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BY

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SOLENOPOTES CAPILLATUS, A SUCKING LOUSE OF CATTLE NOT HERETOFORE KNOWN IN THE UNITED STATES

By F. C. BISHOPP, *Entomologist, Investigations of Insects Affecting the Health of Animals, Bureau of Entomology, United States Department of Agriculture*

INTRODUCTION

In 1904 Enderlein¹ described a single male sucking louse taken on cattle in Leipsic, Germany, as a new genus and species, *Solenopotes capillatus*. Apparently no further reference was made to this insect until 1916, when Ferris² incidentally mentioned the species, stating that he considered the Enderlein type specimen as being immature and concluding that the species was a synonym of *Linognathus vituli* L.

In examining the specimens of Anoplura in the collection of the Dallas laboratory of the Bureau of Entomology in 1917, H. P. Wood noted that some of the material collected on cattle did not appear to be either *Linognathus vituli* L. or *Haematopinus eurysternus* Nitzsche. This led to a search of literature for other species recorded from this host, and the references mentioned above were found. Upon comparing the material in question with Enderlein's description it was evident that it was *Solenopotes capillatus*.

Material in the collection at the Dallas laboratory indicates that the species has a wide distribution in the United States, and notes upon it show that at times it may become a serious cattle pest. Data on the collections are as follows:

Bishopp No. 9192, Dallas, Tex., March 20, 1910, many specimens on bull (*Bos taurus* L.) in laboratory yard, F. C. Bishopp, collector; Bishopp No. 2681, Viewpoint, Oreg., March 8, 1913, heavy infestation of range cattle (*B. taurus*), H. H. Hatch, collector; No. 4292, Riverside, Md., February 14, 1915, on calves, F. C. Bishopp, collector; No. 7485, Dallas, Tex., November 13, 1917, many specimens on cow in laboratory yard, H. P. Wood, collector; No. 8487, Olympia, Wash., December 28, 1918, on Jersey bull, R. W. Wells, collector; No. 8500, Uvalde, Tex., January 10, 1919, on calf, D. C. Parman, collector; No. 8995, Bennington, Vt., March 17, 1919, on cow, R. W. Wells, collector; No. 9699, Herkimer, N. Y., March 20, 1920, on calf, F. C. Bishopp, collector.

¹ ENDERLEIN, Günther. LÄUSE-STUDIEN . . . In Zool. Anz., Bd. 28, No. 4, p. 144, fig. 14-15. 1904.
² FERRIS, G. F. CERVOPHTHIRIUS CRASSICORNIS. (N.) (ANOPLURA). In Ent. News, v. 27, no. 5, p. 197-200. 1916.

The species shows a marked tendency toward attaching in dense groups about the head and neck of the host. Sometimes these patches are almost circular.

In 1917 H. P. Wood made an effort to secure oviposition of the lice under control on cattle, but with little success. Evidence was gained which indicates that the incubation period is rather long, probably about 12 days, and also that the eggs will not hatch when removed from the host.

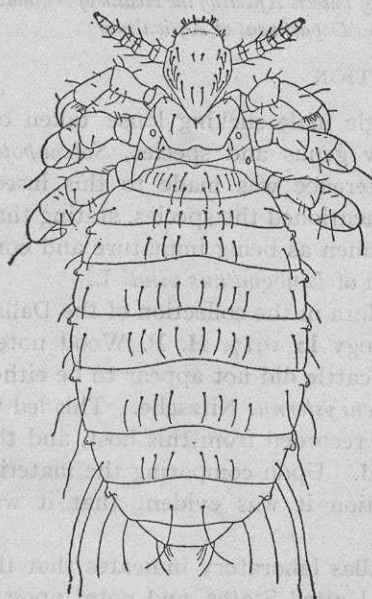


FIG. 1.—*Solenopotes capillatus*: Dorsal aspect of female. $\times 40$.

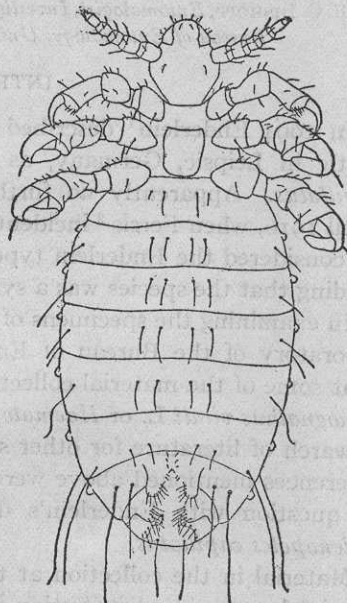


FIG. 2.—*Solenopotes capillatus*: Ventral aspect of female. $\times 40$.

DESCRIPTION

THE FEMALE

As the female of this species has not been described, it will be characterized fully here.

Length (fig. 1 and 2) about 1.5 mm., greatest width about 0.7 mm., thorax and legs brownish yellow, abdomen grayish blue.

