



Two new species of *Dictyosporium* from India

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Abstract

Two species of *Dictyosporium* were collected from forests of Himachal Pradesh, India. *Dictyosporium indicum* sp. nov. and *D. hydei* sp. nov., found on a dead petiole of *Phoenix rupicola* and bark of *Tecoma stans*, respectively, are described and illustrated. The former species is characterized by conidia with sub-apical appendages while the latter has supra-basal conidial appendages. A synopsis of the genus is also provided.

Key words: hyphomycetes, systematics, taxonomy

Introduction

The genus *Dictyosporium*, erected by Corda (1836) with a single species *D. elegans*, is characterized by having micronematous conidiophores forming compact sporodochia or sometime effuse colonies. Conidia are holoblastic, cheiroid, with compact rows of cells, which may be either flattened in one plane (complanate) or non-flattened (not complanate) with or without hyaline appendages. Damon (1952) accepted seven species in the genus while Sutton (1985) recognised 17 species. Goh *et al.* (1999) reviewed the genus and described three new species giving a key and synopsis to the 22 species. Cai *et al.* (2003a) described two new species and provided a key to the genus. Crous *et al.* (2009) provided an updated key and Whitton *et al.* (2012) provided a synopsis of 43 accepted species. Later, Kirschner *et al.* (2013) described *D. inflatum* thus raising the number of species to 44. Of these 44 species 14 are characterized by the presence of hyaline appendages and 30 species are without appendages.

Two species with morphological characteristics of the genus *Dictyosporium* were collected during a floristic investigation of microfungi from Mandi and Bilaspur districts of Himachal Pradesh, India. These two species were found to be distinct from any of the previously described species of *Dictyosporium* (Whitton *et al.* 2012). Therefore, they are proposed as new to science. A synopsis of the 46 species, including the two new species characterized by presence of hyaline appendages, is provided along with the descriptions of the new taxa.

Materials and methods

Decaying culms, twigs, dead wood and bark were collected into separate ziplock plastic bags and taken to the laboratory. The specimens were mounted on glass slides either in 4% KOH or lactophenol and stained in cotton blue (0.01% cotton blue in lactophenol). These specimens were studied microscopically using a Matrix stereo trinocular microscope (VL–Z60) and a transmission microscope (VRS–2f) for macroscopic and microscopic characters. All measurements were made with the help of Pro MED software. The specimens were deposited in the herbarium of Panjab University, Chandigarh, India (PAN).

Several attempts were made to culture the fungi by single spore isolation on 2% potato dextrose agar, 2% oatmeal agar, 2% malt extract agar, liquid and solidified glucose peptone medium and glucose nitrate medium as well as on 2% agar with wood chips of the host, but they did not grow.

TABLE 1. (Continued)

Species	Size of conidia (µm)	Type of conidia	No. of rows of cells	Cells per conidia	Cells per row	Source
<i>D. schizostachyfolium</i>	15–17 × 11–12	Complanate	4	13–16	2–4	Batista & Farr (1960)
<i>D. sinensis</i>	50–130 × 20–35	Complanate	4–7	50–93	7–15	<i>fide</i> Whitton <i>et al.</i> (2012)
<i>D. stellatum</i>	(50–)95–140(–175) × (27.5–)30–40(–52.5)	Complanate	(5–)6(–7)	(59–)110–165(–180)	14–33	Crous <i>et al.</i> (2011)
<i>D. subramanianii</i>	33–42 × 10–8	Complanate	7	24–43*	5–8*	Sutton (1985)
<i>D. taishanensis</i>	27–43 × 15–30	Complanate	(3–)5(–7)	24–55	4–9	Zhao & Zhang (2003)
<i>D. tetrasporum</i>	23.5–40 × 16–21.5	Complanate	3(–4)	12–27	5–7*	Cai & Hyde (2007)
<i>D. tnlakhanpalii</i>	80–120 × 25–36	Not complanate	(4–)6(–8)	90–100+*	16–22*	Manoharachary <i>et al.</i> (2007)
<i>D. toruloides</i>	38–56 × 25–32	Complanate	(–5)6–8	36–51*	4–8*	<i>fide</i> Whitton <i>et al.</i> (2012)
<i>D. triramosum</i>	40–60 × 10–13.5	Not complanate	2(–3)	26–30	9–10	Arambarri <i>et al.</i> (2001)
<i>D. triseriale</i>	26–32 × 16–18	Complanate	3	15–21	5–7	Matsushima (1980)
<i>D. yunnanensis</i>	25–45 × 22–38	Complanate	(5–)6(–7)	19–47	5–9*	Cai <i>et al.</i> (2003a)
<i>D. zeylanicum</i>	26–40 × 13–25	Complanate	5	28–34*	4–8*	Petch (1917)

