

FIRST RECORD OF *SCYTINOPOGON ANGULISPORUS* (PAT.) CORNER FROM BANGLADESH

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The hot humid climatic conditions of Bangladesh are highly congenial for fungi and as such, a rich fungal biodiversity is evident in the country but the fungal flora have not been fully recorded as yet (Shamsi, 2019). To record the fungal flora of mangrove ecosystems in Bangladesh, the authors conducted several extensive field surveys in different mangrove ecosystems, viz. Sundarbans, Haringhata (Pathorghata, Borguan), Sonbunia (Babuganj, Borguna), Tengragiri (Taltoli, Borguna), and Gangamoti (Kuakata) during 2015-2019. To achieve the objective, an exploration made to the Tengragiri mangrove reserve forest in Borguna district of Bangladesh during August 2017 under a research project funded by Bangladesh Ministry of Science and Technology (MOST). During this exploration, a different looking fungus was collected and after a detailed taxonomic investigation on its macro and microscopic features, the specimens finally identified as *Scytinopogon angulisporus* (Pat.) Corner that belongs to the family Clavariaceae. The species and the genus do not match with any species previously published in relevant literature covering the fungal flora of Bangladesh (Alam and Amin, 2007; Alam *et al.*, 2008; Romainul and Aminuzzaman, 2016; Hosen and Li, 2017; Tanjim *et al.*, 2019; Hosen and Ge, 2020; Tanni *et al.*, 2020). Therefore the genus *Scytinopogon* and the species *Scytinopogon angulisporus* are reported here as the new records for Bangladesh. Detailed taxonomic description with notes on ecology, distribution, representative specimen examined and photographs including photomicrographs and drawing are provided.

Fresh fruiting bodies of *S. angulisporus* were collected, properly processed following the standard procedure described by Prance and Fechner (2017) and deposited at the Department of Botany, Jahangirnagar University with accession number for voucher specimens. Morphological features including shape, size, color etc. were recorded in the field. Microscopic studies were carried out in the laboratory on preserved dry and wet samples. Dry samples mounted in 5% KOH and Lactophenol-cotton blue. Length and width of basidium, basidiospore and hymenium were measured using ocular micrometer. Photomicrographs were taken under 40X and 100X magnification with Leica DM500 Binocular Microscope. For spore measurement, 25 spores from mature collections were studied. The specimen was identified according to Corner (1950) and Dutta *et al.* (2012). The taxonomic descriptions along with photographs have been prepared based on both fresh and preserved specimens.

***Scytinopogon angulisporus* (Pat.) Corner, *Ann. Bot. Mem.* 1: 648 (1950) (Fig. 1)**
Syn.: *Clavaria angulispora* Pat., in Patouillard & Gaillard, *Bull. Soc. mycol. Fr.* 4(1): 41 (1888); *Scytinopogon angulisporus* var. *curtus* Corner, *Ann. Bot., Lond., n.s.* 16: 701 (1950); *S. angulisporus* var. *gracilis* Corner, *Monograph of Clavaria and allied Genera*, (Annals of Botany

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Memoirs No. 1): 701 (1950); *S. angulisporus* var. *parvus* Corner, Monograph of *Clavaria* and allied Genera, (Annals of Botany Memoirs No. 1): 701 (1950); *S. parvus* (Corner) Douanla-Meli, *Bibliotheca Mycol.* **202**: 119 (2007).

Systematic position: Fungi, Basidiomycota, Agaricomycotina, Agaricomycetes, Agaricomycetidae, Agaricales, Clavariaceae, *Scytinopogon*, *Scytinopogon angulisporus*.

