SOME ASCIDIANS FROM NAMIBIA
(SW AFRICA)

by

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1. SUMMARY

This paper describes the ascidian fauna collected off Namibia during the research cruises Benguela V, VI, VII, and VIII of the Institute of Sea Sciences of Barcelona.

We identified nine species of ascidians, three of which (*Aplidium aff. fuegiense*, *Polysyncraton bilobatum* and *Ascidia challengeri*) are new additions to the ascidian fauna of the shores of the Southern Africa.

Resumen

El presente trabajo describe la fauna de ascidias recolectadas en las costas de Namibia durante las campañas Benguela V, VI, VII y VIII del Instituto de Ciencias del Mar de Barcelona.

Se han identificado nueve especies de ascidias, tres de las cuales (*Aplidium aff. fuegiense*, *Plyodycratop bilobatum* y *Ascidia challengeri*) representan nuevas adiciones para la fauna de ascidias del Sur de Africa.
2. INTRODUCTION

The description of the ascidian fauna of the South and Southwest coasts of Africa has been the subject of several scientific publications since the pioneer account of the Challenger (Herdmann, 1882, 1886). Since this first account, numerous other scientists have contributed to the issue, notably Sluiter (1898), Hartmeyer (1913), Michaelson (1923, 1934) and Millar (1955, 1962, 1964, 1968). The study of the ascidian fauna of these regions, however, has not been as extensive as the study of the ascidian fauna of the West African region (see Millar, 1955 for a review).

Here I contribute to the study of the ascidian fauna of Southwest African coast by describing the species collected off Namibia. All specimens, but one sample collected directly in the littoral zone, were obtained by trawling along the bottom during the research cruises Benguela V, VI, VII and VIII of the Institute of Sea Sciences of Barcelona.
3. SPECIES LIST

The samples (Table 1) comprised nine different species of ascidians that were identified as the following.

Order ENTEROGONA Perrier, 1898
  Suborder APOUSOBANCHIATA Lahille, 1890
    Family POLYCLINIDAE Verrill, 1871
      Aplidium aff. fuegiense Cunningham, 1871
      Aplidium colleloides (Herdman, 1886)
  Familia DIEMNIDAE Verrill, 1871
    Lissoclinum aff. cavum Millar, 1962
    Polysyncraton bilobatum Lafargue, 1968
    Trididemnum cerebriforme Hartmeyer, 1913

Order PLEUROGONA Perrier, 1898
  Suborder PHLEBOBANCHIATA Lahille, 1890
    Family ASCIDIIDAE Herdman, 1880
      Ascidia challenger Herdman, 1882
    Family CORELLIDAE Lahille, 1887
      Corella eumyota Traustedt, 1882
  Suborder STOLIDOBANCHIATA Lahille, 1890
    Family STYELIDAE Sluiter, 1895
      Styela sp.
    Family MOLGULIDAE Lacaze-Duthiers, 1877
      Mulgula scutata Millar, 1955
4. TAXONOMIC NOTES

_Aplidium aff. fuegiense_
(Figure 1)

References

_Aplidium fuegiense_ Van Name (1945), p. 43.
_Aplidium fuegiense_ F. Monniot (1970), P. 325.
_Aplidium fuegiense_ Monniot & Gailh (1978), p. 143, fig. 4a.

Material

Benguela VI, P 79, 8 colonies.

Description

The colonies of this species are built of small cylindrical masses with flattened tops. Several of these units may be united by a basal layer of test. These masses reach 1 cm in height and 1.5 cm in diameter. The test has a brownish color, with sand intrusions in the basal zone. The outer portion of the tunic is firm and cartilaginous, whereas the inner zone has a soft consistency.

No regular system of zooids has been observed. Their examination is made difficult by the poor state of preservation of the specimens, which are very contracted. Despite this problem I have been able to count 15 to 20 rows of stigmata in the branchial sac. The oral aperture has six lobes, whereas the atrial languet has a median lobe and two small lateral lobes.

The stomach has 5-6 longitudinal folds. Many zooids present gonads, although only one larva (obviously not fully differentiated) was found.

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Fig. 1. _Aplidium aff. fuegiense_ Cunningham, 1871. a) aspect of one colony; b) part of the thorax of a zooid; c) stomach; d) developing larva.
Remarks

Because of the remarkable plasticity of *Aplidium fuegiense* (e.g.) its taxonomy is difficult. Some authors consider that many other species are in fact synonymous of *Aplidium fuegiense* (e.g. Van Name, 1945; Kott, 1969), whereas it is possible that *Aplidium fuegiense* be in fact a group of different, morphologically similar, species.

