

Diorygma kurnoolensis (Graphidaceae), a new saxicolous lichen species from Andhra Pradesh, India

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Manuscript received: 20 August 2014

Accepted for publication: 10 December 2014

ABSTRACT

Mohabe S., Nayaka S., Madhusudhana Reddy A. & Anjali Devi B. 2015. *Diorygma kurnoolensis* (Graphidaceae), a new saxicolous lichen species from Andhra Pradesh, India. *Geophytology* 45(1): 47-50.

A new species of saxicolous lichenized fungal genus *Diorygma* Eschweiler (family Graphidaceae) is described here as *D. kurnoolensis*. It is found growing on rocks in moist places of the forest in Kurnool district of Andhra Pradesh at an elevation of 337 m. *D. kurnoolensis* differs from already known saxicolous species of *Diorygma*, viz. *D. rupicola* and *D. saxicola*, in having stictic acid complex and slightly smaller ascospores (50–105 × 15–25 µm).

Key-words: *Diorygma kurnoolensis* sp. nov., Graphidaceae, lichenized fungi, taxonomy, biodiversity, Rayalaseema, Andhra Pradesh, India.

INTRODUCTION

Eschweiler (1824) established graphidaceous lichen genus *Diorygma* [(Lectotype: *D. hieroglyphicum* (Pers.) Staiger & Kalb (Staiger 2002)]. *Diorygma* is widely distributed in tropical to subtropical regions and about 50 species are known throughout the world, with only 25 species reported from India (Kalb et al. 2004, Archer 2006, 2007, Cáceres 2007, Archer & Elix 2008, Makhija et al. 2009, Sharma & Makhija 2009a, b, Sharma & Khadilkar 2012, Tripp et al. 2010). All the species known from India, except *D. rupicola* and *D. saxicola*, prefer corticolous habitat. The genus *Diorygma* was studied in detail by Kalb et al. (2004). The genus is characterized by lirellate, simple to branched ascomata with a densely pruinose disc; carbonized or pale exciple;

I+ blue hymenium; arranged in parallel, branched and anastomosing paraphyses with thick gelatinized wall, reticulately interwoven tips that form the epithecium. Asci are of *Graphis*-type with hyaline, transversely septate or muriform ascospores which rarely become brown and degenerate at maturity. The lichen substances reported in *Diorygma* include norstictic, stictic acid and/or protocetraric chemosyndrome.

The Eastern Ghats region of Indian peninsula is lichenologically interesting in terms of unique lichen mycota and new discoveries. The present collection is from Rayalaseema, which is a politically demarcated region within the state of Andhra Pradesh that lies in the tracts of Eastern Ghats. Earlier, Nayaka et al. (2013a) recorded *Peltula farinosa* Büdel as new to India and mentioned the occurrence of newly described

species *Pyxine yercaudensis* Nayaka & Upreti (Nayaka et al. 2013b) in this region.

MATERIAL AND METHODS

The present investigation is based on the fresh lichen collection from Kurnool district in Rayalaseema region of Andhra Pradesh (Text-figure 1). External morphological features of lichen thallus and ascomata were studied and images were made under Leica S8AP0 stereo-zoom microscope. The anatomical details were studied with thin sections of thallus and ascomata under compound microscope Leica DM500. The sections were mounted in water, 10% aqueous potassium hydroxide solution (K), lactophenol cotton blue and Iodine solution (I). Secondary compounds were investigated by the standard method of Thin Layer Chromatography (White & James 1985, Orange et al. 2001) by using solvent system Toluene 180: Dioxane

60: Acetic acid 8 ml. The type specimen has been preserved in herbarium of CSIR-National Botanical Research Institute, Lucknow (LWG).

