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ON A NEW SPECIES OF SCYPHOMEDUSA, *ATOLLA VANHÖFFENI* N.SP.

By F. S. RUSSELL, F.R.S.
The Plymouth Laboratory

(Plate I and Text-fig. 1)

It seems to be the general opinion that there are only two species of *Atolla*, *A. wyvillei* Haeckel, with smooth marginal lappets, and *A. chuni* Vanhöffen in which the marginal lappets have warts.

But Vanhöffen (1902, p. 21, pl. v, figs. 27–29) described in some specimens organs which he thought might be excretory in function. These organs appeared as eight dark spots disposed radially on the subumbrellar walls of the stomach where the gastric cavity narrows towards the ostia. In these dark spots the ectoderm and endoderm cells are higher than those in the neighbouring areas, the ectoderm cells being more darkly pigmented than the endoderm cells. Sections do not show any passage through the mesogloea so that there are in fact no pores.

Maas (1903, p. 10, and 1904, p. 52) drew attention also to these spots and reproduced an excellent photograph of a specimen with them (Maas, 1903, pl. XII, fig. 108).

They were subsequently referred to by Stiasny (1934, p. 52) who saw them in some of the specimens in the 'Discovery' collections.

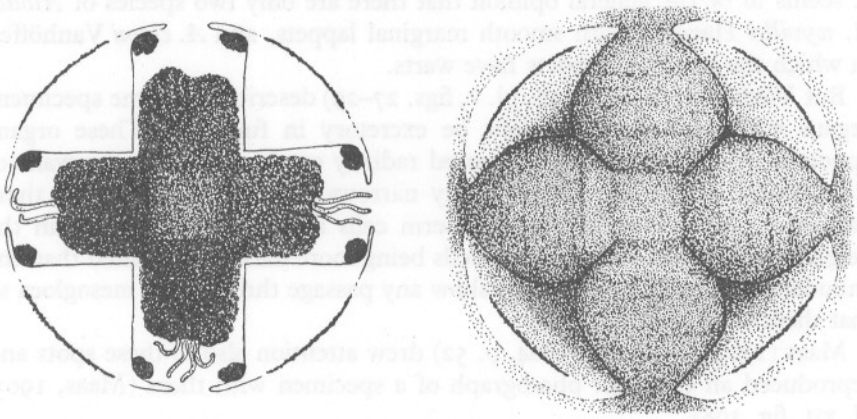
Recently I found two such specimens in a collection made on R.R.S *Discovery II* with a 2 m stramin ring trawl hauled obliquely from *ca.* 2400 m at 39° 38′ N., 11° 30′ W. on 26 February 1956 (Discovery Station 3370). The general appearance of these medusae was so different from that of all the other specimens of *Atolla* that I had seen that I suspected they might belong to a separate species. I was fortunate enough to find another such specimen in a collection made on R.V. *Sarsia* with a 2 m stramin ring trawl with 900 fathoms of wire out at 47° 03′ N., 5° 47′ W., on 3 July 1956. This specimen was in an excellent state of preservation, and with it was another well-preserved specimen of the same size without spots and with the pigmentation typical of *A. wyvillei*. It could be seen at once that they were so different that they must be specifically distinct (Pl. I).

Besides the difference of the presence or absence of the eight spots there are other quite obvious distinctions.

In the medusae with spots the basal attachment of the stomach forms a cross whose arms slope downwards towards the umbrella margin and are of approximately uniform width until they narrow suddenly to form the ostia into

the gastrovascular sinus (Text-fig. 1*a*). In the typical *A. wyvillei* the basal attachment is quite different and has rather the form of a four-leaved clover (Text-fig. 1*b*).

In the medusa with spots the umbrella is almost entirely unpigmented, except for some faint pigmentation at the bases of the marginal tentacles; some clusters of minute spots on the ring muscle; and four curved lines of pigment along the bases of the four triangular septa. The gonads are yellowish brown on the exumbrellar side, and this pigmentation curves over the side of each gonad leaving a circular patch free of pigment on the subumbrellar side; one gonad is missing in this specimen (Pl. I).



Text-fig. 1. Exumbrellar view of the base of the stomach of *a*, *Atolla vanhöffeni* n.sp., and *b*, *A. wyvillei*. For clarity the buccal portion of the stomach has been omitted.

The stomach and the eight spots are intense blackish purple. The pigment stops short before the end of each arm of the cross leaving transparent spaces in which one or two of the pigmented gastric cirri may be seen. Beneath these transparent areas are the perradial pillars of jelly running down the outside of the buccal walls of the stomach.