*After Whitton *et al.* (2012)

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References

- Arambarri, A.M., Cabello M.N. & Cazau, M.C. (2001) *Dictyosporium triramosum*, a new hyphomycetes from Argentina. *Mycotaxon* 78: 185–189.
- Batista, A.C. (1951) Notes on “*Dictyosporium cocophilum*” n. sp. and revision of the genus “*Dictyosporium*” (*Speira*). *Boletim Da Secretaria de Agricultura, Industria e Comercio* 18: 1–6.
- Batista, A.C. & Farr, M.L. (1960) Algumas especies de *Dictyosporium* e *Podosporium*. 1. *Saccardoia* 1: 103–109.
- Bhat, D.J. & Sutton, B.C. (1985) New and interesting hyphomycetes from Ethiopia. *Transactions of the British Mycological Society* 85: 107–122.
[http://dx.doi.org/10.1016/S0007-1536\(85\)80160-1](http://dx.doi.org/10.1016/S0007-1536(85)80160-1)
- Cai, L. & Hyde, K.D. (2007) Anamorphic fungi from freshwater habitats in China: *Dictyosporium tetrasporum* and *Exserticlava yunnanensis* spp. nov., and two new records for *Pseudofuscophialia lignicola* and *Pseudobotrytis terrestris*. *Mycoscience* 48: 290–296.
<http://dx.doi.org/10.1007/s10267-007-0369-1>
- Cai, L., Zhang, K., McKenzie, E.H.C., Lumyong, S. & Hyde, K.D. (2003a) New species of *Canalisporium* and *Dictyosporium* from China and a note on the differences between these genera. *Cryptogamie, Mycologie* 24: 3–11.

