

## Some New Reports of Resupinate Non-Poroid Agaricomycetous Fungi From Punjab and Adjoining Areas

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(Submitted in January, 2017; Accepted on April 10, 2017)

### ABSTRACT

An account of five species [*Athelia decipiens* (Höhn. & Litsch.) J. Erikss., *Clavulicium macounii* (Burt) J. Erikss. & Boidin ex Parmasto, *C. venosum* (Berk. & Ravenel) Ginns, *Lindtneria chordulata* (D.P. Rogers) Hjortstam and *Piloderma lanatum* (Jül.) J. Erikss. & Hjortstam] of resupinate non-poroid Agaricomycetous fungi is given here based on collections made from different localities of Punjab and adjoining areas. All the five species are described and illustrated for the first time from the study area. Of these, *Clavulicium venosum*, *Lindtneria chordulata* and *Piloderma lanatum* are new records for India.

**Key words:** Basidiomycota, Agaricomycetes, wood rotting fungi, corticioid fungi

### INTRODUCTION

During the field surveys conducted in different localities of districts Rupnagar and Patiala in the state of Punjab and Union Territory of Chandigarh during rainy season of the years 2012-2013, the authors collected some interesting specimens of resupinate, non-poroid Agaricomycetous fungi from the localities surveyed. On the basis of macroscopic and microscopic examination and comparison with literature (Eriksson and Ryvarde, 1973; Rattan, 1977; Eriksson *et al.*, 1981; Bhosle *et al.*, 2005; Bernicchia and Gorjon, 2010; Dhingra *et al.*, 2011; Ranadive *et al.*, 2011; Sharma, 2012; Ranadive, 2013; Dhingra *et al.*, 2014; Kaur *et al.*, 2014, 2016; Martini, 2016 and Mycobank, 2016) these specimens were identified as *Athelia decipiens* (Höhn. & Litsch.) J. Erikss., *Clavulicium macounii* (Burt) J. Erikss. & Boidin ex Parmasto, *C. venosum* (Berk. & Ravenel) Ginns, *Lindtneria chordulata* (D.P. Rogers) Hjortstam, and *Piloderma lanatum* (Jül.) J. Erikss. & Hjortstam. All the five described species are new reports for the study area. It is worth mentioning that *Clavulicium venosum*, *Lindtneria chordulata* and *Piloderma lanatum* are being described for the first time from India. Dried samples of these species have been deposited in the Herbarium of the Department of Botany, Punjabi University, Patiala, (PUN).

### OBSERVATIONS

**1. *Athelia decipiens*** (Höhn. & Litsch.) J. Erikss., *Symbolae Botanicae Upsalienses* **16** (1): 86, 1958. - *Corticium decipiens* Höhn. & Litsch., *Sitzungsberichte der Kaiserlichen Akademie der Wissenschaften Math.-naturw. Klasse Abt. I* **117**: 1116, 1908. **Figs. 1-3**

**Basidiocarp** resupinate, loosely adnate, thin, pellicular, up to 100 µm thick in section; hymenial surface smooth, whitish to pale orange when fresh, not changing much on drying; margins thinning, somewhat fibrillose, paler than the colour of hymenial surface or indeterminate.

**Generative hyphae** simple-septate, thin-walled; basal hyphae up to 3.2 µm wide, parallel to the substrate, less branched; subhymenial hyphae up to 2.6 µm wide, vertical, more branched.

**Cystidia** none.

**Basidia** 13-23 × 4.5-7.2 µm, clavate, somewhat sinuous, tetrasterigmate, without basal clamp, sterigmata up to 4 µm long.

**Basidiospores** 5.2-7.2 × 2.6-4 µm, ellipsoid, thin-walled, smooth, inamyloid, acyanophilous.

**Collection examined** - India, Punjab, Rupnagar, Forest Rest House, on bark of *Phoenix* sp., Gurpreet and Avneet, 8310 (PUN), September 05, 2012.

**Remarks** - A new report for the study area, but this species was earlier reported/ listed by various workers from different localities in India [Natarajan and Kolandavelu (1998) from Tamil Nadu, Kaur (2012) from Himachal Pradesh, Samita (2014) from Uttarakhand, Prasher and Ashok (2013) from Himachal Pradesh, Ranadive (2013) without mentioning localities and Dhingra *et al.* (2014) from Himachal Pradesh].

