

## Report on first record on the occurrence of *Geastrum* Pers. (Geastrales Geastraceae) in Western Ghats forests in Goa (India)

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### ABSTRACT

The species of genus *Geastrum* Pers. belonging to Basidiomycotina (Geastrales Geastraceae) is observed and reported in this paper for the first time. The Cotigao Wildlife Sanctuary in Western Ghat forest, Goa (India) has been examined by the author thoroughly on a monthly basis to collect samples of microfungi. This is the first instance wherein the earthstars have showed their presence by formation of minute fruiting bodies. Hence it is reported for the first time as new records to this part of the Western Ghats forest as one of the hotspots in the world.

### KEY WORDS

*Geastrum*; Western Ghats; forests; biodiversity.

Received 10.11.2017; accepted 29.11.2017; printed 30.12.2017

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### INTRODUCTION

*Geastrum* Pers. is a genus of mushroom belonging to the Basidiomycotina, which is currently placed in the order Geastrales and in the Geastraceae family (Hosaka & Castellano, 2008). This genus is well distributed geographically, with approximately 50 known species around the world (Kirk et al., 2008). Many species of *Geastrum* are commonly called "Earthstars". This common name refers to the outer layer of the fruiting body, the exoperidium, that, when mature, splits into segments which turn outward creating a star-like pattern on the ground.

According to the Index Fungorum (2017), the widely used fungal database, so far, around 334 records of *Geastrum* have been reported from all over the world. There is a large number of studies that have focused on the different species of the

*Geastrum* both in tropical and temperate countries (Demoulin, 1984; Douanla-Meli et al., 2005; Fazolino et al., 2008; Silva & Baseia, 2013; Zamora et al., 2015).

Below we report the first record of the smallest known, so far, *Geastrum* species from the Cotigao Wildlife Sanctuary in Western Ghat forest, Goa (India).

### MATERIAL AND METHODS

On 11th October 2011, during our regular field sampling of plant for microfungi in the Western Ghat forest in Cotigao Wildlife Sanctuary, Canacona, South Goa, India (14°58'43.17"N, 74°8'56.75"E), a very unusual earthstar was encountered measuring 0.5–0.7 mm in diameter, caught the attention of the author who was also ac-

