

A new, locally common *Graphis* (Graphidaceae) species from southern Brazil

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Abstract – The new lichen species *Graphis obtectostriata* is described from Rio Grande do Sul in southern Brazil. It is characterized by lirellae that are almost totally covered by thallus, but are striate underneath, and long, transversely septate ascospores. All species so far known with similar ascomata, the so-called *consanguinea*-morph, have muriform ascospores.

Lichen / new species / Rio Grande do Sul / *consanguinea*-morph / Pampa biome

INTRODUCTION

The lichen flora of Rio Grande do Sul is relatively well investigated, already since more than a century ago. In the rather recent checklist of lichens known from the state Rio Grande do Sul (Spielmann, 2006), which cites more than 900 lichen species, there are 14 species listed under the name *Graphis* and 17 under the synonymous name *Graphina*. Of these species, 19 are currently accepted in the genus *Graphis* (Table 1), following the new taxonomy (Staiger, 2002; Lücking *et al.*, 2009). In addition, 19 *Graphis* species have been reported since 2010 from the state (Käffer *et al.*, 2011; Martins & Marcelli, 2011; Koch *et al.*, 2013), partly under synonymous names, showing the rise in attention for the study of this group and for the study of microlichens in Brazil in general. This brings the total number of currently known *Graphis* species in Rio Grande do Sul up to 38 (Table 1).

In the world-wide key to the species of *Graphis* (Lücking *et al.*, 2009), 330 species were accepted. Since this publication, a few dozen additional species have been described, which were summarized in Barcenas Peña *et al.* (2014).

While examining lichens in the Ibirapuitã Environmental Protection Area, an undescribed species of *Graphis* was found to be locally common. It is characterized by lirellae that are almost totally covered by thallus, but are striate

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Table 1. *Graphis* species known from Rio Grande do Sul

<i>Species</i>	<i>Reference</i>	<i>Synonymous names</i>
<i>Graphis acharii</i> Fée	Spielmann, 2006	<i>Graphina acharii</i> (Fée) Müll. Arg.
<i>Graphis adpressa</i> Vain.	Martins & Marcelli, 2011	
<i>Graphis albotecta</i> (Redinger) Staiger	Spielmann, 2006	<i>Graphina rimulosa</i> Redinger
<i>Graphis anfractuosa</i> (Eschw.) Eschw.	Martins & Marcelli, 2011	
<i>Graphis archeri</i> Dal-Forno & Eliasaro	Käffer <i>et al.</i> , 2011	
<i>Graphis assimilis</i> Nyl.	Martins & Marcelli, 2011	
<i>Graphis caesiella</i> Vain.	Käffer <i>et al.</i> , 2011	<i>Graphis kakaduensis</i> A.W. Archer
<i>Graphis caesiocarpa</i> Redinger	Käffer <i>et al.</i> , 2011	
<i>Graphis calcea</i> (Fée) A. Massal.	Spielmann, 2006	<i>Graphis tenuescens</i> Nyl. incl. var. <i>subimmersa</i> Redinger
<i>Graphis chrysocarpa</i> (Raddi) Spreng.	Spielmann, 2006	
<i>Graphis consanguinea</i> (Müll. Arg.) Lücking	Spielmann, 2006	<i>Graphina pseudosophistica</i> (Vain.) Müll. Arg., <i>Graphina nylanderiana</i> Zahlbr., <i>Graphina heteroplacoides</i> Redinger
<i>Graphis dealbata</i> Nyl.	Spielmann, 2006	<i>Graphina albostrata</i> (Vain.) Zahlbr., <i>Graphina dealbata</i> (Nyl.) Müll. Arg.
<i>Graphis dolichographa</i> Nyl.	Käffer <i>et al.</i> , 2011	
<i>Graphis dracaenae</i> Vain.	Käffer <i>et al.</i> , 2011	<i>Graphis geraensis</i> Redinger
<i>Graphis dupaxana</i> Vain.	Käffer <i>et al.</i> , 2011	<i>Graphis leioplaca</i> Müll. Arg.
<i>Graphis duplicata</i> Ach.	Koch <i>et al.</i> , 2013	
<i>Graphis granulocarpa</i> Redinger	Spielmann, 2006	
<i>Graphis handelii</i> Zahlbr.	Spielmann, 2006	<i>Graphina chondroplaca</i> Redinger, <i>Graphis lineola</i> var. <i>chondroplaca</i> Redinger
<i>Graphis invisibilis</i> Dal-Forno & Eliasaro	Käffer <i>et al.</i> , 2011	
<i>Graphis leptoclada</i> Müll. Arg.	Käffer <i>et al.</i> , 2011	<i>Graphis rigidula</i> Müll. Arg.
<i>Graphis librata</i> C. Knight.	Käffer <i>et al.</i> , 2011	<i>Graphis palmyrensis</i> Zahlbr.
<i>Graphis lineola</i> Ach.	Spielmann, 2006	
<i>Graphis lueckingii</i> Dal-Forno & Eliasaro	Käffer <i>et al.</i> , 2011	
<i>Graphis macella</i> Kremp.	Spielmann, 2006	<i>Graphina acharii</i> var. <i>vestita</i> Müll. Arg.
<i>Graphis olivacea</i> Redinger	Martins & Marcelli, 2011	
<i>Graphis parallela</i> (Müll. Arg.) M. Cáceres & Lücking	Käffer <i>et al.</i> , 2011	
<i>Graphis paranaensis</i> Dal-Forno & Eliasaro	Käffer <i>et al.</i> , 2011	
<i>Graphis paraserpens</i> Lizano & Lücking	Käffer <i>et al.</i> , 2011	
<i>Graphis pavoniana</i> Fée	Spielmann, 2006	
<i>Graphis platycarpa</i> Eschw.	Spielmann, 2006	<i>Graphina platycarpa</i> (Eschw.) Zahlbr.
<i>Graphis plurispora</i> (Redinger) Lücking & Chaves	Spielmann, 2006	<i>Graphina pseudosophistica</i> (Vain.) Müll. Arg. var. <i>plurispora</i> Redinger

