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GENUS *HYPHODONTIA* JOHN ERIKSS. IN THE EASTERN HIMALAYA

GURPAUL S. DHINGRA
Department of Botany, Punjabi University, Patiala – 147 002

An account of 7 species of genus *Hyphodontia* based on the collections from the Eastern Himalaya made during the years 1978-82 has been given. All the seven species are new records for the study area. Of these, *H. caulicystidiata* Dhingra is proposed as a new species; *H. nespori* John Erikss. & Hjortst. is a new record for India; while *H. alutacea* John Erikss., collected only from Bhutan, is a new record for the Himalaya. An illustrated detailed account has been given for the new species and new records for India/ Himalaya, for rest of the taxa only brief taxonomic notes are given. A key to distinguish all the 7 species is also provided.

Key words : *Hyphodontia*, Corticiaceae, Aphyllophorales, Eastern Himalaya.

The genus *Hyphodontia* (Corticiaceae, Aphyllophoralers) was raised by Eriksson (1958) to bring together about 20 closely related species, which were earlier placed under different genera. This genus is world-wide in its distribution and represented by about 54 species (Hawksworth *et al.*, 1995). Eriksson & Ryvarden (1976) gave an account of 23 species from North Europe. Rattan (1977) gave an account of 12 taxa from North Western Himalaya. This paper gives information about 7 species of this genus based on the collections made from the Eastern Himalaya during the monsoon months of the year 1978-82. The material of all these taxa is deposited in the Herbarium of Botany Department, Panjab University, Chandigarh, India (PAN), and parts of some of these collections have also been deposited at other Herbaria as indicated within parenthesis after the collection number. The abbreviations used for herbaria follow Holmgren and Keuken (1974), while the colour standards used are according to Kornerup and Wanscher (1978).

MATERIALS AND METHODS

Collections were made from the Eastern Himalaya during the monsoon months. A good hand lens, sharp knife, chisel, small hammer and small saw are important tools required in the field for making collections. A field note concerning locality, date of collection, substratum, type of hymenial surface and abhymenial surface in case of reflexed materials, is written on every specimen. It is then put in paper packet, given a temporary number and taken to the temporary laboratory in a bag where observations regarding the colour of the hymenial and abhymenial surfaces, type of hyphae, cystidia, basidia, basidiospores, and their reactions with cotton blue, melzer's reagent and sulphovanillin are made and noted down using a compound microscope. A spore print is taken for every specimen. The specimens are dried either in the sun or in artificial air driers. The dried collections are packed in bond paper packets and stacked in card board boxes. Effort is also made to photograph the specimens in the field or at the temporary laboratory. A detailed study of every material is made by making crush mounts and free hand section cutting using different stains e.g. 0.5% cotton blue in lactophenol, 1% congo red in water, 1% phloxine in water, melzer's reagent and sulphvanillin. Diagrams of different structures are made using camera-lucida. All the data are compiled into the description, which are compared with the published literature and unidentified specimens are sent to other herbaria for comparison with the type before publication.

KEY TO THE SPECIES

1. Lagenocystidia present 2
1. Lagenocystidia absent 4
2. Hymenium odontioid..... 1. *H. alutaria*

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2. Hymenium smooth or somewhat tuberculate 3

3. Basidiospores 3-4.5 x 2.25-3 mm ..... 2. *H. pallidula*

3. Basidiospores 5.5-8.5 x 4-5 mm ..... 3. *H. propinqua*

4. Cystidia long, tubular, cylindrical or subfusiform, thick-walled, except in the apical part.....4. *H. caulicystidiata* sp.nov.

