

## ON THE HYDROID *MERONA CORNUCOPIAE* (NORMAN)

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(Text-figs. 1-3)

### INTRODUCTION

During a short visit of seven days to the Station Biologique, Roscoff, in June 1955, I was able to make some observations on living colonies of *Merona cornucopiae* (Norman) and on other hydroids. The object of my visit was to see living polyps of *Tricyclusa singularis* which were also found, but unexpectedly *Merona* was found during dredging and provided the opportunity for a much needed re-description from living material.

I am grateful to Professor Georges Teissier for kindly placing a table at my disposal at Roscoff, and also to Dr Claude Levi and Dr Bertil Swedmark for many kindnesses during my stay.

### A RE-DESCRIPTION OF *MERONA CORNUCOPIAE* (NORMAN)

There has been no adequate description of *Merona cornucopiae* since Norman (1864) described the species from preserved material from the Shetlands, although Garstang (1892) described some features of a large colony from Plymouth.

#### *Material*

Colonies found on *Glycimeris glycimeris* (L.) (Fig. 1) and *Turritella communis* Lamarck, dredged from 15 to 25 m off Callot in the Baie de Morlaix on 23 June 1955, were examined alive, and the following description is based mainly on this material, supplemented by a re-examination of preserved material in the British Museum (Natural History).

The Museum material examined is noted below.

#### *Shetland*

On *Dentalium entale* inhabited by *Phascolion*, fertile. B.M. No. 1912.12.21.255. Coll. A. M. Norman (Syntype). This colony is in alcohol; the hydranths have partially disappeared but the perisarcal tubes and the reproductive polyps with their mulberry-like bunches of gonophores remain.

On two shells of *Dentalium entale* with *Phascolion*, sterile, 1867. B.M. No. 1912.12.21.254. Coll. A. M. Norman. There are no polyps and the perisarcal tubes are well covered with adhering sand grains. This colony was probably dead when collected.

*Plymouth*

On *Aporrhais pes-pelecani* inhabited by *Phascolion strombi*, sterile. B.M. No. 1910.10.1.1. Coll. A. M. Norman. The hydranths are well retracted into the perisarc tubes which have a height of 3.0–4.0 mm. The tubes have a diameter of about 0.14 mm at the base and expand gradually distally and have a diameter of about 0.35 mm at the rim.

On two living *Dentalium entale*, sterile, Eddystone Grounds, 26 May 1898, B.M. No. 1948.9.8.53. Coll. E. T. Browne. No hydranths or gonophores are present. The taller perisarc tubes have lengths of 1.98–3.34 mm. The stolons have diameters of 0.06–0.08 mm.

On one living *D. entale*, fertile, Eddystone Grounds, 4 June 1898, B.M. No. 1941.3.20.516. Coll. E. T. Browne. This colony occurs right at the tip of the *Dentalium* shell. The polyps have been killed in an expanded condition and are very life-like. The reproductive polyps have long stalks like the nutritive ones and are further discussed on p. 502. Measurements of this colony are given in Table I.

On a dead *Aporrhais pes-pelecani*, sterile; off Stoke Point, 4 November 1913, B.M. No. 1948.9.8.18. Coll. E. T. Browne. Sterile colony with short stems and polyps moderately extended.

Fragments from the shell of *Glycimeris glycimeris* (L.), sterile, 18 March 1914. B.M. No. 1948.10.1.26. Coll. E. T. Browne. Fragments with few polyps; stems 1.0–3.5 mm high.

Three colonies each on *Dentalium entale*, fertile. B.M. No. 1921.8.31.5 (purchased). Colonies on the apices of the shells; each colony with tall reproductive polyps of the same length as the nutritive polyps.

*Eastern Channel, position, 50° 28' 45" N., 00° 05' W.*

On *Glycimeris glycimeris* (L.), sterile, 49 m., 24 July 1947. Manihine Collections. A small sterile colony with retracted polyps.