HEAD.—Length 287μ , width 215μ . Anterior margin rather broadly rounded, lateral margins slightly widest behind antennae, somewhat narrowed at transverse groove just anterior to antennae, posteriorly pointed. Antennae attached about one-third length of head from anterior border, rostrum just ventrad of anterior margin, a chitinized rim around anterior margin above rostrum. Antennae slightly longer than greatest width of head, basal segment markedly broader than succeeding segments, segments 3 and 4 somewhat shorter than others. Several short spines on anterior margin of head, two spines on ventral surface behind antennae, dorsally with a slightly curved row of about five spines on either side, one somewhat smaller spine outside the anterior end of this row just in front of the antenna on either side, and two near the margin behind the antennae. Near the median line is a small spine on either

side opposite the point of attachment of the antennæ and toward the posterior margin of the head another pair, somewhat longer than any others, about the same distance from the median line

THORAX.—About $200\ \mu$ long by $344\ \mu$ wide, deeply incised anteriorly to receive the head, narrowed somewhat anteriorly and with rounded sides. Division of thorax fairly distinct dorsally and the mesothorax and metathorax bearing at the margin a rather prominent but not projecting spiracle. Prothorax with two rather strong submedian spines and mesothorax with two or three small and one strong spine. Sternal plate about $172\ \mu$ long by $114\ \mu$ wide, not very highly chitinized, slightly narrow posteriorly, anterior end truncate, posterior end rounded.

LEGS.—Rather short and stout, anterior pair much shorter, more slender, and less chitinized than others. They terminate in long, slender claws, while the posterior legs are provided with highly chitinized dark reddish brown terminal segments and blunt claws. A few short hairs on all leg segments.

ABDOMEN.—Elongate oval, narrowing gradually to terminal segment which is broadly rounded; abdomen dorsally with a considerable number of yellowish, rather slender spines distributed as follows: First segment, two transverse rows, anterior with 8 or 10 spines irregular in length, posterior with from 4 to 6; second, from 4 to 6; third, 6; fourth, from 6 to 8; fifth, from 6 to 8; sixth, 8; seventh, 6; eighth, 2; the last rather longer than the others. Near the lateral margin of the second to seventh segments is a single spine on each side, those on the sixth and seventh being two or three times as long as the others and hairlike toward their tips. On the venter the spines are less variable in number than on the dorsum, the second to eighth segments with 4 submedian spines, the outer pair on second segment being small and those on the eighth segment being farther removed from the median line and very long and hairlike at tips. Near the lateral border on either side is a single row of spines on the third to seventh segments, those on the sixth and seventh segments being long (longer on the seventh) and hairlike toward the tips.

On the posterior margin of the eighth segment are two genital flaps or protuberances margined with 7 rather stout spines (fig. 3). Between these on either side are 2 minute spines, and from the middle to the anterior border of this segment near the median line are 3 pairs of very short spines. The chitinized bands on the terminal segments are rather narrow dorsally and broad on their ventral margins. There is a slight projection on this band in the internal anterior angles which bears 3 or 4 stout spines on each side near the margin. Just anteriorly from the inner angles of the bands occur on each side a group of about 6 moderately stout spines, and mesad from their borders about 3 small spines.

The second to eighth segments are provided near their anterior margin with projecting, rather large spiracles $29\ \mu$ in diameter.

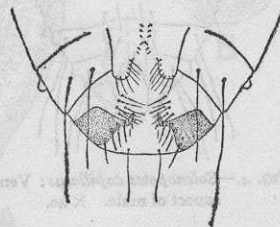


FIG. 3.—*Solenopotes capillatus*: Eighth and terminal segments of abdomen of female. $\times 53\frac{1}{2}$.

THE MALE

While Enderlein's¹ description of the male is fairly complete, it is deemed advisable to redescribe this sex and point out some of the variations in the distribution of the abdominal spines.

Length 1.2 mm., width 0.6 mm.

HEAD.—Length $287\ \mu$, width $208\ \mu$. Rather broadly rounded anteriorly (fig. 4), widest just behind antennæ which are attached about one-fourth of the length of the

¹ ENDERLEIN, Günther. op. cit.

head from the anterior margin. A row of about 6 small spines extending across near the anterior margin dorsally and a longitudinal row on each side with about 6 spines. One short spine in front and 2 behind each antenna and also 2 large spines toward posterior edge of head medially. Ventrally a spine of moderate length on each side behind and mesad of base of antennæ. Mouth parts slightly ventrad of anterior extremity, a chitinized transverse ridge running across the anterior margin just above the mouthparts.

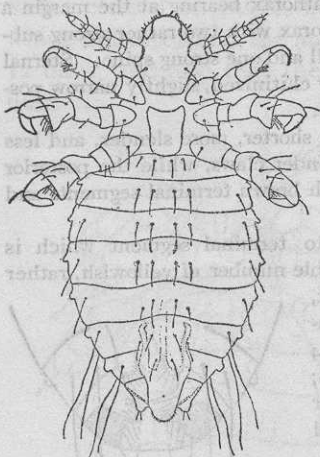


FIG. 4.—*Solenopotes capillatus*: Ventral aspect of male. $\times 40$.

