

Pentagonaster meridionalis, id. Phil. Trans. 168. (1879) p. 276.
Gnathaster meridionalis, Sladen, Chall. Rep. Ast. (1889) p. 287.
Gnathaster pilulatus, id. t. c. p. 292.

8. ODONTASTER MILIARIS.

Astrogonium miliare, Gray, P. Z. S. 1847, p. 79.
Gnathaster miliaris, Sladen, Chall. Rep. Ast. (1889) p. 750.

I include this species on Mr. Sladen's authority ; the only specimen of it that I have seen, that described by Dr. Gray, has the mouth-parts so poorly preserved that I cannot say whether or no it had the spines which are characteristic of this genus.

9. ODONTASTER PAXILLOSUS.

Astrogonium paxillosum, Gray, P. Z. S. 1847, p. 79.
Gnathaster paxillosus, Sladen, Chall. Rep. Ast. (1889) p. 750.

10. ODONTASTER PEDICELLARIS.

Asterodon pedicellaris, Perrier, Miss. Cap Horn (1891), p. K. 135.
 For the limits of this species, see the remarks under *O. grayi*.

11. ODONTASTER SINGULARIS.

Goniodiscus singularis, M. Tr., Arch. f. Nat. 1843, p. 116.
Pentagonaster singularis, Perrier, Arch. Zool. expér. v. (1876) p. 38.
Gnathaster singularis, Sladen, Chall. Rep. Ast. (1889) p. 750.
Asterodon singularis, Perrier, Miss. Cap Horn (1891), p. K. 134.

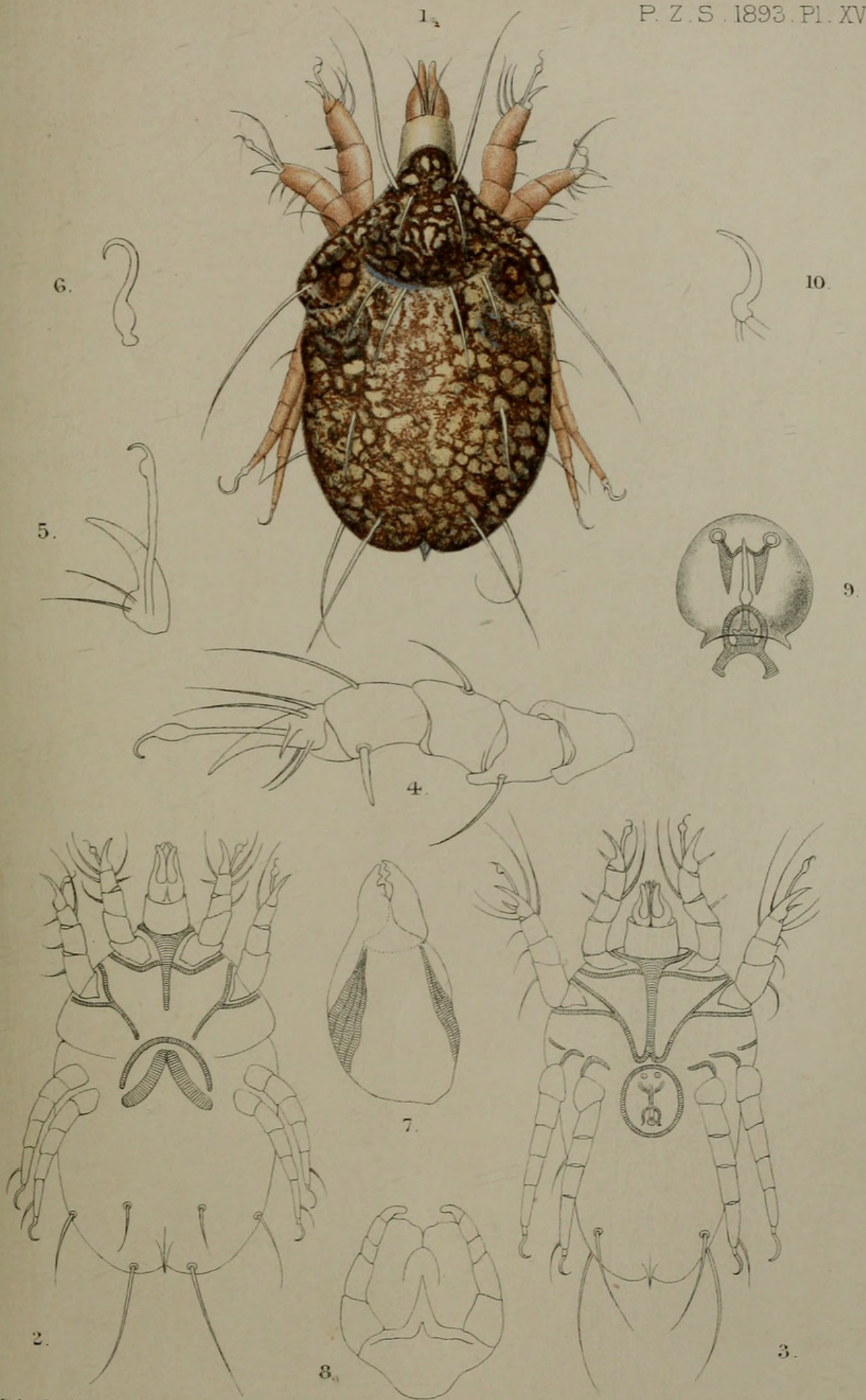
Mr. Sladen includes *Goniodiscus verrucosus*, Phil., under *Gnathaster* with a sign of doubt.

