

RESEARCH NOTES

A NEW SPECIES OF *BOVICOLA* (MALLOPHAGA)

A species of Mallophaga represented by several collections from the American elk or wapiti, *Cervus canadensis*, appears to be new and is described herewith.

Bovicola americanum n. sp.

Holotype, a female and 7 paratype females from *C. canadensis*, Yellowstone National Park, Wyoming, collected February, 1934, by Wm. Rush and the writer. The following specimens have also been examined and are paratypes: ninety-five females and 80 immature specimens from *C. canadensis*, Yellowstone Park, February, 1935, by Dr. C. B. Philip. Twelve females from *C. canadensis occidentalis* in the Olympic National Forest, Washington, April 19, 1933, by H. H. Stage. Thirty-five females and 29 immature specimens from *C. canadensis occidentalis* in the Olympic Mountains, Washington, March 12, 1935, by H. H. Stage. One immature specimen from *C. canadensis* in Cameron County, Pennsylvania, December 4, 1931, by H. S. Peters. The last 3 lots were loaned to the writer by the Bureau of Entomology and Plant Quarantine through the courtesy of H. S. Peters.

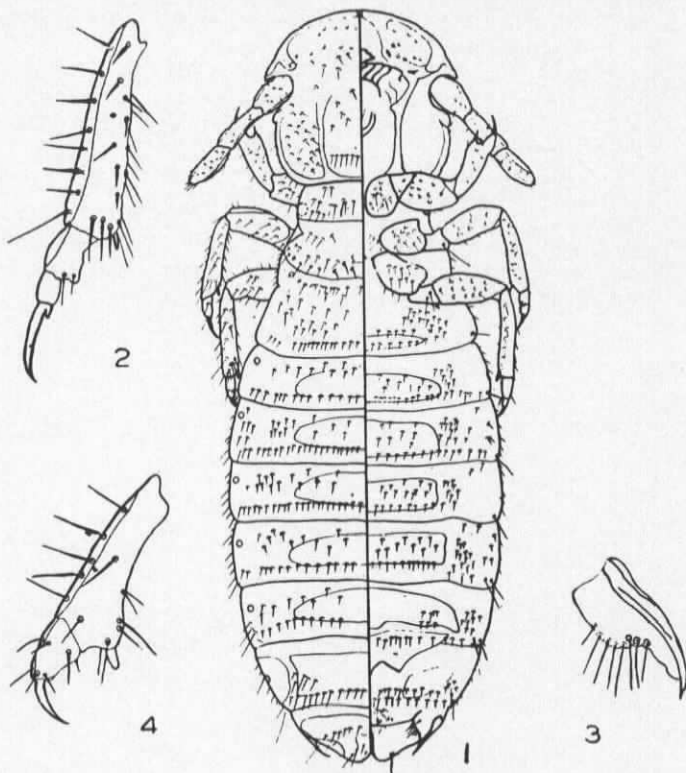


Fig. 1 *Bovicola americanum*, female.

Fig. 2. *B. americanum*, third tibia and tarsus.

Fig. 3. *B. americanum*, gonopod.

Fig. 4. *B. ovis*, third tibia and tarsus.

Holotype and paratypes deposited at the Rocky Mountain Laboratory at Hamilton, Montana. Paratypes also deposited at the United States National Museum, Bureau of Entomology and Plant Quarantine, and at Stanford University.

Female (Fig. 1) length 1.7 mm., head and thorax brown, abdomen light brown with darker cross bands. Head as broad as long. Forehead convex, broadly and evenly rounded. Trabecula not projecting from even curve of forehead. Very narrow pale interruption in the middle of the marginal band of forehead. Temples rounded. Posterior border of occiput slightly concave. Antennae three segmented, second segment longest. Numerous setae on all segments but no prominent spines. Mandibles dark. Thorax nearly as wide as head. First pair of legs smallest with well developed, pointed tibial spine opposing tarsal claw. Setae and a very small hyaline tibial spur opposing tarsal claws on tarsi 2 and 3 (fig. 2). Abdomen long ovate, wider than head. Tergal and sternal plates weakly sclerotized. Spiracles on segments 2 to 7. Sternal and tergal plates each with row of 26 to 34 and 32 to 40 fine setae respectively on posterior border on segments 2 to 6. Other setae irregularly placed on plates, more numerous laterally. Gonapophyses wide, with a marginal row of 7 to 9 setae on membrane. Membrane joins the lateral pointed chitinous blade near the tip (fig. 3)

Male unknown.

Although other biting lice from North American Cervidae have been placed in the genus *Tricholipeurus* Bedford (1929, 15th Annual Rept. Dir. Vet. Services, Union of S. Africa) by Peters (1930, Proc. Ent. Soc. Washington, 32: 76-79) this species definitely belongs to the genus *Bovicola* established by Ewing (1929, A Manual of External Parasites) for biting lice of Bovidae. Bedford (1932, 18th Rept. Dir. Vet. Services and Animal Industry, Union of S. Africa) included in it certain species from Equidae. Other members of the genus have been recorded in North America from domestic goats, sheep, cattle and horses.

The semicircular forehead separates this form from *B. bovis* of cattle, the elongate body distinguishes it from *B. caprae* of the goat. It differs from *B. equi* in being smaller and having the lateral blade of the gonopophyses projecting beyond the membranous portion. It is very similar to *B. ovis* from the sheep but may be readily separated by the shape of the third tibia. In *B. americanum* the tibia (fig. 2) gradually expands distally to twice the width of the proximal portion, whereas in *B. ovis* the tibia widens abruptly at the distal end forming a prominent lateral lobe on the inner side (fig. 4).—WM. L. JELLISON, Assistant Bacteriologist, United States Public Health Service, Rocky Mountain Laboratory, Hamilton, Montana.

STUDIES ON *CLINOSTOMUM*. IV. NOTES ON THE PENETRATION AND GROWTH OF THE CERCARIA OF *CLINOSTOMUM MARGINATUM*

The contention that the yellow grubs (metacercariae of *Clinostomum*; Clinostomidae; Trematoda) of frogs and fish constitute two distinct and valid species has been supported by Cort (1913, Tr. Am. Mic. Soc., 32: 169-182), Hunter and Hunter (1934, Suppl. 23rd Ann. Rep. N. Y. St. Conserv. Dept., No. VIII, Rep. Biol. Surv. Raquette Watershed, 1933: 245-254), and Van Cleave and Mueller (1934, Roosevelt Wild Life Ann., 3: 161-334). Morphological data have been accumulated by the Hunters which, when analyzed statistically, show significant differences, thus indicating that the *C. marginatum* of fish and the *C. attenuatum* of frogs may be considered as separate species. Cross-feeding experiments by these authors on the definitive bird hosts, the great blue heron and the bittern respectively, furnish additional evidence to support this contention. The remaining "critical" experiment seemed to be the exposure of the piscine and amphibian hosts to the cercariae of a known species of *Clinostomum*. If this form developed metacercariae in both hosts it would cast doubt upon the previously performed cross-feeding experiments and the accumulated morphological data. If, on the other hand, metacercariae developed only in fish or amphibia it would definitely clinch the two species contention.