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Particular qualities of identification and taxonomy of some scleractinian (Scleractinia: Fungiina), Fungiidae Gregory, 1900

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ABSTRACT

Is a brief history of taxonomy and identification of one of the most interesting groups of single as mushroom corals Fungiidae family, characterized by extraordinary forms of corallites and having Acroporidae and Faviidae the greatest number of genera and species diversity among all Scleractinian. Describes terminology and morphological signs under the definition and description of corals of the family.

Keywords*:* Fungiidae, History, Systematics, Signs

1. INTRODUCTION AND BRIEF HISTORY OF TAXONOMY

Mushroom corals (Fungiidae) regular inhabitants of the shallow coastal areas in tropical Indo-Pacific. Their appearance as animals attracted and attracts many people visiting the cays. The vast majority of species are free-living and therefore easy to assemble. Because of their attractiveness, large hard corals are more likely to be placed in various collections, including the home as souvenirs. It is not surprising, therefore, that they can also be purchased in the shops of souvenirs and aquariums that have been removed from the place where they originally met. It is obvious that they are the most massive in the zoological collections of the natural history museums throughout the world.

Fungiidae, probably are the most prosperous in taxonomic relation group Scleractinia. Thanks to a single way of existence, free-living corallites some specific features of the morphology of the corallite, a structure and the structure of septal partitions that belong only to the corals. Fungiidaeare one of the very few bands that kept the taxonomic status of many parts from the time before the Linnaean taxonomy.Already in the beginning of the 20th century Fungiidae were subdivided by morphological features into six stable groups (Döderlein, 1902), which later became subgenera (Wells, 1966). Both for the family as a whole and for genera (subgenera) and species a number of phylogenetic cladograms have been elaborated (Wells, 1966; Cairns, 1984; Hoeksema, 1989). Some disagreements exist in distinguishing some subgenera (*Danafungia*, *Ctenactis, Verrillofungia*and others), their generic identification or attributing some species to one or the other genera (Matthai, 1924; Boschma, 1929; Wells, 1966; Veron and Pichon, 1979). These problems were considered in more detail while describing Fungiidae of the Great Barrier Reef of Australia (Veron and Pichon, 1979). These problems considered especially in Hoeksema's monograph, in which, in addition to revision of all existing Fungiidae, the problems of their taxonomy, phylogeny and biogeography were elucidated in detail (Hoeksema, 1989). In this monograph, 40 species attributed to 11 genera, one of which ‑*Fungia*‑ subdivided into 7 subgenera, were described.

B. Hoeksema said the merit of wells for systematics Fungiidae with its overall review of all as mushroom corals. Many coral accepted giving the status of most species subgenus well. This, according to Hoeksema, contributed to the hypothetical cladogram regarding evolution Fungiidae subgeneric level up. Nevertheless, wrote Hoeksema, in literature, taxonomic status of many nominal taxa remains uncertain or interpreted incorrectly, because most authors were unfamiliar with the model material. Therefore, in the current revision of the taxonomic changes, many had to make Hoeksema said the merit of wells for systematics Fungiidae with its overall review of all as mushroom corals. Many coral accepted giving the status of most species subgenus well. This, according to

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Y. Latypov, without taking the taxonomic "sub genus" level of Veron, Pishon and Hoeksema, considered the composition of the family of 12 genera. He focused on the history of classification as mushroom corals and certain features of their morphological features concerning the structure of the septal apparatus. Her described 33 species, Fungiidae common to the Vietnamese reefs, two of them new for science (Latypov, 1995, 2014).

1.1.TERMINOLOGY AND CRITERIA USED IN TAXONOMY

1.1.2. Corallum

Fungiidae are mainly unattached and have the largest corallites among all scleractinian, which is why we shall consider their morphology and terminology in more detail.

Fungiidae have quite a varied form of corallite. It can be circular (disk), oval (elliptical), long gloss-like, etc. (Fig. 1). Damaged corals may be three and four-beam. Drive, ellipses, and other forms of fungiid can be thin, thick, strongly convex and concave, like arch and pipe bowls.

The majority of mushroom corals have a single growth form with one mouth cavity -stomodaeum (primary mouth or ostium), but some species are able to form numerous circumoral (around the mouth) and peripheral secondary stomatal centers. That is why it is better to call fungiid corals, having many of stomata, polystomatal (or polycentric), instead of colonial (Hoeksema, 1989; Latypov, 2014). Corals with one stomodeumcan be called solitary or monostomatal corals.

