

Fifth annual
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ON THE CAVE FAUNA OF INDIANA. BY A. S. PACKARD, JR.

THE Museum of the Academy of Natural Sciences has received from Prof. E. T. Cox, State Geologist of Indiana, Dr. John Sloan of New Albany, Ind., and M. N. Elrod, Esq., of Orleans, Ind., some important material elucidating the cave and subterranean fauna of Indiana, an account of which, with the localities, is here presented.

DIPTERA.

Anthomyia? Five specimens of this fly occurred in a cave at Bradford, Ind. (Dr. John Sloan). It is of the same species as the *Anthomyia?* mentioned by Mr. Cope as occurring in Wyandotte Cave, as I find by comparing them with his type specimens kindly lent me.

COLEOPTERA.

Anopthalmus tenuis Horn. Two specimens were received from Mr. Elrod, taken from a cave at Orleans, the locality being remote from the light. One specimen is considerably paler than the other, but both agree with Dr. Horn's description.

Platynus marginatus Lec. (determined by Mr. P. S. Sprague). This species, with eyes of the normal appearance, occurred in company with *A. tenuis*, in the same cave and "remote from the light." Its pupa was also found with it, hence it is probable that the larva lived in the same situation. The pupa had well formed eyes.

ORTHOPTERA.

Ceuthophilus Sloanii, n. sp. One ♂, three ♀. This species is allied to *C. maculatus*, having much the same markings, but the thoracic brown bands are better marked and the body is rather paler. Eyes rounded pyriform; a dark spot beneath each eye and a longer one between; a brown band connects

the eyes above. Antennæ three times as long as the body; at intervals, increasing distally, conspicuously banded with pale. Legs unusually short, of much the same proportions as in *C. maculatus*, the joints being short and stout. Hind femora marked and spined as in *C. maculatus*, but without the twist seen in that species. Anal cerci as in that species. Ovipositor in my (probably immature) specimens very short and blunt, unarmed.

Length of body, .55; antennæ, 1.60; hind femora, .50; ovipositor, .10 inch. From *C. latens* Scudd., Jour. Bost. Soc. N. H., vii, 437 (1862), an Illinois species, it differs in the still shorter femora.

From a cave in Bradford, Ind. (Dr. John Sloan). I dedicate this species to Dr. Sloan in recognition of the interest shown by him in extending our knowledge of cave life.

CRUSTACEA.

Cambarus pellucidus (Tellkf. 1844). *Orconectes inermis* Cope, Amer. Nat. vi, 419, 1872. On comparing one small specimen of this species from Wyandotte Cave, measuring 1.45 inch, with one 1.70 inch long, and several others larger, from Mammoth Cave, I am unable to find any but the slightest differences in the proportion of different parts, or in ornamentation; such differences as do exist seem to be simply individual. Being a little younger specimen than those from Mammoth Cave, the spines in the Wyandotte individual are not quite so large, but the frontal spine is the same, as well as the chelæ and the end of the abdomen and its appendages. The terminal spine extends a little beyond the apex of the antennal lamellæ. The lateral ridges on the sides of the rostrum are thicker and more strongly marked than in the Mammoth Cave specimens. The antennal lamellæ are alike in specimens from both caves. The spines on the side of the thorax are smaller in the Wyandotte Cave specimen, and those above are rudimentary. The postabdomen is as in Cope's figure and in the Mammoth Cave specimens. I should regard Prof. Cope's specimens, judging from his descriptions and figures, as belonging to *Cambarus pellucidus*, and not even a variety. The absence of pigment in the eyes, and the loss of sight, I should scarcely regard as of generic value, and am hence inclined to follow Dr. Hagen in retaining *pellucidus* in the genus *Cambarus*. One specimen from Wyandotte Cave, presented by Prof. E. T. Cox.

Crangonyx vitreus (Cope), *Stygobromus vitreus* Cope, Amer. Nat., Vol. vi, p. 422. This species agrees in the main with Prof. Cope's description so far as I am able to comprehend it. The antennæ and their proportions are as he describes them, and in this character and that of their being eyeless and of the same size, my specimens agree with his description, so that I am inclined to regard them as of the same species as those from Mammoth Cave. In my specimens the second antennæ are half as long as the first pair. In this respect the species approaches the European *C. subterraneus* Bate (British Sessile-eyed Crustacea, i. 327), though the antennæ are longer and slenderer than in that species. It differs from *C. gracilis* Smith (Report on Dredging in Lake Superior, 1871), specimens of which have been obligingly furnished me for comparison, in being eyeless, and in the antennules being scarcely half the length of the body, while the antennæ are half as long as the antennules; in *C. gracilis* they are about two-thirds as long; flagellum shorter than in *C. gracilis*. In the form of the body and abdominal appendages it closely resembles *C. gracilis*. The antennules 17-jointed; in *C. gracilis* 23-jointed. The antennæ 8-10-jointed; in *C. gracilis* 10-jointed. Taken from three different wells in Orleans, Ind., in company with *Cæcidotæa stygia* "and blind crayfish and the blind fish" (M. N. Elrod).

