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Lasiosphaeria-2002

**THE GENUS *LASIOSPHAERIA*
AND ALLIED TAXA**

by R.(f) Hilber et O.Hilber



Illustrations by Ruzena Hilber

Impressum:

ISBN 3-00-09737-6

Erschienen im Selbstverlag 2002

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THE GENUS LASIOSPHAERIA AND ALLIED TAXA
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Abstract

A subdivision of the genus *Lasiosphaeria* into following five sections is proposed: *L. sect. Lasiosphaeria*, *L. sect. Hirsutae*, *L. sect. Strigosae*, *L. sect. Subiculatae*. Some closely related genera to *Lasiosphaeria* are described, as *Cercophora*, *Herminia*, and *Ruzenia* O. Hilber, gen. nov. *Iodosphaeria phyllophila* does not exactly fit into the *Amphisphaeriaceae*. Therefore this taxon is thought to be the type of a new family, the *Iodosphaeriaceae*, which serves as link between the *Lasiosphaeriaceae* and the *Amphisphaeriaceae* in its morphological features. The close relationship of the *Lasiosphaeriaceae* to the *Nitschkiaceae* is discussed.

Introduction

The genus *Lasiosphaeria* has been heterogeneous up to now. Our aim was to receive a \pm natural taxon. Therefore doubtful taxa have been excluded, so as all bitunicate species (excluded taxa will be cited in "**The Genus *Lasiosphaeria* and allied Taxa (2)**"). In this paper the main subject is the genus *Lasiosphaeria*, its relationship to other unitunicate genera and families, as well.

BRIEF REMARKS ON THE GENUS LASIOSPHAERIA CES. & DE NOT.

1. Morphological characters of the teleomorph: With or without a small subiculum; perithecia smooth to gibbous; wall with bristles or a tomentum; outer layer of peridium thick-walled, carbonaceous, or composed of setiform cells; bristles with or without septa; asci unitunicate, mostly with a simple, refractive, inamyloid, neither cyanophilous nor chitinoid apical ring; ascospores cylindrical to allantoid, sigmoid, curved (mostly oblique geniculate in

the lower quarter), one - to more-celled, hyaline to brownish.

2. **Characteristics of the anamorph:** Not known in all taxa, when present phialidic state or holoblastic conidiogenesis with annelidic proliferation. No *Helicoma*-state!

A NEW SYSTEM OF THE GENUS *LASIOSPHAERIA* CES & DE NOT.

The genus *Lasiosphaeria* has been divided into five sectiones to point out the relationship of the taxa, using the morphological characters of the teleomorph and anamorph. Different anamorphs were no reason for us to split the genus, if the morphology of the teleomorphs was ± identical. It is well-known, that one species can have more anamorphs. Also it is possible, that certain taxa might have lost the ability to form anamorphs in the course of evolution.

1. *Lasiosphaeria* Ces. et de Not. sectio
Lasiosphaeria

Typus generis sectionisque: *Lasiosphaeria ovina* (Pers.: Fr.) Ces. et de Not.

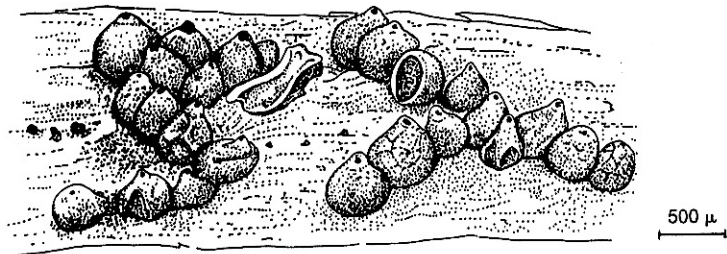
- Fig. 1 -

Morphological features: Wall smooth, covered by a tomentum; ascospores geniculate to sigmoid or ellipsoid to allantoid; plasmatic content mostly ochraceous or pinkish.

