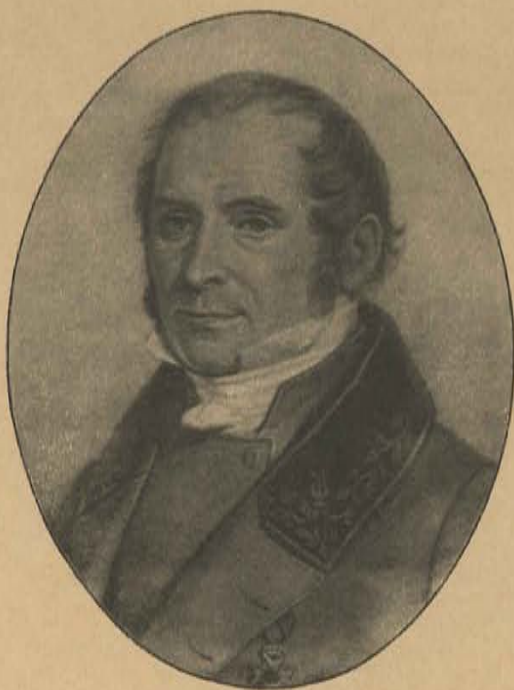


FRIESIA

NORDISK MYKOLOGISK TIDSSKRIFT



BIND IX

HEFTE 3

KØBENHAVN 1970

INDHOLD

	Side
John Eriksson: SETH LUNDELL. 18. april 1892 — 23. september 1966	289
D. D. Shukla & Ashok Mishra: Effect of salts on growth of <i>Trichoderma viride</i>	299
M. P. Christiansen: Notes on rare or new <i>Agarics</i> recorded in Denmark	302
M. P. Christiansen & J. E. Brejnhoj Larsen: <i>Byssocristella pallidocitrina</i> gen. nov., sp. nov.	313
Erika Löhr & D. Müller: Die drei ältesten Abbildungen von Pilzen	315
B. B. Lal & V. N. Pathak: Growth of <i>Diplodia natalensis</i> POLE EVANS (orange isolate) in relation to carbon sources and C/N ratio	322
N. Fabritius Buchwald: <i>Septotis</i> g. nov. and <i>Ovulitis</i> g. nov. Two new form-genera of <i>Sclerotiniaceae</i>	326
S. Henry Wassén: Soma och <i>Amanita muscaria</i> . (Summary: Soma and <i>Amanita muscaria</i>)	330
N. Fabritius Buchwald: <i>Fomes idahoensis</i> BROWN. A fossil polypore fungus from the late Tertiary of Idaho, U.S.A.	339
Roland Moberg: <i>Neogyromitra caroliniana</i> and <i>N. gigas</i> in Fennoscandia.....	341
Onsberg, Per: Five new <i>Myxomycetes</i> recorded in Denmark	344
Notitser	348

*

REDAKTION:

N. F. BUCHWALD

*

Udgivet af Foreningen til Svampekundskabens Fremme
Thorvaldsensvej 40, 1871 København V.

Trykningen afsluttet den 30. December 1970.

Hertz-Bogtrykkergaarden, København



Fot. 1962.

SETH LUNDELL

18. APRIL 1892 — 23. SEPTEMBER 1966

By JOHN ERIKSSON

When SETH LUNDELL, fil. dr. h. c., died some years ago, a remarkable course of life was ended. As a young man he became by chance interested in fungi and from having been an inquisitive amateur, he at last became a professional mycologist and one of the great names of his branch. Requested by the editor of this journal I will make an attempt to sketch a picture of him. My acquaintance with SETH LUNDELL did not, however, begin until 1944. It seems to me as if the 20 or 25 preceding years formed the period when LUNDELL's activity was at its very best and it may therefore happen that my picture of him is onesided and incomplete, but yet it may be of some interest to those who work in the scientific study of the *Basidiomycetes*. The material for this story of SETH LUNDELL's life is gathered from what

he himself told me, as well as from the presscuttings he collected and from his extensive correspondence. Important information has been given by Miss RUTH GUSTAFSSON, his housekeeper since 1933, and by professor J. A. NANNFELDT, Uppsala, who knew LUNDELL since 1924 and who collaborated with him until LUNDELL's death.

