

PRELIMINARY STUDIES IN SIPHONAPTERA.—V.

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Genus Pulex (Division III.)

TABLE OF SPECIES.

- A. Head gently and evenly rounded from occiput to mouth; eyes in anterior half of head, about equally distant from upper and lower edges; antennal groove in middle of head; mandibles reaching two-thirds of anterior coxæ.....*B.*
- AA. Head more or less distinctly angled in front above, not evenly rounded from occiput to mouth; head combs of 5 to 6 spines; in anterior tarsi joint 1 equals 3; in middle tarsi joint 2 a little shorter than 5; in posterior tarsi joint 2 equals 5 and as long as 3 and 4 together, while 1 is one-half longer than 2; abdominal segments with one row of bristles above and below; posterior femora with a row of bristles on the side.....*D.*
- B. Abdominal segments above each with three rows of bristles, each row with 8 to 12 bristles on either side, below two rows, the first with 4 to 7, the second with 6 to 7 bristles on either side; eye small; bristles on joint 2 of antennæ as long as joint 3; maxillary palpi in female with joint 2 two-thirds of 4, and 3 about one-half of 4; labial palpi 5-jointed; head combs with 1 or 2 spines on either side; pronotal comb of 20 spines; in middle tarsi joint 2 three-fifths of 1, 2 one-fourth longer than 5, 5 more than twice 4, and 1 as long as 3, 4 and 5 together; in posterior tarsi joint 1 as long as 2 and 3 together; 5 a little more than one-third of 1, while 2 is more than 3 and 4 together, and more than 4 and 5 together; apical spine on joint 2 of hind tarsi shorter than joint 3; posterior femora without a row of bristles on the side; colour, light reddish-brown; length: female, 4 mm.....*gigas.*
- BB. Abdominal segments above each with one row of bristles, 5 to 8 on either side; below one row of 2 to 4 bristles on either side; eye very large; bristles on joint 2 of antennæ shorter than joint 3; maxillary palpi with joint 2 about equalling 4, and 3 two-thirds of 4; labial palpi 4-jointed; in anterior tarsi joint 3 three-fourths of 2, 5 about two and one-half times 4, and less than 1 and 2 together; in middle tarsi 2 one-half longer than 1, 5 two and one-half or three times 4, 1 about equalling 3; in posterior tarsi joint 5 more

- than one-half of 1, 2 as long as 3 and 4 together ; posterior femora with a row of bristles on the side.....C.
- C. Head combs of 6 to 9 spines, pronotal comb of 14 to 18 spines ; in anterior tarsi joint 3 about equals 1 ; in middle tarsi 2 equals 5 or less ; in posterior tarsi 1 as long as 2 and 3 together, and 2 less than 4 and 5 together ; apical spines on joint 2 of hind tarsi as long or longer than joint 3 ; male claspers oval, the broad portion pointing up and back, thickly finely haired around the upper end ; colour, dark brown above, lighter below ; length : female, 2.5-3 mm. ; male, 1.5-2 mm.....*serraticeps*.
- CC. Head combs of 2 to 3 spines, pronotal comb of 6 spines ; in anterior tarsi joint 3 longer than 1 ; in middle tarsi joint 2 one-fifth longer than 5 ; in posterior tarsi 1 about one-third longer than 2, 2 one-fourth longer than 5 ; apical spine on joint 2 of hind tarsi longer than joints 3 and 4 together ; male claspers inverted shoe-shaped, the toe pointing backward, moderately hairy above ; colour, dark brown ; length : female, 3 mm. ; male, 2.5 mm.....*erinacei*.
- D. Maxillary palpi with joint 2 as long as 3 and 4 together, and 3 three-fourths of 4 ; head obtusely angled in front above ; eye large, at the middle, and nearer the upper than the lower edge ; antennæ in posterior half of head ; bristles on joint 2 as long as joint 3 ; labial palpi 4-jointed ; mandibles reaching to end of anterior trochanters ; pronotal comb of 16 spines ; in anterior tarsi joint 3 three-fourths of 2, 4 shorter than 3, 5 as long as 2, 3 and 4 together ; in middle tarsi 3 slightly longer than 4, 1 much longer ; apical spine on second joint of posterior tarsi longer than joints 3 and 4 together ; dorsal rows of bristles on abdominal segments with 5 to 8 bristles on either side, ventral with 2 to 4 on either side ; male claspers as in *erinacei*, except not so rounded, and very thickly hairy above ; colour, dark brown ; length : female, 1.75-2.25 mm. ; male, 1.5 mm.....*inaequalis*, n. sp.
- DD. Maxillary palpi with joints of equal length ; head sharply angled in front above ; eye moderate, in anterior half of head, and about equally distant from upper and lower edges ; mandibles reaching to two-thirds of anterior coxæ ; pronotal comb of 12 spines ; in anterior tarsi joint 5 nearly as long as 2, 3 and 4 together ; in middle tarsi 3 as long as 4, 1 a little longer ; male claspers narrow, curved backward, thickly haired above ; colour, yellowish brown ; length, 2 mm.....*goniocephalus*.