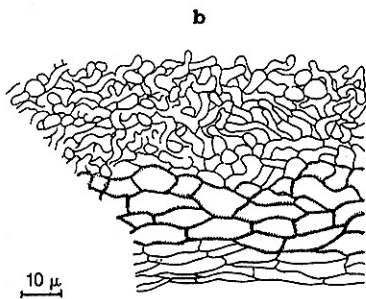
Anamorph: Phialidic state (a. o. *Phialophora*) or unknown.

Taxa: *L. ovina* (Pers.:Fr.) Ces. et de Not.; *L. chrysentera* Carroll et Munk; *L. glabrata* (Fr.) Munk; *L. sorbina* (Nyl.) P. Karst.

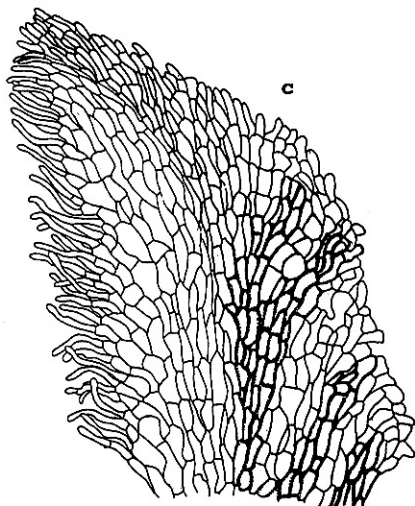
Fig. 1. *Lasiosphaeria* sect. *Lasiosphaeria*. a. perithecia; b. peridium; c. wall of the ostiole in longitudinal section; d. ascospores.



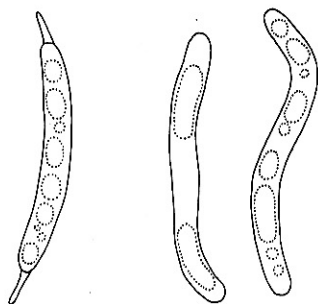
a



b



c



d

10 μ m10 μ m

2. *Lasiosphaeria* Ces. et de Not. sectio *Hirsutae*

R. Hilber & O. Hilber, sect. nov.

Peridium leve vel tuberculatum. Stratum externum cellulis parietibus incrassatis vel carbonaceis. Pili leviter incrassati, septati, interdum fasciculati. Ascosporae cylindratae, geniculatae vel sigmoideae, apicibus rotundatis; raro basaliter acutae apice gongyloide vel clavatae et basi acutae. Stato anamorphidis cum phialoconidiis vel ignoto.

Etymology: hirsutus (L.) = covered by hairs.

Type: *Lasiosphaeria hirsuta* (Pers.:Fr.) Ces. et de Not.

- Fig. 2 -

Morphological features: Wall smooth to tuberculate; peridium outside thick-walled to carbonaceous; hairs slightly thick-walled, septate, sometimes in fascicles or absent; Spores cylindrical, geniculate to sigmoid, with rounded ends, rarely with spiny knob like basal end or clavate with pointed basal end.

Anamorph: Phialidic state or unknown.

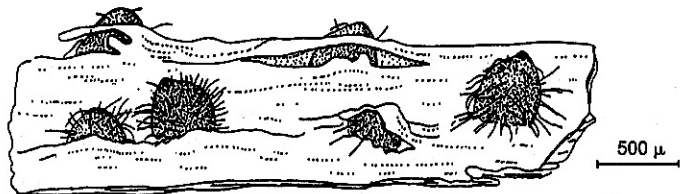
Taxa: *L. hirsuta* (Pers.:Fr.) Ces. et de Not.; *L. immersa* P. Karsten; *L. hispida* (Tode :Fr.) Fuckel; *L. sublanosa* (Cooke) Berlese; *L. muscicola* de. Not.; *L. meznaensis* R. Hilber.