Table 1. *Graphis* species known from Rio Grande do Sul (continued)

Species	Reference	Synonymous names
<i>Graphis rhizocola</i> (Fée) Lücking & Chaves	Spielmann, 2006	<i>Graphis illota</i> Müll. Arg. var. <i>leopoldensis</i> Redinger
<i>Graphis rimulosa</i> (Mont.) Trevis.	Spielmann, 2006	incl. var. <i>brachycarpa</i> Müll. Arg.
<i>Graphis schiffneri</i> Zahlbr.	Käffer <i>et al.</i> , 2011	
<i>Graphis scripta</i> (L.) Ach.	Spielmann, 2006	
<i>Graphis sitiana</i> Vain.	Spielmann, 2006	as <i>Graphis sittiana</i> Vain.
<i>Graphis striatula</i> (Ach.) Spreng.	Spielmann, 2006	<i>Graphis bicrenatula</i> Redinger
<i>Graphis submarginata</i> Lücking	Spielmann, 2006	<i>Graphis lineola</i> Ach. var. <i>marginata</i> (Meyer & Flotow) Zahlbr.

underneath, and long, transversely septate ascospores. All species so far known with similar ascomata, the so-called *consanguinea*-morph, have muriform ascospores. Therefore, the species is described below as new to science.

MATERIAL AND METHODS

Identification and descriptive work was carried out in Soest using an Olympus SZX7 stereomicroscope and an Olympus BX50 compound microscope with interference contrast, connected to a Nikon Coolpix digital camera. Sections have been mounted in tap water, in which all measurements were taken. The specimen from this study is preserved in HAS, F and ABL. The chemistry of the type specimen has been investigated by thin-layer chromatography (TLC) using solvent A and by observing extract recrystallization in acetone with a compound microscope (Orange *et al.*, 2001). Chemical reactions were applied directly on the medulla and on acetone extracts on filter paper.