Pulex gigas, Kirby.

1837. Kirby, Faun. Boreali-Amer. IV., p. 318, pl. 6, fig. 9 (*P. gigas*).

I have referred to this species, specimens taken on cotton-tail rabbit at Lansing, Michigan. The spines on the cheeks are easily overlooked,

and often broken entirely off. It is one of the largest and most well-marked of the known North American fleas. Ritsema, to whom the species was unknown, suggested that it might possibly be identical with *Hystrichopsylla obtusiceps*. This was, however, merely a guess, as it does not bear the slightest resemblance to that species. It was originally described from specimens taken in Canada.

Pulex serraticeps, Gervais.

1832. Duges, Ann. d. Sci. Nat. XXVII., p. 157, pl. 4, fig. 2, 5-9 (P. canis).

1835. Bouche, Nov. Act. Acad. Leop. Carol. XVII., 1, p. 505 (P. felis).

1844. Gervais, Hist. Nat. des Insectes. Apteres. III., p. 371, pl. 48, fig. 8 (P. serraticeps).

This is the common cat and dog flea, well-known from all parts of the world. Besides various wild cats and dogs, it has been reported from *Herpestes ichneumon*, *Foetorius putorius*, *Hyaena striata*, *Lepus timidus*, and *Procyon lotor*. It is also stated to occasionally sip human blood. I have specimens from various parts of North America, and also from Europe.

Pulex erinacei, Bouche.

1835. Bouche, Nov. Act. Acad. Leop. Carol. XVII., 1, p. 507 (P. erinacei).

I have received a series of specimens of this species from Dr. Taschenberg, taken in Germany on *Erinaceus europeus*, which is the only known host.

Pulex inaequalis, n. sp.

Mr. A. B. Cordley sent me a series of specimens of this species taken on cotton-tail and jack rabbits, near the Grand Canon in Arizona. It seems to be the North American representative of *goniocephalus*, but differs very widely from that species as described and figured by Dr. Taschenberg. A variety of this species, which I will call var. *simplex*, occurs on a species of *Lepus* in Michigan. It may eventually prove to be a good species, but it bears such a close resemblance to *inaequalis* that I cannot at this time recognize it as more than a variety of that species. The slightly larger size, 2.5 mm., the head combs of 8 spines, and the pronotal comb of 14 spines, will separate it from the typical form, while the proportions of the tarsal joints and other details are nearly identical.

Pulex goniocephalus, Taschenberg.

1880. Taschenberg, Die Flohe, p. 82, pl. III., fig. 20 (P. goniocephalus).

Recorded from Europe as occurring on hares and rabbits, *Capra ibex*, and *Canis vulpes*.

[TO BE CONTINUED.]

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