4. Cystidia not as above 5

5. Basidiospores ellipsoid to broadly ellipsoid ..... 5. *H. aspera*

5. Basidiospores allanotoid or cylindric or almost so..... 6

6. Basidiospores allantoid, 6-8 x 1.5-2 mm ..... 6. *H. alutacea*

6. Basidiospores ellipsoid to subcylindrical, 4.5-5.3 x 2.2-3.0 mm .....7. *H. nespori*

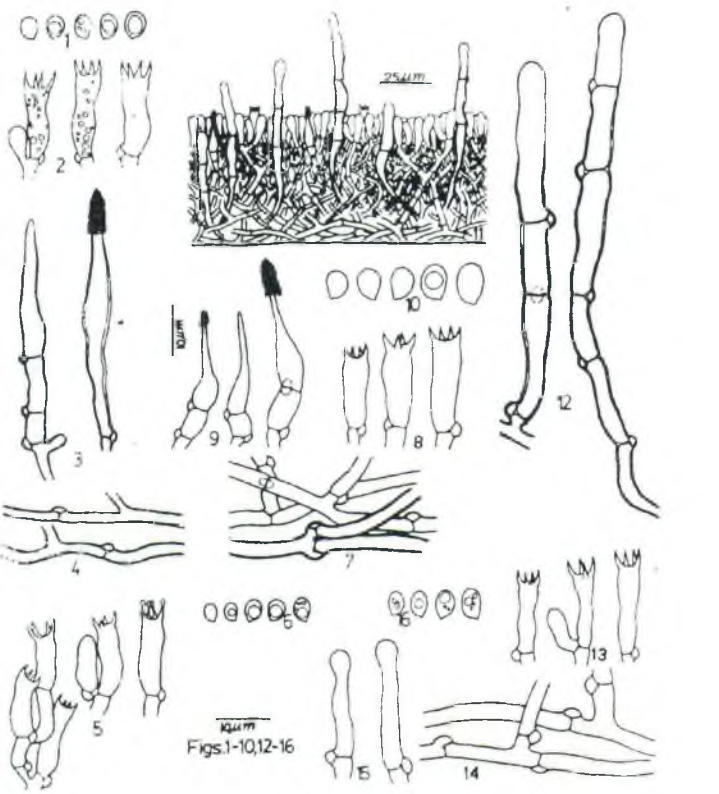
1. ***Hyphodontia alutaria*** (Burt) John Erikss., Symb. bot. Ups. 16: 1 p 104, 1958. *Peniophora alutaria* Burt, Ann. Miss. Bot. Gard. 12 p 332, 1925. (Figs. 1-4)

Collection examined :Arunachal Pradesh: West Kameng, Bomdila, New Bomdila, on a decaying angiospermous stump, G.S. Dhingra 19781 (PAN, GH), August 30, 1981.

Hyphodontia alutaria is a fairly common species in the North Western Himalaya, from where Rattan, 1977 reported it for the first time in India. PAN 19781 is the only collection made from the Eastern Himalaya and is typical of the species except for the presence of some thick-walled, apically encrusted cystidia, which possibly seem to be a modification of lagenocystidia.

2. ***Hyphodontia pallidula*** (Bres.) John Erikss., Symb. bot. Ups. 16: 1 p 104, 1958. – *Gonatobotrys pallidula* Bres., Ann. Mycol. 1 p. 127, 1903. (Figs. 5 - 6)

Collections examined: Arunachal Pradesh: West Kameng, Bomdila, about 3 Km from Bomdila towards Tawang, on a decaying angiospermous log, G.S. Dhingra 19718 (PAN), August 25, 1981. Bhutan:



Figs. 1-4 *Hyphodontia alutaria* 1. Basidiospores 2. Basidia 3. Cystidia 4. Subicular generative hyphae Figs. 5-6 H. pallidula 5. Basidia 6. Basidiospores
Figs. 7 - 12 *H. propinqua* 7. Subicular generative hyphae 8. Basidia 9. Lagenocystidia 10. Basidiospores 11. V. S. Fruitbody 12. Septate cystidia
Figs. 13 - 16 *H. aspera* 13. Basidia 14. Subicular generative hyphae 15. Capitate hyphal ends 16. Basidiospores

Thimphu, Dochula, on a decaying angiospermous log, G.S. Dhingra 19393 (PAN), September 22, 1980; Thimphu, Ha, Jankana, on a decaying gymnospermous log, G.S. Dhingra 19474 (PAN), October 2, 1980; Thimphu, Bunakha, on a decaying *Pinus* log, G.S. Dhingra 19531 (PAN), July 29, 1981; Thimphu, Dochula, on a decaying gymnospermous log, G.S. Dhingra 19573 (PAN), August 3, 1981.