THORAX.—Much as in female, a few short and one long spine on either side of pronotum and mesonotum. Spiracles on pronotum and mesonotum prominent. Sternal plate more elongate than in female and slightly concave on lateral border.

ABDOMEN.—Greatest width at about fourth segment, elongate oval. Second to eighth segments provided with projecting spiracles as in female, ninth segment with a distinct notch on either side, the central terminal portion being rather stout and bearing a number of small spines along the border. On the dorsal side segments armed submedially as follows: The first segment with two transverse rows, anteriorly to these 6 small spines and posteriorly about 8 spines, the two median being the largest; second segment, 8 spines; third, 6 spines; fourth, 8 or 10 spines; fifth, 8 spines; sixth, 8 spines;

seventh, 6 or 8 spines; eighth, from 4 to 6 spines. Near lateral margins another row of spines, one spine to each segment, those on seventh and eighth segments being very long and hairlike, those on first segment small. Ventrally, the second to seventh segments with a row of 4 spines submedially and the eighth with 2 spines. All ventral spines somewhat stronger than the dorsal ones. Near the lateral margin the second to eighth segments provided with a single spine on either side, those on seventh and eighth segments being long and hairlike, as on the dorsal surface.

Genital frame (fig. 5) rather simple, apparently consisting of six parts. Basal portion forked for about one-fifth of its length at the posterior end where it articulates with two elongate plates which in turn join at their posterior end with two other plates of slightly greater length. These diverge posteriorly and bend dorsally and cross the anterior ends of a wishbonelike plate the posterior end of which terminates in a rather acute, highly chitinized point known to some as the pseudopenis. The penis is simple, nearly equaling in length the inclosure of the frame, the aperture situated well back between the legs of the wishbonelike plate.

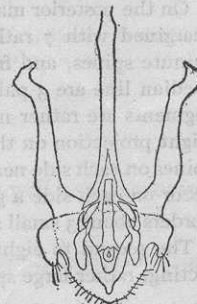


FIG. 5.—*Solenopotes capillatus*: Genital frame. $\times 106\frac{2}{3}$.

NYMPHAL STAGES

First instar, color pale yellowish before feeding, except for parts of abdomen which are darker; after feeding, much as in adult though somewhat paler; tarsi and claws yellowish to light brown. Later instars darker.

HEAD.—Showing slightly stronger transverse groove than in adult.

THORAX.—About as in adult, but slightly less chitinized.

ABDOMEN.—In first instar very elongate, not wider than thorax; in later instar markedly broader, a shallow submarginal groove on each side running from first segment to about the seventh, where they join. Along the line of this groove on each side is a row of depressions, one near the anterior border of each segment. Spines about as in adult female though hairs are very short except on the sides of seventh and eighth segments on which they extend well beyond the tip of the abdomen. Apex of abdomen slightly bilobed, spiracles projecting distinctly on the third to eighth segments, inclusive.

THE EGG

Color pale yellowish. Elongate oval, the side next to the hair upon which attached practically straight, the other side curved, set at a comparatively small angle from the hair and cemented to it by a basal, somewhat heart-shaped, broad and comparatively short attachment (fig. 6). Length of egg, not including attachment, $735\ \mu$, greatest width $278\ \mu$ at right angles to a plane passing through the egg and hair to which it is attached, the other diameter being about $244\ \mu$. The well-defined, somewhat elevated operculum set almost at right angles to the straight side of the egg; diameter about $190\ \mu$; its height about one-third of its diameter; length of attachment clamp about $190\ \mu$, its greatest width about $180\ \mu$. Surface of egg minutely reticulated, under moderate magnification giving a granular appearance. Operculum with a number of slight protuberances which give it a deeply roughened appearance.

A number of eggs are frequently attached to a single hair and may be found anywhere from the base to the tip of the hair.

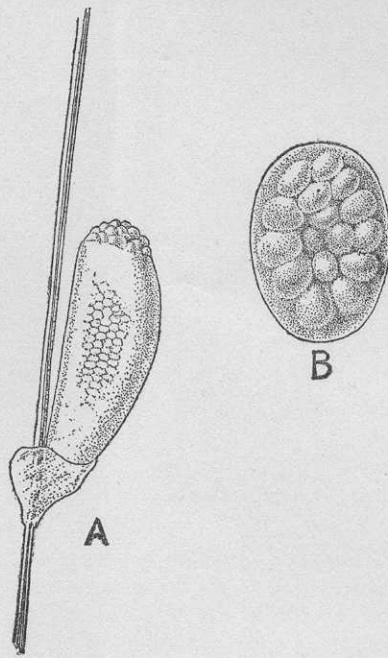


FIG. 6.—*Solenopotes capillatus*: A, Egg attached to hair, $\times 40$; B, operculum of egg, greatly enlarged.

