Journal on New Biological Reports **3**(2): 71 – 74 (2014) **ISSN 2319 – 1104 (Online)**

Gyrodontium sacchari (Spreng.) Hjortstam — a new record of wood-inhabiting hydnoid fungus from India

M.E. Hembrom[1], Arvind Parihar[2] and Kanad Das[2*]

[1]*Botanical Survey of India, CNH, P.O. – B. Garden, Howrah 711103, India.*
[2]*Botanical Survey of India, Cryptogamic Unit, P.O. – B. Garden, Howrah 711103, India*

(Received on: 20 April, 2014; accepted on: 15 May, 2014)

ABSTRACT

Gyrodontium sacchari, a hitherto unrecorded hydnoid fungus for Indian mycobiota was collected during early monsoon in 2013 from Acharya Jagadish Chandra Bose Indian Botanical Garden, Howrah on *Casurina* wood. Its detailed macro- and micromorphological description along with supporting illustrations are given in this communication.

Key Words: Macrofungi, Coniophoraceae, taxonomy, distribution, West Bengal, India.

INTRODUCTION

India, one of the megadiverse countries of the world is being underexplored in terms of the wealth of the Hydnoid macrofungi, except some sporadic noteworthy contributions (Berkeley 1816, 1839, 1856; Curry 1874; Cooke 1891; Banerjee 1935, 1947; Bagchi *et al.* 1954; Mass Geesteranus 1961, 1964, 1971; Thind & Khara 1968, 1975a & b; Khara 1977; Harsh & Bisht 1982; Das & Sharma 2010; Das *et al.* 2011, 2013; Sharma 2013; Sohi *et al.* 1964).

Acharya Jagadish Chandra Bose Indian Botanic Garden is located on the West bank of the river Hooghly in the state of West Bengal (India) and has an area of 273 acres. It is divided into 25 sections including 17 km of roads and 24 lakes. Being one of the large botanic gardens in Asia it is conserving many native, endemic and exotic plants along with diverse groups of mycobiota (Curry 1874; Sharma & Ghosh 1989; Das *et al.* 2013; Hembrom *et al.* 2013). During early monsoon while undertaking a routine survey of this historic garden authors collected one interesting hydnoid macrofungus growing on the cut logs of *Casurina* near the Kings Lake of this garden. Critical macro- and micro-morphological studies of this fungus followed by thorough literature survey, reveals it, as *Gyrodontium sacchari*, an unrecorded taxon for Indian mycobiota. A detailed description coupled with the illustrations of this species is presented here.

Corresponding author: daskanadbsi@gmail.com

MATERIALS AND METHODS

Macromorphological/field characterization was made with the fresh basidiomata. Field-photographs of these basidiomata and its host were taken with the aid of Nikon D300s and Olympus C-5060. Colour codes and terms (mostly) follow Methuen Handbook of Colour (Kornerup & Wanscher 1978). In the laboratory, macromorphological characters were again observed from both the fresh and dry materials with the help of a stereo-zoom dissecting microscope: Nikon SMZ 1500 and photographs were taken through the attached dedicated camera. Micromorphological characters were recorded with the help of a light microscope Olympus CX 41 and Nikon Eclipse N*i* from the free hand sections of the dry samples stained in a mixture of 5 % KOH and phloxin and then mounted with 30 % glycerol. Sections were also mounted with Cotton blue and Melzer's reagent separately. Measurements for the

spores were noted based on that of twenty basidiospores. Spore-measurement and Quotient indicating length-width ratio (Q = L/W) are presented as minimum–**mean**–maximum. Herbarium name follows Holmgren *et al.* (1990).

TAXONOMIC DESCRIPTION

Gyrodonitium sacchari (Spreng.) Hjortstam, *Mycotaxon* 54: 186 (1995);
syn.: *Hydnum sacchari* Spreng., *K. sevenska Vetensk-Akad. Handl*. 46: 51 (1820).