SETH LUNDELL was born in Uppsala on April 18, 1892, son of VILGOTH LUNDELL (+ 1922) and his wife ANNA born ÖSTMAN (+ 1937). He was the youngest of eight children. His father was manager of a brewery in the town (Erlangen Brewery). After a fire in 1900 the brewery was given up and the LUNDELL family moved to Stockholm, from there to Örebro, where SETH went to school, and then returned to Stockholm. The Örebro period, which lasted some years, was often mentioned by S. LUNDELL himself as a happy time. He was at that time interested i. a. in athletics and achieved excellent results as a sprinter. After leaving school he tried an employment at a postoffice but his career as a clerk was abruptly broken by an accident, which was to be of vital importance for his whole life. During his military service he was overtaken by the dreaded epidemic of that time, tuberculosis. Sanatory care was necessary and a long period of convalescence followed. LUNDELL overcame the illness but his health remained weak all his life. It was to be about 30 years before he got permanent employment. The period of convalescence got an importance in another way. In 1914 his family had moved to Storvreta in Uppland. In the fresh air in this forest-rich area SETH recovered his strength. Very often he spent his days in the woods, either by feet or riding. It was probably during these trips his interest in fungi was awakened.

The press-cuttings show that LUNDELL's interest in fungi goes back to about 1915. Every autumn a daily newspaper in Stockholm arranged mushroom expos, directed by competent mycologists, above all LARS ROMELL. LUNDELL's visits to the expos resulted in a collaboration between him and ROMELL, which lasted as long as ROMELL (+ 1927) lived. LUNDELL began to collect fungi which he showed to ROMELL. They also made excursions together, i. a. in the surroundings of Storvreta, where LUNDELL at that time lived. Thanks to ROMELL he learned to know numerous species of fungi but also got acquainted with scientific literature. Numerous letters from ROMELL to LUNDELL have been saved. They show clearly how eager LUNDELL was to widen his knowledge but also how much ROMELL appreciated his young partner. His praise is overflowing when he comments on LUNDELL's

ability to make interesting finds. In a letter from 1922 he writes (in translation): "By Jove, you are a tremendous hunter, who has rendered me unvaluable services and afforded me immeasurable delight with your lucky finds."

Thanks to ROMELL LUNDELL came into contact with other mycologists, both laymen and professionals, among which professor CARL TH. MÖRNER († 1940)*) was of special importance for him. MÖRNER, himself a descendent of ELIAS FRIES, was the leading agaricologist in Uppsala of that time. Thanks to him LUNDELL had access to more literature as he had a very good and large library, and LUNDELL's mycological horizon widened. He realized that if he got the opportunity, he would be able to make a contribution to scientific mycology. Of decisive importance for LUNDELL was his contact with the young J. A. NANNFELDT, who later became docent and finally professor in systematic botany in Uppsala. It can be said without exaggeration that LUNDELL entered the world of scientific mycology already during the 20s.

After the death of L. ROMELL LUNDELL found that he was accepted as a scientific mycologist. In ROMELL's comprehensive herbarium more than 17000 specimens from Sweden and 5000-6000 from abroad lay unarranged at Naturhistoriska Riksmuseet, Stockholm, in temporary envelopes and only provisionally labelled. LUNDELL was commissioned to get these collections into order. This vast task, which was accomplished between 1929 and 1937, was performed with carefulness and ability. Thanks to ROMELL's diaries the incomplete labels could be improved. Mycologists of today, making use of ROMELL's collections, can hardly understand how troublesome this task was. In a letter of December 13, 1937, he writes: "Now I have at last finished the work with the Romellian trash". For the work he was paid 1.50 Sw. cr. an hour, a very decent salary even at that time.

During the long drawn-out work on the ROMELL herbarium LUNDELL certainly got his mycological knowledge much augmented. Besides, he learned how difficult it is to prepare fungi for a herbarium and he had many opportunities to think of how this problem should best be solved. That herbarium material is needed for scientific mycology was quite clear to him. ROMELL himself had tried several ways to dry or press fungi, but the result was seldom a good one, especially not for the fleshy mushrooms.

*) See „Friesia“ 2: 173-174, 1941.

LUNDELL's work on the ROMELL herbarium did not only mean getting the collections into order, conveniently accessible for the student, but in many respects it also meant a critical revision of the material as ROMELL's determinations very often were not definite. As to the resupinate *Basidiomycetes*, growing preferably on wood, ROMELL's knowledge was rather incomplete. For these fungi he had no tradition from ELIAS FRIES to rely upon, as they cannot be determined without microscopic studies. He, however, collected them eagerly. To take care of this material LUNDELL started a correspondence with VICTOR LITSCHAUER in Innsbruck and prevailed on him to revise a large part of ROMELL's collections. In this way LUNDELL not only got the material arranged but he himself acquired a very good knowledge of these fungi, in which he henceforth maintained a great interest. Other experts were also consulted, above all H. BOURDOT and W. NEUHOFF. LUNDELL's work on ROMELL's herbarium thus expanded and finally became a contribution of importance for not only his own mycological career but also the future research on *Basidiomycetes* in Sweden.