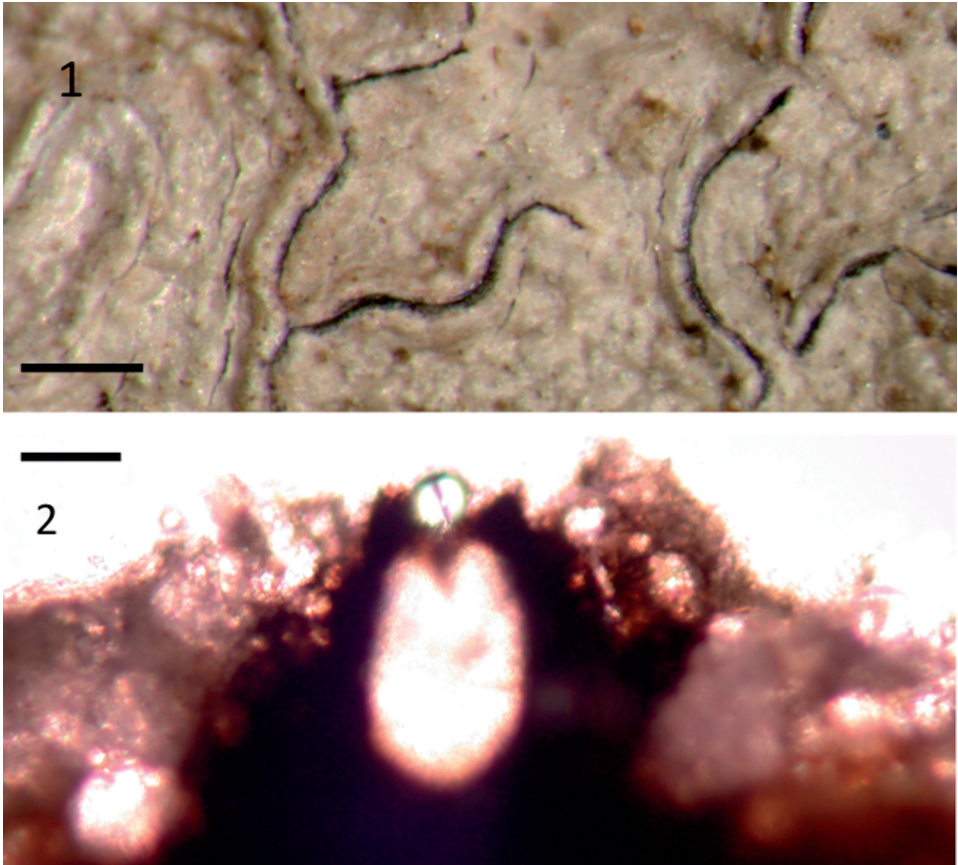
TAXONOMY

Graphis obtectostriata Käffer & Aptroot, sp. nov.

Figs 1-2

Mycobank: MB 809812.

Thallus crustose, corticate, shiny, smooth and rather thick, c. 0.15-0.25 mm thick, olivaceous grey, without prothallus. Algae trentepohlioid. **Ascomata** lirelliform, repeatedly branched and partly broken up, occupying an area of up to several square centimeters, immersed to erumpent, 0.3-0.4 mm wide; ascomata only visible from above by a grey pruinose slit; margins becoming striate, completely carbonized at the sides and below the hymenium, covered by a 50-100 µm thick layer of smooth thallus, so that the striae are filled and obscured, in accordance with the *consanguinea*-morph sensu Lücking *et al.* (2009). Hamathecium not interspersed with hyaline oil droplets. **Ascospores** 8/ascus, hyaline, 13-17-septate, fusiform, 90-104 × 13-15 µm, lumina ellipsoid. **Pycnidia** not observed.



Figs 1-2. *Graphis obtectostriata*, isotype in ABL. **1.** habitus; **2.** transverse section through ascoma, showing carbonized crenate excipulum and thick thalline cover with large hyaline crystals; Scales: **1** = 0.5 mm; **2** = 50 μ m.

Chemistry: Thallus UV-, C-, K-, KC-, P-. TLC: no substances detected.

Type: BRAZIL. **Rio Grande do Sul**, Santana do Livramento, Ibirapuitã Environmental Protection Area (APA do Ibirapuitã), Fazenda Rincão Bonito, on tree bark, 30°34'29.5''S, 55°31'63.8''W, 674 m alt., 23 January 2013, *M. Käffer* 778 (HAS 89332-holotype; ABL-isotype); same locality, *M. Käffer* 479 (HAS 49560-topotype); same Fazenda, but 30°33'88.7''S 55°31'01.6''W, 540 m alt., *M. Käffer* 782 (HAS 89355-paratype); Fazenda Lolita, 30°46'78.9''S 55°35'69.7''W, 883 m alt., *M. Käffer* 718 (HAS 49564-paratype).

Etymology: After the ascomata that are covered by the thallus and striate.

Ecology and distribution: On rough, rather stringy bark in riparian forests, slope forest remnants and on farms in the Pampa biome. Known only from Brazil.

Discussion: The new species is characterized by lirellae that are almost totally covered by thallus, but are striate underneath, and long, transversely septate ascospores. All species so far known with similar ascomata, the so-called

consanguinea-morph sensu Lücking *et al.* (2009), have muriform ascospores. The striae cannot be observed in surface view and are therefore likely to be missed by superficial observation. The overall appearance is, however, very similar to other species with the *consanguinea*-morph, so that it is unlikely to be misidentified or confused with species with other morphologies. The new species would key out in couplet 14 of key 17 in Lücking *et al.* (2009), different from both other species in that couplet, *viz.* *Graphis angustata* Eschw. and *G. calcea* (Fée) A. Massal., the latter of which also grows in the same locality, by the thick thalline cover on the labia; the first moreover differs by the prominent lirellae.

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