Fig. 1

Basidiomata annual, resupinate, effused-reflexed to pileate, often imbricate, arising as small circle coalesce to form large complex basdiomata, easily separable from the host, soft, light weight, sticky, unchanging when bruised. Pileus applanate, many small pilei arising and laterally fused to form long effused pileus to 90 mm long and 5–20 mm wide (resupinate part extended to 350 mm long and 80 mm wide), zonate, irregularly grooved; surface woolly to subvelvety; margin sterile. Rhizomorphs cottony, chalky white. Hymenial surface smooth to tuberculate when young, aculeolate with maturity, light yellow to lemon yellow (3A5–3B8), gradually paler towards the margin and finally chalky white. Spines 2–6 mm long, elongate to cylindric, densely arranged; tip subulate, flattened, conic to angular or irregular. Context to 5 mm thick, cottony, soft and spongy, chalky white, yellowish tinge near margin; unchanging when exposed, greyish green (30B5) with $FeSO_4$, orange grey (6B2) with KOH, grey (6B1) with Guiacol. Spore print light yellow.

Hyphal system monomitic. Generative hyphae in the context 2–8 µm wide, mostly thin-walled (to 0.5µ thick), septate, branched, hyaline. Hyphae in spines 3–7 µm wide, septate, thin-walled, branched, parallel arranged, collapsed with maturity or after drying, hyaline. Basidia 14–19 × 3–4 µm, subclavate, clamps absent as base, 4-spored, thin-walled, hyaline; sterigmata 0.5–2 µm long. Basidiospores 3.0–**4.2**–5.0 × 1.9–**2.3**–2.8 µm (Q = 1.4–**1.82**–2.27), ellipsoid to elongate, abundant, smooth, apiculate, guttulate, thin- to thick-walled, cyanophilic and dextrinoid.

Specimens examined: India, West Bengal, Acharya Jagadish Chandra Bose Indian Botanic Garden (AJCBIBG), 5m, N 22°33′25.17″ E 88°17′13.89″, on dead log of *Casurina* sp., KMA 13-016 (CAL 1156), leg. K. Das, M.E. Hembrom & A. Parihar, 26th June 2013.
Ecology: Rare, on the dead wood log of *Casurina*.
Distribution: Ethiopia, Tanzania & Zimbabwe (Africa); Australia; Mexico (North America); Brazil & French Guyana (South America); India & Thailand (Asia).

NOTES

Gyrodontium sacchari is widely distributed amongst all the five continents and considered as "pantropical species" (Carlier *et al.* 2004) but, considering the availability in AJCBIBG as well as India, it is rare in occurrence and managed to be gathered only once in past six years.

The combination of macro- and micromorphological features like resupinate to effused-reflexed basidiomata being easily separable from its host, olive-green to sulphur-coloured hydnoid hymenophore, thick yellowish white context, thick-walled septate generative hyphae of 2–8 µm wide, thick-walled basidiospores (3.0–5.0 × 1.9–2.8 µm) with strongly dextrinoid and cyanophilic nature and absence of any kind of cystidia undoubtedly place this specimen as *Gyrodontium sacchari*. Moreover, its morphology completely agrees with the description given by Hjorstatm (1995) and Valenzuela *et al*. (2012).

ACKNOWLEGEMENTS

The authors are grateful to the Director, Botanical Survey of India (BSI), Kolkata for providing all kinds of facilities during the present work. Dr. Md. N. Aziz (BSI, Cryptogamic Unit), Dr. P. Lakshminarasimhan (BSI, Central National Herbarium) and Dr. A. Pramanik (BSI, AJCBIBG, Howrah) are duly thanked for helping the authors in many ways.