The characters of the colonies are in agreement with the descriptions of *Aplidium fuegiense*, although the poor state of preservation of the material does not preclude a misclassification of these specimens.

Distribution

This species has a wide circumantarctic repartition (Kott, 1969).

*Aplidium colleloides* (Herdmann, 1886)

(Figure 2)

References

* Amaroucium colleloides Herdmann (1886), p. 233; pl. XXXVII, figs. 9-12.
  * Aplidium colleloides Millar (1962), p. 125, fig. 4.

Material

Benguela VII, P 48, 1 colony.

Description

This species has pedunculated colonies, with an oval head and a long and narrow stalk (the colony examined was 4.8 cm long, 2.3 cm corresponding to the stalk). The stalk is heavily incrusted with sand, whereas there are only some scattered sand grains in the tunic of the head.

The zooids are rather contracted. The oral siphon has six lobes, and there is a simple atrial langet opposite to the fourth row of stigmata. The atrial aperture of the zooids is generally large. The total number of rows of stigmata ranges between 10 and 15. The stomach has 10-14 longitudinal folds. Developed gonads were observed in many of the zooids examined, these have an anterior ovary and testis comprised of numerous follicles approximately arranged in a double series. Some zooids have a pair of larvae incubating in the atrial chamber. No fully developed larva has been found.

Distribution

The original record of *Herdman* (1886) is based on a single specimen found near the Cape of Good Hope, and more recent accounts also report this species in South African (Millar, 1962), and Australian (Kott, 1972a, 1972b) waters.

*Lissocrinum* aff. *cavum*

References


Material

Benguela VII, P 40, 1 colony.

Description

The colony found was small (1.5 cm²) and encrusting. The tunic had two layers with numerous spicules. The spicules had about 30 rays (with either rounded or square ends) in their visible portion.

The zooids are suspended between the two layers of tunic. The wing-shaped thoracic organs lie between the second and third row of stigmata. The testis is formed by 4-5 male follicles, with the straight sperm duct emerging from the centre of the testis.

Remarks

The colony examined shows a good agreement with the description of *Millar* (1962), with the exception of the thoracic organs. The thoracic organs appear in the original description as two ovoid masses of spicules in the postero-ventral margins of the thorax. The figure corresponding to this description shows these spiculair masses somewhat detached from the thorax, thus it is possible that its apparent position in the figure differs from its true anatomical location. The identification of this specimen as *Lissocrinum cavum*, therefore, should be regarded with caution until the anatomical location of the thoracic organs is clearly established.
Distribution

*Lissoclinum* aff. *cavum* has only been reported in South African waters (Millar, 1962).

Fig. 2. *Aplidium cololoides* (Herdman, 1886). a) zooid; b) developing larva; c) general aspect of the colony.
Polysyncraton bilobatum Lafargue, 1968

References

Polysyncraton bilobatum Lafargue (1968), p. 401, fig. 8.

Material

Benguela VII, P 48, 1 colony.

Description

The colony resembles a thin rounded sheet (1.5 cm²). The tunic is densely packed with spicules with 12 to 19 rays in the visible sector. There is no cloacal languet. The thoracic appendix is rather long, and the thoracic organs are small and are located between the second and third row of stigmata. The testis is formed by two follicles surrounded by a coiled (about 7 turns) sperm duct.

Remarks and distribution

This colony resembles closely the European specimens of Polysyncraton bilobatum. This species was first described in the French Atlantic and Mediterranean coasts, and has been recently reported near Dakar (Lafargue & Wahl, 1987). Our record of this species off Namibia extends considerably its range of distribution. It is possible, however, that Polysyncraton bilobatum be in fact a group of morphologically close species.

Tridemnum cerebriforme Hartmeyer, 1913

(Figure 3)

References

Tridemnum cerebriforme Hartmeyer (1913), p. 139; pl. 7, fig. 1; pl. 8, fig. 4,5.
Tridemnum cerebriforme Millar (1955), p. 178, fig. 9.

Material

Benguela VIII, P 39, 1 colony.

Description

The colony was found growing on a Bryozoan. The colony has an irregular shape (5 × 3.5 cm), and a smooth surface. The spicules are scattered throughout the tunic, with about 15 rays in the visible sector.

