



## **GONATOCLADIUM, A NEW HYPHOMYCETES FUNGAL GENUS FROM RAIPUR, CHHATTISGARH, INDIA**

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### **ABSTRACT**

During the present investigations for mycobial diversity of aero climate, a new fungus to science namely *Gonatocladium indica* amongst Hyphomycetes group have been recorded for the first time from intramural environment of the Banjari temple during November 2013 (winter season) Raipur, Chhattisgarh, India.

**KEYWORDS:** Addition of New *Gonatocladium* genus, air mycoflora, Banjari temple, Intramural, Winter season, Raipur (C.G.), India.

### **INTRODUCTION**

Various groups of fungi play an important role in atmosphere creating major risk to human health worldwide and causing serious concern such as allergies, asthma, infections, as well as many toxic reactions. Nearly 10% of people worldwide have fungal allergy.<sup>[2]</sup> Some fungi produce many poisons, dreaded substances, mycotoxins and odorless chemicals.<sup>[3]</sup> The quality and quantity of airborne fungi differ with time of the day, location, and human population, load of dust particles, atmospheric temperature and humidity factors. With this view a survey of air mycoflora was conducted of Raipur city atmosphere and large

numbers of fungi of Hyphomycetes group were recorded. Some species were recorded for the first time from Raipur climate while, one fungus genus namely *Gonatocladium* recorded new to science and designated with *G.indica* the type species of the new genus and herewith, being described taxonomically.

## MATERIALS AND METHODS

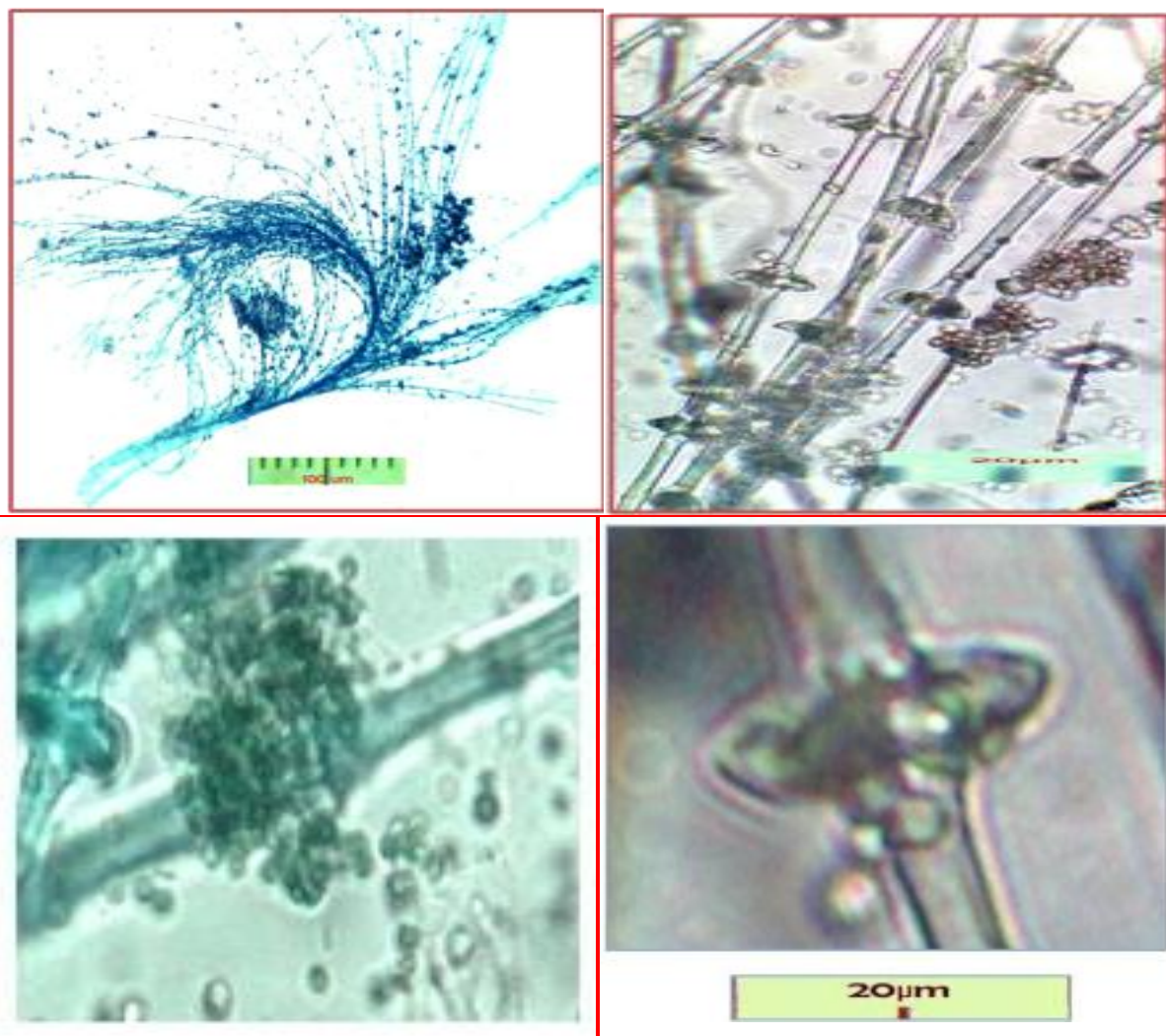
The study is based on living culture isolated as air mycoflora from different locations and seasons of Raipur city, Chhattisgarh, India. The collection was done by Air sampler<sup>[1]</sup> placed in the center of the thickly populated area measuring, 1-2 meters above the ground level. Potato Dextrose Agar (PDA) and Oat Meal Agar (OMA) were used as growth medium of different fungi. The Airflow maintained 5 L/min during the sampling and the sampling time was limited to 5 minutes upon Petri plates aseptically poured earlier with agar media. Such Petri plates were incubated at 25<sup>0</sup> C for 5-7 days and further taxonomic investigations were conducted through Sterio and Compound microscopes concerning macro and micro characters of collected aeromycoflora.