TAXONOMIC DESCRIPTION

Genus: *Diorygma* Eschweiler 1824

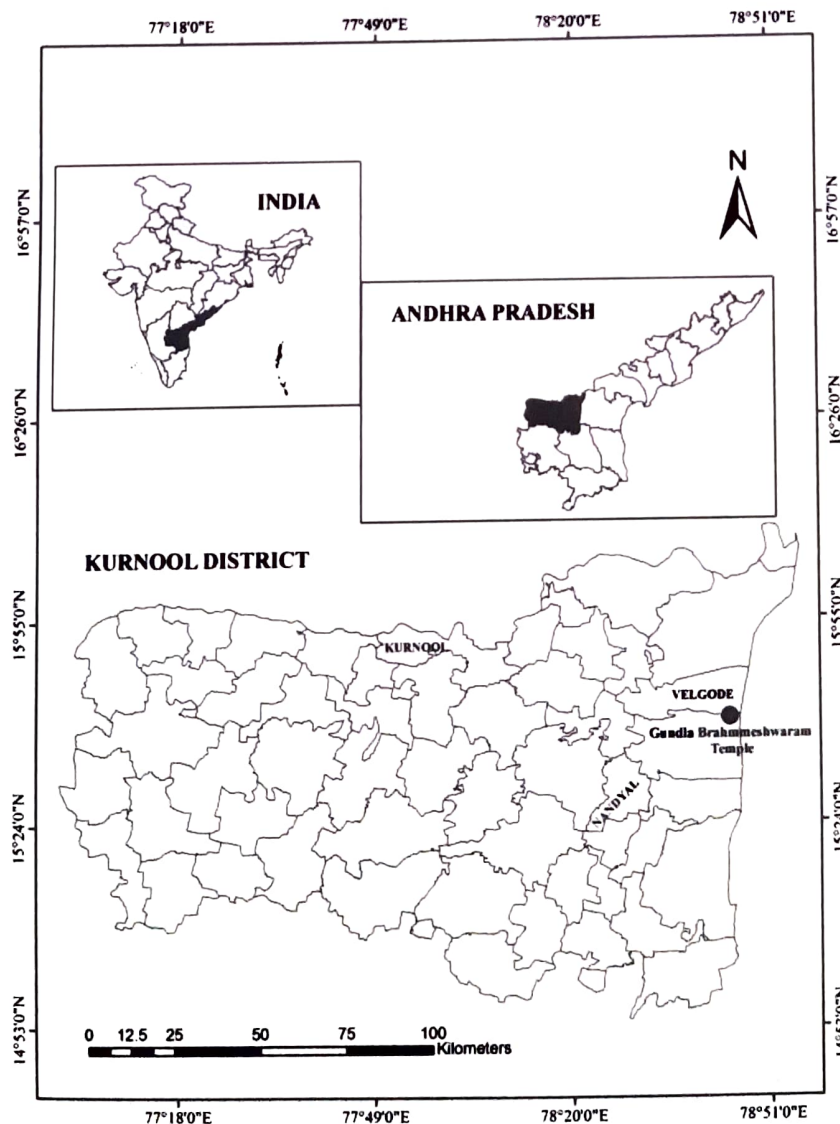
Diorygma kurnoolensis Mohabe, Nayaka & A. M. Reddy, sp. nov.

Plate 1, figures A-C

MycoBank No.: MB812312.

Type: India, Andhra Pradesh, Kurnool district, Nandyal Reserve Forest, in front of Gundla Brahmeshwaram Temple (GBM), alt. ca. 337 m, on rocks, 27.10.2012, Satish Mohabe 2540, Holotype deposited in the herbarium of CSIR-National Botanical Research Institute, Lucknow (LWG).

Diagnosis: Thallus saxicolous, lirellae rare, simple



Text figure 1. Map showing locality of lichen collection, Gundla Brahmeshwaram Temple (GBM) in Kurnool district, Andhra Pradesh.