*Description*

All the colonies seen by me have consisted of 10–40 nutritive polyps, with or without a small number of reproductive polyps, but Garstang (1892) noted a very large colony of 90–100 polyps covering almost the whole upper surface of a shell of *Aporrhais pes-pelecani* inhabited by the sipunculid *Phascolion strombi*. In this colony the hydrorhiza formed a continuous crust, whereas in Norman's colonies and others in the Museum, the stolons sometimes form a crust and sometimes a reticulate network. When the stolons can easily be seen (as on *Dentalium*), they are seen to be covered with smooth, non-annulated, horn-coloured perisarc; they have diameters of 0.06–0.08 mm.

The unbranched polyp stems have a height (to hypostome) of 2.0–5.0 mm when the polyp is expanded. The stems are not usually vertical but slope in the direction of the ciliary currents of the host mollusc; they arise directly from the hydrorhiza with a diameter at base of about 0.14 mm. They expand gradually distally to a diameter of 0.4–0.56 mm. The distal margin is often flared into a trumpet-shape but this feature is more noticeable in young polyps than in old ones which become coated with sand grains or fine mud. When the

polyps die down and regenerate, new tubes arise within the mouths of the old ones as noted by Norman, but this feature is not always apparent and caused Garstang to remark: 'The lines of growth encircling the hydrothecae nowhere project so as to assume a ridge-like form, as shown in Norman's figure.'

The large polyps have a length of up to 5 mm when expanded, and have about twenty long filiform tentacles scattered over the anterior half (Figs. 1, 2). Tentacles proximal to the mouth seem to be arranged in an oral whorl of four to seven in number. The proboscis is bluntly rounded and of an intense white

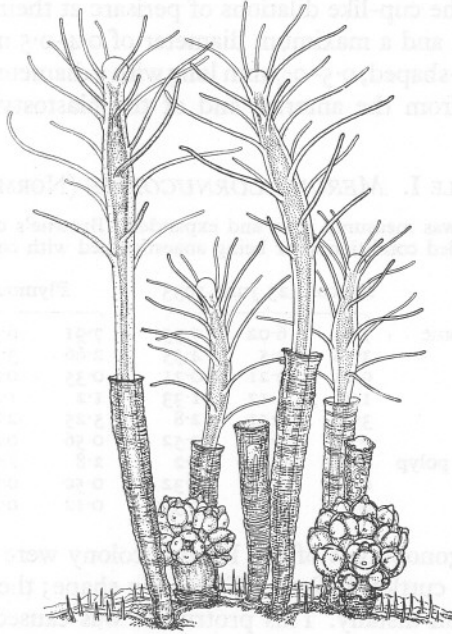


Fig. 1. *Merona cornucopiae* (Norman): a portion of a fertile colony dredged off Callot, Baie de Morlaix, 23 June 1955; drawn from life.

colour but posterior to it the digestive endoderm is orange brown to scarlet in colour, and this fades distally to an uniformly pale tint in the non-tentacular portion of the polyp. When brought in from the dredgings the polyps were contracted into their perisarc tubes with only the tip of the hypostome and the tips of the oral tentacles visible. They did not expand into full length until nearly 12 hours had passed. In the Roscoff colonies the perisarc is of a pale horn colour and rather opaque; it was usually covered with a fine layer of mud particles. The dimensions of the Roscoff and Plymouth colonies are given in Table I.

The gonophores in one of the Roscoff colonies were, as Norman stated, borne in the form of mulberry-like masses on very short stalks arising from

openings in the stolons. These reproductive polyps have short collars of perisarc at their point of origin on the stolons. It was noticed by Garstang (1892) that 'the blastostyles invariably possess a slender terminal portion, with a slightly dilated apex, which is prolonged beyond the mulberry-like mass of gonophores except when contracted. It is an interesting vestigial structure being homologous with the tentacular portion of a digestive polyp....'

In one of E. T. Browne's well-preserved colonies (B.M. No. 1941.3.20.516) these reproductive polyps had long stalks so that they had a total height of 1.75–3.5 mm, but the cup-like dilations of perisarc at their base had a height of only 0.4–0.6 mm and a maximum diameter of 0.4–0.5 mm (Fig. 2). Each gonophore was pod-shaped, 0.5–0.7 mm long with a diameter of 0.12–0.22 mm. They arise single from the anterior end of the blastostyle and not in any particular order.