The 30s was for LUNDELL a decade of very great activity but it did not give any solution to his economical situation. His father was dead and he had to take care of his mother who was almost constantly ill till she died in 1937 at the age of 84. LUNDELL was very much emotionally fixed to his mother and this devotion may be one reason that he remained a single man all his life. They were financially supported by a brother of SETH, who besides worked as a free-lance book-keeper, making business statistics a. s. o., thus earning some money. From 1933 and some years on he was engaged in the mushroom control of the market of Uppsala. His mycological studies, however, went on uninterrupted by these activities. Numerous excursions were made every autumn in the surroundings of Uppsala and Storvreta. During one of them, in 1934, he was struck by an accident — he fell and broke both his arms. One arm was severely damaged by a fracture in the elbow.

The work with the ROMELL herbarium had given LUNDELL the idea of editing a large fungus exsiccate, that would give the mycologists of the world information about the species, described in the publications of ELIAS FRIES. As is well known FRIES's "Systema mycologicum" is the accepted base for international fungus nomenclature, and it is therefor necessary for mycologists wherever they live to know just those species, which grow in Sweden. LUNDELL's idea



S. LUNDELL (t. h.) tillsammans med M. A. DONK på exkursion i Nosten nära Uppsala 1932.

could be realized thanks to J. A. NANNFELDT, whose interest was won for the project. The result was "*Fungi exsiccati suecici praesertim upsalienses*". As this work is very well known and frequently cited there is no further need of presentation in this journal. Its immense extent (during LUNDELL's lifetime 2800 numbers were distributed), the careful taxonomical and nomenclatural analyses, as well as the high and even quality of the distributed material, are some reasons for its renommé. As to its quality LUNDELL's practical ability has played a great role. This applies especially for the preparation of the fleshy species, e. g. the mushrooms. LUNDELL liked to talk about "his" method and as nothing is published about it, some words about his technique may be accounted for. As a matter of fact it is not really a new technique. Many other mycologists had used drying and pressing for preparing fungi. The specific thing about LUNDELL's work was the care and aptitude with which he performed the preparation. He characterized it himself as an artistic handicraft. It was achieved in the following way. Nice specimens were chosen. They were dried in warm air until they were brittle-dry. In this state all hyphae are dead and cannot start growing again as often happens when semi-dry fungi are pressed. Thereafter

the specimens were moistened in a closed box together with some wet paper until they had got a tough consistency. Then they could be straightened out, nicely flattened, and at last pressed between two pieces of card board under a suitable weight. The result is an exsiccate, which has a practical, not bulky shape, well apt to be kept in a herbarium. Many species keep their colours astonishingly well, while other change them in a way characteristic of the species. It is very important that the moistening is carefully controlled and interrupted at the right time. LUNDELL aimed above all at keeping the outer marks of the fungus and for these this method must be considered to give a very satisfactory result. For microstructures (details of the hymenium etc.) the method does not work just as well. During the moistening and the relatively slow drying thereafter, destructive processes of different kinds take place. The moistened fungus must be considered as being a very delicate product. This is true especially for larger fungi, which need longer time for moistening as well as for the drying under press (which in the worst of cases may take several days). It would therefore have been very valuable if a sector of the fungus cap had been preserved only dried and thus left for microscopic studies as proper drying in itself does not damage any fungus material. Maybe it would be possible to reduce the damages if the moistening were performed in frigidaire temperature and the following drying in a warm air current. Except for this reservation — and as a matter of fact the damages are as a rule not very important — LUNDELL's herbarium technique must be said to be extraordinarily good. His sense for a neat and well arranged product is very striking. He disliked people who came to him with dirty, more or less disintegrated specimens. He did not like to deal with such material.