4. On a new Genus and Species of *Acar*i found in Cornwall. By A. D. MICHAEL, F.L.S., F.Z.S., P.R.M.S., &c.

[Received March 11, 1893.]

(Plate XVIII.)

In November 1892 I was staying near the Land's End, Cornwall: in one of the small rocky bays which are found along this granite coast a little stream of fresh water comes down from the cliffs in the middle of the bay; at the edge of the stream, where it only trickled, and near enough to the sea to be within the influence of wind-carried spray, some considerable patches of the small green water-weed *Cladophora fracta* were growing. Amongst this weed I found examples of several species of *Acarina*, and was taking the



A D Michael ad nat del. J. Smit lith.

Mintern Bros. Chromo lith.

LENTUNGULA ALGIVORANS. N.S.



opportunity of studying the anatomy of two of these species. For this purpose I required frequent fresh supplies of the creatures, but, unfortunately, before I had completed my investigations, a two days' storm of violent rain and wind came, and when I revisited the stream I found almost all the alga washed away and not an *Acarus* left in what remained. Under these circumstances I began to search for other patches of the *Cladophora*, and found a largish quantity growing on the face of the cliff near the horn of the bay, in a place somewhat difficult of access, nearer to the sea than the other, but higher up the cliff; a very thin thread of fresh water trickled down the cliff here, keeping the alga moist, and the spray of the sea would dash there in rough weather, and probably more or less would be carried there whenever the wind was from the sea, its most frequent direction. It was a warm corner facing south. The weed was abundant and in good condition, having been protected from the storm; but, to my surprise, I did not find in it a single specimen of either of the species which I was looking for, but, on the other hand, I did find examples of two other totally distinct species which I had not ever before found in the *Cladophora* either at the stream in the middle of the bay or elsewhere. The first was in great numbers and in all stages; it was one of the Halicaridæ.

More careful examination with a microscope disclosed that there was also a second and much smaller species present in considerable numbers; it is, I believe, unknown, and the object of this paper is to record it. The creature, in spite of its minute size, has structural peculiarities which seem to me to render it particularly interesting. It belongs to the family Tyroglyphidæ. I thought at first that I had a new species of the genus *Hericia*, and that genus is certainly its nearest ally; but it is not possible to include it in that or any other existing genus. The great and singular difference of the two front pairs of tarsi and claws, the different position of the anus, and the absence of the strong sexual dimorphism found in *Hericia*, besides other points, distinguish it from that genus. There is only one recorded species of *Hericia*, viz. *H. robini* (Canestrini ex Robin), a very singular creature of a flattened diamond-shape (the male especially) which wades in the sap which exudes from elm-trees where the bark has split. The present species shares the flattened diamond-shape and the wading habits of *H. robini*, although the habitat is so very different.

The great peculiarity and interest of the present species consists in the tarsi and claws. The Tyroglyphidæ usually have rather slender tarsi and from the actual end of each tarsus springs a single claw either with or without a caruncle: where the caruncle is present the claw is usually small; where it is absent, as in the genus *Hericia*, the claw is usually larger and more powerful. The claw generally consists of hard colourless chitin, and is a strongly curved hook with a very short, straight, hard, and solid peduncle, at the proximal end of which a small ball-like swelling serves to give attachment to tendons. Hook, peduncle, and ball