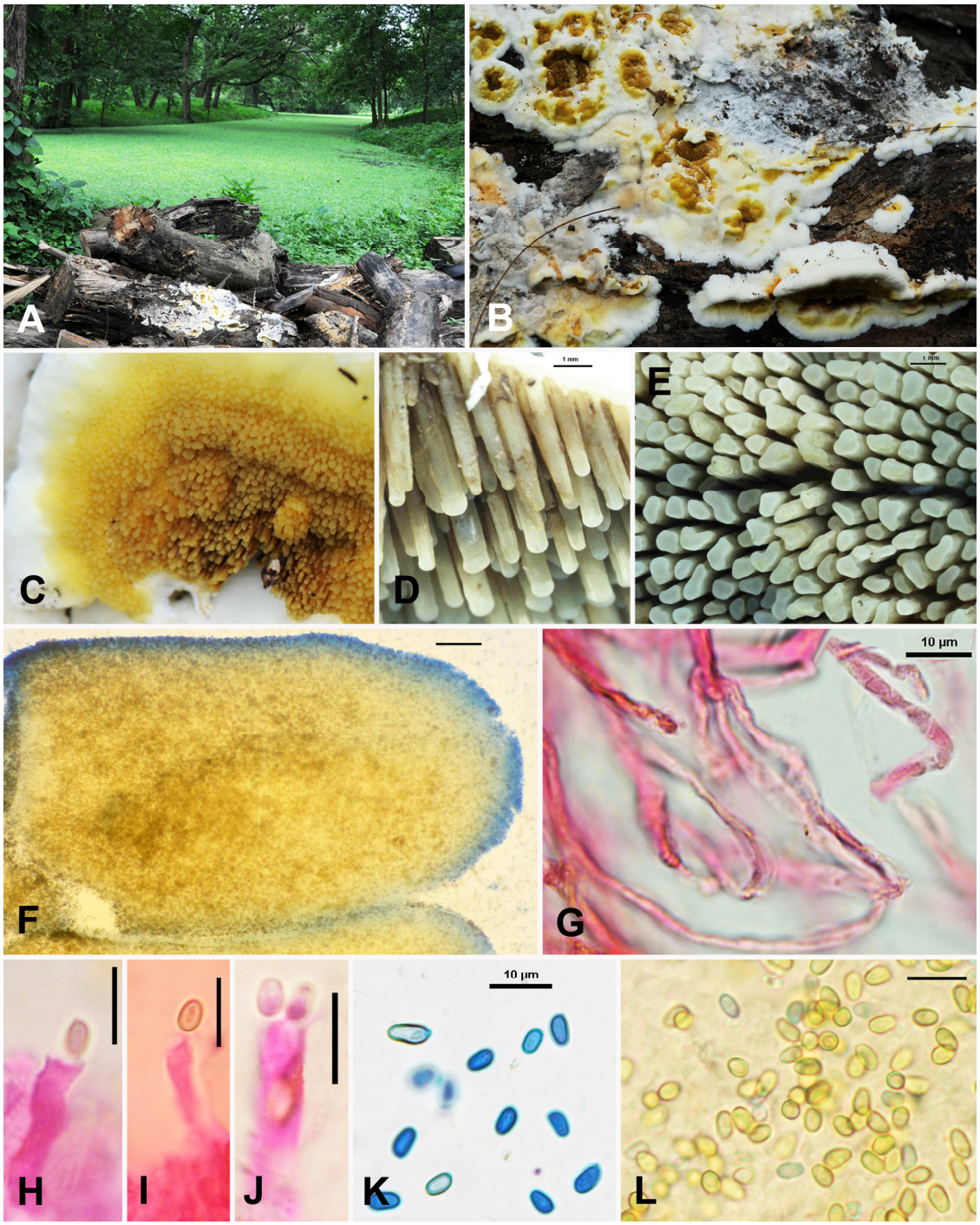

Fig.1: *Gyrodontium sacchari* (Spreng.) Hjorstam: **A**. Habitat; **B**. Basidiomata showing resupinate to effused reflexed habit; **C.** Basidiomata showing spinose hymenophore; **D.** Spines; **E**. Tip of spines showing variable shapes; **F**. Individual fertile spine under light microscope; **G**. Branched and septate generative hyphae; **H–J**. Basidia bearing basidiospores; **K–L.** Basidiospores showing cyanophilic and dextrinoid reaction respectively. Scale bars: **D–E** = 1mm; F = 100 µm; **G–L** = 10 µm.

REFERENCES

Bagchee K, Puri YN, Bakshi BK. 1954. Principal diseases and decays of oaks and other hard woods in India-II. Ind Phytopathl 7**:** 18**–**42.

Banerjee SN. 1935. A new species of Hydnaceae from Bengal: *Grammothele effusoreflexa*. Annal Mycol 34: 76.

Banerjee SN. 1947. Fungus flora of Culcutta and suburbs-I. Bullet Bot Soc Bengal 1: 37**–**54.

Berkeley MJ. 1816. Three fungi from Kashmir. Grevillea 4: 137–138.