Most zooids have a black spot in the upper end of the endostyle. The atrial siphon extends opposite the third row of stigmata. There is a circular, cup-shaped thoracic organ between the second and third row of stigmata, although it may occasionally appear on the upper portion of the third row. The size of the thoracic organ is variable, and often quite large. The number of stigmata per row reaches up to 8-11 in some well expanded thoraces. The testis has a single male follicle, connected to a sperm duct with 7-8 spiral coils.
Remarks

The colony examined agrees well with previous descriptions. The zooids collected in this study have a black spot over the top of the endostyle. Millar (1955, 1962) pointed out the great variability in the extent of the dark pigmentation of the thorax.

The basal zone of this colony bore a large number of unidentified foraminifera.

**Ascidia challengeri** Herdman, 1882
(Figure 4)

Distribution

This species has been reported from South African and Australian waters, as well as in the Indo-Pacific region (Hartmeyer, 1913; Eldredge, 1966; Kott, 1972b).

References

*Ascidia challengeri* Herdman (1882), p. 202, pl. XXX.
*Ascidia challengeri* Kott (1969), p. 90, fig. 119, 120.
*Ascidia challengeri* Monniot & Monniot (1973-74), p. 720 (and Table 1).
*Ascidia challengeri* Kott (1985), p. 32, fig. 8e, pl. la.

Material

Benguela VI, P 48, 1 individual.

Description

The individual examined has an elongated body (12 cm length, 3 cm diameter), narrowing towards

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**Fig. 4. Ascidia challengeri, Herdman, 1882.**

a) general aspect; b) dissected mantle; c) pericorial area; d) digestive tract with gonads.
the anterior part and attached by the posterior end. The test is smooth and transparent. The atrial siphon is prominent and has its opening near the anterior end of the body. Further details on this part of the body cannot be provided because the external part of the oral siphon is missing from the specimen.

There are up to 50 simple tentacles; the pericoronar area is small, and the dorsal tubercle has a W-shaped opening. The ganglion is located near the dorsal tubercle.

The branchial sac has a series of longitudinally arranged vessels (50 on the left side, 53 on the right) with protruding intersection papillae. No intermediate papillae have been observed. There are 4-5 stigmata per branchial mesh. The dorsal lamina has a smooth margin.

The most conspicuous feature of the digestive tract is the long and narrow terminal intestine (because of the anterior location of the atrial siphon).

The gonads are located in the gut loop, and both ducts, filled with sexual products, develop along the posterior intestine.

Remarks

The characters observed in the specimen examined lie well within the range of variability reported for Ascidia challengeri, with the possible exception of the siphons, which are somewhat closer than reported by other authors. This observation, however, is only cautionary, because the extensive damage of this part of the body of the specimen precludes any further assertion. In general, the good agreement between the characteristics of this specimen and previous accounts of Ascidia challengeri, as well as the great variability of this species (C. Monniot, 1978), recommends its classification as this species.

Distribution

This species has a broad Antarctic and Subantarctic distribution (Kott, 1985).

Corella eumyota Traustedt, 1882
(Figures 5, 6)

References

Corella eumyota Traustedt (1882), p. 273; pl. IV, fig. 2, 3; pl. V, fig. 13, 14.
Corella eumyota Van Name (1945), p. 212; pl. 22, fig. 2, 3.

Material

Benguela VII, FL1, 7 individuals.

Description

This individuals reach up to 3 cm in length, and have a laterally compressed oblong body. The tunic is translucid or whitish, and sometimes presents small tubercles.

The oral siphon has eight lobes, whereas the atrial siphon is six-lobed. The mantle is delicate.

The tentacles are simple and exceed a hundred in number. The dorsal lamina is divided in languets. The branchial sac develops longitudinal vessels (over thirty on each side). The stigmata are spiral, with primary and accessory spirals.

The digestive tract is located in the right side of the body. The stomach is plicated. The gonads ramify over the intestinal loop: the testicles lie in its periphery, whereas the ovaric follicles occupy a more central position.

Distribution

This is a circumpolar species, occurring in the Antarctic and Subantarctic waters (Van Name, 1945; Kott, 1985), and it was first reported for the South African region by Sluiter (1898).
**FIG. 5.** *Corella eumyota* Traustedt, 1882. *a*) dissected mantle; *b*) digestive tract with gonads.

**FIG. 6.** *Corella eumyota* Traustedt, 1882. SEM image of the branchial wall, as seen from inside *a*) and outside *b*) (*× 70*)
Styela sp.
(Figure 7)

Material
Benguela VIII, P 4, 2 individuals.

Description
The two specimens were found growing on the tunic of an specimen of Molgula scutata.