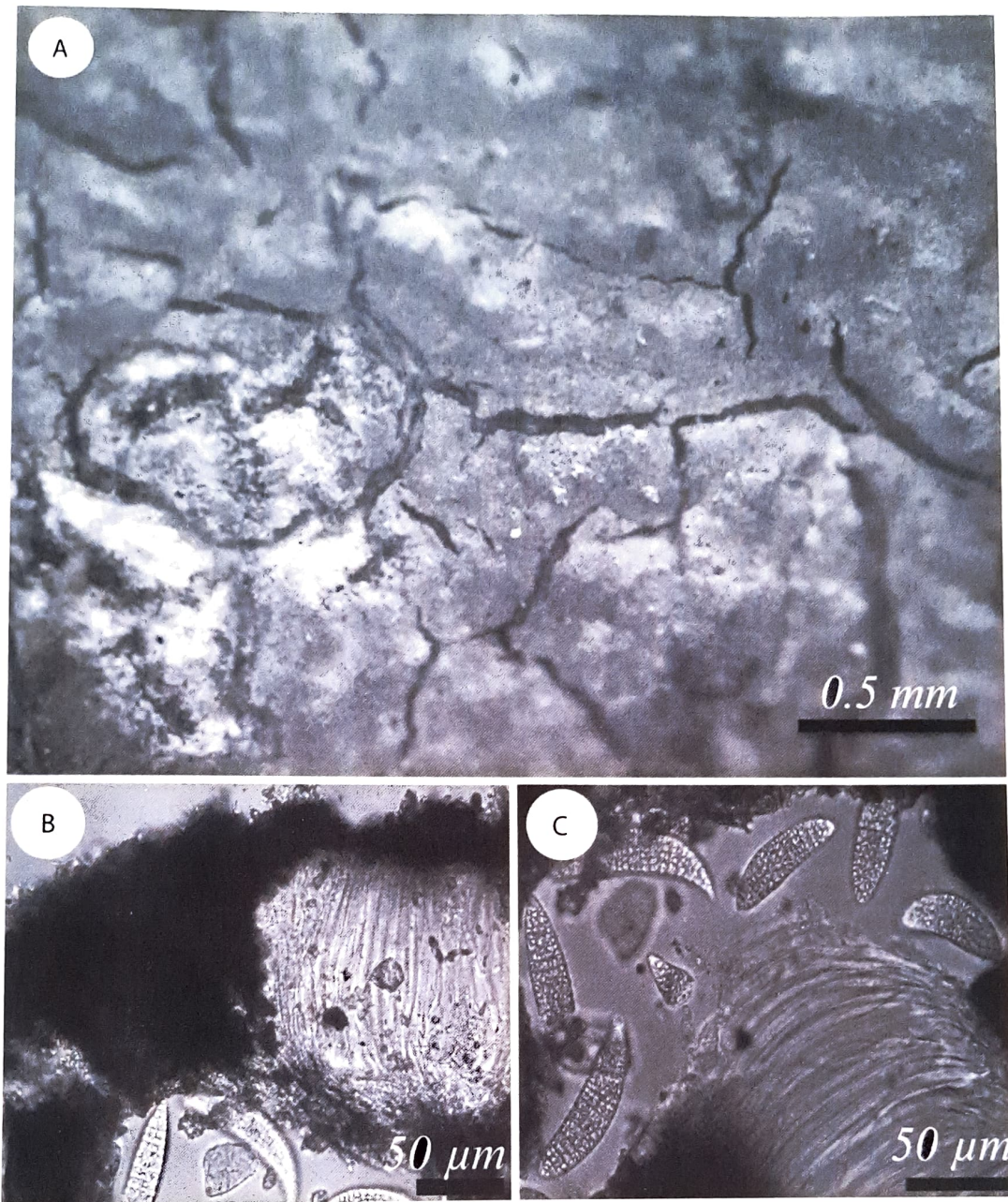


Plate 1

A-C. *Diorygma kurnoolensis* sp. nov. A. Habit (Holotype). B. Cross section of ascomata with striate exciple. C. Muriform ascospores.

to branched, disc densely white pruinose, exciple pale, labia striate, convergent to rarely divergent, ascospores muriform, $50\text{--}105 \times 15\text{--}25 \mu\text{m}$ size, stictic acid chemosyndrome in chemistry.