3. *Lasiosphaeria* Ces. et de Not. sectio *Strigosae*

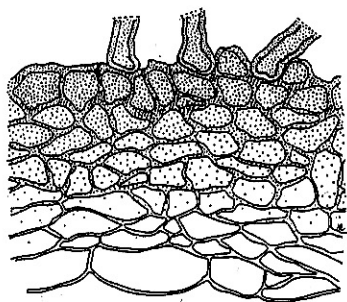
R. Hilber, sect. nov.

Peridium leve. Stratum externum cellulis setiformibus. Setae breves, praesertim prope ostiolum; unicellulares, parietibus distincte incrassatis. Ascosporae allantoideae vel geniculatae (mediano sporae). Stato anamorphidis cum phialoconidiis vel ignoto.

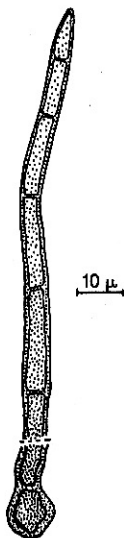
Fig. 2. *Lasiosphaeria* sect. *Hirsutae*. a. perithecia; b. peridium; c. hair; d. ascospores; e. ascospore, germinating by phialides.



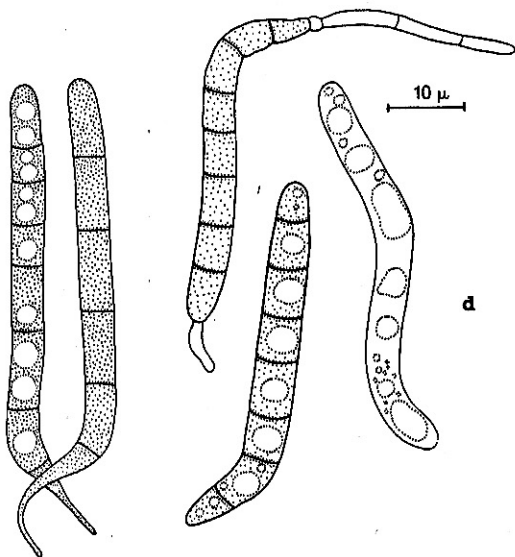
a



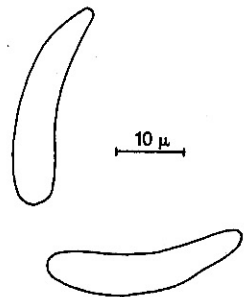
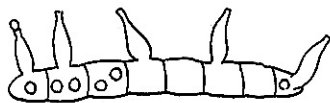
b



c



d

10 μ 10 μ 

e

10 μ

Etymology: strigosus (L.) = covered with short bristle-like hair.

Type: *Lasiosphaeria canescens* (Pers.:Fr.) P. Karsten.

- Fig. 3 -

Morphological features: Wall smooth, outer layer of thick-walled setiform cells; bristles mostly short (especially around the ostiolum), unicellular, very thick-walled; ascospores allantoid to geniculate (in the middle of the spore).

Anamorph: Phialidic or unknown.

Taxa: *L. canescens* (Pers.:Fr.) P. Karsten, *L. heterostoma* P. Karsten, *L. stuppea* Ellis et Everhart.

4. *Lasiosphaeria* Ces. et de Not. sectio *Setosae*

O. Hilber & R. Hilber, sect. nov.

Peridium (leviter) tuberculatum. Stratum externum cellulis incrassatis vel setiformibus. Setae incrassatae, septatae. Ascosporae cylindratae, rectae vel curvatae; in tertia parte inferiore oblique geniculatae, distincte acutae, saepe apice spineo. Stato anamorphidis cum phialoconidiis vel ignoto.

Etymology: Seta (L.) = bristle; -osus (L.) = full of.

Type: *Lasiosphaeria breviseta* P. Karsten.