**2. *Clavulicium macounii*** (Burt.) J. Erikss. & Boidin ex Parmasto, *Conspectus Systematis Corticiacearum: (Tartu)*: 165, 1968. *Corticium macounii* Burt, *Annals of the Missouri Botanical Garden* **13**(3): 256, 1926. **Figs. 4-6**

**Basidiocarp** resupinate, adnate, effused, up to 150 µm thick in section; hymenial surface smooth to tuberculate, somewhat cracked, reddish whitish to pale orange to greyish orange when fresh, colour not changing much, but more cracks



**Figs 1-3. *Athelia decipiens*:** 1. Basidiocarp showing hymenial surface; 2. Basidiospores; 3. Vertical section through basidiocarp

develop on drying; margins thinning, pruinose, paler than the colour of the hymenial surface or indeterminate.

**Hyphal system** monomitic. Generative hyphae up to 3.4  $\mu\text{m}$  wide, branched, septate, clamped, thin-walled; basal hyphae horizontal, less branched; subhymenial hyphae more branched, vertical.

**Gloeocystidia** 28-49  $\times$  5-5.6  $\mu\text{m}$ , tubular to somewhat subfusiform, sinuous, smooth, thin-walled, with basal clamp, with oily contents which gives negative reaction with sulphovanillin.

**Basidia** 23-30  $\times$  4.6-5.6  $\mu\text{m}$ , clavate, somewhat sinuous, 1-4 sterigmate, with or without oily contents, with basal clamp; sterigmata up to 9.6  $\mu\text{m}$  long.

**Basidiospores** 6.2-11.2  $\times$  4-6.3  $\mu\text{m}$ , ellipsoid to broadly ellipsoid, smooth, thick-walled, with oily contents, inamyloid, acyanophilous.

**Collection examined** India, Union Territory of Chandigarh, Industrial area Phase- I, on angiospermous log, Gurpreet and G.S. Dhingra, 8315 (PUN), August 16, 2013.

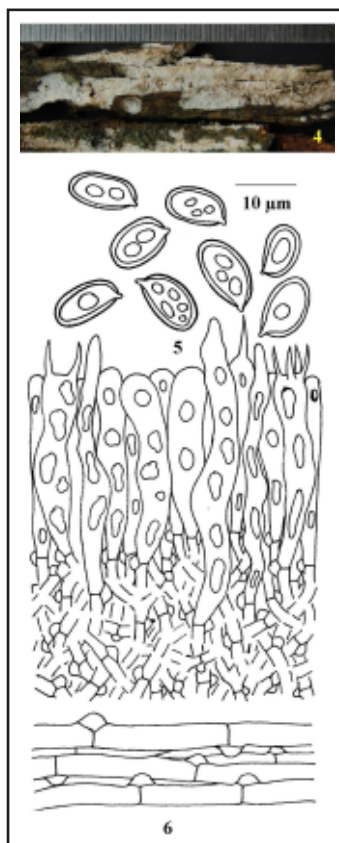
**Remarks** *C. macounii* is peculiar in having thin-walled clamped hyphae, tubular to somewhat subfusiform gloeocystidia and ellipsoid to broadly ellipsoid, thick-walled basidiospores. From India, it was earlier described by Samita (2014) and listed by Dhingra (2014) from Uttarakhand, but here it is being reported for the first time from the study area.

**3. *Clavulicium venosum*** (Berk. & Ravenel) Ginns, *Mycotaxon* 44 (1): 213, 1992. *Corticium venosum* Berk. & Ravenel, *Grevillea* 1 (12): 177, 1873. **Figs. 7-9**

**Basidiocarp** resupinate, adnate, effused, up to 245  $\mu\text{m}$  thick in section; hymenial surface smooth, light orange to greyish orange to brownish orange when fresh, greyish red on drying; margins thinning, whitish or indeterminate.

**Generative hyphae** up to 3.1  $\mu\text{m}$  wide, branched, septate, clamped, thin-walled; basal hyphae horizontal, less branched with patches of crystalline encrustation in the form of rosette present in the basal zone; subhymenial hyphae more branched, vertical.