For the collecting of material for "*Fungi exsiccati suecici*" never-ceasing excursions during the fungus season were needed. He could manage to make about 80 excursions during one season. Dry autumns — not to rare in the neighbourhood of Uppsala — became somewhat of a catastrophe. The surroundings of Uppsala were closely investigated. Vårdsätra Nature Park, Fiby Urskog, Nosten, Lunsen, and many other localities gave their numerous tributes. Many years he spent several weeks in Femsjö parish in Småland (where ELIAS FRIES had his parental home*), alone or together

*) See „Friesia“ 5: 135-160, 1955.

with other mycologists. He also visited Göteborg, parts of Södermanland, and the province of Blekinge in SE. Sweden. He was, however, no great traveller. Instead he solved the procurement of material through local amateurs. Every fungus season his correspondence was enormous, especially during the 30s. One year he says that he received 2500 specimens. Package after package was delivered at Floragatan 17 in Uppsala where he lived at that time. They came from all parts of the country. In answer he did not only leave determinations of species but he commented and discussed them, praising beautiful collections (if there was something nice and rare his superlatives were overflowing!), encouraging further collecting ("last year you found ...") and gave pieces of advice for collecting, handling, transportation. To those who showed interest to get a deeper knowledge he sent duplicate material from interesting species. Several of his correspondents became by and by skilled mycologists and with some of them the relations developed into real and lasting friendship. In this way LUNDELL widened the knowledge of the Swedish fungus flora, as his co-workers were to be found throughout the country, from Skåne in the S to Norrbotten in the N, from Bohuslän in the W to Gotland in the E. Earlier only restricted parts (particularly the Stockholm-Uppsala area) were mycologically investigated. The phytogeographical differences in the fungus flora between different parts of the country began to be manifest. The importance of LUNDELL's work for this development cannot be exaggerated. For himself this correspondence meant a heavy load of work which tore his already weak health.

The work with "*Fungi exsiccati suecici*" gave to LUNDELL some income. In 1933 the ELIAS FRIES-committee had been established and had to sponsor the editing of the exsiccate. In a letter LUNDELL tells that he had got 500 Sw. cr. per hundred numbers. One year his total income was 1600 Sw cr. (ab. 300 \$), a very modest sum of money even at that time. It became necessary to arrange a permanent post for him at the university of Uppsala. However, this was not easily done, as he had no academic degree. Time went on. His letters are very often pessimistic. As early as 1937 he writes that he is disappointed and has lost his joy in work. In 1943 he got a modest position but his economic problems were not definitely solved until 1946 when a personal post as a herbarium curator was created for him by the Swedish Parliament. This became the culmination of his life work. Now everything seemed to have turned out well.

"*Fungi exsiccati suecici*" was universally known and praised. The mycological department of the museum was enlarged and improved. In 1942 he had been created *doctor honoris causa* at the university of Uppsala. During the last part of the nineteen forties, however, periods of illness became more and more frequent and his ability to work diminished more or more. During the 50s he continued to work with the exsiccate but his illness journal became at last very long and tragic. Besides more commonplace infections (to which he was very sensitive) and a cronical bronchitis, he was overtaken by a number of serious diseases, e. g. an attack of zoster, operation for hernia inguinalis, a heart disease, a very severe pneumonitis, nephritis, gall stone, and at last an incurable cancer oesophagi. His last years were a constant struggle for life.

Some traits of LUNDELL's personality deserve to be preserved. When at the height of his vigour he was a gay and good-humoured man, who liked a good joke, not least the rude jests. He was full of stories about LARS ROMELL, who must have been a very strange personality. His loud laugh echoed through the institute. He liked to be looked upon as a man of the people, free from academic vanity and narrowness. His temper changed easily, however, and even very small well-intentioned remarks could by him be taken as a hostile criticism. His sensitiveness made him hurt himself as well as his closest friends. He never felt at home in the academic world, where circumstances had placed him. Without any reason he feared to be looked down upon. A defensive attitude was a natural consequence and very often he followed the rule that "attack is the best defense". Unexpected visitors were as a rule met with cordiality. It was much worse for well-known scientists, who had advised their visit in advance. LUNDELL had in such cases time to mobilize his worry, maybe he was afraid not to match the expectations he found natural and the result was very often that his courage began to desert him and he stayed at home, pretending illness. SETH LUNDELL made a very remarkable career but he had to pay a very high price.

