

*Short Communication*

Developmental Anomaly and Deformity in *Fungia fungites* (Anthozoa: Scleractinia: Fungidae) from Suakin and Port Sudan, Red Sea, Sudan

Zuheir N. Mahmoud<sup>1\*</sup>

<sup>1</sup>Department of Zoology, Faculty of Science, University of Khartoum, Sudan.

\*Corresponding address: Prof. Zuhier Mahmoud, email: zuheirnm@hotmail.com.

Tel. 00249122929940 or 00249911300333,

ORCID number: 0000-0002-3257-0206

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**Abstract**

**Background:** The objective of this work is to describe two developmental anomalies and some deformity patterns of the mushroom coral *Fungia fungites*.

**Methods:** Macroscopic investigation of coral material was made by a hand lens.

**Results:** Unlike deformity, developmental anomaly is extremely rare in *Fungia fungites*.

**Keywords:** Anomaly, Deformity, *Fungia fungites*, Corals.

## Introduction

*Fungia fungites* (Linnaeus, 1758) are solitary free-living mushroom corals [1,2] detached from a stalked juvenile [3]. They are usually found in sandy areas near the base of stands of reef-building corals, and on rubble slopes at the outer edges of fringing reefs [4]. They feed on items ranging from bacteria to mesozooplankton [5]. Its corallum (disc), mostly 10cm in diameter and in some may attain 33cm. The corallum is circular or oval with distinct oral and aboral surfaces [4]. From the central mouth septo-costae form straight ridges that radiate out to the tip. Corals of *F. fungites* are found in various bright colors. Adequate description of the habitat of *F. f. fungites* and *F. (Lobactis) scutaria* based on specimens including type material was made by [6]. The details of their morphology and septo-costal ornamentations were provided using scanning electron microscopic in case of *F. f. fungites* and close-up photographs in case of *F. (Lobactis) scutaria*. Fungiid spp. Now, for all material, *Fungia fungites* is the valid name. According to [7] the species is Near Threatened ver 3.1 (IUCN Red List).

The old literature described over 30 *Fungia* species, but recent studies based on both

molecular and morphological evidence reduced the number to a single valid species *fungites* [8,9]. According to [8] *F. fungites* is the sister taxon of a clade with *Halomitrapileus*, *Halomitraclavator* and *Danafungiascruposa*. It was stated that *F. fungites* is a species complex that masks phenotypic variation [10].

## Material and Methods

Two developmental anomalies were obtained from antique merchants. One specimen was purchased from Suakin in 1995 (Fig. 1) and the second was purchased from Port Sudan in 2009 (Fig. 2). In addition, several deformed *F. fungites* were collected and/or purchased from both locations. The investigation spanned from 1995 to 2020. A hand lens was used to examine each specimen. Photography was made by a Nikon DX (AF-S NIKKOR 18-55mm 1:3.5-5.6G).

## Results and Discussion

The developmental anomaly of *F. fungites* (Fig. 1a and b) from Suakin is approximately 113cm<sup>2</sup> and is firmly joined. The cleavage line is not straight and led to formation of a large and a small disc. In the small disc the attachment scar is slightly raised probably due to growth overlap. The septa, above and underneath the coral are clearly vertical.

