The Lichenologist **36**(6): 361–363 (2004)
DOI: 10.1017/S0024282904014409 *Printed in the United Kingdom*

A new isidiate species of *Graphis* from India

Bharati ADAWADKAR and Urmila MAKHIJA

Abstract: A new isidiate species in the genus *Graphis* Adans. (*sensu* Staiger 2002), *Graphis isidiza* (*Graphidaceae*, ascomycetes) is described from the Western Ghats of India.

Key words: Ascomycetes, isidia, *Graphidaceae*, lichenized fungi, taxonomy

Introduction

The lichen family *Graphidaceae*, is widely distributed in pantropical regions of the world and comprises *c*. 918 species (Kirk *et al*. 2001). The occurrence of isidia and soredia is rather rare in the family. Isidia have so far been reported in the species *Graphina dimorphodes* (Nyl.) Zalbr., [now *Platythecium dimorphodes* (Nyl.) Staiger], *G. dealbata* (Nyl.) Müll. Arg., *G. albostriata* (Vain.) Zalbr., *G. heteroplacoides* Redinger, *G. rimulosa* Redinger, *Graphis isidiifera* Wirth & Hale, *G. patwardhanii* Kulk., *Phaeographina* (=*Graphina*!) *includens* (Vain.) Zalbr. and *Thalloma isidiosum* Staiger (Kulkarni 1977; Wirth & Hale 1978; Staiger 2002). So far *Graphis patwardhanii* is the only isidiate species which has been reported from India (Kulkarni 1977; Awasthi 1991, 2000).

Our recent studies of the family *Graphidaceae* in India have revealed a new isidiate species possessing a well-developed exciple with distinctly carbonized areas and hyaline ascospores turning I+ violet. It clearly belongs to the genus *Graphis* Adans. (*sensu* Staiger 2002) and it is described below.

Materials and Methods

External morphology was studied using a dissecting microscope; sections for anatomical studies of the thallus and ascomata were stained with Lugol's iodine, mounted in lactophenol, and examined with a Zeiss Axioskop microscope. TLC was carried out using the standard methods (Culberson 1972; White & James 1985) with solvent systems benzene-dioxane-acetic acid (180:45:5) and toluene-ethyl acetate-formic acid (139:83:8).The specimen was observed under UV light (365 nm).

B. Adawadkar and U. Makhija: Agharkar Research Institute, G. G. Agarkar Road, Pune-411 004, India.

The Species

Graphis isidiza Adawadkar & Makhija sp. nov.

Similis *Graphis patwardhanii* Kulk. praesentia isidum sed differt excipulo bruniorum sed fuliginio ad strias et ascosporis 5–9 trans-septatis, minoribus, 21–30(–34) × 4–8 µm et species acidum constictum et acidum sticticum (paulum) continens.

Typus: India, Western Ghats of south India, Tamil Nadu, at foot of the Nilgiri Hills, Kulhalli, on bark, 4 November 2001, *U. V. Makhija* 01.106 (AMH—holotypus).

(Fig. 1)

Thallus corticolous, greenish grey, unevenly thickened, tightly attached to the substratum, cracked, epruinose, delimited by thin blackish brown hypothallus, distinctly isidiate. *Isidia* small, globose, or more or less terete, 100–140 µm tall (measured under the microscope), spread over the thallus, concolorous with the thallus or darker.

Ascomata lirellate, 2–8 mm long, simple to sparingly branched, slightly elevated,