LUNDELL saw in himself a bearer of the mycological traditions from ELIAS FRIES. Even if there is no reason to stress the importance of this tradition for LUNDELL's knowledge (its seems to me more a question of image), it may be well worth some words. As already said LUNDELL got much of his knowledge from CARL TH. MÖRNER and in that way he could really be considered a Friesian. However, he was far more a pupil of ROMELL, and a question must therefore be

where ROMELL had got his knowledge. There were certainly many sources (ROMELL's own studies in literature, his correspondence with many foreign mycologists) but there was also an evident direct tradition. He had learned mycology from ELIAS FRIES's sons and from H. v. POST, a true Friesian who, among his many scientific activities, also had room for eminent mycological knowledge. As far as it deals with mycological problems for which microscopic studies is needed, ROMELL laid a foundation of his own through his comprehensive study and registration of the spores of *Basidiomycetes*.

In 1951 LUNDELL became corresponding member of the National Museum of Praha and in 1963 honorary member of the Danish mycological society „Foreningen til Svampekundskabens Fremme“*) Several species of fungi are named after him: *Crepidotus lundellii* PILÁT, *Russula lundellii* SINGER, *Lachnum lundellii* (LEGAL) NANNFELDT, *Peniophora lundelli* LITSCH. (est *Gloeocystidiellum convolvens* (KARST.) DONK), *Laeticorticium lundellii* JOHN ERIKSS., *Corticium lundellii* BOURDOT ex JOHN ERIKSS., and *Omphalia lundellii* PILÁT ap. PILÁT & NANNFELDT.

Besides the schedae of “Fungi exsiccati suecici” LUNDELL published only few papers:

Bidrag till Uppsalatraktens hymenomycetflora. I. Vårdsätra naturpark. — K. Svenska Vet. Akad. Skr. i Naturskyddsärenden n. 22, 1932.

Svamplokaler vid Femsjö. — Friesia I: 5, 1936.

Together with A. PILÁT: Über *Polyporus wynnei* BERK. & BR. — Svensk Bot. Tidskr. 30: 3, 1936.

Three underscribed vernal agarics, *Mycena vernalis* H. v. POST in sched., *Clitocybe verna* Egeland in sched., and *Entoloma vernum*. — Svensk Bot. Tidskr. 31: 2, 1937.

Together with J. A. LOWE: The Identity of *Polyporus trabeus* ROSTK. — Pap. Mich. Acad. Sci. Arts a. Lett. 41, 1956.

LUNDELL described several new species:

In the Vårdsätra paper: *Mycena subtilis*, *Mycena iodiolens*, and *Pluteus quercicola*.

In “Fungi exsiccati suecici”:

n. 401. *Mycena vernalis* H. v. POST ex LUNDELL = *Mycena majalis* LUNDELL.

*) See „Friesia“ 7: 107, 1963; here also a photo of SETH LUNDELL.

- n. 402. *Entoloma verum*.
- n. 744. *Gloeocystidium triste* LITSCH. & LUNDELL.
- n. 1035. *Corticium pulchrum*.
- n. 1043. *Peniophora alienata*.
- n. 1411. *Mycoleptodon robustior* JOHN ERIKSS. & LUNDELL.
- n. 1840. *Corticium aerugineolividum* ROMELL ex LUNDELL.
- n. 2007. *Entoloma bahuense*.
- n. 2041. *Tubaria umbonata*.
- n. 2048. *Conocybe friesii*.
- n. 2146. *Odontia pilaecystidiata*.
- n. 2331. *Hygrophorus insipidus*.
- n. 2367. *Russula fageticola*.

Of these species all the agarics belong to more or less critical species groups and therefore it is difficult to take into consideration their value. Those species belonging to *Aphylllophorales* seem all to be good species (with a possible reservation for *Mycoleptodon robustior*).

SETH LUNDELL was a very remarkable man who fulfilled a highly unusual course of life. He made a magnificent contribution to the furtherance of Swedish mycology and will not be forgotten.

ACKNOWLEDGEMENT

In wish to thank Professor J. A. NANNFELDT, who read this paper in manuscript and proposed additions and changes for its benefit.

Göteborg, januari 1970.

EFFECT OF SALTS ON GROWTH OF TRICHODERMA VIRIDE

By D. D. SHUKLA and ASHOK MISHRA

Department of Plant Pathology, College of Agriculture,
University of Udaipur,
Udaipur, India.

SUMMARY

Effect of sodium, potassium and magnesium salts on growth of *Trichoderma viride* has been studied. The growth of the fungus was significantly increased by all salts as compared with the medium containing no salts, however, magnesium salts were found to be most suitable. Amongst the magnesium salts, $MgSO_4$ supported the maximum mycelial growth.

