

Gyrotrema wirthii, a new species of *Gyrotrema*
(Ascomycota: Ostropales: Graphidaceae)
from Costa Rica

Gyrotrema wirthii, eine neue Art der Gattung *Gyrotrema*
(Ascomycota: Ostropales: Graphidaceae) aus Costa Rica

Eimy RIVAS PLATA, Robert LÜCKING,
H. Thorsten LUMBSCH & José Luis CHAVES

Key words: *Gyrotrema*, Graphidaceae, Thelotremataceae, new species, Volkmar WIRTH.

Schlagwörter: *Gyrotrema*, Graphidaceae, Thelotremataceae, neue Art, Volkmar WIRTH.

Summary: The new species *Gyrotrema wirthii* E. RIVAS PLATA, LÜCKING & LUMBSCH is described from Costa Rica. It is the second species known in the genus and differs from the type species, *G. sinuosum*, by its cinnabar-red instead of pink apothecial pruina and by the absence of hypoprotocetraric acid. *Gyrotrema wirthii* is known from several rich collections from the province of Puntarenas in southern Costa Rica, being a characteristic element of lowland to lower montane rainforests in that area.

Zusammenfassung: Die neue Art *Gyrotrema wirthii* RIVAS PLATA, LÜCKING & LUMBSCH wird aus Costa Rica beschrieben. Sie ist die zweite Art der Gattung und unterscheidet sich von der Typusart, *G. sinuosum*, durch ihre zinnoberrote, anstelle pinkfarbener, Apothecienpruina und durch das Fehlen von Hypoprotocetrarsäure. *Gyrotrema wirthii* ist von mehreren reichhaltigen Aufsammlungen aus der Provinz Puntarenas im südlichen Costa Rica bekannt und formt dort ein charakteristisches Element der Tiefland- und unteren Bergregenwälder.

The lichen family Thelotremataceae has recently experienced major changes, both concerning its systematic placement and its generic classification. FRISCH et al. (2006) provided a major revision of genus concepts in the family, abandoning the traditional concepts of ascospore and excipular genera (*Lep-*

totrema, *Myriotrema*, *Ocellularia*, *Phaeotrema*, *Thelotrema*) in favour of a more natural concept considering several character complexes. Simultaneous DNA sequence analyses revealed that Thelotremataceae are nested within Graphidaceae (STAIGER et al. 2006; MANGOLD et al. 2008) and thus had to be submerged within the latter family.

Among the newly established genera recognized by FRISCH et al. (2006) is *Gyrotrema* A. FRISCH, a hitherto monospecific genus based on *G. sinuosum* (SIPMAN) A. FRISCH. *Gyrotrema* is characterized by its conspicuous apothecia, with produce new hymenia in centrifugal fashion within old apothecia, and the new hymenia are separated from older ones by concentric rings of excipular tissue. The apothecia of *G. sinuosum* are covered by a thick layer of pink pruina, and while this character is shared with species in other genera (*Chapsa*, *Chroodiscus*, *Ocellularia*, *Thelotrema*), the concentric hymenia are unique within the family. Otherwise, the species resembles a large *Chroodiscus* or *Chapsa*. *Gyrotrema* is certainly the most spectacular thelotremoid Graphidaceae, and the unique apothecial morphology with the brightly colored disc makes this genus unmistakable.

In this paper, we describe a second species, *Gyrotrema wirthii*, known from Costa Rica and differing from *G. sinuosum* in chemistry and pigment type.

Gyrotrema wirthii RIVAS PLATA, LÜCKING & LUMBSCH, spec. nova (fig. 1A-D)

Gyrotremi sinuosi similis sed pruinae cinnabarinæ et acido hypoprotetrarico noncontinente differt.

Type: Costa Rica. Puntarenas: Corcovado National Park, Sirena Section, Sirena Biological Station, 8° 29' N, 83° 35' W, sea level, lowland and coastal rain-forest zone, oldgrowth coastal secondary forest and primary forest remnants, on bark (lower stem), 7 Apr 2003, LÜCKING 16252b (INB-4003214, holotype; CR, F, USJ, isotypes).

Paratypes: Same locality and date, LÜCKING 16241 (F). Corcovado National Park, Sirena Station, 0–50 m, 8° 28' N, 83° 36' W, 7 Apr 2003, SIPMAN 51105a (B, CR), 51162a (B, INB-4029376). Marengo Biological Station, Feb 1997, LÜCKING 116, 172 (F).

Thallus corticolous, pale to moderately dark olive-gray, shiny surface, smooth to rimose or fissured with the substrate. Cortex strongly conglutinated with periclinal hyphae. Photobiont layer endophloeodal. Medulla indistinct. Vegetative propagules lacking. Apothecia rounded with recurved, chroodiscoid, strongly raised margin, up to 3 mm diam., with numerous parallel, sinuous, partly carbonized remnants of excipula of old hymenia; disk flat, covered with a cinnabar-red pruina, K+ purple. Proper exciple cupular and hyaline. Columella lacking. Hymenium clear, up to 75 µm high. Paraphyses thin, simple, not conglutinated, epihymenium indistinct. Asci, 8-spored. Ascospores hyaline, transversely 5-7-septate, with lentiform cells, 20-28 × 5-8 µm, subacute ends, not ha-

lonate, amyloid. Pycnidia not seen. No chemical substances detected by TLC except for unknown anthraquinone in apothecial disc.