Secondary ostiumscan be formed inside stomata, around them and along the coral periphery. Intrastomatal budding takes place by the way of division of the primary stomodeum due to the merging of two opposite primary septa. Each of the

newly formed ostiumsis divided in turn in the same way. In circumstomatal budding, new stomata are formed around the previously formed ones, appearing due to the invagination of septa. Peripheral budding occurs at successive invagination of septa on the coral periphery. Intracalice, circumoral and peripheral budding are different kinds of intratentacular budding.

1.1.3. Septa

Septa, forming new stomata by way of division, are not homologous to septocostae, present between corallites in coral colonies of other scleractinian. In Fungiidae costae are located on the under side of the coral. For the secondary septal structures, it is preferable to use the term "interstomatal" septa (Hoeksema, 1989). In addition to their unattached way of living, the main distinctive feature of fungid corals is a great number of septa. Hundreds of long thin septa of up to 15 or more cycles, always highly dentate and with numerous rows of synapticulae, are formed in the Fungiidae. Septocostal ridges are lamellar structures, consisting of septa and costae, laterally joined to each other by complicated synapticulae and a coral wall. Septa and ribs of the first cycles are called lower cycles, and that of the last cycles – higher cycles (Bourne, 1887).

As a rule, mushroom corals septa are thin and straight, but sometimes they are wavy or with tear-shaped reinforced axial parts. When septa are reinforced and dense, synapticulae are poorly istinguished. Septa and costae of higher cycles are more reinforced and protrude upwards to a greater extent than the other septa. Sizes and shapes of septal and costal dentation and ornamentation serve as the main morphological features of Fungiidae.

1.1.4. Dentation

The dentations on the septal margin are either small and granulate, large and lobate, or angular. On the septal side's granulations occur which are irregularly distributed or arranged in patterns, such as rows and ridges either perpendicular or parallel to the septal margin. The costal protuberances vary from small, granular spines in some species, to short and club-shaped or long and thorn-like projections in others. Large costal spines may have a smooth either surface, or covered by

granulations (Fig. 2, 3).The lower-order septa are usually solid, but in some species they perforated at the margin; those of higher orders are usually perforated. There may occur relatively large holes in the septa, which then are called fenestrate. Number of septae, their orientation and morphology can serve as a reliable of taxonomic sign (fig. 4).

1.1.5. Fossa and columella

In monostomatous species, particularly the length of the fossa (the skeleton part containing the mouth or stoma) may be a distinctive character. Because the length of the fossa depends on the corallum size, it is only useful as a taxonomic criterion when it is related to the corallum length (the diameter measured in the extension of the fossa). Inside the fossa a distinct columella is usually present, consisting of trabecular and paliform lobes, which protrude from the bottom of the fossa and from the inner edges of the septa, respectively. The structure of the columella may vary in the arrangement of the trabeculae and the paliform lobes. The size and shape of the septal and costal ornamentations (dentations and spines, respectively) are very useful characters in the classification of the Fungiidae.
An important criterion in the classification of fungiid taxa is the form of the corallum outline. The corals may be round (discoidal), oval (elliptical) or elongate in shape (see Fig. 1,4) Further, the species may have corals of varying thickness, which can be flat, arched (with the upper side convex) or cup shaped (with the upper side concave). Some characters may change during the ontogeny. Up to now, several "species" have been distinguished, based upon the shapes of corals, which were actually successive ontogenetic phases within only a single species.
Therefore, in the present study the range of the diameter (c.q. length) of the studied specimens is given for each species. This is relevant if the state of a character depends at least partly on the size of the animal. Furthermore, the maximum length found per species may be of taxonomic importance. In monostomatous species, particularly the length of the fossa (the skeleton part containing the mouth or stoma) may be a distinctive character. Because the length of the fossa depends on the corallum size, it is only useful as a taxonomic criterion when it is related to the

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2.CONCLUSION

Identification of known or establishment of new species as lower taxonomic categories are essential for practical and theoretical objectives of the biology, ecology and biogeography, paleontology, stratigraphy,paleoecology and industries in which no uniquely identify types of impossible any successful research. The boundaries of species, coelenterates historically determined based on morphological characteristics of skeletal structures, anatomy and composition of thread-cell no skeletal forms. Interpretation of such features is normally operational methodology for taxonomists. However, the extreme variability of these animals has led to consistently current problem of species identification. At colonial coelenterates, even individuals of the same colony are exposed to different environmental conditions-light, fluid dynamics, sedimentation, action commensals or parasites. When in the hands of taxonomist many such individuals from a variety of habitats, it is difficult to determine the nature of the variability and set its limits. All cnidarians researchers believe that the study of variability and definition

of its borders is the basis without which it is impossible to their successful identification and classification.

