ashmead. Papers from the Harriman Alaska Expedition, XXVIII. Hymenoptera. Proc. Wash. Ac. Sci., IV, 1902, pp. 117-274, Pls. IX-XI.

†Report of the Canadian Arctic Expedition, 1913-18. III, Part G, 1919, pp. 26-35.

Bombus Latreille.**Terrestris** group.

1. **Bombus lucorum** Linnæus var. **moderatus** Cresson.
Kodiak, 2 ♀, 4 ♂, and 13 ♂, Sept., 1917. Katmai, 1 ♀, June 10, 1919. Savonoski, 1 ♂, July, 1919.
2. **Bombus occidentalis** Greene (*B. proximus* Ashmead; *B. mckayi* Ashmead).
Seattle, Wash., 1 ♀ and 1 ♂ of the typical form, May 25, 1919.
All the Alaskan specimens in the collection belong to the var. *proximus* Cresson: Katmai, 2 ♀, 25 ♂, and 1 ♂, Aug. 2, 1917; 1 ♀, June 10, 1919. Excursion Inlet, 1 ♀, May 31, 1919. Savonoski, 7 ♂, July, 1919.

Kirbyellus group.

3. **Bombus kirbyellus** Curtis.
Katmai, 1 ♂, Aug., 1917.

Pratorum group.

4. **Bombus melanopygus** Nylander.
Seattle, Wash., 1 ♂, May 25, 1919. Savonoski, 1 ♀ and 1 ♂, July, 1919.
5. **Bombus sylvicola** Kirby.
Katmai, 8 ♂ and 1 ♂, July 28, 1917, and Aug., 1917. Savonoski, 1 ♂ and 2 ♂, July, 1919.
6. **Bombus gelidus** Cresson.
Kodiak, 1 ♀, Sept., 1917. Katmai, 2 ♂ and 1 ♂, Aug., 1917. Valdez, 1 ♂, June 9, 1919.
7. **Bombus frigidus** F. Smith (*B. Couperi* Ashmead).
Katmai, 1 ♀ and 4 ♂, Aug., 1917. Savonoski, 1 ♂, June 9, 1919.
8. **Bombus pleuralis** Nylander (*B. justus* Ashmead).
Kodiak, 20 ♂ and 1 ♂, Aug., 1917. Kodiak, 2 ♂, Sept., 1917. Savonoski, 1 ♀, July, 1919.
9. **Bombus sitkensis** Nylander (*B. mixtuosus* Ashmead; not *B. sitkensis* Ashmead).
Seattle, Wash., 1 ♀, 6 ♂, and 2 ♂, May 25, 1919. Katmai, 1 ♂, Aug., 1917.

10. **Bombus mixtus** Cresson (*B. oregonensis* Ashmead).

Seattle, Wash., 10 ♀ and 1 ♂, May 25, 1919. Kodiak, 9 ♀ and 3 ♂, Sept., 1917. Excursion Inlet, 1 ♀, May 31, 1919. Yakutat, 2 ♀, May 31, 1919.

Dumoucheli group.

11. **Bombus californicus** F. Smith (*B. neglectulus* Ashmead).

Seattle, Wash., 1 ♀, May 25, 1919. The species is also known from southern Alaska.

Psithyrus Lepeletier.

Laboriosus group.

1. **Psithyrus insularis** (F. Smith).

Seattle, Wash., 2 ♀, May 25, 1919. Katmai, 1 ♀, July 28, 1917.

2. **Psithyrus consultus** Franklin.

Savonoski, 1 ♂, July, 1919. As suggested by Franklin, this is most probably the male of *P. insularis*.

In addition to the foregoing, the following species of *Bombidæ* have been recorded from Alaska:

Bombus kincaidii Cockerell (*Psithyrus kodiakensis* Ashmead; *Bombus gelidus* Ashmead).

B. strenuus Cresson (?*B. frigidus* Ashmead).

B. polaris Curtis. Franklin regards Ashmead's Alaskan records of this species as questionable; it has, however, again been recorded from Alaska by F. A. Lutz (Bull. Amer. Mus. Nat. Hist., XXXV, 1916, p. 520) and Sladen (1919, p. 27).

B. arcticus Kirby. There are two queens of this from Point Barrow (Stefanson Coll.) in the American Museum of Natural History.

B. edwardsii Cresson (*B. nearcticus* Ashmead).

B. flavifrons Cresson (*B. alaskensis* Ashmead; *B. dimidiatus* Ashmead).

B. alboanalis Franklin (*B. sitkensis* Ashmead).

B. (Bombias) nevadensis Cresson.

Psithyrus fernaldæ Franklin.

P. tricolor Franklin.

ANDRENIDÆ.

Andrena Latreille.1. **Andrena frigida** F. Smith.

Valdez, 2 ♀, June 4, 1919.

Originally described on the female from Nova Scotia. Morice and Cockerell (Canad. Entom., XXXIII, 1901, p. 149) have published a few notes on the type specimen which is still preserved in the British Museum. Ashmead (1902, p. 131) records the male from Muir Inlet and Sitka.

VESPOIDEA.

In addition to the species mentioned below, *Ancistrocerus albophaleratus* (Saussure), one of the Eumenidæ, is known from Alaska (Ashmead, 1902).

VESPIDÆ.

Vespa Linnæus.

