

## NOTES ON THE MEDUSA *AMPHINEMA* *KRAMPI* RUSSELL

By F. S. RUSSELL, F.R.S.

The Plymouth Laboratory

(Text-figs. 1-3)

In a recent paper (Russell, 1956) I described a new medusa *Amphinema krampi* from a single specimen. I have now found three more specimens in collections made with a 2 m stramin ring trawl by R.V. *Sarsia*. Two of these were caught on 13 June 1956 at 48° 29' N., 9° 05' W. with 450 fathoms of wire out; one was a female 7 mm high and the other a male about 5 or 6 mm in height. The third specimen, a male 6.5 mm high, was taken on 4 July 1956 at 47° 03' N., 5° 47' W. with 880 fathoms of wire out. Of the three specimens the female being the best preserved was kept intact; the two males were used for sectioning.

It is now possible to add to my previous description of the species. As in the specimen already described, the umbrellas are crumpled and have their margins turned inwards. In the female, however, it is certain that there is a small apical projection. The radial canals leave the stomach below the lower limits of the gonads so that there are fairly long 'mesenteries'. The marginal tentaculæ are six in number in each specimen, two perradial and four interradial. It is possible therefore that the eight which I recorded in my first specimen may have been an abnormal number. The interradial female gonads are irregularly folded and much corrugated. All specimens have exactly the same coloration as that given in my previous description. A drawing of the female medusa is given in Fig. 1. The medusa bears a superficial resemblance to *Merga rubra* described by Kramp (1957, p. 14) from the Discovery Collections.

I was unable to see any discharged nematocysts so could not be certain of their type. Those on the marginal tentacles and small tentaculæ are 7-9  $\mu$

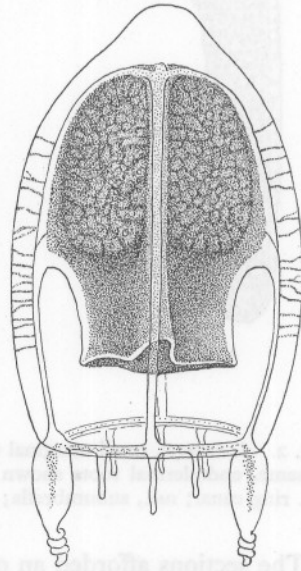


Fig. 1. *Amphinema krampi*, female, 7 mm high.

in length and appear to be micro-basic euryteles. The nematocysts along the margin of the mouth are longer, being about  $13\ \mu$  in length, and may also be micro-basic euryteles.

The two males were sectioned, one longitudinally and the other transversely. Sections show that the marginal tentacles are hollow. The small marginal tentaculæ are filled with endoderm cells, which are not arranged in a single row, and have endodermal roots which clasp the ring canal above and below (Fig. 2 *a-c*).

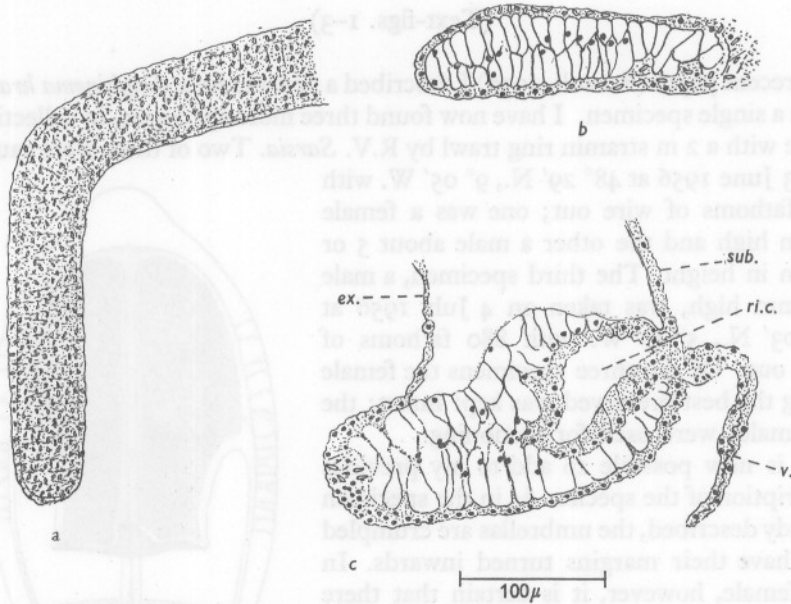


Fig. 2. *A. krampi*, small marginal tentacula. *a*, appearance of whole tentacula; *b*, *c*, sections of same, endodermal roots shown in *c*. The scale refers only to *b* and *c*. *ex.*, exumbrella; *ri.c.* ring canal; *sub.*, subumbrella; *v.*, velum.

The sections afforded an opportunity to make a closer examination of the peculiar strands of tissue which run from the radial canals to the surface of the exumbrella. It should be emphasized that these medusae, which had been preserved in formalin and sea water in which they had remained for several months, were not in a good state for histological observations. Nevertheless, it was possible to observe a number of details.