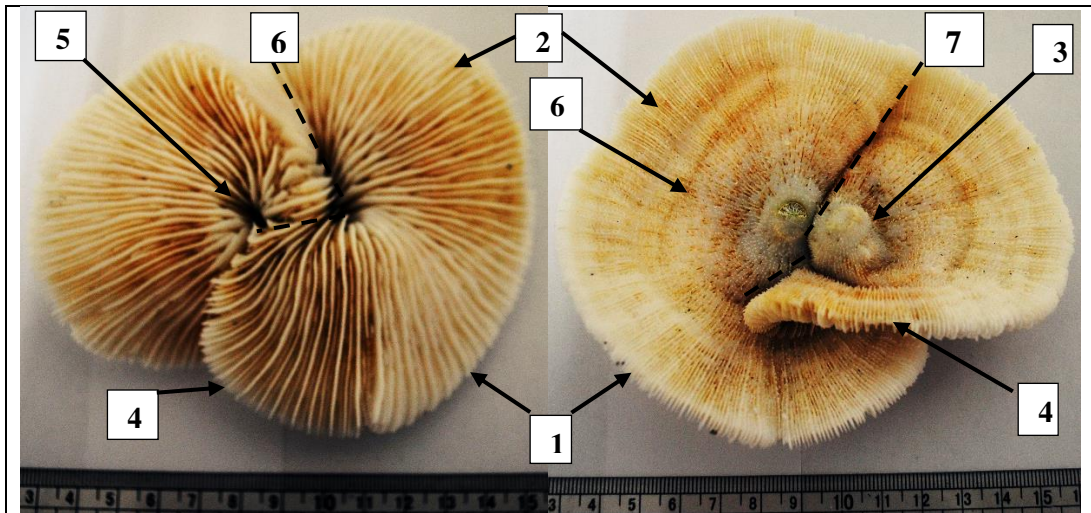


Fig. 1a. *Fungiafungites*, oral side view left, aboral side view right.

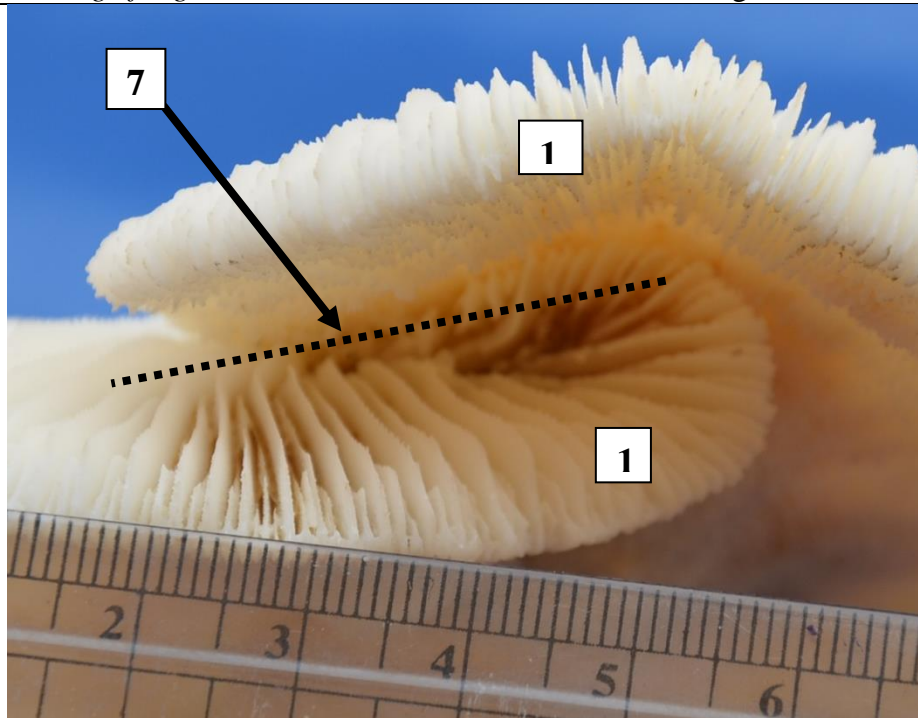
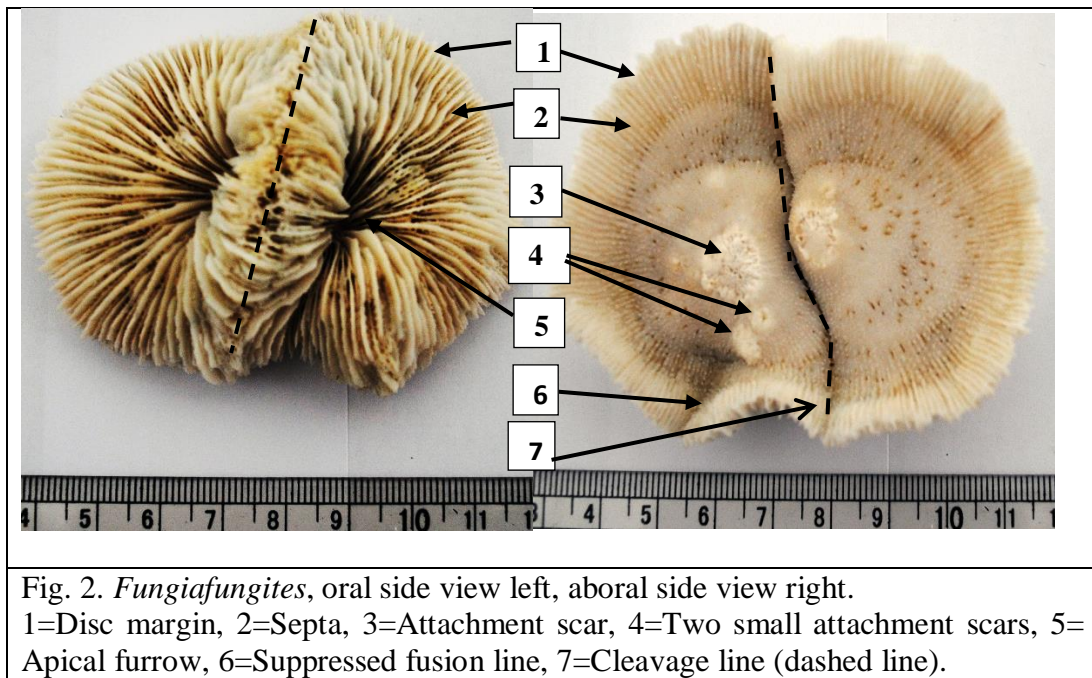