TABLE I. *MERONA CORNUCOPIAE* (NORMAN)

The Roscoff colony was measured alive and expanded. Browne's colony from Plymouth was killed in an expanded condition after being anaesthetized with cocaine. Measurements in mm.

	Roscoff, 23 June 1955			Plymouth, 4 June 1898			
Total height to hypostome	7.0	6.02	7.35	7.91	6.3	9.59	7.28
Length of polyp	3.78	3.5	4.55	2.66	3.5	5.04	3.08
Diameter of polyp	0.21	0.21	0.21	0.35	0.28	0.28	0.28
Length of tentacle	1.36	1.12	1.33	1.2	1.25	1.3	1.1
Height of stem	3.22	2.52	2.8	5.25	2.8	4.55	4.2
Max. diameter of stem	0.56	0.5	0.52	0.56	0.49	0.56	0.42
Height of reproductive polyp	0.84	0.84	1.2	2.8	1.75	3.5	—
Diameter of gonophore	0.24	0.28	0.32	0.50	0.7	0.6	0.6
Length of gonophore	0.4	0.32	0.35	0.12	0.22	0.22	0.2

By contrast the gonophores of the Roscoff colony were styloid and rather like the eggs of the cuttlefish *Sepia officinalis* in shape; they were round with a teat-like protrusion distally. This protrusion was caused by the tip of the scarlet-coloured spadix. The eggs were pinkish in colour and few in number (two to six). Male gonophores were not seen by me.

#### Distribution

Although *Merona cornucopiae* is probably not a rare species in our waters, records of its occurrence are few, but these indicate that it may be found all round our coasts except perhaps in the southern North Sea. The species is known from the following localities: Shetland (Norman, 1864), Northumberland (Alder, 1867), 2 miles north-east of Bamborough Castle (Schulze, 1875), the Plymouth area (Garstang, 1892, 1894; Allen, 1899; Crawshay, 1912), the Isle of Man (Moore, 1933, 1937), Blacksod Bay, Ireland (Duerden, 1895) and the Eastern Channel (this paper, p. 500).

Outside British waters the hydroid has been taken at Roscoff (Teissier, 1950), the Faroes (Broch, 1916), the Eastern Kattegat (Kramp, 1935) and in the

Mediterranean (Graeffe, 1884; Motz-Kossowska, 1905). On the North American coast it has been recorded from New England by Verrill (1879) and by Fraser (1936) from Queen Charlotte Islands, British Columbia.

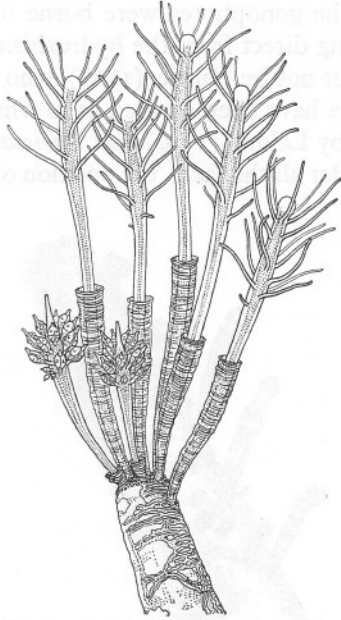


Fig. 2. *Merona cornucopiae* (Norman): fertile colony at the tip of a shell of *Dentalium entale*, Eddystone Grounds, Plymouth, 4 June 1898; E. T. Browne Collection (Brit. Mus. No. 1941.3.20.516). This colony was anaesthetized with cocaine.

### Biology

*Merona cornucopiae* exhibits a preference for the shells of molluscs as a substratum. Where the mollusc is a bivalve like *Glycimeris glycimeris*, the colonies are found at the posterior or postero-ventral margin of the valves, and the stems always lean towards this edge, so that the polyps when expanded project into the ciliary feeding currents of the host. Similarly, the colonies on *Dentalium* are found strategically placed close to the tip of the shell.

