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Cumanotus beaumonti (ELIOT, 1906), A NUDIBRANCH ADAPTED FOR LIFE IN A SHALLOW SANDY HABITAT?

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ABSTRACT

Many of the anatomical peculiarities of the family Cumanotidae are possibly explained by the ecology of the species. New observations on the habitat and diet of the species *Cumanotus beaumonti* suggest that the broad foot, long muscular cerata modified for swimming and unusual spawn coil are adaptive features which enable *Cumanotus* to be successful in a shallow sandy environment feeding on the hydroid Corymorpha nutans.

INTRODUCTION

The aeolid nudibranch *Cumanotus beaumonti* has been rather enigmatic since its almost simultaneous discovery in southern England and Norway during the first decade of this century. Recent publications describing the British fauna have relied on the original descriptions of this species, and little was known about its habitat and ecology. The discovery of populations in Northern Ireland during 1985 and direct observations by SCUBA diving have provided new information about this attractive aeolid.

Synonymy

Coryphella beaumonti Eliot, 1906
Cumanotus laticeps Odhner, 1907

Description

The body is 20–25 mm long in mature specimens and the foot is broad, about 8 mm wide. There are prominent propodial tentacles at the front corners of the foot and small oral tentacles on the anterior corners of the head. Two smooth erect rhinophores are placed close together on the top of the head; they are shorter than the surrounding cerata (Fig. 1). The cerata are long and numerous, exceeding three-quarters of the body length; the anterior ones arise in front of the rhinophores. The cerata are arranged in rows, 6 rows of up to 9 cerata arise from the anterior liver ducts and 6–7 single rows of up to 8 cerata arise from the posterior liver. Elongate cnidosacs can be seen at the tips of the cerata. The anal papilla is on the right side of the body, between the cerata arising from the anterior and posterior liver. The coloration of the body is pellucid white, becoming rosy pink in the dorsal and head region. The digestive gland is purple in colour. The dorsal surface and cerata are speckled with gold-coloured pigment, concentrated in the head region.

The reproductive system consists of a coiled ampulla, two bursae, and a coiled vas deferens leading to a large penial sheath containing an extensively coiled penis. There are two distinctive rosettes of tubercles tipped with tiny chitinous hooks alongside the female aperture, as noted by previous authors.

The radula of a 20 mm preserved specimen consisted of 20 rows of teeth of formula 1—1—1. The central tooth is horseshoe-shaped, with a strong central denticle and 11–16 small denticles on either side. The lateral teeth also have strong main denticles and cutting edges of 13–20 small denticles. The radula tapers rapidly from the oldest row with central tooth 50 μm wide to the youngest row, with central tooth 200 μm wide.

Biology

Fifteen specimens were collected in June 1985 in Church Bay and one from Arkill Bay on Rathlin Island, Co Antrim, Northern Ireland. The animals were either crawling on a sea-bed of medium sand in 15 m of water or were at the tops of the stalks of the hydroid *Corymorpha nutans* M Sars, 1835, which was common on the sand. This hydroid consists of a solitary stem, 50–100 mm tall, bearing a single large polyp which measures 15–20 mm across the ring of long, undulating tentacles. Animals on the *Corymorpha* stems were