A commonly occurring species in the Himalaya, *H. pallidula* was first reported from India by Thind and Rattan (1976) from the North Western Himalaya. However, it is being reported for the first time from the Eastern Himalaya.

3. ***Hyphodontia propinqua*** Hjortst., Mycotaxon 25: 553, 1983. (Figs. 7 - 12)

Fruitbody thin, resupinate, adnate, effused, at

first porose, with time continuous, subceraceous; hymenial surface creamsih-white to yellowish, smooth to finely tuberculate, pilose under lens by the projecting cystidia; margin not well differentiated. Hyphal system monomitic; generative hyphae 2-3.5 mm wide, branched at wide angles, septate, clamped, cyanophilous; basal hyphae loosely interwoven, somewhat thick-walled; subhymenial hyphae thin-walled, densely interwoven. Cystidia of two kinds, i) 50-125 x 5-6 mm, hyphoid, somewhat thick-walled, septate, clamped, cyanophilous, apically obtuse, projecting up to 50 mm out of hymenium, number of septa varies from one to several; ii) 19-25.5 x 3.5-4.5 mm, generally immersed lagenocystidia which consist of hyphal ends, abruptly ending in needle like apices, provided with a characteristic encrustation. Basidia 14.5-19 x 5-5.5 mm, subcylindrical, with a basal clamp, cyanophilous, 4-sterigmate; sterigmata up to 4 mm long. Basidiospores 5.5-8.5 x 4-5 mm, ellipsoid to broadly ellipsoid, smooth, thin-walled, non-amyloid, acyanophilous, usually uniguttulate.

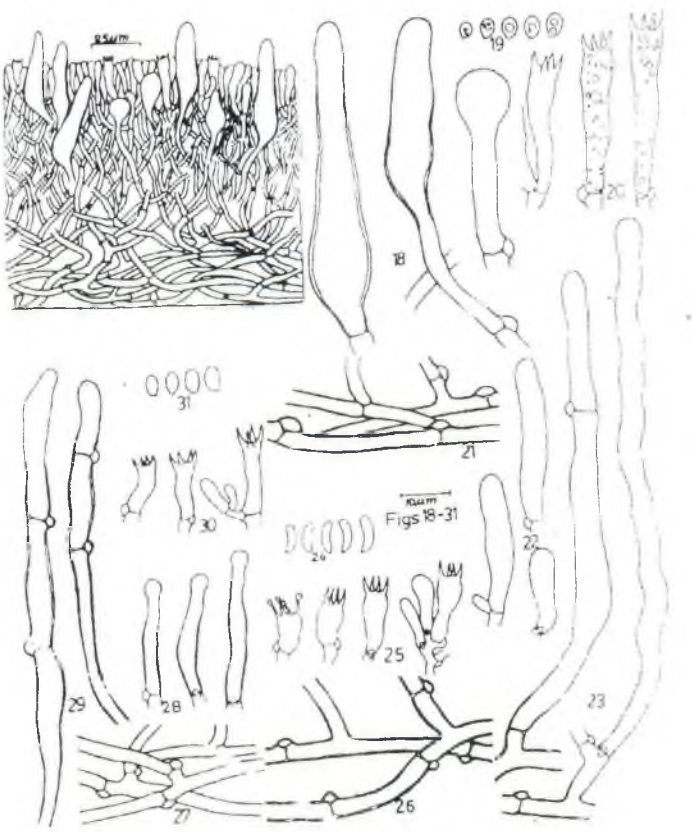
Collection examined: West Bengal: Darjeeling, about 4 Km fom Ghoom towards Sukhia, on a decaying angiospermous stump, G.S. Dhingra 19267 (PAN, O), August 21, 1980.

