

LIV.—*A Key for the Ready Identification of the Species of Cephalodiscus.* By W. G. RIDEWOOD, D.Sc.

IN the Report on the specimens of *Cephalodiscus* obtained by the 'Terra Nova' on the British Antarctic Expedition of 1910-1913, published in 1918 by the British Museum (Nat. Hist.), there is given a synopsis of the species at present known, and a list of all recorded specimens (pp. 66-77). The particulars therein set forth were derived mainly from an examination of actual specimens, but in the case of five species that were not available for personal study they were taken from the published descriptions. The list records the latitude and longitude of the locality from which each specimen was obtained, and is supplemented by two maps showing the geographical distribution of the various species.

It has been pointed out that the synopsis and list would have been of greater service if there had been appended a key or table such as would enable those who have not made a special study of the genus to identify readily the species of any material that might come into their hands. It is with a view to supplying this deficiency that the present key has been drawn up. Seeing that it is only intended as a supplement to the Report, to be used in conjunction with the synopsis, only a few explanatory notes need be given here.

Three subgenera of *Cephalodiscus* are at present recognized, the first two—*Demiothecia* and *Idiothecia*—being introduced in 1907 in the Report on the Pterobranchia of the National Antarctic Expedition ('Discovery'), and the third—*Orthoecus*—added by Andersson later in the same year in his report on the Pterobranchia obtained on the Swedish South-Polar Expedition of 1901-1903. The differences between *Orthoecus* and *Idiothecia* are much less pronounced than are those between *Idiothecia* and *Demiothecia*, and on p. 19 of the 'Terra Nova' report are given the reasons for transferring Schepotieff's species, *indicus*, from the subgenus *Idiothecia*, in which he placed it, into the subgenus *Orthoecus*.

The reasons for regarding Andersson's *inaequatus* as synonymous with *hodgsoni* are published in the report on the Pterobranchia of the Scottish National Antarctic Expedition (1902-1904, 'Scotia'), 1913, pp. 559-563. *Cephalodiscus aequatus* is not easily separated from *C. hodgsoni*, but the evidence is not sufficiently strong for regarding the two as synonymous—see 'Terra Nova' Report, pp. 59 and 69. Since the characters that distinguish the species *hodgsoni*, *aequatus*, and *dodecalophus* cannot be expressed in a few

words, the synopsis itself should be consulted by those wishing to discriminate between these species. As regards the two diminutive species of the subgenus *Demiothecia*, Harmer writes ('Pterobranchia of the "Siboga" Expedition of 1899-1900,' Leiden, 1905, p. 4):—"The possibility is not excluded that *C. sibogæ* is the male form of *C. gracilis*."

A study of the large and varied collection of *C. densus* obtained by the 'Terra Nova' leads to the conclusion that what Andersson described as *C. rarus* is but an early colony of *C. densus*, with the tubes of the cœnoecium lax, straggling, and irregular, instead of closely set and more or less parallel—see 'Terra Nova' Report, pp. 39-40.

Gravier's species—*C. anderssoni*—is with difficulty distinguishable from *C. densus*; his description of the zooids is incomplete, and the principal feature that distinguishes the cœnoecium of his species is the aggregation of the tubes into clumps or clusters which stand out more or less distinctly from the other clumps—see 'Terra Nova' Report, pp. 40 and 76.

The present key is so drawn up as to bring the species *nigrescens* and *solidus* together. Although belonging to different subgenera, they have many points in common, and I was for some time uncertain whether the cone-shaped colonies obtained on the Australasian Antarctic Expedition of 1911-1914 were small, short-tubed colonies of *C. solidus* or unbranched colonies of *C. nigrescens*—see report on the Pterobranchia of the expedition, Sydney, 1918, pp. 19-20. The arms of well-preserved zooids of *C. nigrescens* show a characteristic double black band on the axis, but the bands are lost in badly preserved material. On the other hand, it is not definitely known that the zooids of *C. solidus* do not possess such bands; Andersson does not mention them, and the zooids of one of his specimens that I had an opportunity of studying do not show them; the material, however, is not well preserved, and there are evident signs of the colour of the zooids having become diffused and reduced in intensity.