INTRODUCTION

Trichoderma viride, a common soil inhabitant, is well recognized for its antifungal activities against a large number of important soil-borne plant pathogenic fungi, viz: *Armillaria mellea* (2), *Colletotrichum falcatum* (6), *Helminthosporium sativum* (1), *Macrophomina phaseoli* (8), *Ophiobolus graminis* (7), *Pythium debaryanum* (4), *Rhizoctonia solani* (8), *Sclerotium rolfsii* (5) etc. Its role in the biological control of various soil fungi has been greatly emphasized by GARRET (1952). Although the fungus is found in every type of soil, nevertheless, if its population in soil infested with such plant pathogenic fungi is increased somehow, the incidence of diseases could greatly be minimized. Keeping it in view, laboratory studies on the effect of sodium, potassium and magnesium salts, which could be easily incorporated in the soil through fertilizers, on the growth of the fungus, were undertaken and the results are presented in this paper.

MATERIAL AND METHODS

Trichoderma viride was isolated from the soil of Botanical garden, College of Agriculture, Udaipur, on Sabouraud's medium by dilution plate method, purified and maintained on Potato-Dextrose Agar Slants. The basal medium used in the experiment contained Dextrose 5.0 gm., Asparagine 0.16 gm. and distilled water 1 litre. The salts added to the basal medium were NaNO₃, Na₂SO₄, NaCl, KNO₃, K₂SO₄, KCl, MgNO₃, MgSO₄ and MgCl₂. These were incorporated to the medium separately to give 35 mM concentration of the cations equivalent to the sodium in 3.04 per cent sodium nitrate. Twenty ml. of the medium was dispensed in acid washed 100 ml. conical flasks with four replicates for each treatment and autoclaved at 15 lbs. P.S.I. for 15 minutes. The pH was adjusted to 6.0 before autoclaving. Inoculation was done by taking inocula of equal size cut by agar disc method. The inoculated flasks were incubated at 25° C for 21 days. Whatman filter papers dried to constant weight at 60° C for 24 hours were used for filtration and dry weight determination. The observations are summarized in Table 1.

RESULTS AND CONCLUSION

The Table 1 indicates that the growth of *T. viride* was increased significantly by all salts as compared with the medium containing no

TABLE 1.

Growth of *Trichoderma viride* on medium containing salts of sodium, potassium and magnesium.

Salts	Percent concentration in media	Dry weight of mycelium in mg.
1. Sodium nitrate	3.04	414.5
2. Sodium sulphate	5.75	442.5
3. Sodium chloride	2.09	312.5
4. Potassium nitrate	3.62	356.5
5. Potassium sulphate	3.11	476.5
6. Potassium chloride	2.66	372.5
7. Magnesium nitrate	9.15	487.5
8. Magnesium sulphate	8.78	705.00
9. Magnesium chloride	7.24	520.00
10. Control (no salt)	—	210.00

salts. However, $MgSO_4$ supported the maximum growth followed by $MgCl_2$, $MgNO_3$, K_2SO_4 , Na_2SO_4 , $NaNO_3$, KCl , KNO_3 and $NaCl$ in order of merit.

These findings clearly indicate that if a proper amount of $MgSO_4$ is added to the soil in the form of commercial fertilizers, the population of *T. viride* could be tremendously increased, which would suppress the growth of soil-borne plant pathogenic fungi by its anti-fungal activities.

ACKNOWLEDGEMENTS

The authors wish to record their grateful thanks to Dr. N. PRASAD, Dean, College of Agriculture, University of Udaipur, Udaipur, for encouragement and facilities. They are also thankful to Dr. G. C. AINSWORTH, Director, C.M.I., Kew, Surrey, for confirming the identity of the fungus.

LITERATURE CITED

- Anwar, A. A.: Factors affecting the survival of *Helminthosporium sativum* and *Fusarium lini* in soil. — *Phytopathology* 39: 1005-1010. 1949.
- Bliss, D. E.: Artificial inoculation of plants with *Armillaria mellea*. — *Abs. in Phytopathology* 31: 859. 1941.
- Garret, S. D.: The soil fungi as a microcosm for ecologists. — *Sci. Progr. (London)* 40: 436-450. 1952.
- Gregory, K. F., Allen, O. N., Ricker, A. J. & Peterson, W. H.: Antibiotics and antagonistic micro-organisms as control agents against damping-off of Alfalfa. — *Phytopathology* 42: 613-622. 1952.
- Morton, D. J. & Stroube, W. H.: Antagonistic and stimulatory effects of micro-organisms upon *Sclerotium rolfsii*. — *Phytopathology* 45: 417-420. 1955.
- Ramkrishanan, T. S.: Studies in the genus *Colletotrichum*. II. Physiological studies on *Colletotrichum falcatum* Went. — *Proc. Indian Acad. Sci., Sect. B*, 14: 395-411. 1941.
- Slagg, C. M. & Fellows, H.: Effects of certain soil fungi and their biproducts on *Ophiobolus graminis*. — *J. Agric. Res.* 75: 279-293. 1947.
- Vasudeva, R. S. & Sikka, M. R.: Studies on root rot diseases of cotton in the Punjab. X. Effect of certain fungi on growth of root rot fungi. — *Indian J. agric. Sci.* 11: 422-431. 1941.