Above collection from Darjeeling is the only collection of this species from India, which was included by Hjortstam (1983) as a paratype while describing the new species *H. propinqua* from Tanzania.

4. ***Hyphodontia caulicystidiata*** Dhingra sp. nov. (Figs. 17-21)

Fructificatio resupinata, adnata, ad 130 mm crassa in sectione; superficies hymenialis laevigata ad porosofloccosa; margine indistincta; hyphae 2-3.5 mm in diam., nodoso septata; cystidia 55-85 x 9.0-12.5 mm, subcylindrica ad subfusiformea, con distinctus stipitata, subcrassitunicata in fundamenti, cyanophilae; basidii 25-36 x 5-6.3 mm, clavata ad subclavata, 4-sterigmatibus, et fibula basali instructa; basidiosporii 3.5-5.0 x 2.5-3.5 mm, ellipsoidae, laevis, tenuitunicatae, non-amyloidae.

Holotypus: India: West Bengal, Darjeeling, fere 5 Km ex Ghoom versus Sukhia, super *Cryptomeria japonica*



Figs. 17-21 *H. caulicystidiata* 17. V. S. fruit body 18. Cystidia 19. Basidiospores 20. Basidia 21. Subicular generative hyphae
Figs. 22-26 *H. alutacea* 22. Leptocystidia 23. Cystidia 24. Basidiospores 25. Basidia 26. Subicular generative hyphae
Figs. 27-31 *H. nespori* 27. Subicular generative hyphae 28. Capitate hyphal ends 29. Hyphae in the center of aculei 30. Basidia 31. Basidiospores

marcescentem truncum, G.S.Dhingra 19262 (PAN, O) Augustus 21, 1980.

Fruitbody resupinate, adnate, effused, soft, thin, up to 130 mm thick in section, hymenial surface smooth to porose-floccose under lens, at first whitish then yellowish-grey to pale ochraceous; margin indistinct. Hyphal system monomitic; generative hyphae branched at wide angles, septate, clamped, 2-3.5 mm wide; basal hyphae loosely interwoven, somewhat thick-walled, subhymenial hyphae denser and thin-walled . Cystidia 55-85 x 9.0-12.5 mm, numerous, subcylindrical to subfusiform with a distinct stalk, smooth, somewhat thick-walled at the base, gradually thinning above, cyanophilous. Basidia 25-36 x 5-6.3 mm, clavate to subclavate, somewhat sinuous, with oily contents and a basal clamp, 4-sterigmate; sterigmata up to 5.0 mm long. Basidiospores 3.5-5 x 2.5-3.5 mm, ellipsoid, smooth, thin-walled, non-amyloid,

acyanophilous, with one to many oil drops.

Collection examined: West Bengal: Darjeeling, about 5 Km from Ghoom towards Sukhia, on a decaying stump of *Cryptomeria japonica*, G.S.Dhingra 19262 (PAN, O), August 21, 1980.

This species differs from the closely related *Hyphodontia alienata* (Lund.) John Erikss., in having differences in the development (a conspicuous stalk develops first followed by the formation of the main body of the cystidium), size (55-85 x 9-12.5 mm as compared to 60-100 x 5-6 mm in *H. alienata*) and shape of cystidia (subcylindrical to subfusiform with a characteristic stalk which can be as long as the main body of the cystidium) and larger basidia (25-36 x 5-6.3 mm in comparasion to 16-20 (-25) x 4.5-5.5 mm).

5. ***Hyphodontia aspera*** (Fr.) John Erikss., Symb. bot. Ups. 16: 1 p. 104 1958. – *Grandinia aspera* Fr., Hym. Eur. p. 627, 1874. (Figs. 13 - 16).

