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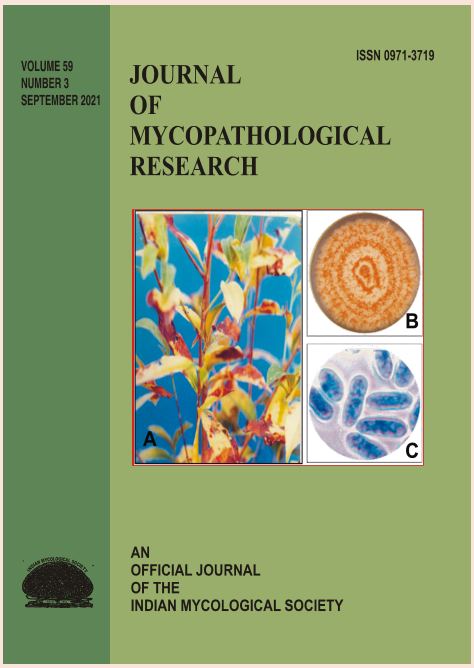

J. Mycopathol. Res. 59(3) : *255-258 2021;*
ISSN 0971-3719

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J. Mycopathol. Res. **59(3)** : 255-258, 2021; (ISSN 0971-3719)

Janetia heterospora sp.nov.- A new anamorphic fungal species reported from Western Ghats of India

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Received : 12.05.2021 Accepted : 05.08.2021 Published : 27.09.2021

During a mycological excursion to the Western Ghats of India in 2017, an interesting anamorphic fungi was collected. In morphology, new collection resembles with the genus *Janetia* Ellis. The new species is compared and contrasted with the other 23 species described in the genus. *Janetia heterospora* sp. nov., occurring on fallen wood in Western Ghats of India is described and illustrated. It differs from the previously described *Janetia* species in the presence of two types of conidia.

Key words: Anamorphic, dematiaceous hyphomycetes, litter fungi

INTRODUCTION

The Western Ghats or Sahyadri is a UNESCO World Heritage Site and is one of the eight "hottest hotspots" of biological diversity in the world. It has an exceptionally high level of biological diversity and endemism which is situated in the southern west coast of Indian peninsula and covers an area of about 160,000 square kilometeres. The pristine natural forests, microhabitats, and tropical warm humid climate that prevail in the Western Ghats support many rare and new forms of fungi (Dubey and Moonambeth 2013, 2014, Dubey and Neelima, 2014). As a part of studies of Terrestrial Litter Fungi, field surveys and visits were conducted to Patches of Western Ghats in the year 2017. During this pilot investigation, along with several rare and new micro-fungi an unusual and very interesting anamorphic Ascomycetes growing on terrestrial wood litter was collected.

The genus *Janetia* was erected with *J. euphorbiae* as the type species. the broader generic concept of *Janetia* is formalized and includes species producing obclavate or cylindric, euseptate or distoseptate, phragmosporous conidia from dematiaceous, denticulate conidiogenous cells. Conidiogenous cells denticulate, integrated, terminal or intercalary, solitary or aggregated, monoblastic or polyblastic; denticles large, usually thick-walled, darkly pigmented, flat-topped, cicatrices not thickened, conidiogenous loci apparently not proliferating. The conidial secession is schizolytic. The conidia are solitary; typically obclavate, dematiaceous, phragmosporous, euseptate and lack a thickened hilum. Their habit may be foliicolous, caulicolous, lignicolous, or fungicolous. The generic concept of *Janetia* has been expanded by da Silva *et al* (2016).

Twenty three species are currently included in Janetia (Anonymous 2021). The genus is primarily tropical or subtropical, with species reported from Argentina, Australia, Brazil, China, Cuba, Japan, Kenya, New Zealand, Taiwan, North America and Tanzania and India. Most of the species are reported from either living or dead dicotyledonous leaves, Only six species, viz. *J. euphorbiae* , *J. canescens* , *J. mangiferae*, *J. refugia*, *J. synemnatosa* and *J. curviapicis* are reported from stems or branches.

MATERIALS AND METHODS

Samples of dried wood were placed in paper and aluminium foil bags, taken to the laboratory, and prepared according to Castañeda–Ruiz (2005). Mounts were prepared in PVL (polyvinyl alcohol, lactic acid, and phenol), and measurements were made at different magnification. Photomicrographs were taken with the

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help of Nikon eclipse 50 i Microscope connected with Nikon DS– Fi 1 camera was used. Scanning Electron microscopic images were also captured by using Zeiss Scanning Electron Microscope Model EVO 18–12 –97. The type specimen is deposited in Botanical Survey of India, Western Regional Centre, Pune with accession no. BSI 136437 and the description has been deposited in Mycobank with no. MB 828898.