**Gloeocystidia** 57-80  $\times$  4-5.6  $\mu\text{m}$ , subcylindrical, sinuous, smooth, thin-walled, with basal clamp, with oily contents



**Figs 4-6. *Clavulicium macounii*:**

4. Basidiocarp showing hymenial surface; 5. Basidiospores; 6. Vertical section through basidiocarp

which gives negative reaction with sulphovanillin.

**Basidia** 55-103  $\times$  5.9-7.8  $\mu\text{m}$ , narrowly clavate, sinuous, 2-sterigmate, with basal clamp; sterigmata up to 7  $\mu\text{m}$  long.

**Basidiospores** 9-13.8  $\times$  4.6-6  $\mu\text{m}$ , subcylindrical to ellipsoid, smooth, thin-walled, with oily contents, cyanophilous, inamyloid.

**Collection examined** India, Rupnagar, Boat Club, on trunk of *Leucaena leucocephala*, Gurpreet and Avneet, 8316 (PUN), September 5, 2012.

**Remarks** The species is characterized by clamped hyphae, subcylindrical gloeocystidia and thin-walled subcylindrical to ellipsoid cyanophilous basidiospores and is here reported for the first time from India. Earlier, it was reported from the type locality in South Carolina (Mycobank 2016). No direct comparison has been done with the type material.

**4. *Lindtneria chordulata*** (D.P. Rogers) Hjortstam, *Mycotaxon* 28 (1): 33, 1987. *Pellicularia chordulata* D.P. Rogers, *Farlowia* 1: 98, 1943. **Figs. 10-13**

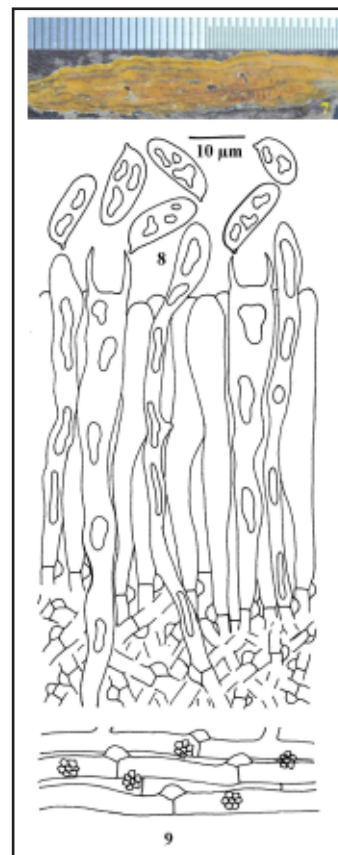
**Basidiocarp** resupinate, adnate, up to 250  $\mu\text{m}$  thick in section; hymenial surface smooth to granulose, reddish white to greyish red when fresh, greyish brown to reddish brown on drying; margins thinning, fibrillose, paler than the colour of the hymenial surface, or indeterminate.

**Generative hyphae** up to 5.6  $\mu\text{m}$  wide, branched, septate, with or without clamps; basal hyphae parallel to substrate, less branched, long-celled, generally without clamps, thick-walled; subhymenial hyphae vertical, short-celled, generally clamped, thin-walled. Hyphal cordons up to 76  $\mu\text{m}$  wide, individual hyphae up to 3.8  $\mu\text{m}$  wide, without clamps.

**Basidia** 13.8-17.3  $\times$  6.4-8.2  $\mu\text{m}$ , clavate, tetrasterigmate, with basal clamp; sterigmata up to 3.8  $\mu\text{m}$  long.

**Basidiospores** 3.5-5.3  $\mu\text{m}$  in diameter, globose, thick-walled, echinulate, cyanophilous, inamyloid.

**Collection examined** India: Rupnagar, Forest Rest House, on trunk of *Eucalyptus tereticornis*, Gurpreet & Avneet, 8309

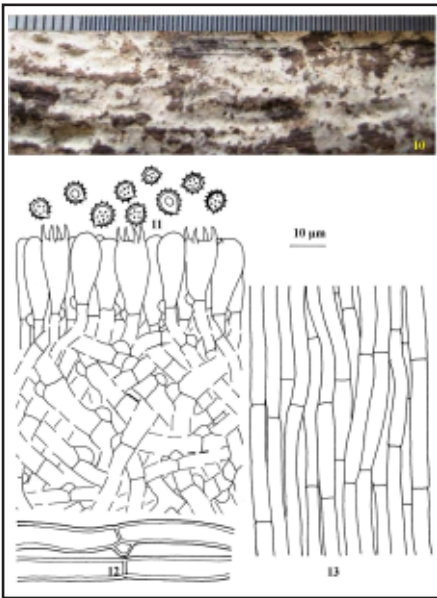


**Figs 7-9. *Clavulicium venosum*:**

7. Basidiocarp showing hymenial surface; 8. Basidiospores; 9. Vertical section through basidiocarp

(PUN), September 5, 2012.