Berkeley MJ. 1839. Description of exotic fungi in collection of Sir, W.J. Hooker from memoirs and notes of J.F. Klotzsch with additions and corrections. Annal Natural History 3: 375–401.

Berkeley MJ. 1856. Decades of fungi, Decas 1–62 Nos. 1–620 In: Hooker's London J Bot 3–8: 1844–1856.

Carlier FX, Bitew A, Castillo G, Decock C. 2004. Some *Coniophoraceae* (*Basidiomycetes, Boletales*) from Ethiopian highlands: *Coniophora bimacrospora*, sp. nov. and a note on the phylogenetic relationships of *Serpula similis* and *Gyrodontium*. Cryptogamie Mycologie 25(3): 261–275.

Cooke MC. 1891. Species of Hydnei. Grevillea 20: 1–4.

Currey F. 1874. On a collection fungi made by Mr. Sulpiz Kurz, Curator of the Botanic Garden, Calcutta. Transaction of the Linnean Society London, Ser. II, Bot. I, 119**–**131.

Das K, Hembrom ME, Parihar A. 2013. Two interesting species of stinkhorns from India. NeBIO 4(4): 1–6.

Das K and Sharma JR. 2010. *Hericium cirrhatum* (Pers.) Nikol. A new record to Indian mycoflora. Kavaka 37–38: 17–19.

Das K, Stalpers J, Eberhardt U. 2011. A new species of *Hericium* from Sikkim, Himalaya (India). Cryptogamie Mycologie 32: 285–293.

Das K, Stalpers JA, Stielow, JB. 2013. Two new species of hydnoid fungi from India. IMA Fungus. 4(2):359–369.

Harsh NSK , Bisht NS. 1982. The tooth fungi of Kumaon hills. Ind Phytopathol 35: 418–422.

Hembrom ME, Parihar A, Das K. 2013. A new Species of *Poronia* from India. Current Res Environ Appl Mycol 3(2): 182–185.

Hjortstam K. 1995. Two new genera and some new combination of Corticoid fungi (Basidiomycotina, Aphyllophorales) from tropical and subtropical areas. Mycotaxon 54: 183–193.

Holmgren PK, Holmgren NH, Barnett LC (editors). 1990. Index Herbariorum. Part I: The Herbaria of the world [Regnum Veg. vol. 120]. New York: New York Botnacial Garden.

Khara HS. 1977. Some stipitate Hydnums from North Western Himalayas-V. Ind J Mycol Pl Pathol 7: 127–134.

Kornerup A and Wanscher JH. 1978. Methuen Handbook of Colour. 3rd ed. London, UK: Eyre Methuen Ltd. Reprint.

Maas Geesteranus RA. 1961. A *Hydnum* from Kashmir. Persoonia 1: 409–413.

Mass Geesteranus R A. 1964. Notes on Hydnums-II. Persoonia 3(2): 155–192.

Mass Geesteranus, RA. 1971. Hydnaceous Fungi of the Eastern Old world. North Holland Publishing Company Amsterdam.

Sharma JR, Ghosh PK. 1989. Polypores that decay trees of Indian Botanic Garden. Bulletin of Botanical Survey of India 31(1–4): 95–102.

Sharma, JR. 2013. Ahyllophorales of Himalayas. BSI Publication, Calcutta, India.

Sohi HS, Kumar S, Seth PK. 1964. Some interesting fleshy fungi from Himachal Pradesh. Ind Phytopathol 17: 317–322.

Thind KS and Khara HS. 1968. The hydanceae of the North Western Himalayas. Ind Phytopathol Soc Bullet 4: 25–65.

Thind KS and Khara HS. 1975a. The hydanceae of the North Western Himalayas-II. Ind Phytopathol 28 (1): 57–65.

Thind KS and Khara HS. 1975b. The hydanceae of the North Western Himalayas-III. Ind Phytopathol 28 (1): 66–75.

Valenzuela R, Raymundo T, Decock C, Esqueda M. 2014. Ahyllophoroid fungi from Sonora, Mexico 2. New records from Sierra de Alamos-Rio Cuchujaqui Biosphere Reserve. Mycotaxon 122: 51–59.