This pigmentation is in marked contrast to the varying range of coloration to be found on the umbrella of *A. wyvillei*, in which the pigment is more reddish brown in colour. Even those specimens of *A. wyvillei*, in which only the stomach and gonads are pigmented (group I of Broch, 1913, p. 15), are immediately distinguishable by the shape of the base of the stomach and its reddish brown colour.

Vanhöffen (1902) described the dark spots in a general account of the histology of the genus *Atolla*, ascribing the character to no single species. Maas (1903, pl. I, fig. 4; pl. XII, fig. 108) figured the spots as *A. valdiviae*, but later (Maas, 1904, pl. V, fig. 38) as *A. bairdi*. Stiasny (1934) referred to them under a general account of *A. wyvillei*.

Since, therefore, the species with spots cannot be allocated to any known specific name I propose to call it *A. vanhöffeni* n.sp. in honour of Ernst Vanhöffen who was the first to draw attention to the occurrence of the spots.

I have so far seen three specimens: these were 15, 18 and 20 mm in diameter. Two of these had twenty tentacles, but the third was cut up for sectioning before they were counted. Two were females and one male. In the female shown in Pl. I each gonad had one very large egg about 1 mm in diameter with a few smaller eggs.

Pl. I gives a photograph of *A. vanhöffeni*, and, for comparison, the specimen of *A. wyvillei* found with it in the same collection.

I hope that I may find more specimens of *A. vanhöffeni*, when it may be possible to determine other specific characters. At any rate the following characters are quite sufficient for the identification of the species.

A. vanhöffeni	*A. wyvillei*
With eight pigment spots	Without pigment spots
Umbrella almost completely unpigmented	Umbrella with characteristic pigment pattern
Base of stomach in form of a cross	Base of stomach in form of a four-leaved clover
Colour of stomach and spots blackish purple	Colour of stomach and on umbrella brownish red

The largest specimen I have is 20 mm in diameter. It seems possible that *A. vanhöffeni* may not grow to so large a size as *A. wyvillei*, since all previous authors when recording specimens with spots have remarked that they are usually young specimens.

The specimen of *A. vanhöffeni* figured in Pl. I has been deposited in the British Museum (Natural History) and has been given the registration number B.M. 1957.1.30.1.

My thanks are due to Dr J. A. C. Nicol who preserved two of the specimens for me while on a cruise on R.R.S. *Discovery II*; to Captain C. A. Hoodless and the crew of R.V. *Sarsia* who collected the fine specimen on which the above account is based; and to Mr A. C. G. Best who took the photographs reproduced in Plate I.

SUMMARY

In 1902 Ernst Vanhöffen drew attention to the occurrence of eight dark pigment spots in *Atolla* which he thought might be excretory organs.

It is shown that these spots are a specific character occurring only in some specimens, and medusae with this character have been named *Atolla vanhöffeni* n.sp. This species can now be distinguished from *A. wyvillei* by other characters.

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Note added in proof

I have now found two more specimens of *A. vanhöffeni*, both collected from 47° 09′ N., 7° 38′ W. on 21 July 1955. One was a small specimen 8 mm in diameter: it had 18 marginal tentacles and developing female gonads. The other, beautifully preserved, was 25 mm in diameter; it had 20 marginal tentacles and was a female with one very large egg among other eggs in some of the gonads. This specimen differed from the description given above in that the muscles at the bases of the marginal tentacles were strongly pigmented.