- Fig. 4 -

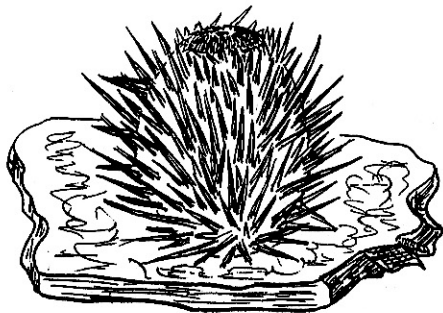
Morphological features: Peridium slightly to distinctly tuberculate; outer layer of thick-walled, mostly setiform cells; bristles thick-walled, ± short, septate; ascospores cylindrical or curved; geniculate in the lower third and pointed; often with a long, spiny, knob like enlarged tip.

Anamorph: Phialidic or unknown.

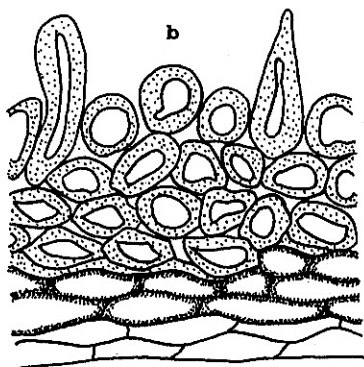
Taxa: *L. breviseta* P. Karsten, *L. caudata* (Fuckel) Sacc., *L. moseri* O. Hilber, *L. munkii* R. Hilber & O. Hilber.

Fig. 3. *Lasiosphaeria* sect. *Strigosae*. a. perithecium; b. peridium; c. setae; d. ascospores (one germinating by a phialide).

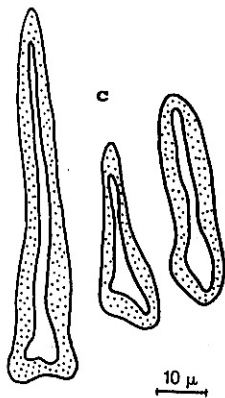
a



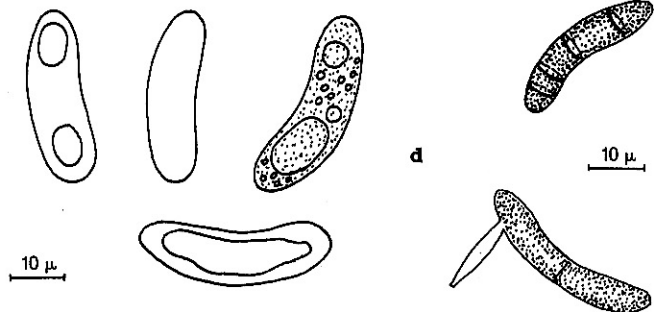
b

10 μ

c

10 μ

d

10 μ 10 μ

5. *Lasiosphaeria* Ces. et de Not. sectio *Subiculatae*
O. Hilber, sect. nov.

Perithecia dispersa subiculo. Peridium leve vel gibbosum. Stratum externum cellulis incrassatis vel carbonaceis. Pili septati, parietibus incrassatis, ad apicem acuti et parietibus leviter incrassatis. Ascosporae cylindratae, rectae, in tertia parte inferiore oblique geniculatae, distincte acutae, saepe apice spineo. Stato anamorphidis cum conidiis 3 - 4-cellularibus, holoblasticis, brunneis vel ignoto.

Etymology: Subiculum (L.) = subicle; -atus (L.) = indicates possession.

Type: *Lasiosphaeria punctata* Munk.