Fig. 1b. *Fungia f. fungites* discs overlap (side view).

Figure 1a and b''1=Disc margin, 2=Septa, 3=Attachment scar, 4=Overlap, 5=Apical furrow, 6= Growth ring. 7=Cleavage line (dashed line).

The *F. fungites* specimen (Fig. 2) from Port Sudan is approximately 50cm<sup>2</sup>. It is also firmly joined. The cleavage line is not straight and the two discs are almost equal in area. One disc has 4 and the other have 2 attachment scars. The septa were clearly vertical.



The differences in measurements of Suakin and Port Sudan specimens (Table 1) is in harmony With their differences in sizes.

Table 1. Some measurements of developmental anomalies of *Fungiafungites* in cm.

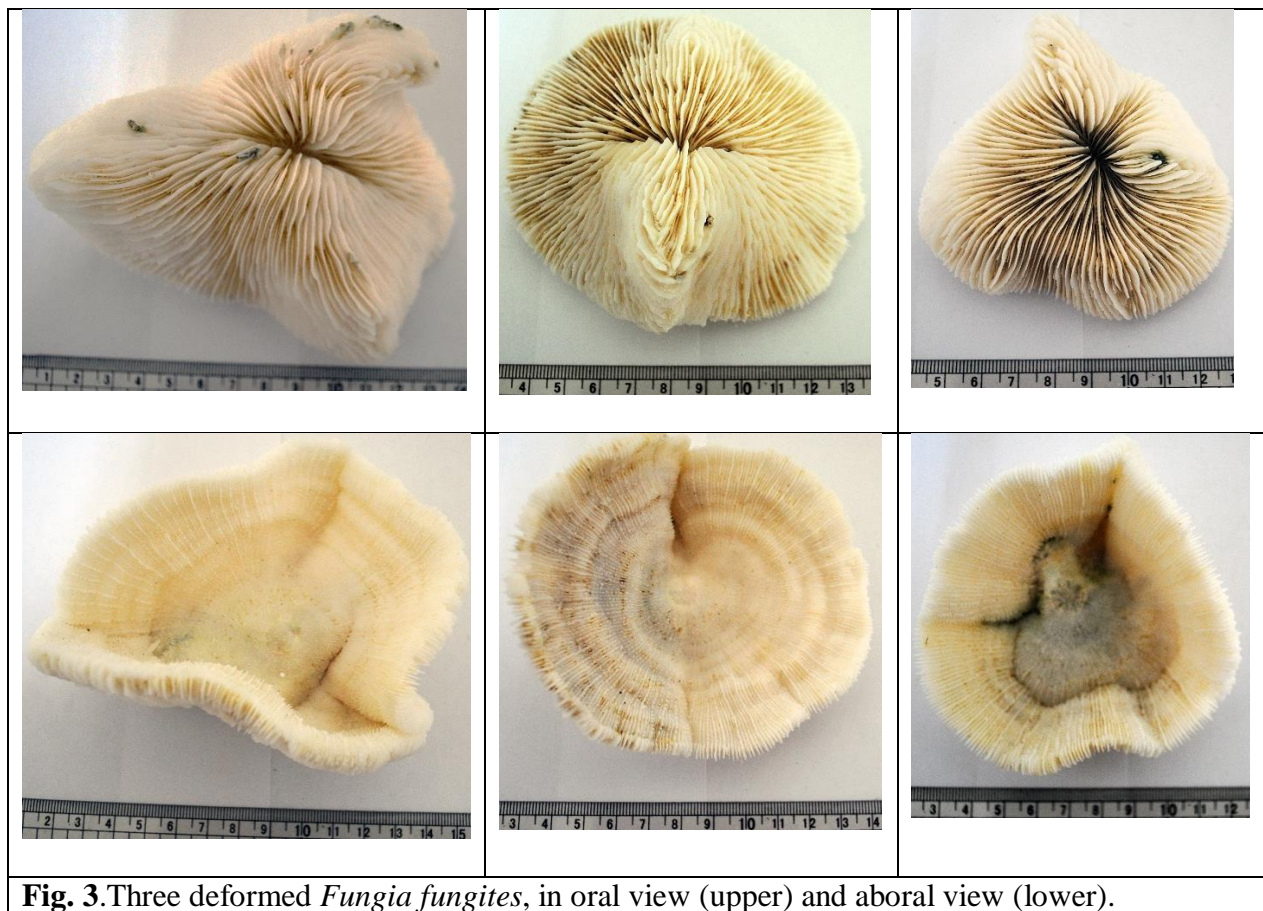
Measured trait (cm)	Suakin Specimen		Port Sudan Specimen	
	Left	Right	Left	Right
Oral view				
Apical Furrow	1.6	2.3	2.4	1.4
Disc length	10.1	12.1	7.8	7.6
Disc width	6.6	7.1	4.9	4.9
Disc thickness	1.1	1.1	1.3	1.3
Cleavage line	9.6		7.9	
Aboral view				
Apical Furrow	1.2	0.9	0.9	0.7
Disc length	7.5	10.4	5.8	5.4
Disc width	6.0	6.0	4.0	4.0
Fused part	3.6		5.8	
Cleavage line	9.1		7.4	

The occurrence of two fused polyps in mushroom corals is rare but not unknown. Fused individuals of *Fungia* (*Danafungia*) *scruposa* (Klunzinger, 1879, valid name=*F. fungites*); *Heliofungia actiniformis* (Quoy & Gaimard, 1833), *Ctenactisechinata* (Pallas, 1766) and juveniles of *Herpolithalimax* (Esper, 1797) were documented by Hoeksem (1989 and in *Fungiagranulosa* (Klunzinger, 1879, (valid name=*F. fungites*) was photographed and displayed at [www.marinelifephoto.com](http://www.marinelifephoto.com). The described fusion in *F. fungites* seem to be caused by change



in the orientation of the egg resulting in formation of two organization centers along which the fertilized egg splits. In Port Sudan specimen the structure abnormality may be due to fusion of two regenerating polyps.

Deformity in *F. fungites* was observed in many specimens (Fig. 3). This is probably due to settlement of the tiny larvae in a narrow confinement. As the larvae start to secrete its hard carbonate exoskeleton and grow, the confinement shaped the disc growth, attachment and morphology. This is apparent from several compressions and attachment points observed in discs. The deformed discs are either round-distorted or oval- distorted but the septa are clearly vertical.



**Fig. 3.** Three deformed *Fungia fungites*, in oral view (upper) and aboral view (lower).

### Conclusion

Over 25 years more than 2,000 specimens of *F. fungites* were macroscopically examined and only two cases of developmental anomalies were found.

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### Deposition:

The developmental anomalies of *F. fungites* were deposited in Sudan Natural History

Museum, Faculty of Science, and University of Khartoum under S.G.M/S.N.H.M (MC) 3.

### Acknowledgement:

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### Ethical clearance:

Only dead mushroom corals were collected and studied.

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