Collection Examined: Bhutan: Thimphu, Paro, D'Dzong, on a decaying gymnospermous log, G. S. Dhingra 19433 (PAN), September 28, 1980.

It is a rare species in the Himalaya. Rattan (1977) was the first to report this species from India on the basis of single collection from N. W. Himalaya. Here it is being reported as a new record for the Eastern Himalaya.

6. ***Hyphodontia alutacea*** (Fr.) John Erikss., Symb. bot. Ups. 16: 1 p 104, 1958. – *Hydnum alutaceum* Fr., Syst. Mycol. I p. 417, 1821. (Figs. 22 - 26)

Fruitbody resupinate, adnate, effused, thin; hymenial surface yellowish when fresh to sordidly ochraceous in herbarium, at first flocculose, with time more or less odontioid with small (less than 1 mm long) aculei; margin indistinct. Hyphal system monomitic; generative hyphae branched at wide angles, septate, clamped, cyanophilous, up to 4 mm wide; subhymenial hyphae densely packed, thin-walled; basal hyphae and hyphae in the centre of the aculei somewhat thick-walled. Cystidia 90-130 x 4.5-7.0 mm, hyphoid, somewhat sinuous, thin-walled, enclosed or projecting, rarely with a clamped septum. Some thin-walled, subcylindrical leptocystidia (18-36 x 5-5.5 mm) are present in between the basidia. Basidia 8-14 x 4.5-5.3 mm, subclavate with a suburniform constriction, with a basal clamp, 4-sterigmate; sterigmata up to 4 mm long. Basidiospores 6-8 x 1.5-2 mm, allantoid, smooth, thin-walled, non-amyloid, acyanophilous.

Collection examined: Bhutan: Thimphu, Begana, on a decaying gymnospermous log, G.S. Dhingra (PAN, GH), August 7, 1981.

This species is frequent in the coniferous forests in N. Europe. It is also reported from C. Europe, W. Soviet, N. America and Canada (Eriksson and Ryvarden, 1976), but is not yet reported from India. It is the first report of this species from the Himalaya.

7. ***Hyphodontia nespori*** (Bres.) John Erikss. and Hjortst., in Eriksson & Ryv., Cort. N. Europe 4 p. 655, 1976. – *Odontia nespori* Bres., Ann. Mycol. 18: 1-3 p. 43, 1920. (Figs. 27 - 31)

Fruitbody resupinate, effused, adnate, submembranous or sub-crustaceous; hymenial surface odontioid with small, conical aculei, apically fimbriate by projecting hyphae, creamish-white to pale ochraceous; margin somewhat determinate, in young colonies often with a pruinose, sterile zone. Hyphal system monomitic; generative hyphae branched at wide angles, septate, clamped; subicular hyphae 2-3 mm wide, somewhat thick-walled, irregularly interwoven into a rather open texture; subhymenial hyphae thinner and densely packed; projecting hyphae in the aculei enlarged, up to 5.5 mm wide, somewhat thick-walled. Cystidia not clearly differentiated, but some thick-walled hyphae in the aculeial tips are wider and look like cystidia, also some sterile, capitate hyphal ends present in between the basidia. Basidia 10-18 x 3.5-4 mm, subcylindrical with a suburniform constriction, 4-sterigmate, with a basal clamp; sterigmata up to 4 mm long. Basidiospores 4.5-5 x 2.2-3.0 mm, ellipsoid to subcylidrical, smooth, thin-walled, non-amyloid, acynophilous.

Collection examined: Arunachal Pradesh: West Kameng, Bomdila, about 10 Km from Bomdila towards Tawang, on decaying angiospermous twigs,

G. S. Dhingra 19745 (PAN, GH), August 28, 1981.

This species was first described by Bresadola (1920) as *Odontia nespori*. Eriksson and Hjortstam (fide Eriksson and Ryvarden,1976) shifted it to genus *Hyphodontia*. Here it is being described as a new record for India.

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