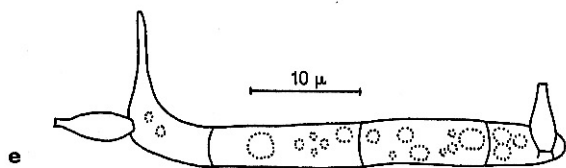
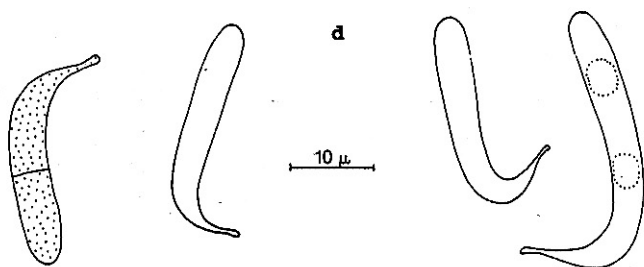
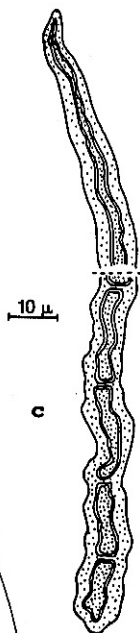
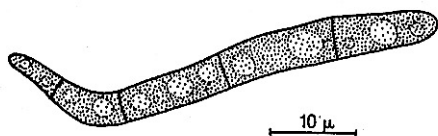
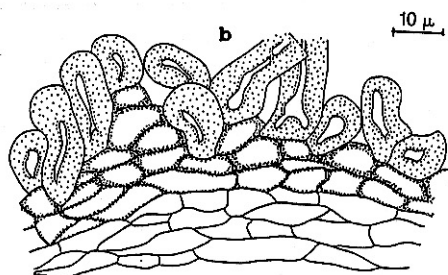
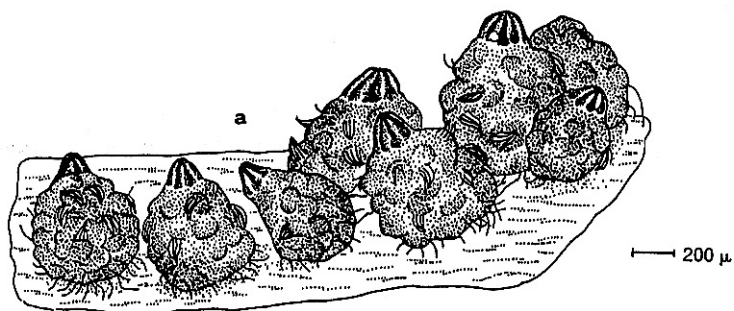
- Fig. 5 -

Morphological features: Perithecia scattered on a small subiculum; peridium smooth to gibbous; outer layer with thick-walled to carbonaceous cells; hairs septate, thin walled towards the apex, rarely bristle like; ascospores cylindrical, curved in the lower third and pointed to a spiny, knob like tip; or geniculate in the middle of the spores.

Anamorph: Conidiogenesis holoblastic with enteroblastic percurrent proliferation; also cfr. *Sporidesmium* Link, or anamorph unknown.

Taxa: *L. punctata* Munk, *L. dactylina* Webster, *L. foliicola* O. Hilber & R. Hilber.

Fig. 4. *Lasiosphaeria* sect. *Setosae*. a. perithecia; b. peridium; c. seta; d. ascospores; e. ascospore, germinating by phialides.



RELATED TAXA WITHIN THE LASIOSPHAERIACEAE

1. *Cercophora* Fuck. emend. Lundq., Symb. Bot. Upsal.
22(1): 80, 1972

Lectotype: *Cercophora mirabilis* Fuck.

Syn.: vide Lundqvist, 1972

- Fig. 6(A) -

The morphological features are very similar to those of *Lasiosphaeria*. Only the ascospores show a swollen upper part. This is a feature, which can occur very late (often only in overmature perithecia). Therefore it is a misleading character in the determination of *Lasiosphaeria* and *Cercophora*. More attention has to be paid to the anamorphs of both genera. Then we can decide, whether it is justified or not to keep *Cercophora* as subgenus of *Lasiosphaeria*. There is also the possibility, that *Cercophora* and *Lasiosphaeria* have separated in the course of evolution, the first in the majority with coprophilous, the second mainly with lignicolous taxa.