DISCLOSURE STATEMENT

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Explanation and legendoffigures

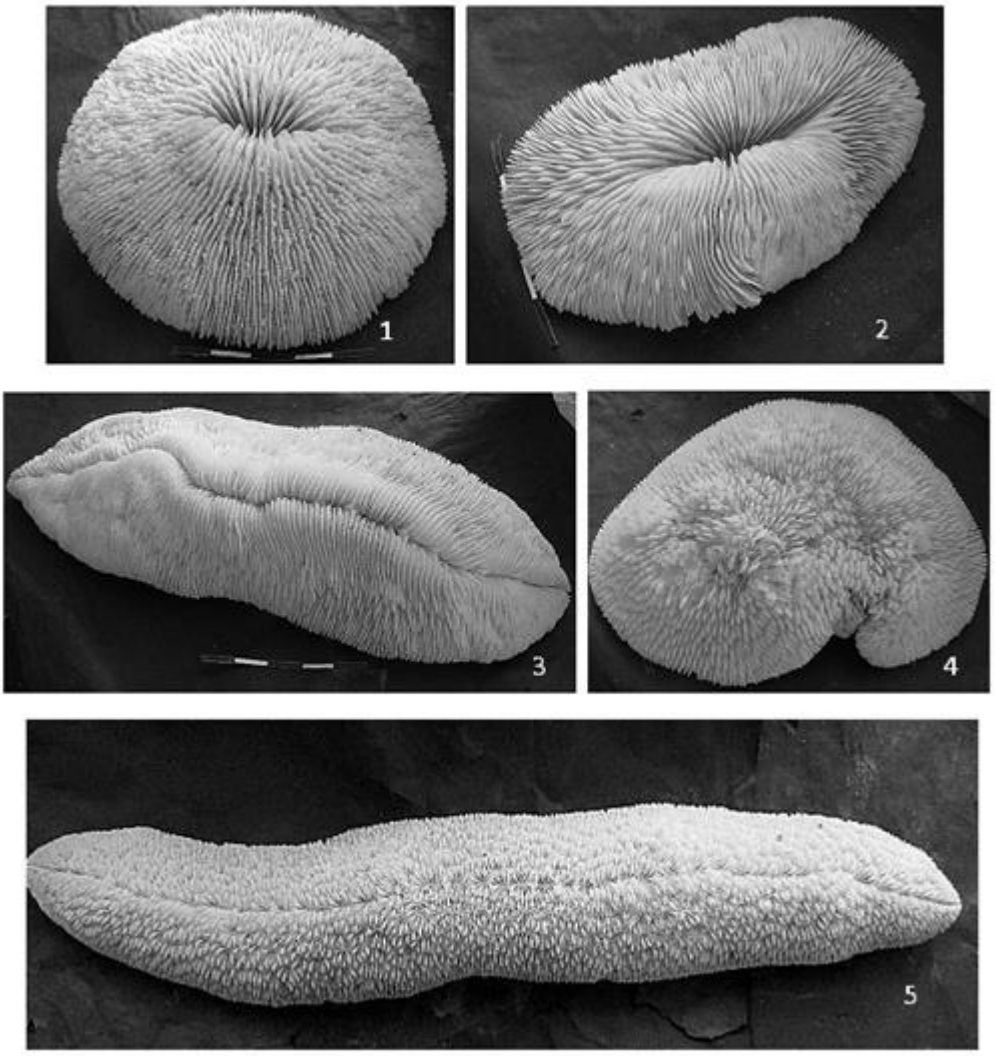

Figure. 1.