RESULTS AND DISCUSSION

Taxonomic Description

Janetia heterospora sp. nov. (MB 828898) (Fig 1 a-l & fig.2 a-f)
Index Fungorum number: IF555707

On PDA and PCA of 32 days, *Colonies* 8-9 mm diam., of loose and blackish brown mycelium, margin entire, but mixed cultures were always observed.

Colonies on terrestrial fallen wood, scattered, brown to dark brown. *Mycelium* partly superficial, partly im- mersed in the substratum, sparse, associated with other hyphomycetes (Fig.1a). *Hyphae* pale brown, branched, septate and 4-5 µm wide.

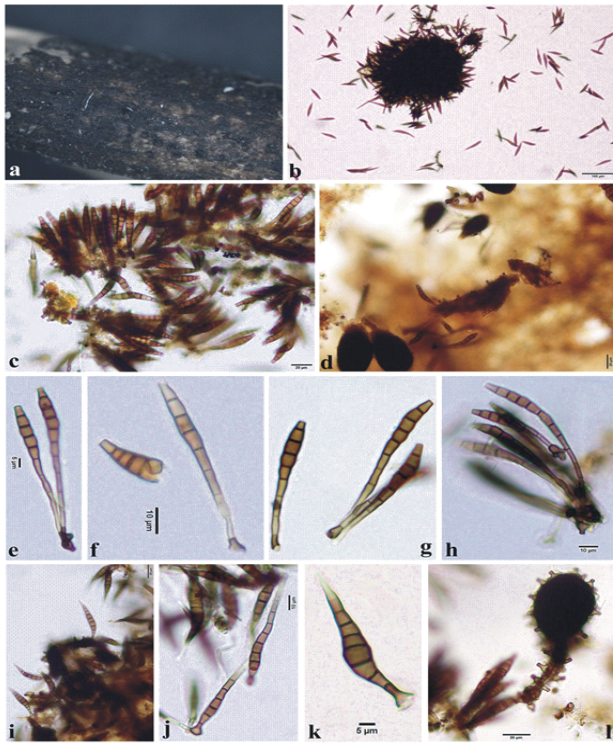

Fig. 1 : *Janetia heterospora* sp.nov.(a) Colonies of fungus growing on host tissues. (b) Colony (c-d) Attachment of fusoid conidia to denticulate conidiogenous cells. (e) Attachment of fusoid conidia to edge of conidiogenous cells. (f-h) Attachment of fusoid conidia to intercalary conidiogenous cells, (i-k) Attachment of obclavate conidia to intercalary conidiogenous cells. (l) Hyperparasitism of new species on other fungi.