2. *Herminia* R. Hilber, Z. Mykol. 45(2): 225, 1979

Typus generis: *Herminia dichroospora* (Ell. & Ev.) R. Hilber

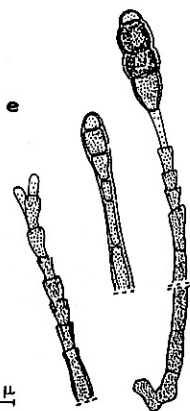
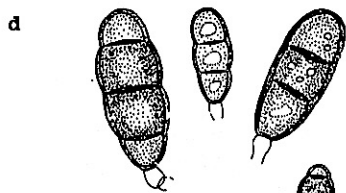
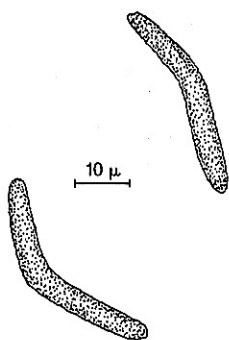
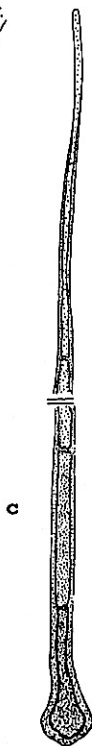
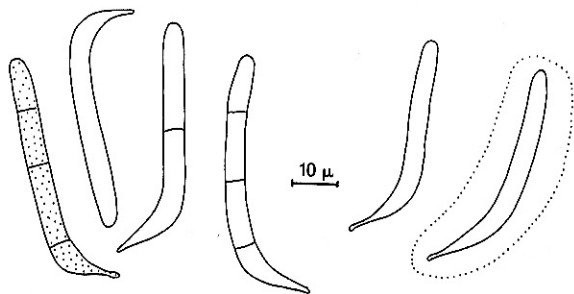
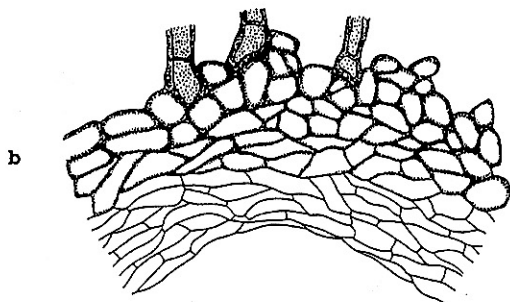
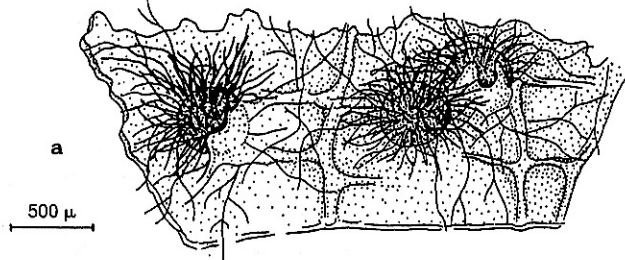
- Fig. 6(B) -

Monotypic genus! Morphological characteristics are a heterogeneous peridium, composed of four recurring elements, sigmoid, in the lower third curved ascospores, which have an upper translucent brownish part. Caudae are present. An anamorph is unknown.

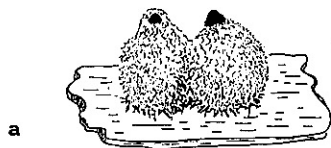
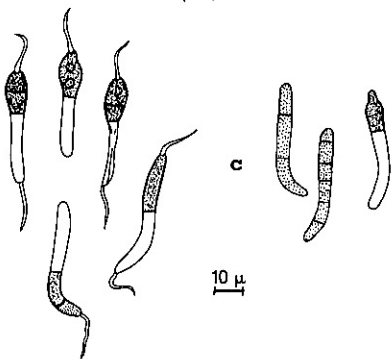
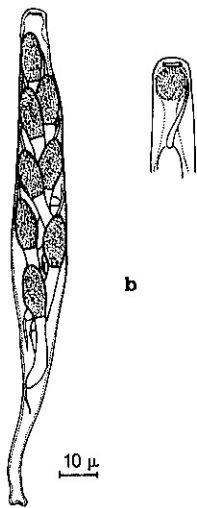
Fig. 5. *Lasiosphaeria* sect. *Subiculatae*. a. perithecia; b. peridium; c. hair; d. ascospores; e. anamorph.