Corallites form and stomates centers while Fungiidae. 1- *Fungia scruposa*, 2 - *F. scutaria*, 3 – *Herpolithalimax*, 4 – *Polyphyllianovaehiberniae*, 5 - *P. talpina*

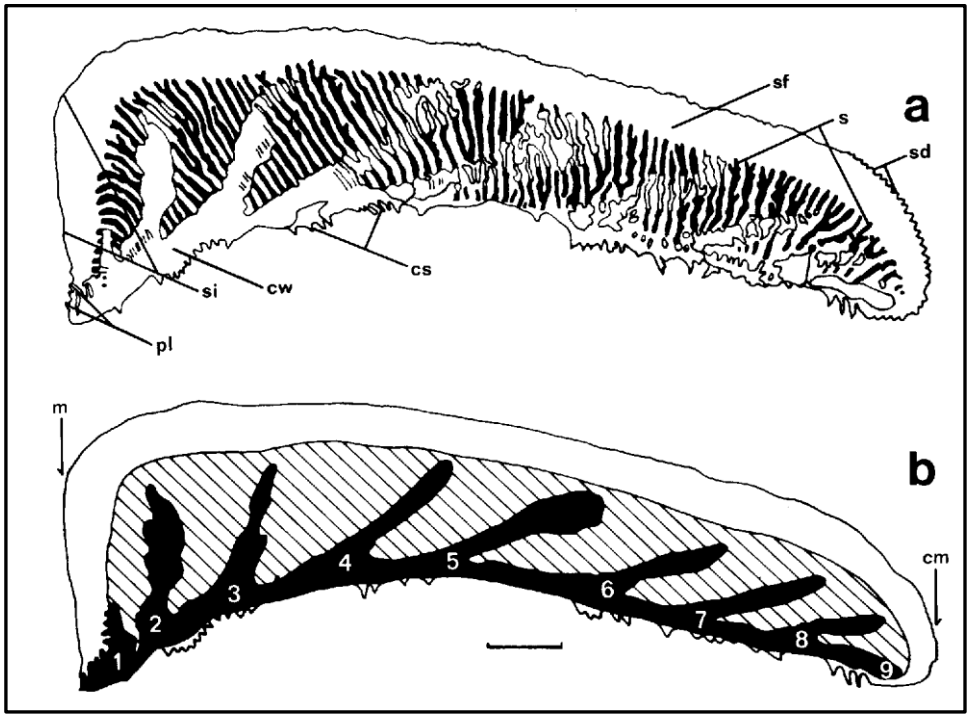

Figure. 2.

Lateral view of a septo-costal unit. a - Several structures displayed when a coral is broken cross-wise, b -Orientation of some parts of a septo-costal unit after several phases of growth, 1-9 - successive locations of the corallum wall (black). Scale bar: lcm. (part by Hoeksema, 1989)