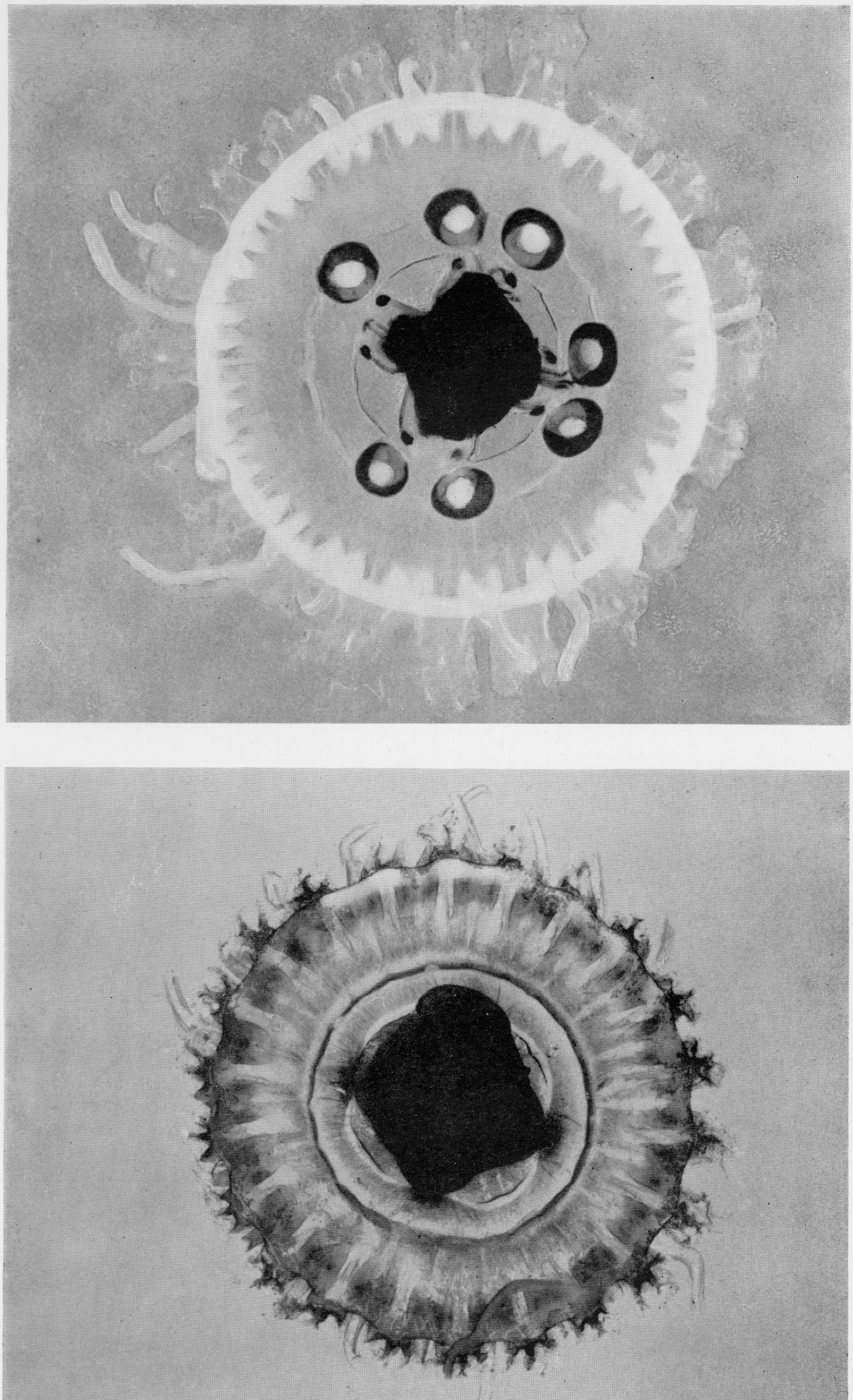
Through the kindness of Dr P. L. Kramp I have also been able to see several specimens of *A. vanhöffeni* picked out from the collections of *Atolla* from the Atlantic in the Universitetets Zoologiske Museum in Copenhagen by Dr Kay Petersen. The details are given below.

			Metres wire	Diameter (mm)	Sex	No. of tentacles
Thor						
3. ix. 1906	St. 180	48° 19′ N., 13° 53′ W.	—	12	♀	20
28. ii. 1909	St. 69	36° 13′ N., 9° 44′ W.	600	15	♀	20
4. iii. 1909	St. 71	39° 35′ N., 9° 45′ W.	600	13	♀	20
				12	♀	20
				11	♀	20
				10	? ♂	20
				8	?	Damaged
4. iii. 1909	St. 71	39° 35′ N., 9° 45′ W.	1600	29	♀	19
18. vi. 1910	St. 91	35° 53′ N., 7° 26′ W.	1600	10	♂	20
				10	No gonads	20
				9	No gonads	20
				8	♀	20
				7	? ♀	19
				6	♀	20
				9	♂	Damaged
9. ix. 1910	St. 232	36° 28′ N., 9° 06′ W.	2000	16	No gonads	20
				16	♀	20
				13	♂	20
Dana						
1. vii. 1931	St. 4206 II	53° 38′ N., 29° 41′ W.	600	25	♀	20

It will be noted that nearly all these specimens had 20 marginal tentacles, and none had more. I have now examined 21 complete specimens, 18 of which had 20 tentacles, two had 19, and one had 18. It seems probable that this is a constant character distinguishing the species from *A. wyvillei* in which the number of tentacles is typically 22.

EXPLANATION OF PLATE I

Above, *Atolla vanhöffeni* n.sp.; below *A. wyvillei*. Both specimens were collected from 47° 03′ N., 5° 47′ W. on 3 July 1956. They are photographs from the subumbrellar side and are both enlarged × *ca.* 4·5.



(*Facing p.* 280)