- Cai, L., Zhang, K.Q., McKenzie, E.H.C. & Hyde, K.D. (2003b) New species of *Dictyosporium* and *Digitodesmium* from submerged wood in Yunnan, China. *Sydowia* 55: 129–135.
- Chen, J.L., Hwang, C.H. & Tzean, S.S. (1991) *Dictyosporium digitatum*, a new hyphomycete from Taiwan. *Mycological Research* 95: 1145–1149.
[http://dx.doi.org/10.1016/S0953-7562\(09\)80565-0](http://dx.doi.org/10.1016/S0953-7562(09)80565-0)
- Corde, A.C. (1836) *Mykologische Beobachtungen*. Weitenweber's Beitrage zur gesammtem Natur-und Heilwissenschaften Prague.
- Crous, P.W., Braun, U., Wingfield, M.J., Wood, A.R., Shin, H.D., Summerell, B.A., Alfenas, A.C., Cumagun, C.J.R. & Groenewald, J.Z. (2009) Phylogeny and taxonomy of obscure genera of microfungi. *Persoonia* 22: 139–161.
<http://dx.doi.org/10.3767/003158509X461701>
- Crous, P.W., Groenewald, J.Z., Shivas, R.G., Edwards, J., Seifert, K.A., Alfenas, A.C., Alfenas, R.F., Burgess, T.I., Carnegie, A.J., Hardy, G. E.St.J., Hiscock, N., Hüberli, D., Jung, T., Louis-Seize, G., Okada, G., Pereira, O.L., Stukely, M.J.C., Wang, W.White, G.P., Young, A.J., Mctaggart, A.R., Pascoe, I.G., Porter, I.J. & Quaedvlieg, W., (2011) Fungal Planet description sheets: 69–91 *Persoonia* 26: 108–156.
<http://dx.doi.org/10.3767/003158511X581723>
- Damon, S.C. (1952) Type studies in *Dictyosporium*, *Speira* and *Cattanea*. *Lloydia* 15: 110–124.
- Emden, J.H. van (1975). Three new fungi from Surinam soil. *Acta Botanica Neerlandica* 24: 193–1975.
- Goh, T.K., Hyde, K.D., Ho, W.H., & Yanna. (1999) A revision of the genus *Dictyosporium*, with descriptions of three new species. *Fungal Diversity* 2: 65–100.
- Hu, D.M., Cai, L., Chen, H., Bahkali, A.H., & Hyde K.D. (2010) Four new freshwater fungi associated with submerged wood from Southwest Asia. *Sydowia* 62 (2): 191–203.
- Hughes, S.J. (1958) Revisiones Hyphomycetum aliquot cum appendice de nominibus rejiciendis. *Canadian Journal of Botany* 36: 727–836.
<http://dx.doi.org/10.1139/b58-067>
- Kirk, P.M. & Spooner, B.M. (1984) An account of the fungi of Arran, Gigha and Kintyre. *Kew Bulletin* 38: 503–597.
<http://dx.doi.org/10.2307/4108573>
- Kirschner, R., Pang, K.L. & Gareth Jones, E.B. (2013) Two cheirosporous hyphomycetes reassessed based on morphological and molecular examination. *Mycological Progress* 12: 29–36.
<http://dx.doi.org/10.1007/s11557-012-0812-3>.
- Kodsueb, R., Lumyong, S., Hyde, K.D., Lumyong, P. & McKenzie E.H.C. (2006) *Acrodictys micheliae* and *Dictyosporium manglietiae*, two new anamorphic fungi from woody litter of Magnoliaceae in northern Thailand. *Cryptogamie Mycologie* 27 (2): 111–119.
- Manoharachary, C., Kunwar, I.K. & Rao, N.K. (2007) Two new species of *Dictyosporium* from India *Indian Phytopathology* 60: 341–344.
- Matsushima, T. (1975) *Icones microfungorum a Matsushima Lectorum*. Matsushima: Kobe, Japan.
- Matsushima, T. (1980) Saprophytic microfungi from Taiwan, part 1. Hyphomycetes. *Matsushima Mycological Memoirs* 1: 1–82.
- Matsushima, T. (1981) *Matsushima Mycological Memoirs* 2. Matsushima: Kobe, Japan.
- McKenzie, E.H.C. (2008) Two new dictyosporous hyphomycetes on Pandanaceae. *Mycotaxon* 104: 23–28.
- McKenzie, E.H.C. (2010) Two new dictyosporous hyphomycetes on *Rhopalosylis sapida* (Arecaceae) in New Zealand. *Mycotaxon* 111: 155–160.
<http://dx.doi.org/10.5248/111.155>
- Mehrotra, M.D. (1990) *Dictyosporium brahmaswaroopii* sp. nov., from India. *Mycological Research* 94 (8): 1149–1151.
[http://dx.doi.org/10.1016/S0953-7562\(09\)81350-6](http://dx.doi.org/10.1016/S0953-7562(09)81350-6)
- Petch, T. (1917) Additions to Ceylon fungi. *Annals of the Royal Botanic Gardens Peradeniya* 6: 195–256.
- Photita, W., Lumyong, P., McKenzie, E.H.C., Hyde, K.D. & Lumyong, S. (2002) A new *Dictyosporium* species from *Musa acuminata* in Thailand. *Mycotaxon* 82: 415–419.
- Sutton, B.C. (1985) Notes on some deuteromycete genera with cheiroid or digitate brown conidia. *Proceedings of the Indian Academy of Science (Plant Science)* 94: 229–244.
- Tzean, S.S. & Chen, J.L. (1989) Two new species of *Dictyosporium* from Taiwan. *Mycological Research* 92: 497–502.
[http://dx.doi.org/10.1016/S0953-7562\(89\)80199-6](http://dx.doi.org/10.1016/S0953-7562(89)80199-6)
- Whitton, S.R., McKenzie, E.H.C. & Hyde, K.D. (2012) Fungi associated with Pandanaceae Springer. *Fungal Diversity Research Series* 21: 1–457.
<http://dx.doi.org/10.1007/978-94-007-4447-9>
- Wongsawas, M., Wang, H. K., Hyde, K.D. & Lin, F.C. (2009) *Dictyosporium zhejiangensis* sp. nov., a new freshwater anamorphic fungus from China. *Cryptogamie Mycologie* 30: 355–362.
- Zhao, G.Z. & Zhang, T.Y. (2003) Notes on dictyosporic hyphomycetes from China, The genus *Dictyosporium*. *Mycosystema* 22: 19–22.