Basidiomes 3.5-9.5 cm high, solitary, form mats or growing in dense tufts, chalk-white, becoming pale yellow with maturity, develop uniform color after drying, palmately branched from a compressed stipe, branching in one plane but twisted, slightly rugulose; branches flattened and narrowly, spatulate, the upper sides of the branches minutely subtomentose, 0.3-0.5 cm wide in the lower branches, tapering towards the apex, polychotomous below, becoming dichotomous, internodes longer gradually, tips acute to blunt, subulate or subterete, narrowly ligulate; stipe 1.65-4.49 cm long, 0.22-0.41 cm in diam., sometimes branched from the base, dilated and flattened below the points of branching; basidiospores (3.6-) 4.2-4.8 (5.1) × 5.8-7.2 (-7.6) μm (Q = 1.4-1.5), hyaline, ovoid to broadly ellipsoid, often but not always appearing angular in outline, with numerous minute, echinulate outgrowths, hilar appendage up to 1.0 μm long, inamyloid; basidia 24.5-25.2 × 6.1-6.9 μm, clavate, hyaline, bi- and/ tetra-sterigmatic; cystidia absent; hymenium covered the whole basidiome except the sterile stipe, thickened upwardly, 53.1-120.2 μm; subhymenium well developed, coralloid, composed of narrow hyphae, 4.1 μm wide, closely interwoven; trama subparallel, smooth, with thin-walled hyphae, 11.9-16.2 μm wide, clamped; sterile stipe to 2.2-4.3 μm wide, smooth, thin-walled, clamped, base of sterile stipe covered by loosely interwoven hyphae.

Ecology: Grown on decaying substances in the forest ground.

Distribution: Commonly distributed in tropical and subtropical regions (Corner, 1970). In Bangladesh, this species found to be grown only in one patch of around 100 m² area of coastal plantation forest near Tengragiri reserve forest in Borguna district of Bangladesh.

Representative specimen examined: **Barguna**: Taltoli, Tangragiri, 14.08.2017, Fakhruddin 2044, Fakhruddin 2045, Gazi 20406 and Gazi 20407 (JU).

Scytinopogon is a genus of several species of clavarioid (coral-like) fungi in the family of Clavariaceae with a fundamentally tropical distribution (Desjardin and Perry, 2015). The etymology of the name *Scytinopogon* refers to its macromorphological resemblance to leather barbs (Donk 1954). The principal characteristic of the genus is spore form and ornamentation, but the exceptionally small size of the spores and very fine ornamentation has limited their use in conventional light microscopy as a specific character.

S. angulisporus is a common taxon in tropical and subtropical regions (Corner, 1970). It has been reported to grow on the forest ground of Africa, Borneo, Brazil, Burma, Cameroons, Congo, Cuba, India, Japan, Java, Madagascar, Malaysia, Mauritius, Nigeria, Panama, Philippines, Solomon Islands, Sumatra, Uganda, USA (Banerjee, 1947; Corner, 1950, 1953, 1966, 1970; Meijer, 2006; Dutta *et al.*, 2012).

The genus *Scytinopogon* morphologically appears to be similar with the genera *Pterula* Fr. which is distinguished from the later by the consistency of its basidiomata and the color of its spores (García-Sandoval *et al.*, 2004). *S. dealbatus* (Rick) Corner, *S. robustus* (Rick) Corner and *S. chartaceum* (Pat.) R.H. Petersen are looks alike to newly recorded *S. angulisporus* due to their morphometric features. The robust form appears in *S. angulisporus* and *S. dealbatus* could be easily confused for their distinction but the presence of flattened branches with hymenium on one side and angular-nodulose basidiospores and lack of agglutination in hyphae of trama clearly separate *S. angulisporus* from *S. dealbatus* which corroborated with the findings of Corner (1950). Furthermore, the robust form and similar basidiome occurs in *S. robustus* and *S. angulisporus* but

these two species can easily be diagnosed by using both macro and microscopic characters. *S. angulisporus* differs from *S. robustus* by the spore size, presence of crystals and the uninflated hyphae (Corner, 1950 and 1970; García-Sandoval *et al.*, 2004).