Mr. Elrod thus writes me under date of June 4th: "I have collected over a hundred *Cæcidotæa* and a number of *Crangonyx* from a well in town. They were in and on the buckets that had been in the bottom of the well for several days. I also have a live eyeless crayfish from one of our wells yesterday, and have fed it with *Cæcidotæa*. If the *Cæcidotæa* are put in its claw it eats them almost instantly."

Cæcidotæa stygia Pack., Amer. Nat., Vol. v, p. 751. *C. microcephala* Cope, Amer. Nat., Vol. vi, pp. 411, 419. Having received Prof. Cope's type specimens from Wyandotte Cave, and compared them with my Mammoth Cave individuals, I am unable to find any differences. Prof. Cope was undoubtedly led to regard his *C. microcephala* as distinct from mine, owing to an error in my engraving of the head, which is represented as being too long and broad in front, while his specimens are, from being badly preserved, too much flattened and narrow in front, and so represented in his figure. But having received through Prof. E. T. Cox, some better preserved specimens from Wyandotte Cave, I am enabled to state that *microcephala* does not differ from *stygia*.

Having received from Mr. Elrod numerous specimens in a better state of preservation than the single one on which my description was founded, *i. e.*, having the larger pair of antennæ and caudal appendages (uropoda) attached, I am able to correct an important misconception of my own regarding the affinities of *Cæcidotea*, and of Prof. Cope respecting the nature of the so-called "egg-sacs." The genus is not a member of the family *Idoteidae*, but of the *Asellidae*, and the "egg-sacs" are uropoda. Indeed, it seems not difficult to recognize in *Cæcidotea* an *Asellus* modified by its subterranean existence. The antennæ and legs are much the same, though a little longer; the body, however, is much lengthened and bleached out, and the eyes have disappeared. The gills are much the same. Had I at the time of writing my description of *Cæcidotea* had an *Asellus* with which to compare it, I do not think I could have fallen into the error of regarding it as an ally of *Idotea*, but the apparent absence of uropoda and the difficulty of seeing any place of attachment for any, together with the consultation of figures alone, misled me. The outer antennæ are as in *Asellus*, but the joints are much longer; while in *Asellus* they reach a little beyond the base of the abdomen, in *Cæcidotea* they reach a third of their length beyond the end of the abdomen. Inner (and smaller) antennæ as in *Asellus*. Legs as in *Asellus*, but slenderer and less spiny. The two pairs of appendages at base of abdomen much as in *Asellus*. The uropoda are long and slender, longer than the terminal abdominal segment; basal joint long and narrow; two terminal joints very unequal, outer one minute, scarcely as long as the basal joint is wide; inner joint long, four times as long as the outer, and half as long as the basal joint. Compared with those of *Asellus*, they are quite different, as in the latter genus the basal joint is broad and shorter than the two terminal joints; and of the latter the outer is half as long as inner. The specimens received from Mr. M. N. Elrod were drawn by means of an old-fashioned windlass and rope from a well in Orleans, Ind., in April and May. They occurred more abundantly in the well which was most frequently used. They would seem to be quite abundant in the wells which evidently connect with subterranean streams.

EUPHILOSCIA, nov. gen.

Two specimens of a pill bug or "sow bug" allied to the British *Philoscia muscorum* and a New England species were found by Mr. Elrod in the same caves and under the same

stones as the *Anophthalmus tenuis* and *Platynus marginatus*, about five hundred and fifty feet from the entrance to the cave, and not more than twenty feet from the water in which blind fish (*Amblyopsis*) occurred. It was afterwards found by Mr. Elrod outside of the cave, in drift wood and under decaying rubbish. The genus *Euphiloscia* differs from *Philoscia* in the flagellum of the outer antennæ being subdivided into fifteen joints, while it is no longer than in the latter genus. The second and third joints are rather short; the inner (and smaller) antennæ are very much larger. The body is longer and slenderer, and the abdomen much longer and wider in proportion to the rest of the body, being large and rounded, not mucronate. Uropoda much longer and slenderer than in *Philoscia*, being as long as the basal abdominal segment is wide; they are subequal. Eyes larger than in *Philoscia*. In the form of the legs and the setæ this genus more closely resembles *Philoscia* than *Philougria*, and is in some respects intermediate between the two genera.

Euphiloscia Elrodii, n. sp. Having no other species with which to compare my two specimens of this species, I can only remark that it is of the usual color of the species of *Philoscia* found running about in moss, and the cave specimens had not been altered by their subterranean life. The eyes are dark as usual, while the body is mottled with brown and carneau, with no well marked dorsal streak.

Length, .30 inch, not including antennæ and stylets.

This species is dedicated to M. N. Elrod, Esq., to whom we are indebted for so much new information concerning our cave fauna. One of the cave specimens is larger and the eyes as well developed as in those found outside, near the mouth of the cave.

Cauloxenus stygius Cope. Found attached to an *Amblyopsis* in the same manner as described by Prof. Cope. From a cave in Bradford, Orleans Co., Ind., by Dr. John Sloan, who had the fish and its parasite alive in an aquarium for nearly a year.