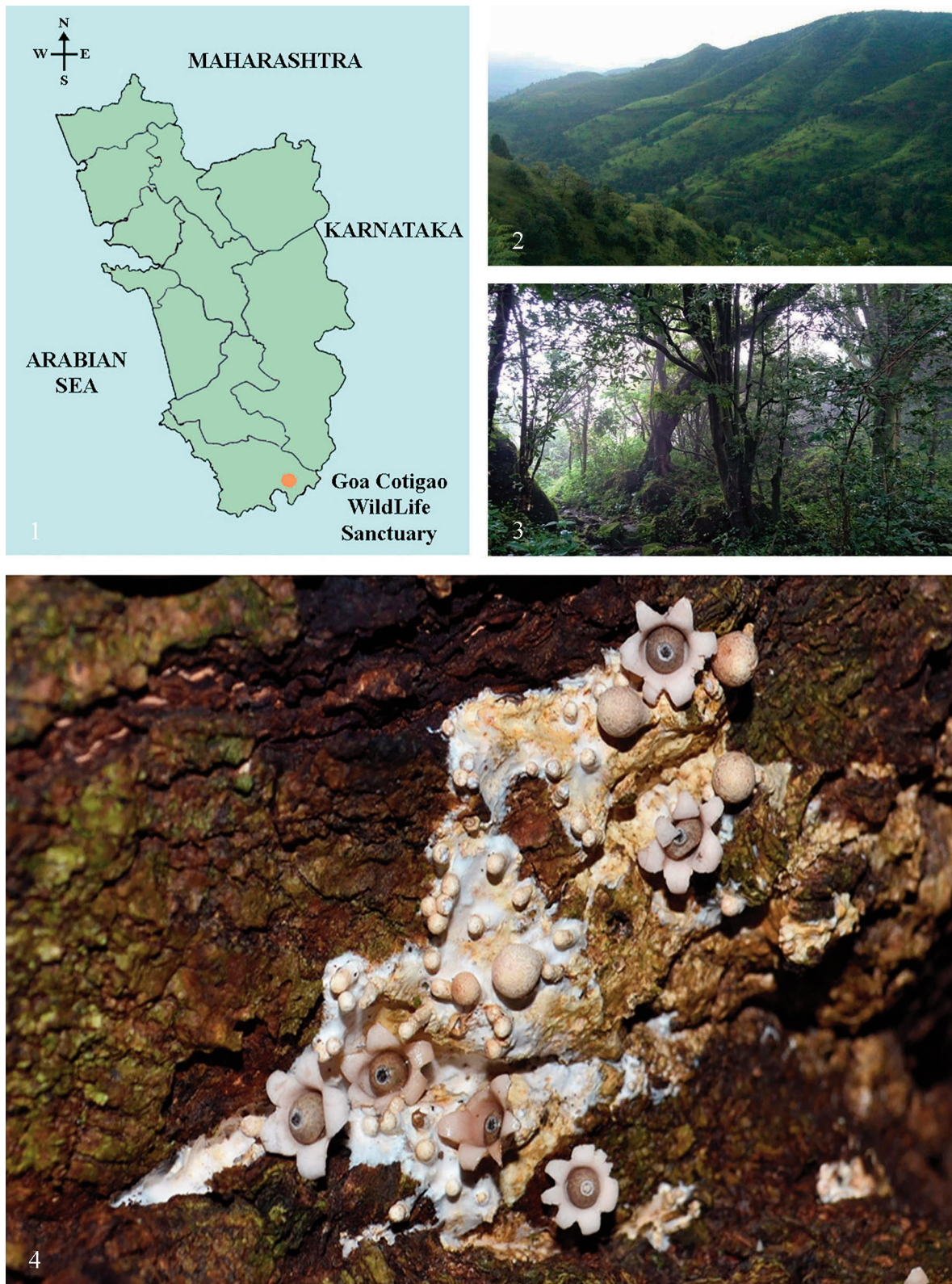


Figure 1. Study area: Western Ghat forest in Cotigao Wildlife Sanctuary, Canacona, South Goa, India.  
Figures 2, 3. Western Ghat forest. Figure 4. *Geastrum* sp. from the study area.





Figure 5. *Geastrum* sp. from Western Ghat forest in Cotigao Wildlife Sanctuary, Canacona, South Goa, India.

companying students during the field sampling (Figs. 1–5). The Cotigao Wildlife Sanctuary, Goa, is located 10 km south-east of Chaudi and was established in 1969 to protect a vulnerable area of the forest in the Goa-Karnataka border.

Earth stars as the *Geastrum* species are not so widely distributed in Goa and shows intermittent appearance when the environmental conditions are favourable. This small size earthstar was found at the base of the trunk of a tree in the crevices and initially, at a distance, it looked like a small flowers at the base of the tree trunk i.e. *Hydnocarpus laurifolia* (Dennst.) Sleumer (Achariaceae) but upon close examination, it was discovered to be the earth star, a species of *Geastrum*. The forest was mostly dominated by trees such as *H. laurifolia*, *Holygarna* sp. (Anacardiaceae), *Psychotria dalzellii* Hook. f. (Rubiaceae), *Terminalia tomentosa* Wight et Arn. (Combretaceae), *Dellenia indica* L. (Dilleniaceae), and was of wet deciduous type. It was carefully collected in polythene bags trying to avoid damage to the specimen as much as possible and brought to the laboratory. Later, we tried to culture the microorganism in the laboratory. Since most of these basidiomycetes are ectomycorrhizal and usually come up with a shower of monsoon or at the end of the monsoon when the showers are fewer. As such, we failed to culture the organism in vitro conditions in laboratory. We need to compile more records and thorough studies on its morphological features as well as on its molecular taxonomy in order to consider it and deem it as a new species.

To my knowledge, this is the first scientific documentation of an occurrence of *Geastrum* sp. of such small dimension from this part of the region in Goa, India. Although detailed studies are essential on the culturing of the fungus and to determine its complete identity, the occurrence of such a small species of *Geastrum* is sufficient to call attention of researchers to take the necessary steps to study and preserve such macrofungi in situ as well as to further use these organisms. This is of particular importance, as the Western Ghats is one of the biodiversity hotspots in India harbouring a wide variety of species of fungi and more species are yet to be discovered and recorded from this part of the region.

The reason for me to share this experience is that such species can also be encountered in a densely populated forest such a Cotigao. We only need to have an eye for such specimens to try to discover and record more.

#### ACKNOWLEDGEMENTS

The author wish to thank Dr. Ashish Prabhuganekar (Botanical Survey of India, India) for photography. Also thankful to Department of Botany, Goa University for providing us the travel facilities for the field trip to Cotigao.

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