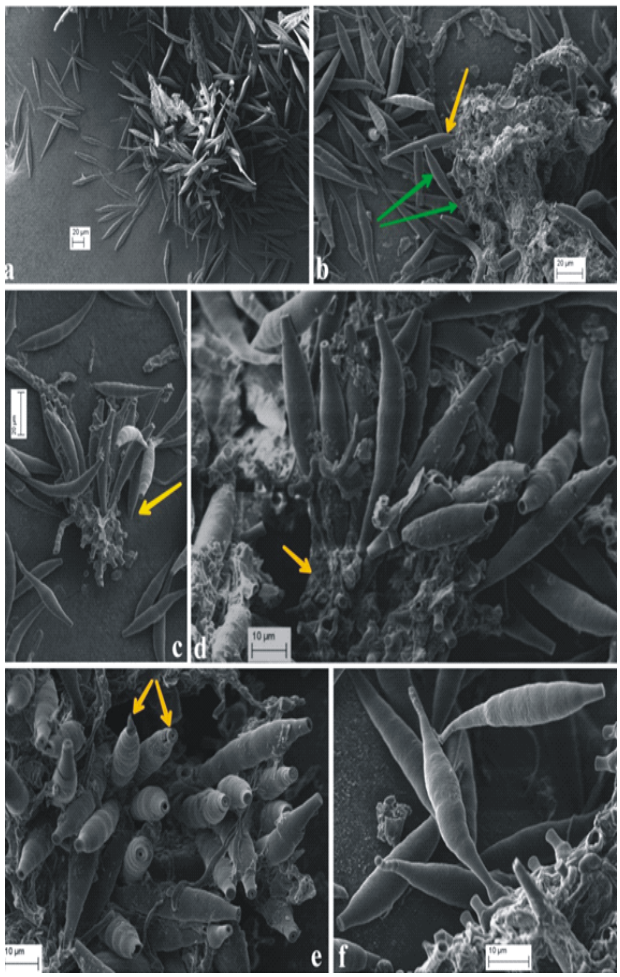

Fig. 2: Scanning Electron microscopic images of *Janetia heterospora* sp. Nov. (a) Colonies, (b) arrow indicating the attachment of fusoid conidia to dark denticulate conidiogenous cell and yellow arrow indicating the attachment of obclavate conidia to denticulate conidiogenous cell. (c-d) Attachment of fusoid conidia to intercalary conidiogenous cells. (e) Arrow indicating the apical truncate end of cylindrical conidia.(f) Attachment of obslavate conidia to denticulate conidiogenous cells apical truncate end of cylindrical conidia.

Hypopodia and *setae* are lacking. *Conidiophores* micronematous to mononematous; *Conidiogenous cells* denticulate, solitary, monoblastic, determinate, brown, intercalary to terminal, small and cylindrical, 4-6 µm long and 3-5 µm wide in fusoid conidia and whereas, cylindrical to ampulliform near base 5.5-9.0µm long and 3.75-11.50 (4-8) µm wide at the bottom in case of dry obclavate conidia, 3-4 µm wide at the apex. *Conidiogenous loci,* not darkened, unthickened, apical truncate, flat, conidial secession schizolytic. *Conidia* solitary, dry, smooth, mid brown and normally of two types: first type of

Table 1 : A comparartive account of all 23 known species of *Janetia* worldwide

Species	Conidial shape, septation and size (µm)	Conidiogenesis	Habitat	Locality
Janetia bacilliformis Gamundí, Arambi&Giaiotti	Cylindric / 5-9 distoseptate/60-156 x 5-9	Monoblastic	leaves	Argentina
Janetia bonarii (M.B. Ellis) S. Hughes 1983	Obclavate/ 5-12euseptate /55-95 x 10-12	Polyblastic	leaves	U.S.A.
Janetia canescens B Sutton & Pascoe	Cylindric / 1-7 distoseptate/ 16-37 x 5.5-9	Monoblastic to Polyblastic	Living branches	Australia
Janetia capnophila S. Hughes 1983	Obclavate/ 7-16 euseptate/58-145 x 10.8-16.2	Monoblastic	leaves	New Zealand
Janetia cubensis Matsush. 1987	Cylindro-obclavate/2-8euseptate /16-77 x 5-8	Monoblastic	Dead palm rachids	Cuba
Janetia curviapicis Goh & K.D. Hyde 1997	Obclavate/ 6-12 euseptate/65-100 x 5.5-7.5	Monoblastic to Polyblastic	Submerged wood	Australia
Janetia dimorphandrae-mollis Marg. Silva & R.W. Barreto 2016	cylindrical, straight to slightly curved/2–7 transversally distoseptate/16–35 x 6.5–9.5 µm	holoblastic	leaves	Brazil
Janetia euphorbiae M.B. Ellis 1976	Cylindro-obclavate/3-6euseptate/18-36 X6-8	Monoblastic to Polyblastic	Stem	Tanzania
Janetia faureae (Piroz.) M.B. Ellis 1976	Long obclavate/3-9 euseptate/50-120 x 4-5	Monoblastic to Polyblastic	Fallen leaves	Tanzania
Janetia garryae (Bonar) S. Hughes 1983	Cylindrical/ 2-6 seueptate/25-70 x 6-8.5	Monoblastic	leaves	U.S.A.
Janetia heterospora sp. nov.*	First type of conidia is fusoid, truncate at the apex and gradually tapered towards a paler, rostrate and acicular base, 8 -12 septate, 72 -110 x 4-7.5; second type of conidia is dry obclavate, truncate at the base and gradually tapered towards a paler apex, 5 -9 septate, 45 -52 µm long x 8-9 µm.	Monoblastic, Conidiogenous cells intercalary/	Wood	India
Janetia indica B.S. Reddy, V. Rao & Manohar. 2004	Obclavte or slightly curved/ 5-9 euseptate/65-105 x 9-15	Monoblastic to Polyblastic	branches	India
Janetia interna H.J. Swart 1985	Obclavate/ 5-8 euseptate/57-128 x 10-11	Monoblastic to Polyblastic	Dead leaves	Australia
Janetia leprosa (Piroz.)	Ellipsoid/2-3 euseptate/10-17 x 3.5-4	Polyblastic	Dead leaves	Tanzania
Janetia longispora P.M. Kirk 1985	Obclavate/ 6-12 euseptate/90-285 x 10-15	Monoblastic	Dead leaves	Kenya
Janetia matsushimae Subram. 1992	Cylindric/4-7 euseptate/20-31.5 x 5-6	Monoblastic	Dead leaves	Japan
Janetia mangiferae S. Hughes & Cavalc.1983	Cylindro-obclavate/1-5 euseptate/8.5-23 x 4.3-6	Polyblastic	Petiole branches	Brazil
Janetia obovata M. Calduch, Gené, Abdullah &Guarro 2002	Broadly clavate/obclavate /3-5septate/22.5 x 33.5	Monoblastic	Submerged wood	Spain
Janetia refugia B. Sutton & Pascoe 1988	Obclavate/4-6 distoseptate/31-37 x 7-8	Monoblastic	Living branches	Australia