In British waters *Merona* has been found on *D. entale* L., *Astarte sulcata* (da Costa), *Glycimeris glycimeris* (L.) and *Venus fasciata* (da Costa), but it has also been found on dead gastropod shells of *Aporrhais*, *Turritella* and *Natica* inhabited by the sipunculid *Phascolion strombi*. Farther afield it has been reported on *Cardium* from the Faroes by Broch (1916) and on an old skeleton of a gorgonian at Banyuls by Motz-Kossowska (1905).

Fertile colonies of *Merona* have been taken at Plymouth in May and June. The species has a bathymetric range of 10–182 m in British waters, but it has been recorded from a depth of 274 m in the Faroes (Broch, 1916).

## DISCUSSION

When Norman first described his species *cornucopiae* he placed it in *Tubiclava* Allman 1863, but later decided (1865) that a new genus, *Merona*, must be created for it, because the gonophores were borne in clusters at the tips of short gonoblastidia arising direct from the hydrorhiza. *Merona* was accepted by Allman (1871-72), but not by Hincks (1868), who preferred to retain it in *Tubiclava*. Later authors have been divided as to what genus to use, and the conclusion was reached by Leloup (1930) that *Tubiclava* should be employed. As Leloup did not consider all the facts, the position of the species *cornucopiae* is discussed below.



Fig. 3. *Merona cornucopiae* (Norman): a sketch of one of Canon Norman's type colonies on *Dentalium entale* from the Shetlands (Brit. Mus. No. 1912.12.21.255).

The re-description of *M. cornucopiae* shows that the reproductive polyps are sometimes tall and may resemble nutritive polyps in which the tentacles had been resorbed through reproductive exhaustion (comparable to what takes place in species of *Hydractinia*, *Coryne* and *Zanclaea*). If this were so, it would narrow the distinction between *Merona* and the more typical *Clava*-like hydroids, but there is no evidence that the reproductive polyp ever possesses tentacles, and it is very significant that the *Merona* reproductive polyp never possesses more than a short collar of perisarc at the base. This last feature indicates that *Merona* possesses two distinct types of polyp and that the reproductive ones are not derived by reduction from the long-stemmed nutritive ones.

Leloup pointed out that *Merona* was distinguished from *Tubiclava* only by '(a) les gonophores prennant naissance sur des polypes reduits au blastostyle; (b) le perisarque lisse des ses hydranthes et assez large à sa partie pour recevoir l'hydranthe retracté'. Evidence has already been presented which

indicates that the reproductive polyps of *Merona* are special ones, not derived from the ordinary nutritive ones. Leloup based his case on the fact that the hydranths of a Mediterranean species, *Tubiclava pusilla* Motz-Kossowska, became reduced to blastostyles, so narrowing (in his opinion) the gap between the two genera.

Leloup, however, did not consider the status of *T. lucerna* Allman 1863; this, the type species, is a problematic one whose identity is uncertain, for Allman himself later doubted whether he had actually observed fixed gonophores in this species (Allman, 1872, p. 256). *T. lucerna* has a closely adherent perisarc below the hydranth, so that the latter is not retractile as in *Merona*, and more properly belongs to the group of hydroids which have at various times been referred to *Corydendrium*, *Dendroclava* and *Turritopsis*. Allman's second species *Tubiclava fruticosa*, described without knowledge of its gonophores, also belongs to this group (of which only *Turritopsis nutricula* McCrady is known from British waters from its medusa only). I propose to regard *Tubiclava* as a possible synonym of *Turritopsis*, but it should be noted that *Tubiclava pusilla*, on which Leloup based his arguments, does not appear to belong to the *Turritopsis* group, and its status will have to be clarified when it is found again.

*Merona* Norman may therefore be confidently accepted as a well-constituted genus for *Tubiclava cornucopiae*.

#### SUMMARY

*Merona cornucopiae* (Norman) is re-described from living material from the Baie de Morlaix, supplemented by a re-examination of material in the British Museum (Nat. Hist.). *Merona* Norman is demonstrated to be a valid genus while *Tubiclava* Allman (in which *M. cornucopiae* is placed by some authors) is shown to have affinities with the *Turritopsis-Corydendrium* group of clavid hydroids.

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