Fig. 6 (A). *Cercophora* sp. a. perithecia; b. asci; c. ascospores;

Fig. 6 (B). *Herminia dichroospora*. a. perithecia; b. peridium; c. ascospores.



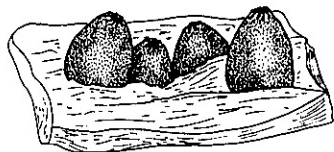
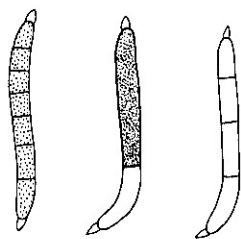
6 (A)

200 μ 10 μ 10 μ

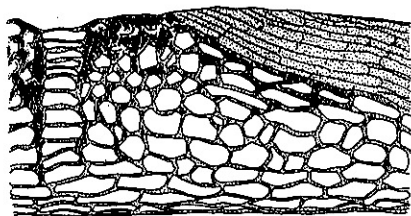
b

c

6 (B)

200 μ 10 μ

c

10 μ

b

3. *Ruzenia* O. Hilber, gen. nov.

A typo familiae praecipue differt praesentia stromae basi peritheciarum.

Etymology: O. Hilber dedicates this genus to his late wife Ruzena in gratitude and acknowledgement of her outstanding scientific research.

Typus generis: *Ruzenia spermoides* (Hoffm.:Fr.) O. Hilber, comb. nov.

- Fig. 7(A) -

Basionym: *Sphaeria spermoides* Hoffmann : Fr. - Syst. Mycol. 2:457,
1823

Syn.: *Lasiosphaeria spermoides* (Hoffm.:Fr.) Ces. et de Not. - Comm.
Soc. Critt. Ital. 1:229, 1863

Leptospora spermoides (Hoffm.:Fr.) Fuckel - Symb. Mycol.:143,
1870

Thaxteria spermoides (Hoffm.:Fr.) v. Höhnelt, - Ann. Mycol.
16:75, 1918

Sphaeria globularis Batsch - Elench. Fung. 1: 271, 1786

Lasiosphaeria globularis (Batsch) Seaver - Mycol. 4: 121,
1912.

Type collection: Germany, Saxonia, Leipzig, on *Acer* sp., 7. 4. 1866,
leg. Auerswald, rev. R. Podlahová (H).

The genus *Ruzenia* has in contrast to the taxa of *Lasiosphaeria* a crustaceous basal stroma, which is connecting the perithecia.

SOME CLOSELY RELATED FAMILIES TO THE LASIOSPHAERIACEAE

1. *Iodosphaeriaceae* O. Hilber, fam. nov.

Simile *Lasiosphaeriacearum*. Asci unitunicati, annulo apicali simplici, amyloideoque. Anamorph: *Selenosporella* sp. et *Ceratosporium* sp.

Etymology: *Iodum* (L.) = iodine.

Type genus: *Iodosphaeria* Samuels, Müller & O. Petrini, Mycotaxon

28(2):486, 1987

Type species: *Iodosphaeria phyllophila* (Mouton) Samuels, Müller & O.

Petrini

- Fig.7(B) -

Iodosphaeria has similar characteristics to *Lasiosphaeria*. The amyloid apical ring was one reason for Samuels et al. (1987) to exclude this species from *Lasiosphaeria* and the *Lasiosphaeriaceae*, as well and to place it into the *Amphisphaeriaceae*. We disagree with the last decision from several reasons. Some of these are the closer morphological similarity of the apical ring (except the amyloidity) to the *Lasiosphaeriaceae* and the divergent spore morphology from the type of the *Amphisphaeriaceae*. Creating the new family *Iodosphaeriaceae* was done in the knowledge, that it is only possible to come to a \pm natural system, if we are using links between families. Samuels et al. (1987): additionally describe *Iodosphaeria ripogoni* without visible apical structure. Mainly the identical synanamorphs (*Selenosporella* and *Ceratosporium*) might have been the reason for them to keep this taxon within *Iodosphaeria*.