The key is also arranged so as to bring together the two specially arenaceous species *agglutinans* and *evansi*; the former has black zooids and the latter white. Although *C. agglutinans* differs from the other species of *Idiothecia* in the tubes not ending blindly in the middle of the branch, the character is not readily determined, owing to the transparency and thinness of the tubes and the confusing effect of the numerous particles of shell embedded in the cœnoecial substance.

The only species outside the subgenus *Demiothecia* that has spines on the cœnœcium is *C. gilchristi*.

The length of the zooids given in the key is that from the free ends of the arms to the end of the trunk, not including the stalk.

I. Cavities of the cœnœcium in the form of tubes.

Each tubular space with a single orifice, and occupied by one zooid and its buds. Arms without end-swellings and refractive beads.

A. Cœnœcium in the form of a branching system, with the newest tubes at the apices of the branches *Idiothecia*.

a. Internal ends of the tubes communicating by a labyrinthic system.

1. Branches massive, fragile, with abundant fragments of shell embedded; each ostium with a short, blunt lip, but no peristomial tube. Zooids 4.5 mm., blackish; arms 8 or 9 pairs. *agglutinans*.

b. Internal ends of the tubes blind.

2. Branches massive, fragile, with abundant fragments of shell embedded; each ostium with a short peristomial tube. Zooids 3.5 mm., white; arms usually 8 pairs. *evansi*.
3. Branches fairly long, slender, not fragile, with numerous long spines, brownish; ostia with or without peristomial tubes. Zooids 1.6 to 1.8 mm., blackish when alive, brown in preserved material, with blackish margin to anterior edge of shield; arms usually 6 pairs *gilchristi*.
4. Branches medium or slender, orange-coloured, no spines; each ostium with a single-lipped peristomial tube. Zooids 2.5 mm., whitish; arms 6 pairs *levinseni*.
5. Branches massive, rarely slender, greyish or brownish, no spines; each ostium with a short, single-lipped peristomial tube. Zooids 4.0 to 6.0 mm., blackish; arms usually 7 pairs, each with two black bands along the axis. *nigrescens*.

B. Cœnœcium in the form of a hemisphere, cone, or cake, with the newest tubes at the edges; basal ends of the tubes blind *Orthoecus*.

6. Colony bulky and massive, tubes long, common cœnœcial substance firm; each ostium with a single thick lip,

- edge of ostium thick. Zooids 4·0 to 5·0 mm., blackish, fading to pale brown; arms usually 8 pairs *solidus*.
7. Colony bulky and massive, or small and lax if young (*rarus*), tubes long, common cœnoecial substance soft and spongy; ostium without a definite lip, transverse or oblique, edge of ostium thin. Zooids 4·0 to 7·0 mm., brownish or greyish; arms usually 8 pairs *densus* (including *rarus* and (?) *anderssoni*).
8. Colony diminutive, orange when fresh, pale in alcohol; ostia without definite lip. Zooids 2·2 mm., pale; arms 3 pairs *indicus*.
- II. Cavity of the cœnoecium continuous, and occupied in common by the zooids and their buds. Cœnoecium branching, with numerous spines. Arms of zooids commonly with end-swellings beset with refractive beads *Demiothecia*.
- a. Colony up to 200 or 250 mm. in height, cœnoecium amber-coloured or pale.
- 9, 10, 11. Colony much branched. Zooids 2·0 to 3·2 mm., crimson, brown, violet, or pale; arms 5 or 6 pairs. Species not easily distinguished, but *hodgsoni* is somewhat more robust, and with larger zooids, than *dodecalophus* *dodecalophus*, *hodgsoni*, (*inæquatus* = [*hodgsoni*], *æquatus*).
- b. Colony diminutive and delicate, cœnoecium orange-coloured.
12. Zooids 1·3 mm., orange-coloured, with a few tracts of black pigment; arms 5 pairs, with end-swellings in buds. No males known *gracilis*.
13. Zooids blackish; neuter zooids 1·3 mm., arms 4 pairs, no end-swellings; male zooids with one pair of arms only, without tentacles, numerous refractive beads. No females known *sibogæ*.

LV.—Observations on the Genus *Crassicauda*.

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Two sets of specimens from Deception Island, South Shetlands, kindly sent to the Museum recently by Mr. A. G. Bennett, throw interesting further light on this little-known genus of Nematodes. The host, in both these cases, was the



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