There may be as many as seventeen strands in any one radius. They are distributed at intervals from about the level of the mouth well up beyond the middle of the stomach, where they occur along the lines of attachment of the stomach to the subumbrella. The strands may run through the mesogloea in rather a tortuous manner; some of them branch towards the exumbrellar

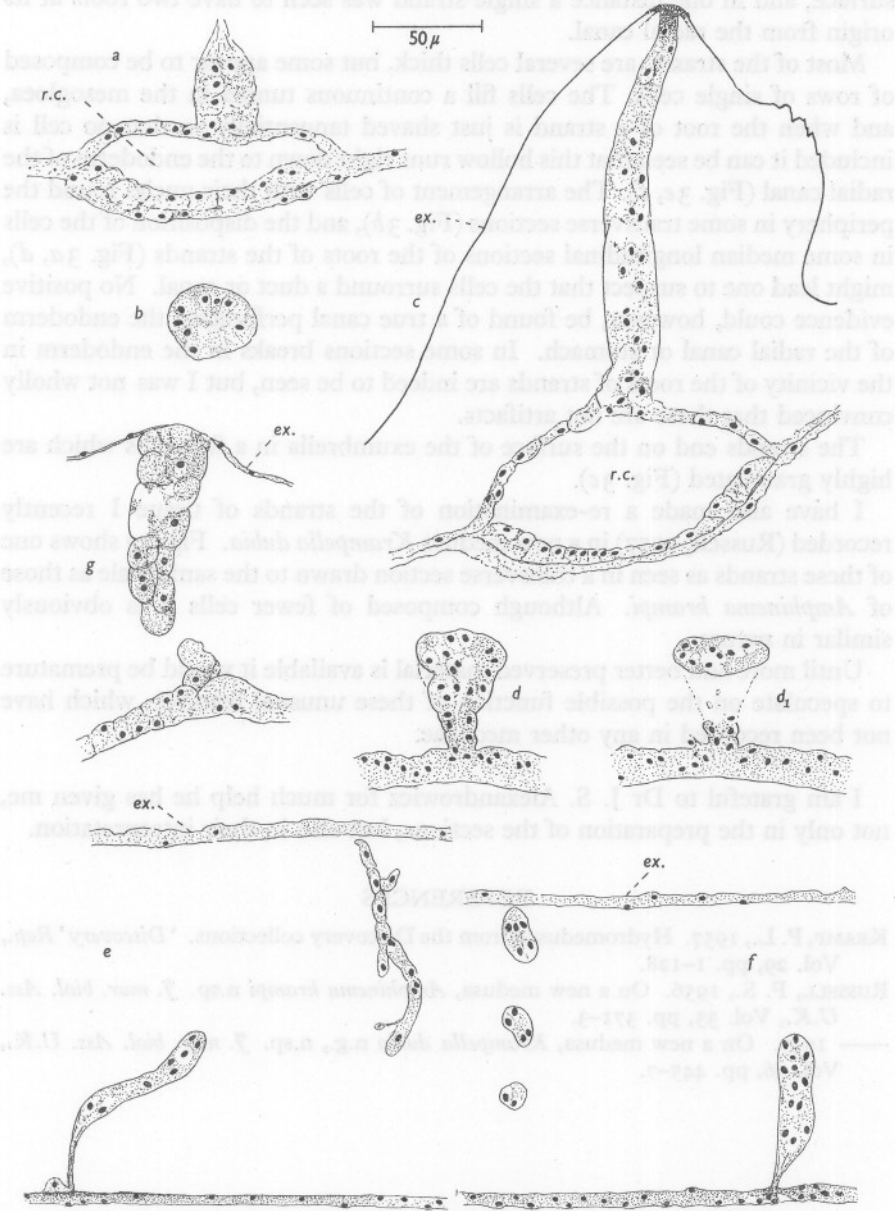


Fig. 3. Appearance of sections of cellular strands in mesogloea. *a-f*, *Amphinema krampi*; *g*, *Krampella dubia*. *a*, *b* and *c* are from transverse sections of medusae; *d*, *e* and *f* are from longitudinal sections; *d* and *d*<sub>1</sub> are consecutive sections. *ex.*, exumbrella; *r.c.*, radial canal. Camera lucida drawings, all to same scale as shown.

surface, and in one instance a single strand was seen to have two roots at its origin from the radial canal.

Most of the strands are several cells thick, but some appear to be composed of rows of single cells. The cells fill a continuous tunnel in the mesogloea, and when the root of a strand is just shaved tangentially so that no cell is included it can be seen that this hollow runs right down to the endoderm of the radial canal (Fig. 3*e, f*). The arrangement of cells with their nuclei round the periphery in some transverse sections (Fig. 3*b*), and the disposition of the cells in some median longitudinal sections of the roots of the strands (Fig. 3*a, d*), might lead one to suspect that the cells surround a duct or canal. No positive evidence could, however, be found of a true canal perforating the endoderm of the radial canal or stomach. In some sections breaks in the endoderm in the vicinity of the roots of strands are indeed to be seen, but I was not wholly convinced that these are not artifacts.

The strands end on the surface of the exumbrella in a few cells which are highly granulated (Fig. 3*c*).

I have also made a re-examination of the strands of tissue I recently recorded (Russell, 1957) in a new medusa *Krampella dubia*. Fig. 3*g* shows one of these strands as seen in a transverse section drawn to the same scale as those of *Amphinema krampi*. Although composed of fewer cells it is obviously similar in nature.

Until more and better preserved material is available it would be premature to speculate on the possible function of these unusual features, which have not been recorded in any other medusae.

I am grateful to Dr J. S. Alexandrowicz for much help he has given me, not only in the preparation of the sections, but also in their interpretation.

#### REFERENCES

- KRAMP, P. L., 1957. Hydromedusae from the Discovery collections. 'Discovery' Rep., Vol. 29, pp. 1-128.
- RUSSELL, F. S., 1956. On a new medusa, *Amphinema krampi* n.sp. *J. mar. biol. Ass. U.K.*, Vol. 35, pp. 371-3.
- 1957. On a new medusa, *Krampella dubia* n.g., n.sp. *J. mar. biol. Ass. U.K.*, Vol. 36, pp. 445-7.