## RESULT AND DISCUSSION

Amongst large number of fungi recorded one fungus found as a new genus which is characteristically distinct, particularly having very long conidiophores with typically encircled whorls of distinct phialides in compact cluster above the septa and described as:

### ***Gonatocladium* H.P.Rajak. Gen. Novo**

Colonies **grow** moderately fast on artificial (PDA) media. Mycelium superficial or immersed. *Conidiophores*, very long macronematous, mononematous, erect or ascending, straight or flexuous, may aggregate freely in group, but not sporodochial or synnematous, brown in color, broad, thick, smooth, septate simple or branched, bearing several whorls of phialides at equidistance, on a thick or nodulose cell along the whole length of conidiophores. Phialides were with inflated or swollen basal portion with very short neck, mono or polyblastic and encircled around the point of attachment, *Conidia* produces semi endogenous or aerogenous, accumulated as dry balls or in chain, simple, globose, nonseptate, smooth, colorless to pale brown, fragile and easily disrupted.



***Gonatocladium indica*; H.P.Rajak. sp.novo.**

*Colonies* effuse felted or cottony, grayish brown. *Mycelium* smooth septate and *Hyphae* 3-4 µm wide, branched, septate, at first colorless, becoming pale brown to dark brown and thicker at the point of origin of the conidiophores. *Conidiophores* arising terminally and laterally of the hyphae, very long (up to 1500 µm) macronematous, mononematous, erect or terminally ascending, straight or flexuous some time may aggregate freely in group, but not sporodochial or synnematos, brown in color, broad, thick (up to 6-10 µm wide), smooth, septate simple or often branched, bearing several whorls of phialides at equidistance, on a thick or nodulose cells along the whole length of conidiophores. *Phialides* with inflated basal portion (8-12 µm) wide with very short neck ( 2-5 µm) and compactly encircled around, mono or polyblastic *Conidia* produces semi endogenous or aerogenous, accumulated as dry balls or in chain, simple, globose, nonseptate, smooth, colorless or pale brown fragile and easily disrupted.

**Habitat: in air, H.P.Rajak Raipur, NCFT-8184.16, National Centre of Fungal Taxonomy, New Delhi, India**

The new proposed genus *Gonatocladium* was compared to justify the new taxon with other closely related genera namely *Acrophialophora*,<sup>[5]</sup> *Botrytis*,<sup>[6]</sup> *Gonatobotrys*,<sup>[4]</sup> *Gonatobotryum*,<sup>[12]</sup> *Nalanthamala*,<sup>[13]</sup> *Nomuraea*,<sup>[10]</sup> *Paecilomyces*,<sup>[2]</sup> *Phialocladus*,<sup>[9]</sup> *Sesquicillium*,<sup>[8]</sup> *Tolypocladi*<sup>[7]</sup> and *Verticillium*.<sup>[11]</sup> But none of the genus from the above found closely was comparable, and consequently found distinct and different with particular reference to Conidiophores length, shape and size. Also differ with the arrangement of Phialides on conidiophores, their shape and size. Conidiogenous cell and conidia were markedly found different with size, shape and color. Therefore, due to above morphologically comparable taxonomic differences *Gonatocladium indica* gen. and sp. novo; named after the country of origin has been added to science.

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#### REFERENCES

1. Andersen, A.A.;- New sampler for collection, sizing and enumeration of viable airborne particles, *Journal of Bacteriology*, 1958; 76: 471–484.
2. Bainier, G.;- Mycothéque de l'école de Pharmacie. XI. Paecilomyces, genre nouveau de Mucedinees. - *Bull. Trimest. Soc. Mycol. Fr*, 1907; 23: 26-27.
3. Burge, H. A.;- Fungi: toxic killers or unavoidable nuisance. *Annals of Allergy, Asthma and Immunology*, 2001; 87(6): 52–56.
4. Corda, A.C.J.;- Pracht, *Flora. Europaeischer Schimmel-Bildungen*, 1939; 2: 322.
5. Edward, J. C.;- A New Genus of the Moniliaceae. *Mycologia*, 1959; 51(6): 781–786.
6. Farlow, W. G.;- *Botrytis rileyi*. - *Rep. U.S. Comm. Agric*, 1883; 121.
7. Gams, W.;-*Tolypocladium*, eine Hyphomycetengattung mit geschwollenen Phialiden. *Persoonia*, 1971; 6: 185-191.
8. Gams,W.;- Cephalosporium-artige Schimmelpilze (Hyphomycetes). - G. Fischer, Stuttgart *Persoonia*, 1971b; 6: 185-191.
9. Kreisel, H.;- Pilze aus Pilzgärten von *Atta insularis* in Cuba. - *Z. allg. Mikrobiol*, 1972; 12: 643-654.

10. Maublanc, A.;- Sur quelques espèces nouvelles de champignons inférieurs. - *Bull. Soc. Mycol. Fr.*, 1903; 19: 291-296.
11. Nees, V. E and Link, K.;- *Linn, Spec Plant*, 1824; 1: 75.
12. Saccardo, P. A.;- *Commentarium mycologicum fungos in primis italicos illustrans.* – *Michelia*, 1882; 2: 385-682.
13. Subramanian, C. V.;- Conidial chains, their nature and significance in the taxonomy of Hyphomycetes. - *Curt. Sci.* 1972; 41: 43-49.