Only two members of this genus, *V. norwegica* and its var. *marginata*, have been heretofore recorded from Alaska; I have also seen from that region a female of *V. rufa* Linnæus var. *americana* R. du Buysson, a form not represented in the present collection.

1. **Vespa (Dolichovespula) diabolica** Saussure.

Katmai, 1 ♀, June 10, 1919. Savonoski, 5 ♀, 1 ♀, and 2 ♂, July and Aug., 1919. There is a male of this species from Skagway, Alaska, Aug. 42, 1918, (F. M. Jones Coll.), in the American Museum of Natural History.

2. **Vespa (Dolichovespula) norwegica** Fabricius (*V. borealis* Kirby, under which name the species is mentioned by Ashmead in 1902).

This is Sladen's *norvegicoides* (Ottawa Naturalist, XXXII, 1918, p. 71), which I am not prepared at present to separate from the European *norwegica*.

The collection contains only two specimens of the typical form, both from Savonoski; a ♂ taken Aug. 8, 1919, and a ♀, July, 1919.

This species has previously been recorded from Sitka and Virgin Bay by Ashmead (1902) and from Point Barrow (north of 70° N. lat.) by myself (Bull. Amer. Mus. Nat. Hist., XXXIX, 1918, p. 22).

var. **marginata** (Kirby) (*V. marginata* Kirby; *V. albida* Sladen).

Katmai, 4 ♀, June 10, 1919. Savonoski, 1 ♀, 5 ♂, and 3 ♂, Aug. 8, 1919.

In North America, this variety is known only from Alaska and the Yukon Territory, where it is apparently common. It has been recorded from Kukak Bay (Ashmead) and from Nome and Teller (Sladen). There are specimens from Alaska in the collection of the Brooklyn Museum and I have seen a ♂ taken at Kutlik (62° 30' N., 63° W.).

Sladen (1919) has fully described this form, which he recognizes as a distinct species. I follow, however, R. du Buysson [Ann. Soc. Ent. France, LXXIII, (1904) 1905, p. 599] in regarding this as a mere variety of *V. norwegica*, from which it differs merely in the creamy white color of the body markings. Frequently, but not always, there are ferruginous red spots on the anterior edges of the second tergite in the male and worker. I find no trace of red on any of the five queens examined. The six workers seen all have the red spots, though in one example it is very small; of the three males, two have no red.

Two of the workers from Savonoski (with distinct creamy white fasciæ and lateral red spots on the second tergite) were taken from the same nest with a queen of typical *norwegica*.

3. **Vespa (Vespula) occidentalis** Cresson.

Seattle, Wash., 1 ♀, May 25, 1919.

4. **Vespa (Vespula) vulgaris** Linnæus.

Savonoski, 1 ♂, August 8, 1919.

This worker has the scape of the antennæ entirely black, a broad black longitudinal stripe on the clypeus, a median black spot on the yellow posterior orbits, and no yellow spots on the propodeum. I have seen several similarly colored workers from California and British Columbia. They agree well in coloration with European specimens of *Vespa vulgaris* and I have provisionally referred them to that species. They could, however, be aberrant specimens of *V. occidentalis*, though numerous workers of the latter species, which I have examined, all have the antennal scape yellow in front, the clypeus yellow with one or three black dots or small spots, the posterior orbits entirely yellow, and two yellow spots on the propodeum. The occurrence of true *V. vulgaris* on the northwestern coast of America would

be very interesting, but can only be definitely established through an examination of males from that region. In this connection it may be useful to add that all specimens from eastern North America which I have seen in collections identified either as *V. vulgaris* or as *V. germanica*, belong, in my opinion, to *Vespa communis* Saussure.

5. **Vespa (Vespula) acadica** Sladen, Ottawa Naturalist, XXXII, 1918, p. 72.

Savonoski, 1 ♀, July, 1919.

This interesting species is apparently the northern and boreal representative of *V. vidua* Saussure. In the American Museum of Natural History there are two workers from N. Ontario, Canada and Boisdale, Cape Breton, which also belong to *acadica*; but I have been unable to find a specimen of this species from the United States in any of the collections examined by me.

6. **Vespa (Pseudovespa) austriaca** Panzer.

Savonoski, 1 ♀, July, 1919.

This specimen agrees perfectly with the females found near New York in 1916 and which I have fully described in Bull. Brooklyn Ent. Soc., XI, 1916, pp. 102-103. Since, I have seen a female of this species from Mt. Hood, Oregon (G. P. Engelhardt Coll.) and a male from Beaver Mouth, Selkirk Mountains, British Columbia (J. C. Bradley Coll.). The genitalia of this male agree in every detail with those of a male from Thuringia, identified as *V. austriaca* by Schmiedeknecht.

American Museum of Natural History, New York City.

SURVEY OF THE FERNS AND FERN ALLIES OF OHIO.

Prof. L. S. Hopkins, of the Kent Normal School, Kent, Ohio, is organizing a survey of the entire state in order to obtain exact information about our Pteridophytes and their geographical distribution. This work, if thoroughly done, will be of great interest and value, not only in giving us an exact list of the species, but adding information about the ecological and agricultural areas of the state. It is to be hoped that all botanists of Ohio and members of the Ohio Academy of Science will co-operate with Prof. Hopkins, either by making collections themselves or inducing some interested person to do so. In this way it should be possible to have one or more collectors in every county. The material should be sent directly to Prof. Hopkins, who will make determinations of the species.

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