Species	Conidial shape, septation and size (µm)	Conidiogenesis	Habitat	Locality
Janetia salicis Li Xu & Y.L. Guo 2002	acicular to obclavate/ multiseptate, 34–91 x2.5–4,	Monoblastic	Living leaves	China
Janetia salvertiae Dorn.-Silva &Dianese 2003	1-6 euseptate, 15–30 x 3–5	Monoblastic	Living leaves	Brazil
Janetia tetracentri Y.L. Guo 1989 (it's a synonym of *Janetia faureae* (Piroz.) M.B. Ellis 1976	Long obclavate/ with 4-5 width	Polyblastic	Living leaves	China
Janetia synnematosa Sivan. & W.H. Hsieh 1990	Obclavate/9-22 distoseptate/80-115 x 10-12.5	Monoblastic to Polyblastic	Dead herbaceous stem	Taiwan
Janetia wilsonii Marg. Silva & R.W. Barreto 2016	Obclavate to cylindrical/5–7.5 µm,1–9 euseptate	Monoblastic	Living leaves	Brazil

Conidia- One type in all cases, except in *Janetia heterospora* sp. nov., where it is of 2 types.

conidia is fusoid, truncate at the apex and gradually tapered towards a paler, rostrate and acicular base, 8-12 septate, 72-110 µm long and 4-7.5 µm wide, apical truncate cell 4.75-3.70 µm long and 3.5-4.0 µm wide, *second type of conidia* is dry obclavate, truncate at the base and gradually tapered towards a paler apex, 4-9 septate, 45-52 µm long and 8-9 µm wide; apical cell conspicuously lighter than the rest of the conidium cells.

Etymology: Based on two different type of spores.

Teleomorph: not observed
Known distribution: Found in Natural forest of North Western Ghats of India.
Material examined: India, Western Ghats, Sawantwadi, on wooden branch, 2 February 2018. Rashmi Dubey, Accession no. BSI 136437.

A comparative account of all the 23 reported species worldwide is enlisted in Table 1. It is clear from the table that the new species Janetia heterospora have significantly distinct morphology. The species has two different types of conidia: one type of conidia is fusoid, truncate at the apex and gradually tapered towards a paler, rostrate and acicular base with 8-12 septa, whereas second type of conidia is 5-9 septate, is dry obclavate, truncate at the base and gradually tapered towards a paler acicular apex, apical cell conspicuously lighter and larger than the rest of the conidium cells. Besides this, the conidiogenous cells is intercalary to terminal. All the twenty three species currently included in *Janetia* world wide, possess only one type of spore and no species of *Janetia* possess two types of spore and no species of genus possesses spores with apical truncate end. This is one of the diagnostic characters, which clearly differs the present specimens from the other existing species. Therefore the present species deserves the rank of new species and designated as *Janetia heterospora* sp.nov.

ACKNOWLEDGEMENTS

Author is thankful to the Director, Botanical survey of India, for his kind support and providing all the research facilities. She is also grateful to the Head of the office, Botanical Survey of India, Western Regional Centre, Pune, for his kind support and encouragement. Ministry of Environment, Forest and climate change, New Delhi and SERB- Science, Engineering, Research board - Department of Science and Technology is thankfully acknowledged.

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