Udaipur, India, May 1968.

NOTES ON RARE OR NEW AGARICS RECORDED IN DENMARK

By M. P. CHRISTIANSEN

SUMMARY

Descriptions and illustrations are given of 7 new agarics recorded in Denmark, viz. *Hebeloma birrum* FR., *Phlegmacium corrosum* (FR.) MOS., *Phl. elegantior* FR., *Phl. glaucopus* (SCHAEFF. ex FR.) var. *olivaceum* MOS., *Phl. multiforme* (FR.) var. *coniferarum* MOS., *Phl. prasinum* (FR.) WÜNSCHE, and *Phl. volvatum* (SMITH) MOS. and of 4 very Danish agarics, viz. *Lactarius chrysorrheus* FR., *L. hysginus* FR., *Naucoria jennyae* KARST., and *Rhodophyllus madidus* (FR.) QUÉL.

INTRODUCTION

During several years the present author lived at the woody tract in the eastern part of the Danish island of Zealand, where he had the opportunity of studying the larger fungi in the large forests. Numerous collections of fungi were made and rare or new species, especially of the genus *Cortinarius*, collected during 1940-1942, were studied, drawn, or photographed. But first in recent time he succeeded by help of modern monographs with colour illustrations of fungi to determine the collected species.

Below descriptions and illustrations are given of 11 agarics from Denmark, viz. *Hebeloma birrum*, *Lactarius chrysorrheus*, *L. hysginus*, *Naucoria jennyae*, *Phlegmacium corrosum*, *Phl. elegantior*, *Phl. glaucopus* var. *olivaceum*, *Phl. multiforme*, var. *coniferarum*, *Phl. prasinum*, *Phl. volvatum*, and *Rhodophyllus madidus*.

For the determination of the species of *Phlegmacium* the monograph by MOSER: Die Gattung *Phlegmacium* (1960) has been an invaluable help.

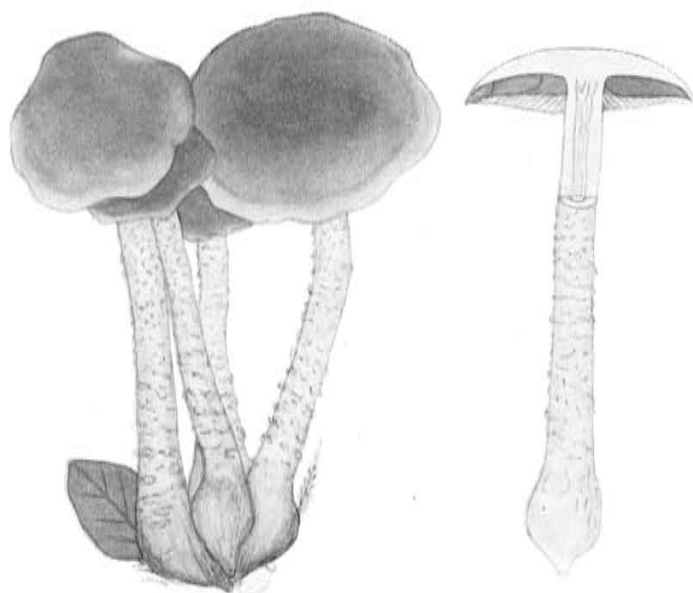


Fig. 1. *Hebeloma birrum* FR. ($\times \frac{2}{3}$).

ABBREVIATIONS

- F. = Funen (Fyn).
M. P. C. = M. P. CHRISTIANSEN.
Z = Zealand (Sjælland).
(C) = in Botanical Museum, Copenhagen.

Numbers in a parenthesis = number of the topographical-botanical districts of Denmark.

1. *Hebeloma birrum* FR.

Fig. 1 and 6a.