Distribution: Thus far known from several collections in southern Costa Rica, found in lowland to lower montane rainforest.

Etymology: This unique new species honours the many, often unique and pioneering contributions of Prof. Dr. Volkmar WIRTH to lichenology.

Notes: The new species *Gyrotrema wirthii* is very similar in morphology and ascospore type to *G. sinuosum* and both are closely related. However, the differences in chemistry, with *G. sinuosum* having hypoprotocetraric acid, and the different pigment of the apothecial disk clearly indicate *G. wirthii* as a separate taxon.

The new species was already mentioned by FRISCH et al. (2006) as a potentially different species, based on a collection from an area nearby the type locality, but left undescribed due to the lack of ascospores. Ascospores are indeed hard to find in *Gyrotrema* species, since usually only the outermost rings within an apothecium bear functional hymenia and ascospores seem to be dispersed quickly. Two further, possibly new species have been found in Costa Rica and will be dealt with in a separate paper: one has orange apothecia, whereas the other agrees with *G. wirthii* in apothecial color and chemistry but has larger apothecia and a white-papillose thallus. The species are keyed out in Sipman's internet key and list of Costa Rican (Central American) Thelotremaaceae (now Graphidaceae). <http://www.bgbm.fu-berlin.de/sipman/Zschackia/Diorygma/theloA.htm#Gyrotrema>.

Acknowledgements

The new species was found during the Ticolichen biodiversity inventory in Costa Rica, supported by a grant from the National Science Foundation (DEB 0206125 to The Field Museum; PI Robert LÜCKING) and funds from the World Bank to the Instituto Nacional de Biodiversidad (INBio). The taxonomic analysis was performed in the frame of a grant from the National Science Foundation (DEB-0516116 to The Field Museum, PI: H. Thorsten LUMBSCH, Co-PI: Robert LÜCKING). We greatly appreciate the support of the Sistema Nacional de Áreas de Conservación (SINAC) and the Ministerio de Ambiente y Energía (MINAE) in receiving collection permits. Daniela Lizano (Universidad de Costa Rica), Eida FLETES, Ronald RODRIGUEZ, and Eduardo ALVARADO (INBio), Susan WILL-WOLF, Marie TREST (University of Wisconsin-Madison), as well as Martin GRUBE (University of Graz, Austria) and William BUCK (New York Botanical Garden), participated in the field work, and their valuable support and company are warmly acknowledged.

- FRISCH, A., KALB, K. & GRUBE, M., 2006: Contributions towards a new systematics of the lichen family Thelotremaaceae. - *Bibliotheca Lichenologica* **92**: 1-556.
- STAIGER, B., KALB, K. & GRUBE, M., 2006: Phylogeny and phenotypic variation in the lichen family Graphidaceae (Ostropomycetidae, Ascomycota). *Mycological Research* **110**: 765-772.
- MANGOLD, A., MARTÍN, M.P., LÜCKING, R. & LUMBSCH, H.T., 2008: Molecular phylogeny suggests synonymy of Thelotremaaceae within Graphidaceae (Ascomycota: Ostropales). *Taxon* (in press).

Annex: fig. 1A-D on page IV

addresses:

Eimy RIVAS PLATA
 Department of Botany
 Field Museum of Natural History
 1400 South Lake Shore Drive
 Chicago, IL 60605-2496, USA
 &
 Ecology and Evolution Program
 Biological Sciences Department
 University of Illinois at Chicago
 845 W Taylor Street
 Chicago IL 60607, USA
email: erivasplata@fieldmuseum.org

Robert LÜCKING & H. Thorsten LUMBSCH
 Department of Botany
 Field Museum of Natural History
 1400 South Lake Shore Drive
 Chicago, IL 60605-2496, USA
emails: rlucking@fieldmuseum.org
tlumsch@fieldmuseum.org

José LUIS CHAVES
 Laboratorio de Hongos
 Instituto Nacional de Biodiversidad (INBio)
 Apdo. 22-3100
 Santo Domingo de Heredia
 Costa Rica
email: jchaves@inbio.ac.cr

ZOBODAT - www.zobodat.at

Zoologisch-Botanische Datenbank/Zoological-Botanical Database

Digitale Literatur/Digital Literature

Zeitschrift/Journal: [Sauteria-Schriftenreihe f. systematische Botanik, Floristik u. Geobotanik](#)

Jahr/Year: 2008

Band/Volume: [15](#)

Autor(en)/Author(s): Lücking Robert, Lumbsch Thorsten Helge, Rivas Plata Eimy, Chaves José Luis

Artikel/Article: [Gyrotrema wirthii, eine neue Art der Gattung Gyrotrema \(Ascomycota: Ostropales: Graphidaceae\) aus Costa Rica 417-420](#)