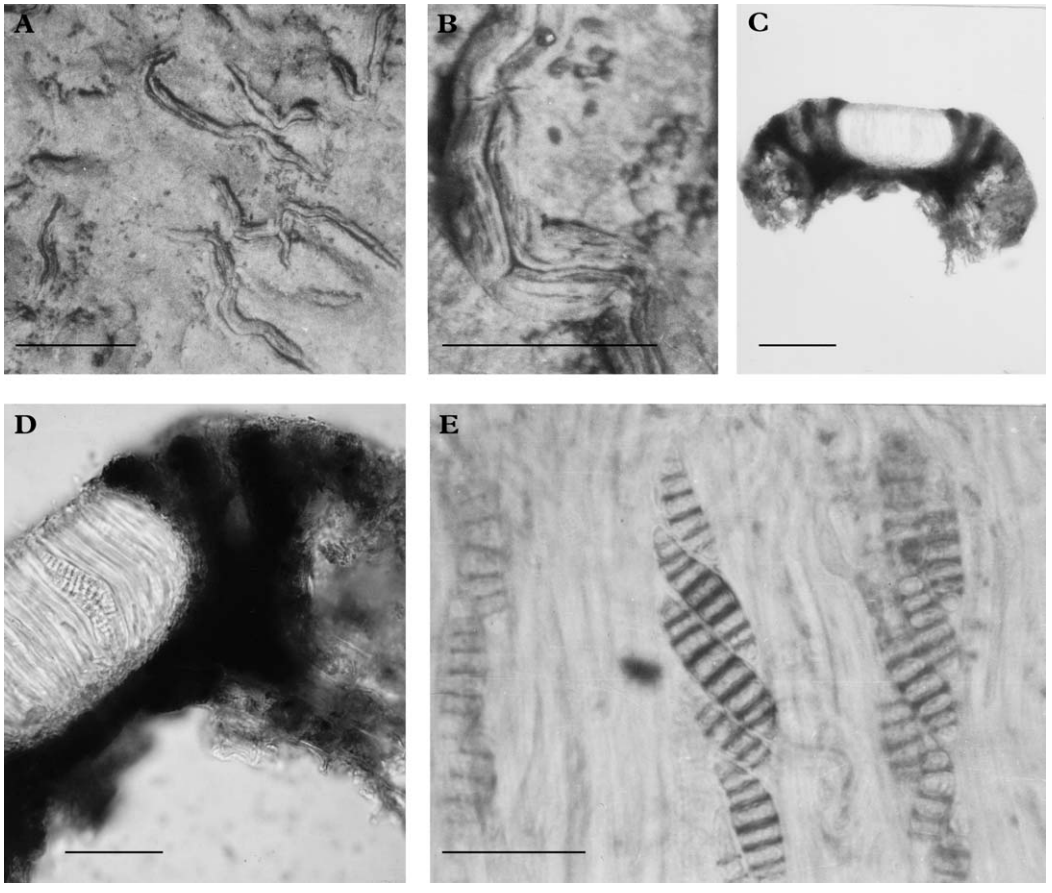

FIG. 1. *Graphis isidiza* (holotype). A, habit; B, same magnified; C, section of ascomata mounted in lactophenol; D, same magnified; E, ascospores in hymenium stained with Lugol's iodine. Scales: A=2 mm; B=1 mm; C=100 μm; D=50 μm; E=20 μm.

straight to irregularly curved, flexuose, scattered all over the thallus, concolorous with the thallus or darker, pointed to rounded at the ends. *Disc* narrow to slightly open, light brown to blackish brown, covered with white pruina. *Thalline margin* moderately raised, overarching the exciple, studded with crystals as seen in the section. *Exciple* light brown, present at the base, thick, entire to 3–4-striate, mostly carbonized in the apical region. *Epithecium* colourless, indistinct, sometimes covered by a thin layer of pruina. *Hymenium* hyaline, not inspersed, 84–159 μm high and 97–194 μm broad, I−, K/I−. *Hypothecium* hyaline to pale yellow, 12–13 μm thick. *Paraphyses* unbranched, dense, thin, filiform, septate, thickened at the apices. *Asci* cylindrical, 8-spored, 97–109 × 12–17 μm. *Ascospores* fusiform, straight, rounded at the ends, 5–9-trans-septate, 21–30(–34) × 4–8 μm, I+ violet.

Chemistry. Thallus K+ light yellow, C−, KC−, P+ orange yellow, UV−; constictic acid and stictic acids (trace) present.

Remarks. *Graphis patwardhanii*, the only other isidiate member of the genus (*sensu* Staiger 2002) with trans-septate spores, differs from the new species, *G. isidiza*, in having a laterally carbonized exciple and much larger, 60–90(–110) × 8–12 μm,

https://doi.org/10.1017/S0024282904014409 Published online by Cambridge University Press

16–19-septate ascospores. Moreover, *G. patwardhanii* does not produce any lichen substances detectable by TLC.

This interesting corticolous lichen has been found only once, associated with a few macrolichens in dry deciduous woodland, at the foot of the Nilgiri Hills in the Western Ghats of India.

We are grateful to the Ministry of Environment and Forests, Government of India, New Delhi, for their financial support.

References

Awasthi, D. D. (1991) A key to the macrolichens of India, Nepal and Sri Lanka. *Bibliotheca Lichenologica* **40:** 1–337.

Awasthi, D. D. (2000) *Lichenology in Indian Subcontinent*. Dehradun: Bishen Singh Mahindra Pal Singh.

Culberson, C. F. (1972) Improved conditions and new data for the identification of lichen products by standardized thin layer chromatographic methods. *Journal of Chromatography* **72:** 13–125.

Kirk, P. M., Canon, P. F., David, J. C. & Stalpers, J. A. (eds) (2001) *Ainsworth and Bisby's Dictionary of the Fungi*. 9th edition. Wallingford: CAB International.

Kulkarni, C. R. (1977) A new species of *Graphis* from Western Ghats, SW India. *Biovigyanam* **3:** 115–116.

Staiger, B. (2002) Die Flechtenfamilie *Graphidaceae*. Studien in Richtung einer natürlicheren Gleiderung. *Bibliotheca Lichenologica* **85:** 1–526.

White, F. J. & James, P. W. (1985) A new guide to microchemical techniques for the identification of lichen substances. *Bulletin of the British Lichen Society* **57:** 1–41.

Wirth, M. & Hale, M. E. (1978) Morden Smithsonian Expedition to Dominica: the lichens (*Graphidaceae*). *Smithsonian Contributions to Botany* **40:** 1–64.

Accepted for publication 24 *August* 2004