The largest of them measures 6 × 4 × 5 mm. It has a globular shape, with a broad fixation area. The tunic is thick and with a yellowish appearance, and has some sand grains adhered to it. There are a few short, root-like, processes emerging from the ventral part. The siphons are quadrangular and located next to each other.

This animal has about sixty elongated and simple oral tentacles, and the atrial velum is divided in filamentous languets. The dorsal tubercle aperture is a curved transversal slit. The branchial sac shows four folds on each side, and the dorsal lamina has a smooth margin.

The highly developed digestive tract has a cylindrical stomach with 20-25 longitudinal folds, and a long intestine with several loops. It occupies most of the space of the left side of the animal.

The gonads have an elongated ovary and a poorly developed male organ, comprised of a few male follicles located very close to the ovary in the distal portion of the gonad. There are two gonads in the left side and only one in the right side of the body. Big endocarps are also scattered along both sides of the mantle.

Although the smaller specimen (2.5 mm) has no gonads, its digestive tract is as developed as in the larger specimen.

Remarks
The asymmetry in the number of gonads at each side of the sexually mature specimen is rather unusual. This feature makes it difficult to assert with great certainty the taxonomical identity of this specimen, which may be either an aberrant form of Styela stephensoni Michelsen, 1934 (Michelsen, 1934) or Styela marquesana Michelsen, 1918 (as described in Millar, 1955).

FIG. 7. Styela sp. a) dissected mantle; b) gonads of the left side, intestinal loop removed.
**Molgula scutata** Millar, 1955
(Figure 8)

References


Material

Benguela V, P 6, 1 individual.
Benguela VI, P 90, 2 individuals.
Benguela VII, P 34, 1 individual.
Benguela VIII, P 4, 1 individuals.
Benguela VIII, P 6, 11 individuals.
Benguela VIII, P 13, 19 individuals.
Benguela VIII, P 54, 21 individuals.

Description

The specimens have a cylindric to ovoid shape, reaching 4 cm in length. The siphons emerge very close to each other from a characteristic flat protuberance on the tunic. The test is thin and cartilaginous, covered to a variable degree with sand. The muscles of the mantle end abruptly a short distance from the siphons.

The tentacles are branched (up to 12 in number) and the dorsal tubercle varies greatly in shape. The branchial sac has a smooth dorsal lamina and seven folds on each side.

The stomach has hepatic papillae somewhat aligned. The intestinal loop is narrow, and its branches lie very close one another. There is a gonad in each side of the animal, each comprising an elongated ovary surrounded by testes. The sperm duct and oviduct run together along most of their length. The renal sac is large and slightly curved.

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**Fig. 8. Molgula scutata** Millar, 1955. a) general aspect, tunic removed; b) dissected mantle; c) several aspects of the dorsal tubercle; d) renal sac and right gonad.
Remarks

These specimens agree very well with the original description by Millar. *Molgula scutata* is by far the most abundant species in the area covered by this study, and appears to be the dominant ascidian species in these benthic systems.

Distribution

This species has been reported only for South African waters (Millar, 1955, 1962).
5. BIOGEOGRAPHIC REMARKS

Most of the species identified in this study are of Subantarctic affinities, and have a wide distributional range. Among the species comprised in this study only *Lissoclinum cavum* and *Molgula scutata* had been reported only in the South African region in the past. This study provides the first account of *Aplidium aff. fuegiense* and *Ascidia challengeri* for the Southern Africa. Finally, the description of *Polysyncraton bilobatum* in South Atlantic waters represents a new addition to the fauna of these waters.
6. ACKNOWLEDGEMENTS

The author thanks Dr. E. Macpherson (Institute of Sea Sciences, Barcelona), for kindly making available the material collected during the Benguela research cruises. I also wish to thank Dr. F. Laffargue (Arago Laboratory, Banyuls-Sur-Mer) for her help in the classification of some members of the family Didemnidae.
### Table 1

List of samples where ascidian specimens were found.

<table>
<thead>
<tr>
<th>Campaign</th>
<th>Sample</th>
<th>Date</th>
<th>Depth (m)</th>
<th>Initial Position</th>
</tr>
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<tr>
<td>BENGUELA V</td>
<td>P6</td>
<td>14-7-83</td>
<td>163</td>
<td>23° 33,5' S – 13° 52,5' E</td>
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<tr>
<td>BENGUELA VI</td>
<td>P79</td>
<td>28-1-84</td>
<td>413</td>
<td>27° 03,2' S – 14° 07,5' E</td>
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7. REFERENCES