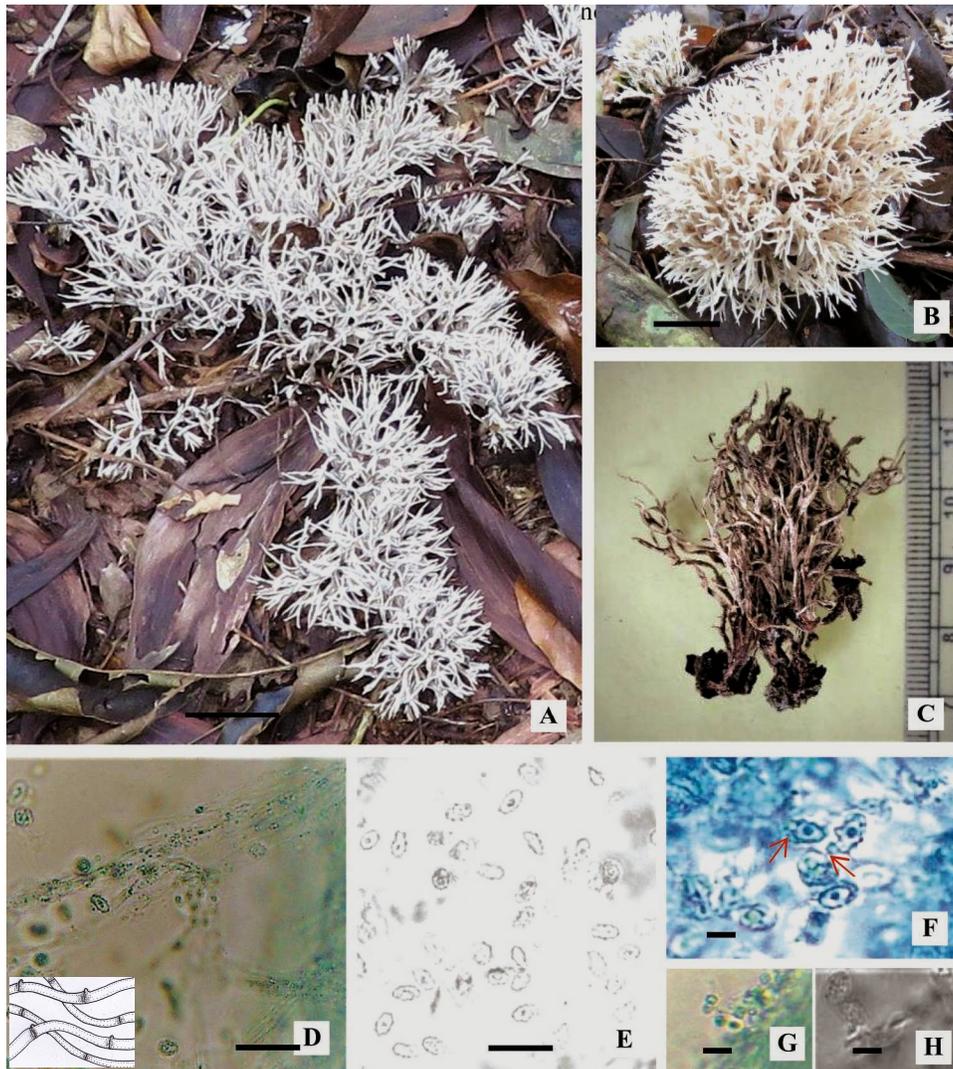


Fig. 1. *Scytinopogon angulisporus*. A= Natural habitat (bar = 15 cm); B = Fresh basidiomata (bar= 1.5 cm); C = Dried fruit body; D = Monomitic hyphae of hymenium (40X, bar = 20 μ m), drawing (inset); E = Echinulate basidiospores (40X, bar = 20); F = Basidiospores with hilar appendage (indicated with arrow marks) (100X, bar = 7 μ m); G = Basidium with spore (40X, bar = 15 μ m) and H = Basidium without spore (100X, bar = 7 μ m).

Another species *S. chartaceum* is quite similar to *S. angulisporus* by the color and morphology of the basidiome. *S. angulisporus* is distinguished from *S. chartaceum* by its larger internodes, rugulose and sub-tomentose basidiomes, nodulose to verrucose basidiospores and a

very abundant and compact basal mycelium in contrast to smaller internodes, smooth surface basidiomes, echinulate with long spines basidiospores and a scarce and loosely attached basal mycelium of *S. chartaceum*.

Ramaria invali (Cott and Waket.) Donk, an allied species of *S. angulisporus* was mentioned by Alam and Amin (2007). Moreover, in recent times, Tanni *et al.* (2020) reported *Ramariopsis kunzei* (Fr.) Corner from Dhaka, which is often deceiving to *S. angulisporus*. Though both the fungi belong to Clavariaceae family, in *R. kunzei*, basidiomes are radially branched, hymenium amphigenous and basidiospores not angular whereas in *S. angulisporus* basidiomes are branching in one plane, mostly flat, hymenium often unilateral and basidiospores angular.

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