



## A new record of *Graphis* (Lichenized Ascomycota) from India

G. Swarnalatha

Botanical Survey of India, Deccan Regional Centre, Hyderabad-500048, Telangana, India

### ARTICLE INFO

*Article history:*  
Received : 07 December 2016  
Accepted : 19 December 2016

*Keywords:*

Darjeeling  
*Graphidaceae*  
*Graphis ruiziana*  
Lichen  
New record

### ABSTRACT

A collection from Darjeeling district in West Bengal state was identified as *Graphis ruiziana* (Fée) A. Massal. This lichen species is recorded for the first time from India. Detailed description, illustration and relevant notes are provided.

© 2016 Orissa Botanical Society

### 1. Introduction

*Graphis* Adans., which is the largest genus in the family *Graphidaceae*, comprises over 370 species worldwide; the members of the genus are found mostly in tropical regions, with few members also being found in the temperate parts. The genus *Graphis* is characterized by mostly lirellate ascomata; partially to completely carbonised excipulum; hyaline, amyloid, transversely septate to muriform ascospores (Staiger, 2002; Lücking, 2009).

Singh & Sinha (2010) reported the occurrence of 111 species of *Graphis* in India. Later, few more species were added to the genus by Jagadeesh Ram and Sinha (2009b), Singh and Swarnalatha (2011b), Singh *et al.* (2011), Chitale *et al.* (2011), Sharma and Khadilkar (2011), Gupta and Sinha (2012), Sethy *et al.* (2012), Singh and Singh (2014, 2015 & 2016), Singh *et al.* (2015). While studying the specimens of *Graphidaceae* the author came across an unidentified collection from Darjeeling hills, which on critical examination was found to be *Graphis ruiziana*. The species *Graphis ruiziana* has not been recorded from India so far in any revisionary/floristic work. Therefore, this is a new distributional record for the species in India.

### 2. Materials and Methods

The morphological examinations were carried out under a stereo zoom microscope (Nikon SMZ 1500). Thin hand-cut sections of thalli and ascomata were mounted in water, 10% KOH and Lugol's solution; all anatomical measurements were made in water mounts and anatomical characters were examined under a compound microscope (Magnüs MLX-Tr). The lichen chemicals were investigated with Thin Layer Chromatography (TLC) in solvent system A, following White & James (1985). The spot tests were performed with the usual chemical reagents (K, C and P). The specimen was also examined under UV light (365 nm). The specimen was taken on loan from the herbarium of Central National Herbarium, Botanical Survey of India, Howrah (CAL) and studied by the author at Lichen Laboratory, Botanical Survey of India, Central Regional Centre, Allahabad, in December 2011. Identification of the specimen followed the key by Lücking *et al.* (2009).

### 3. New Record

*Graphis ruiziana* (Fée) A. Massal., Mem. Lichenogr.: 111. 1853. *Opegrapha ruiziana* Fée, Essai Crypt. Écorc.: 27. 1824. *Graphina ruiziana* (Fée) Müll. Arg., Mém. Soc. Phys. Genève 29(8): 38. 1887.

\* Corresponding author; Email: swarnalathaginnaram@gmail.com



Fig. 1. *Graphis ruiziana* (Fée) A. Massal.

Thallus corticolous, epiphloeodal, thallus 22–32  $\mu\text{m}$  thick above the bark, 4–5 cm diam., finely cracked, irregular in outline, prothallus indistinct; surface white to creamy to ashy-grey, smooth. Thallus in section lacks upper cortex, clusters of small calcium-oxalate crystals present in the thallus.

Ascomata lirellate, simple, jet-black, numerous, scattered all over the thallus, straight to occasionally curved, ellipsoid or oblong to elongate, sessile, 0.4–1.7 mm long, 0.3–0.4 mm broad, obtuse at the ends; disc closed to slit-like, ashy-white pruinose along the slit; excipulum completely carbonized; not covered by thalline margin; labia convergent, entire; hymenium hyaline, not interspersed, I–, 176–208  $\mu\text{m}$  high; epihymenium indistinct; subhymenium hyaline to brown to black, becoming carbonised with age; paraphyses simple, tips without brown walls. Asci clavate, 128–150  $\times$  19–29  $\mu\text{m}$ . Ascospores 8 per ascus, sub-biseriate to biseriate, obovatus or broadly ellipsoid, muriform, 25–58  $\times$  14–19  $\mu\text{m}$ , 8–11  $\times$  3–4 locular, hyaline, I+ blue-violet.