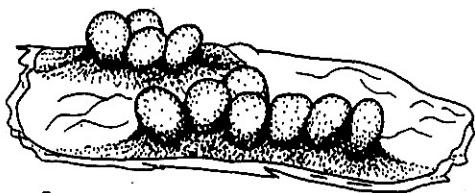
2. *Nitschkiaceae*

The so-called Munk-pores in the peridium are characteristic for all taxa of the *Nitschkiaceae*. But this morphological feature is also present in the genera *Cercophora* and *Lasiosphaeria*. It shows a close relationship between the *Lasiosphaeriaceae* and the *Nitschkiaceae*, which is also mentioned by Eriksson et Hawksworth (1986).

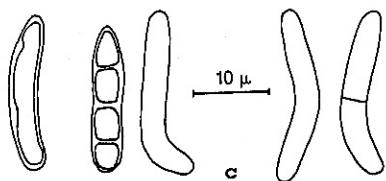
Fig. 7 (A). *Ruzenia spermoides*. a. perithecia; b. ascus; c. ascospores.

Fig. 7 (B). *Iodosphaeria phyllophila*. a. perithecia; b. peridium; c. ascus; d. ascospores.

7 (A)



a



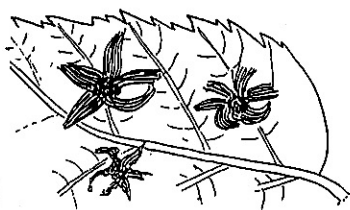
c



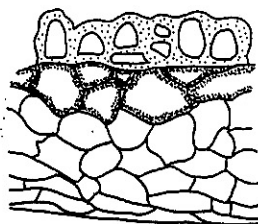
b

10 μ

7 (B)

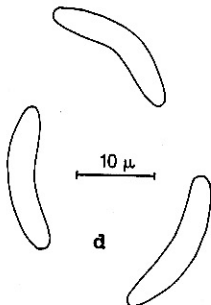


a



b

10 μ



10 μ

d



c

10 μ

The second author wishes to express his sincere thanks to Prof. Dr. M Barr-Bigelow (Sydney/Canada), Prof. Dr. W. Gams (Baarn), Prof. Dr. G. Hennebert (Louvain-La-Neuve), Prof. Dr. E. Horak (Zürich), Prof. Dr. N. Lundqvist (Stockholm), Prof. Dr. D. Malloch (Toronto), Prof. Dr. M. Moser (Innsbruck), Dr. Z. Pouzar (Prague), Dr. A. Rossmann (Beltsville), Dr. M. Svrcek (Prague), and to all, which made this study possible by delivering material. Special gratitude to Mrs. H. Beeck (Krefeld) for completing line drawings of my late wife Ruzena and to Mr. H. Schotte and Mr. K. Drenk (Schotte-Druck GmbH & Co KG, Krefeld) for technical advises and their obligingness.

REFERENCES

- Eriksson, O. et D. L. Hawksworth (1986). Outline of the Ascomycetes - 1986. *Systema Ascomycetum* 5 (2), 185 - 324.
- Hilber, R. et O. Hilber (1979). Einige Anmerkungen zu der Gattung *Cercophora* Fuckel (*Lasiosphaeriaceae*). *Z. Mykol.* 45 (2), 209 - 233.
- Lundqvist, N. (1972). Nordic *Sordariaceae* s. lat. *Symbolae Botanicae Upsaliensis* 20 (1), 1 - 374.
- Samuels, G. J., E. Müller et O. Petrini (1987). Studies in the *Amphisphaeriaceae* (sensu lato) 3. New Species of *Monographella* and *Pestalospaeria*, and two new Genera. *Mycotaxon* 28 (2), 473 - 499.

The Genus *Lasiosphaeria* and allied Taxa (2), we want to publish soon. In it, we also want to bring some key, also the comment of my Colleague to The Genus *Lasiosphaeria* and allied Taxa (1).