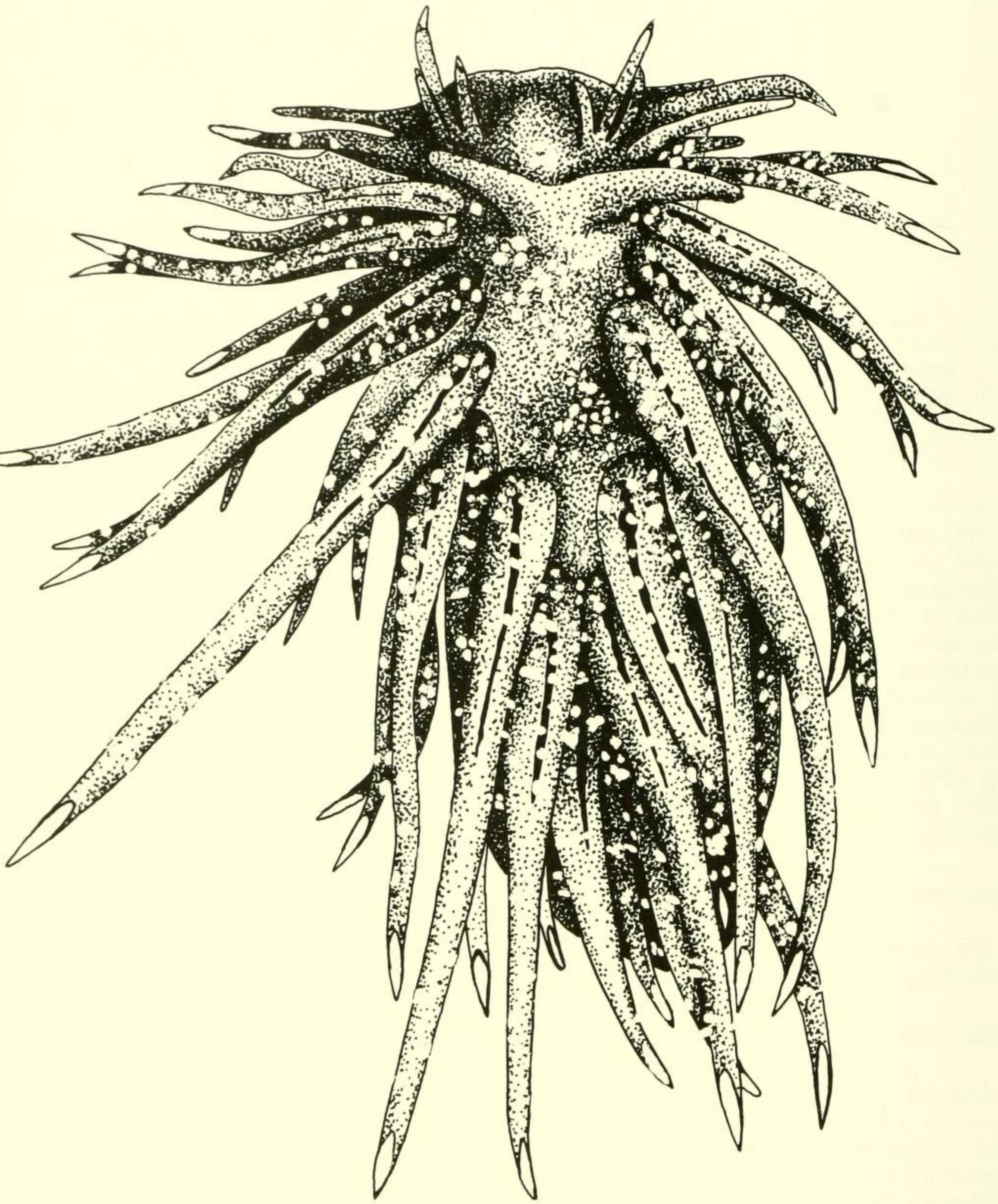

Fig. 1. *Cumanotus beaumonti,* dorsal view of a living specimen (length 20 mm).

in the process of devouring the polyps, and were inconspicuous, with their long, flowing cerata looking very similar to the tentacles of the hydroid. Spawn coils of *Cumanotus* were more numerous than the animals, and consisted of two to four turns of egg-bearing jelly attached to the sand by a long, string-like portion covered with sand grains. Specimens were seen to swim vigorously by moving their cerata in a co-ordinated back and forth motion when collected or disturbed.

DISCUSSION

Two other species of the family Cumanotidae have been described: *Cumanotus cuenoti* Pruvot-Fol, 1936, and *Cumanotus fer-*

naldi Thompson & Brown, 1984. *Cumanotus cuenoti* has recently been redescribed by Tardy & Gantès (1980) and is a smaller animal with no trace of oral tentacles or propodial tentacles and only 5–9 denticles on the central and lateral teeth. It has no surface pigmentation apart from a small orange mark on the head of some individuals. *Cumanotus fernaldi* was proposed as a new name for the species described as *Cumanotus beaumonti* by Hurst (1957) from the Pacific coast of North America. This species is illustrated by Thompson (1976), Thompson & Brown (1976), Behrens (1980) and McDonald & Nybakken (1980). It differs from *C. beaumonti* in colouration, having white apical bands of pigment on the cerata, yellowish-brown digestive gland and none of the gold speckling of *C. beaumonti.* Thompson (1984) reports that the radula is also different, with a slender central cusp flanked by up to 26 denticles on the central tooth and a short cusp on the lateral tooth flanked by 28 denticles.

All known species of Cumanotidae appear to feed on athecate hydroids. The present species feeds on *Corymorpha nutans* as reported above, *C. cuenoti* feeds on *Ectopleura dumortieri* and *Tubularia* according to Tardy & Gantès (1980), and Behrens (1980) reports that *C. fernaldi* feeds on *Tubularia. Cumanotus* species have a number of unusual features in which they differ from most other aeolid nudibranchs. Several of these features could be adaptations to life on unstable sedimentary sea-beds, feeding on transitional populations of hydroids. Tardy & Gantès (1980) point out the resemblance between the ceratal morphology, broad foot and spawn coils in *Cumanotus* and *Cerberilla* and suggest that *Cumanotus* may be capable of burrowing. The ability to swim up into the water column was reported for *C. fernaldi* and *C. cuenoti,* and is shared by the *C. beaumonti* populations reported here. Tardy & Gantès speculate on the possibility that this enables *Cumanotus* populations to follow medusae of their reproducing prey to areas down-current where new populations are being established. There is some evidence from the present observations that this may actually happen. On Rathlin Island there was a steady current of 0.5–1 knot and many more spawn coils than seemed possible for the observed population of *Cumanotus.* At sites off Kilkeel, Co Down, in May 1984 numerous spawn coils and stalks of Corymorpha nutans were seen on the muddy sand sea-bed, but no adult animals could be found despite extensive searching. Is it possible that the animals had exhausted their food supply at this site and dispersed en masse in search of new pastures?

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