Description: Thallus crustose, saxicolous, cracked-areolate, surface smooth to rough, greenish grey to greenish-white, margin white, without isidia and soredia, corticated, medulla white, $110\text{--}180 \mu\text{m}$ thick, photobiont a green alga. Ascomata lirellate, rare, simple to branched, $0.2\text{--}0.7 \text{ mm}$ long, subimmersed to immersed, thalline margin thin or indistinct; disc concealed to slightly open, smooth, greyish-brown,

white pruinose; exciple non-carbonized, brownish, well developed, base paler; labia convergent to rarely divergent, with 2–3 indistinct striation; epihymenium brownish to dark brown, $35\text{--}60 \mu\text{m}$ thick, hymenium hyaline, clear, without oil globules, $90\text{--}120 \mu\text{m}$ high, $100\text{--}160 \mu\text{m}$ wide, slightly l+ blue laterally; hypothecium hyaline to slightly yellowish, $30\text{--}45 \mu\text{m}$ high; paraphyses simple to branched, parallelly arranged to anastomosing, $1.0\text{--}1.5 \mu\text{m}$ thick; asci clavate, having ocular chamber, with 1–2 spores; $95\text{--}165 \times 20\text{--}40 \mu\text{m}$; ascospores hyaline, muriform, ellipsoid to fusiform, sometimes curved, with rounded to pointed curve ends,

transversely 14–18 septate, 3–8 cells per septa, peripheral and central spore locules of equal size, 50–105 × 15–25 µm, I+ slightly blue-violet or pale orange. Pycnidia not seen.

Etymology: The specific epithet refers to Kurnool district from where the type specimen was collected.

Chemistry: Thallus and medulla K+ deep yellow, C-, KC-, P-, TLC: stictic (major), cryptostictic and constictic acid (trace) present.

Ecology and distribution: *Diorygma kurnoolensis* is known only from the type locality where it is found growing luxuriantly on rocks at an elevation of ca. 337 m in moist places of forest.

Remarks: *Diorygma kurnoolensis* is characterized by saxicolous habitat, greyish brown disc with dense white pruina, well developed exciple and striate labia, muriform, large ascospores and stictic acid as major lichen substance. It is close to *D. megasporum* in having convergent exciple, larger ascospores and stictic acid. However, *D. megasporum* is a corticolous species and also differs in having abundant lirellae, poorly developed exciple, non-striate and much larger ascospores [80–170 (–220) × 21–55 µm]. Sometimes, *D. kurnoolensis* also resembles *D. tibellii* Kalb et al. (2004) in chemistry and in having smaller ascospores (55–90 × 20–30 µm). However, *D. tibellii* differs in corticolous habitat, poorly developed exciple and numerous lirellae that are separated by deep fissures. The saxicolous species are rare in the genus *Diorygma*. *D. rupicola* and *D. saxicola* are the only other two saxicolous species recently described from India (Sharma & Makhija 2009b, Sharma & Khadilkar 2012). Both the species are similar to *D. kurnoolensis* in having hyaline, muriform, I+ blue ascospores with equal sized locules and striation in the exciple. However, both of these were reported from higher elevation between 1400 and 2000 m in Meghalaya, Nagaland and Sikkim. They differ from *D. kurnoolensis* mainly in chemistry by having norstictic acid as major substance, abundant lirellae and in much larger ascospores (88–147 × 25–42 µm and 143–172 × 29–34 µm respectively).

ACKNOWLEDGEMENTS

The authors are grateful to the Director, CSIR-

National Botanical Research Institute, Lucknow and to Dr. D. K. Upreti, Chief Scientist at the same Institute for providing laboratory facilities and to the Council of Scientific & Industrial Research, New Delhi and Department of Science & Technology, New Delhi for financial support. The authors are also grateful to the Vice-Chancellor, Yogi Vemana University, Kadapa for encouragement, to the Forest officials of Andhra Pradesh for cooperation during lichen explorations, and to Dr. P. Chandramati Shankar for useful discussion during the study.

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