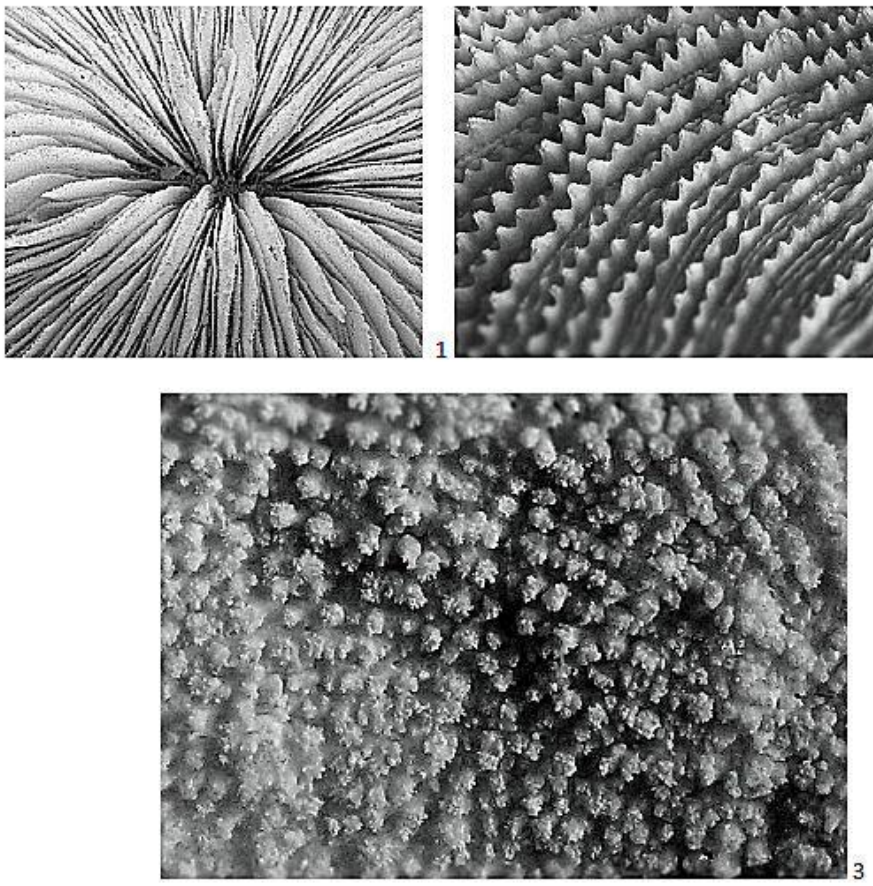

Figure. 3.

Septal and costal apparatus of Fungia.1-thickening of the septa of higher orders. 2-serrated the top plates of septae, 3- ornamentation of the coast

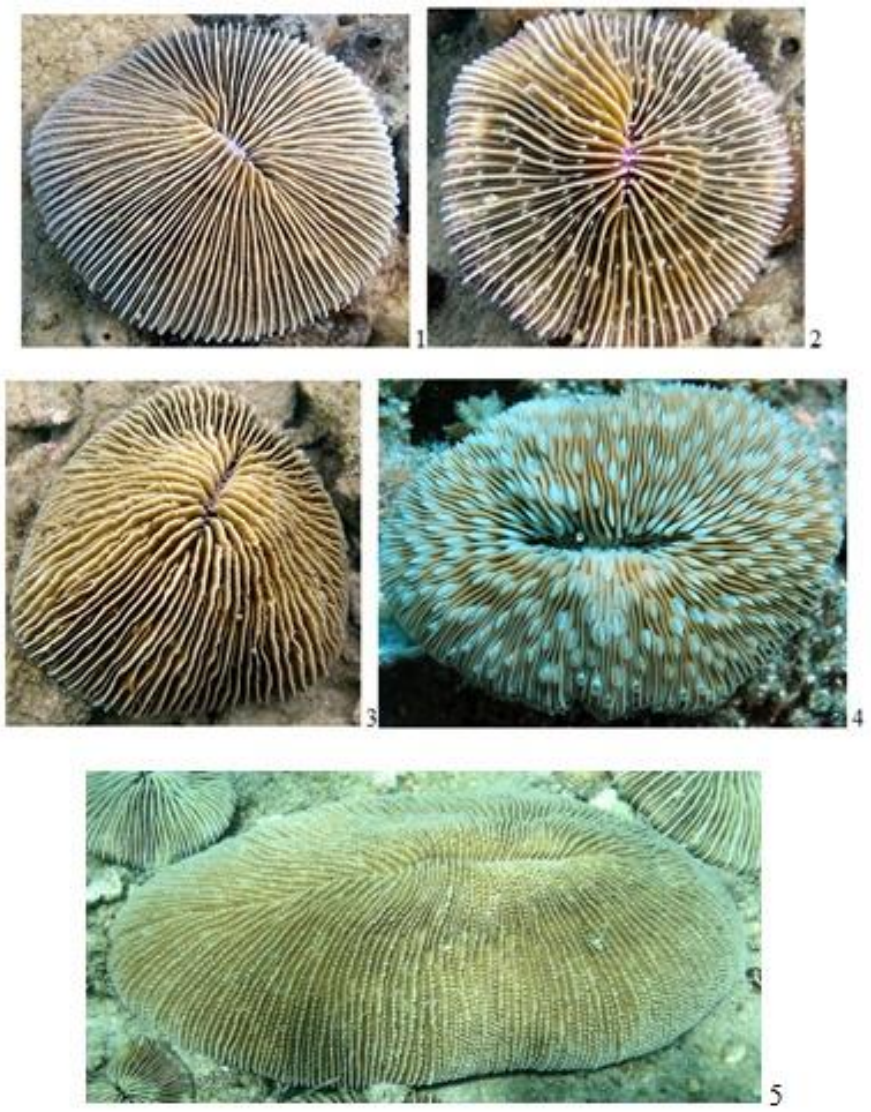

Figure. 4.

The morphology and orientation of septal partitions of different species of Fungia.1-*Fungia fungites*, 2-*F.concina*, 3-*F. corona*, 4-*F.scutaria*, 5 - *Ctenactisechinata*