

but where such doubt exists, I have, in the following list, explained the circumstances as best I can, quoting the authorities who have seen my specimens, and, where my own opinion differs from theirs, stating grounds for my verdict. Breeding from the egg would doubtless clear up many doubts, as well as cause many surprises, but, unfortunately, I have never been able to spare the necessary time and attention for such useful experiments. It is also much to my regret that I have never been able to spend much time collecting after the middle of July. On this account I am very poorly represented in some obscure species, notably in the genus *Argynnis*. This is the more unfortunate by reason of some of the representatives of that genus here in the West being very difficult to place. My thanks are due to Prof. J. B. Smith, who has done all in his power to assist me in naming my Noctuidæ; also to Messrs. Elwes, W. H. Edwards, Drs. Ottolengui, Fletcher, Skinner, Holland, and others who have from time to time named specimens for me. Mr. Bean worked the Laggan district for several years, in the mountains near the western boundary of Alberta, and a few of my records are on his authority. Mr. Sanson, of Banff Museum, and Mr. P. B. Gregson, of Lacombe, about a hundred miles north of Calgary, have also kindly assisted with supplementary lists.

(To be continued.)

ON SOME DIPTERA BRED FROM COW-MANURE.

BY L. O. HOWARD, WASHINGTON, D. C.

In the summer of 1889, while engaged in an investigation of the habits and life-history of the horn fly of cattle (*Haematobia serrata*), the writer at various times brought to Washington from different points in Virginia, large quantities of cow-manure collected in the field, and eventually succeeded in working out the complete life-history of the horn fly, as displayed in *Insect Life*, Vol. II., No. 4, October, 1889. In this article the statement is made, in concluding, that the observations were greatly hindered and rendered difficult by the fact that fresh cow-dung is the nidus for a number of species of Diptera, some about the same size and general appearance as the horn fly, and that no less than twenty distinct species of flies had been reared from horse- and cow-dung, mainly the latter, and six species of parasitic insects as well. The plan finally adopted of securing the isolation of the horn flies was to remove the eggs

from the surface of the dung and place them with dung which was absolutely fresh and collected practically as it fell from the cow. A report upon the other species was promised, but was never published, although Professor Riley, in his report for 1890, listed eight parasites, only two of which were specifically determined.

The writer's recent investigations of the insect fauna of human excrement (Proc. Wash. Acad. of Sciences, Vol. II., pp. 541-604—Dec. 28, 1900) aroused his interest in the general subject of coprophagous insects, and the flies reared in 1889-90, from cow-dung, were looked up and have been named by Mr. D. W. Coquillett. The list is so interesting that it should be recorded. It will be noticed that several of the species are identical with those found breeding in human excrement. These are: *Sarcophaga incerta*, *Helicobia quadrisetosa*, *Musca domestica*, *Morellia micans*, *Myospila mediatubunda*, *Ophyra leucostoma*, *Sepsis violacea*, *Sphaerocera subsultans* and *Limosina albipennis*. The rearing of *Ceratopogon specularis* from cow-dung is of especial interest, since, down to the record in the Washington Academy paper just referred to, no insects of this genus had been found to be coprophagous. Some of the other records are interesting for the same reason. The list follows:

Family CECIDOMYIDÆ.

Diplosis, sp. Issued Dec. 26, 1889; and Jan. 18, 1890; 4 specimens.

Family MYCETOPHILIDÆ.

Sciara, sp. Issued March 26 and 29, 1890; 2 specimens.

Family CHIRONOMIDÆ.

Camptocladius byssinus, Schrank. Issued Jan. 2, 1890. Issued Dec. 31, 1889; and March 25, 1890; 9 specimens.

Camptocladius minimus, Meigen. Issued Dec. 23, 26, 27, 30 and 31, 1889; and Jan. 13, 18, and March 25, 1890; 12 specimens.

Ceratopogon specularis, Coq. Issued August 28, 1889. Issued Dec. 30, 1889; 6 specimens.

Psychoda minuta, Banks. Issued Dec. 26, 30 and 31, 1889; and Jan. 11, 1890; 4 specimens.

Family RHYPHIDÆ.

Rhyphus punctatus, Fabr. Issued Sept. 2, 3 and 4, 1889. Issued Jan. 13, 16, 18, 20, 22, 24 and 29, Feb. 1, March 26 and 29, and April 5 and 9, 1890; 64 specimens.

Family SARCOPHAGIDÆ.

Sarcophaga incerta, Walker. Issued Aug. 31, 1889. Issued Aug. 30, 1889; 7 specimens.

Sarcophaga, sp. Issued April 23, 1890; 1 specimen.

Helicobia quadrisetosa, Coq. Issued Aug. 6 and 30, 1889; 2 specimens.

Pollenia rudis, Fabr. Issued Dec. 23, 1889; 1 specimen.

Family MUSCIDÆ.

Musca domestica, Linne. Issued Aug. 30 and Sept. 2 and 4, 1889; 20 specimens.

Morellia micans, Macq. Issued Aug. 30, 1899. Issued Dec. 23, 26, 27, 28, 30 and 31, 1889; Jan. 2, 6, 8, 9, 10, 11, 13, 14, 16, 17, 18, 20, 25 and 27, Feb. 1, March 25, April 5 and 9, 1890; 125 specimens.

Myospila mediatubunda, Fabr. Issued Aug. 26, 28, 29, 30, Dec. 23, 1889; Jan. 9, March 25, 26, April 2, 9, 14, 15, 1890. Issued April 5, 1890; 48 specimens.

Hematobia serrata, Desv. Sept. 17; 2 specimens.

Family ANTHOMYIDÆ.

Hydrotæa armipes, Fallen. Issued Sept. 27, 30, Oct. 4, 1889; Jan. 2, 6, 7, 8, 9, 10, April 24, 1890; 38 specimens.

Hyetodesia umbratica, Meigen. Issued Feb. 13, 21, April 2, 9, 14, 15, 1890.

Ophyra leucostoma, Wied. Issued Sept. 6, 1889; 11 specimens.

Limnophora, sp. Issued Aug. 30, 31, 1889; 5 specimens.

Cænosa lata, Walker. Issued April 25, 1890; 1 specimen.

Cænosa flavicoxæ, Stein. Issued Aug. 31, 1889; 4 specimens.

Phorbia, sp. Issued March 29, 1890; 1 specimen.

Family SEPSIDÆ.

Sepsis violacea, Meigen. Issued Aug. 28, 1889; 8 specimens.

Family BORBORIDÆ.

Sphærocera subsultans, Fabr. Issued Aug. 30, 1889; 7 specimens.

Limosina albipennis, Rondani. Issued August 28, Dec. 23, 1889; 2 specimens.

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J. ALSTON MOFFAT, Curator.