are all in one piece and quite hard and stiff; all the claws of *Hericia* are of this nature. The two hind pairs of legs of the present species have tarsi and claws fairly similar to those of *Hericia*, except that the shaft is a little more bulbous; the claws are large, of the ordinary type, and spring from the ends of the tarsi. The two front pairs of legs have an entirely different termination; the tarsi are very powerful, strongly curved downward, particularly at the distal end, and formed of stronger and denser chitin than the rest of the legs; they end in blunt points, and have the appearance of the dactylopodite in some Crustaceans. They form efficient climbing-organs, and the *Acarus* practically climbs entirely by their aid. I watched it climbing some dozens of times; it got the curved ends of its tarsi on to or over the edges of small pieces of stone or weed, and clinging to these slowly dragged itself up. From the side, not the end, of each tarsus springs a long, hyaline, slender peduncle, which projects considerably beyond the tarsus; this peduncle is flexible in all directions—not in the sense that it yields when it touches anything, for in effect it seldom does touch anything except very lightly, but in the sense that it has special motion of its own and can be flexed and turned in any direction at the will of the creature; indeed, it is almost constantly in motion. The distal end of this peduncle swells suddenly and forms a bulb, at the end of which is a very minute claw; the bulb can be turned upward and downward, carrying the claw, but the claw has not any motion separate from the bulb. This claw and peduncle are not used in clinging or walking at all; they seem to have become wholly tactile organs; the creature clings with the tarsus and then appears to feel about with the claw by turning and bending its flexible peduncle in all directions until it finds a suitable place to put the tarsus for the next step, then it moves the tarsus and the process recommences, being of course done by opposite legs alternately. I am not aware of anything at all similar in the structure and habits of any of the Acarina. I propose calling the genus "*Lentungula*," and the species *L. algivorans*.

Genus LENTUNGULA¹.

Tyroglyphidæ without marked sexual dimorphism; with the body flattened dorso-ventrally; with the tarsi of the two front pairs of legs strongly curved, gradually diminished, ending in points, and used as climbing-organs. The claws of the same pairs of legs minute and mounted on long flexible peduncles springing from the sides of the tarsi and capable of being flexed at the will of the creature. Tarsi of two hind pairs of legs of the ordinary type, ending in large single claws without caruncles. With terminal anus formed of two upright plates lying against each other. Genital aperture in both sexes near the middle of the body between the coxæ of the fourth pair of legs.

¹ *Lentus*, flexible; *ungula*, a little claw.

LENTUNGULA ALGIVORANS. (Plate XVIII.)

Average length without mandible about $\cdot 38$ mm.

Greatest breadth about $\cdot 20$ mm.

Length of legs 1st pair about $\cdot 13$ mm.

„ „ 2nd „ „ $\cdot 14$ mm.

„ „ 3rd „ „ $\cdot 15$ mm.

„ „ 4th „ „ $\cdot 15$ mm.

Colour.—The actual colour of the creature, if it had been fasting for a long time, would probably be almost entirely light yellowish, but as ordinarily seen it is dark olive-brown with very numerous light yellowish spots and markings. The yellowish colour is chiefly in spots and spaces surrounded with the olive, but the spots are not arranged in any definite pattern; although a few spots on the cephalothorax have a tendency to be permanent, the whole of the markings are most irregular and varying. The olive-brown colour greatly predominates, and some specimens are almost wholly of that tint. The colour apparently arises from the diffusion of food material or products, it is not pigment in the cuticle; this can be demonstrated by placing a dark specimen in a drop of water on a glass slip under the microscope and placing a cover-glass over it; as the water evaporates the cover will be slowly drawn down, producing pressure upon the creature; the result of this will be that what appears like the whole contents of the body are gradually discharged from the anus, and the opaque dark creature becomes yellowish white and transparent. During life the brown colour does not, however, look like food-contents, it has every appearance of being the true colour of the greater part of the body. The rostrum and legs are always pale pinkish yellow.

Texture polished.

Shape.—This also depends considerably upon whether the creature is fully fed; when it is so the distinctive form is lost, and the *Acarus* becomes almost a roll with little shape in it, but when not quite so fully fed the form is rather striking. The cephalothorax is slightly broader than the abdomen, but much thinner dorso-ventrally, so that where the two join the dorsum of the abdomen stands high above the cephalothorax. There is a sharp indentation in the lateral edge of the creature, where cephalothorax and abdomen join; behind this the abdomen of the female is almost sack-shaped; that of the male narrows a little more posteriorly; in both sexes the hind margin is indented in the middle, so that each side forms a rounded lobe.

Cephalothorax.—The rostrum is a smooth tube or collar, long for the family; the strong chelate mandibles project considerably; each arm of the chela is tridentate (fig. 7). The five-jointed palpi (fig. 8), of the ordinary type, are adherent to the membranous maxillary lip, in the centre of and below which is a chitinous triangular sclerite which might possibly be considered to represent a labium. The central portion of the cephalothorax, behind the rostral tube, forms a large, rounded, fleshy lobe which overhangs the



1893. "On a new genus and species of Acari found in Cornwall." *Proceedings of the Zoological Society of London* 1893, 262–267.

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