**Chemistry:** Thallus K– red, C–, KC–, P–, UV–; No lichen substances detected by TLC.

**Remarks:** This species is characterised by its simple, jet-black, short, sessile ascomata; completely carbonized excipulum; convergent, entire labia; 8-spored asci; obovatus or broadly ellipsoid, muriform, 25–58  $\times$  14–19  $\mu\text{m}$ , 8–11  $\times$  3–4 locular, hyaline, I+ blue-violet ascospores and lack of lichen substances. In morphology, anatomy and chemistry *Graphis ruiziana* is very similar to *G. nuda* and *G. subruiziana*, but *G. nuda* has shorter (25–40  $\times$  14–18  $\mu\text{m}$ ) ascospores and *G. subruiziana* has larger (55–90  $\times$  20–35  $\mu\text{m}$ ) ascospores and non-pruinose disc.

**Distribution:** Brazil, Brittany, Costa Rica, France, Ireland, Portugal, Scotland, Venezuela; now recorded here from India also.

**Specimen examined:** INDIA: West Bengal, Darjeeling District, Manebhanjan, May 1985, K. N. Roy Chowdhary 4803 (CAL).

#### Acknowledgements

The author is thankful to Director, Botanical Survey of India, Kolkata, and to former Head of Office, Botanical Survey of India, Central Regional Centre, Allahabad for providing facilities during the study, and Head of Office, Central National Herbarium, Botanical Survey of India, Howrah (CAL) for loan of specimens. The financial support of Ministry of Environment, Forests and Climate Change, New Delhi, under the AICOPTAX project on Lichens & Bryophytes during December 2007 to March 2012, is also acknowledged.

#### References

- Chitale, G., Makhija, U. and Sharma, B. (2011). Additional species of *Graphis* from Maharashtra, India. *Mycotaxon* 115: 469–480.
- Gupta, P. and Sinha, G. P. (2012). A new record of lichen in the genus *Graphis* for India from Assam. *Indian J. For.* 35 (1): 133–134.
- Jagadeesh Ram, T. A. M. and Sinha, G. P. (2009). New species of *Graphis* and *Hemithecium* (lichenized Ascomata) from Eastern Himalaya, India. *Mycotaxon* 110: 31–35.
- Lücking, R. (2009). The taxonomy of the genus *Graphis sensu* Staiger: (*Ostropales: Graphidaceae*). *Lichenologist* 41: 319–362.
- Lücking, R., Archer, A. W. and Aptroot, A. (2009). A world-wide key to the genus *Graphis* (*Ostropales: Graphidaceae*). *Lichenologist* 41(4): 363–452
- Sethy, P., Pandit, G. and Sharma, B. O. (2012). Lichens on mangrove plants in Andaman Islands, India. *Mycosphere* 3(4): 476–484.
- Sharma, B. O. and Khadilkar, P. (2011). Two new species in the lichen family *Graphidaceae* from India. *Lichenologist* 43(5): 487–490.
- Singh, K. P. and Sinha, G. P. (2010). A Indian lichens: An annotated checklist. Botanical Survey of India, Kolkata. 1–571.
- Singh, P. and Singh, K. P. (2014). Two new species of *Graphis* (Ascomata: *Ostropales: Graphidaceae*) from the Indo-Burma biodiversity hot spot. *Mycosphere* (5) 4: 504–509.
- Singh, P. & Singh, K. P. (2015). Additional lichen records of *Graphidaceae* for Manipur, Meghalaya and Nagaland, North-East India. *Geophytology*, 45 (2): 181–194.
- Singh, P., Singh, K. P. and Bhatt, A. B. (2015). Diversity and distribution of microlichens in the state of

- Arunachal Pradesh, Eastern Himalaya, India. Check List 11(6): 1–20.
- Singh, P. and Singh, K. P. (2016). Three new records of lichens in the family *Graphidaceae* for India. Indian J. For. 39(2): 147–149.
- Singh, K. P. and Swarnalatha, G. (2011b). A note on Graphidaceous lichens from Arunachal Pradesh, India. Indian J. For. 34 (3): 353–360.
- Singh, K. P., Swarnalatha, G. and Singh, S. B. (2011). New records to genus *Graphis* (Lichenized Fungi) from India. Indian J. Forest. 34(2): 243–244.
- Staiger, B. (2002). Die Flechnfamilie *Graphidaceae*: Studien in Richtung einer naturlicheren Gliederung. Biblioth. Lichenol.85: 1–526.
- White, F. J. & James, P. W. (1985): A new guide to microchemical techniques for the identification of lichen substances. British Lichen Society Bulletin 57 (Supplement): 1–41.