**Remarks-** It is the first report of this species from Punjab as well as India. Peculiar features of this species are basal hyphae without clamps, subhymenial hyphae with clamps and globose, echinulate, cyanophilous basidiospores. Earlier reports in the world are from Austria, Czech Republic, Finland, France, Germany, Italy, Kenya, Macedonia, Norway, Slovenia, Spain, Sweden and Switzerland (Mycobank, 2016).



**Figs 10-13. *Lindtneria chordulata*:** 10. Basidiocarp showing hymenial surface; 11. Basidiospores; 12. Vertical section through basidiocarp; 13. Hyphal cordons

**5. *Piloderma lanatum*** (Jülich) J. Erikss. & Hjortstam, *The Corticiaceae of North Europe* 6: 1207, 1981. *Piloderma byssinum* var. *lanatum* Jülich, *Willdenowia Beiheft* 7: 230, 1972.

**Figs. 14-16**

**Basidiocarp** resupinate, adnate, effused, up to 200 µm thick in section; hymenial surface smooth, whitish to pale orange; margins thinning, fibrillose, without rhizomorphs, paler than the colour of the hymenial surface, or indeterminate.

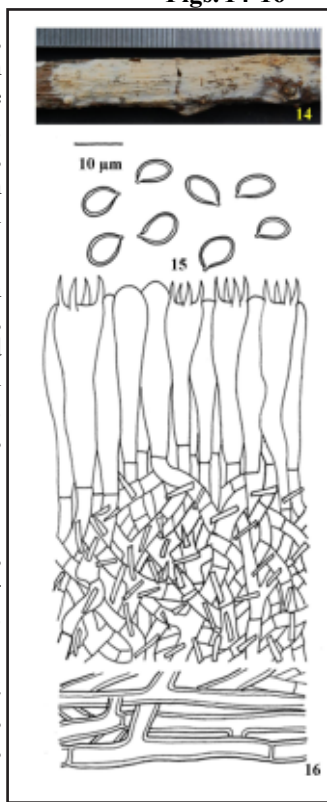
**Generative** hyphae up to 5.3 µm wide, branched, simple-septate, thin- to thick-walled, encrusted with rod like crystals; basal hyphae parallel to the substrate; subhymenial hyphae vertical, richly branched.

**Cystidia** none

**Basidia** 20-38 × 6.4-7.3 µm, narrowly clavate, sinuous, 4-sterigmate, without basal clamp; sterigmata up to 4.7 µm long.

**Basidiospores** 5.2-7.6 × 3.5-5.2 µm, ellipsoid to broadly ellipsoid, smooth, thick-walled, inamyloid, acyanophilous.

**Collections examined** - India: Punjab, Patiala, Punjabi University, Horticulture department, on branches of



**Figs 14-16. *Piloderma lanatum*:** 14. Basidiocarp showing hymenial surface; 15. Basidiospores; 16. Vertical section through basidiocarp.

*Morus alba*, Gurpreet 8312 (PUN), September 10, 2012.

**Remarks** - This species, being described for the first time from India, is characteristic in having thin- to thick-walled simple-septate generative hyphae covered with rod like crystals and ellipsoid to broadly ellipsoid, thick-walled basidiospores. Earlier, it was reported from China, Germany, Estonia, Russia, Italy, Denmark, Norway, Finland, and Spain (Mycobank, 2016).

#### ACKNOWLEDGEMENTS

The authors thank SERB-DST, Government of India for financial assistance under young scientist start up grant; Head, Department of Botany, Punjabi University, Patiala for providing research facilities and Dr. Nils Hallenberg, (Professor Emeritus in Botany, Gothenberg, Sweden) for confirming the identification of some of the species.

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