Icones: JUILLARD-HARTMANN 1919, vol. 2, Pl. 95, fig. 3; M. P. CHRISTIANSEN 1928 (C).

Lit.: E. FRIES 1838, p. 179; RICKEN 1915, p. 116.

Cap 3-5 cm broad, ochraceous yellow with paler margin, slightly zoned, convex plane with narrow inflexed margin, even, very viscid. Stem long, 8-10 cm $\times$ 1 cm, whitish to slightly brownish, almost equal, hollow, at the base onion-bulbous and with short tap-root, apex downy, downwards floccose-scaly to more or less zoned-scaly.

Gills ca. 70, pale ochraceous, crowded, narrow, ca. 4 mm broad, adnate to slightly sinuate, edge with crowded cystidia, white. Flesh in cap and stem pale, slightly bitter. Smell none.

Spore-print pale brown.

Cystidia clavate, ca. $25 \times 10 \mu$. Basidia 4-spored. Spores lemon-shaped, somewhat warty, $10-11.5 \times 5.5-6 \mu$.

In woods of *Fagus*, caespitose at a stub, 8 specimens.

Z. Gunnerup Kohave in Valle Storskov (40), Sept. 2, 1928.

The species is reported for the first time in Denmark.

2. *Lactarius chrysorrheus* Fr.

Icones: RICKEN 1915, t. 13, fig. 4; J. E. LANGE 1940, t. 172, fig. A; M. P. C. 1941 (C).

Lit.: FRIES 1838, p. 342; RICKEN 1915, p. 30; J. E. LANGE 1940, p. 41.

Cap 3.5-6 cm broad, pale yellowish, flesh-coloured with darker, narrow zones, convex, umbilicate, irregular, even, hardly viscid, margin paler, at first incurved, thin. Stem 3-4 cm long, whitish to pale flesh-coloured, stuffed, apex slightly downy. Gills pale yellowish, crowded, very thin, few forked, adnate-decurrent, edge even. Milk and flesh white, then bright sulphur-yellow, acrid.

Spore-print slightly cream. Spores oval, ca. $7.5 \times 6 \mu$, indistinct reticulato-punctate.

On the ground under *Quercus*.

Z: Køge Strandskov (40), Aug. 29, 1941.

3. *Lactarius hyginus* Fr.

Fig. 2 and 6b.

Icones: E. FRIES 1834, Icon. sel., tab. 169, fig. 2; JUILLARD-HARTMANN 1919, Vol. 2, pl. 55, fig. 3; J. E. LANGE 1940, t. 175, fig. B; M. P. C. 1940 (C).

Lit.: E. FRIES 1838, p. 337, J. E. LANGE 1940, p. 39.

Cap 3.5-5.5 cm broad, reddish brown, convex, umbilicate and slightly undulate, becoming plane, even, very viscid, shiny, margin paler, thin and inflexed. Stem short, ca. 3 cm $\times$ 7-11 mm, ochraceous cream or flesh colour. Gills yellow brown, rather crowded, branched. Milk white, acrid.



Fig. 2. *Lactarius hyssginus* FR. ($\times \frac{1}{1}$).

Spores subglobose, $7-8 \times 6 \mu$, with distinct apiculus, subreticulate with coarse bars and prickles.

On the ground under *Betula*.

Z. Solrød (40), Sept. 22, 1940.

E. FRIES, Icones sel. tab. 169, fig. 2, is very good; J. E. LANGE (1940, p. 39) writes: "This type (FRIES tab. 169, fig. 2) has been met with in several, somewhat boggy places — by F. H. MØLLER". The type figured by LANGE in Flora Agar. Danica, t. 175 B, has a darker cap and the gills are whitish with a tinge of yellow. This type was collected in Bornholm by F. TERKELSEN, September 1938.

4. *Naucoria jennyae* KARST.

Syn.: *Simocybe Christinae* (FR.) KARST., Hattsv. I, 1879, p. 417.

Icones: J. E. LANGE 1939, t. 123, fig. A; M. P. C. 1930 (C).

Lit.: KARSTEN 1879, p. 417 (*Simocybe Christinae* FR.) and 1889, p. 221; J. E. LANGE 1939, p. 16.



Fig. 3. *Phlegmacium corrosum* (FR.) MOSER. ($\times \frac{1}{1}$).

Cap 1-2 cm broad, at first dark brown or red brown, then towards the margin paler brownish, conical, then expanded, with obtuse to acute umbo. Stem until 5 cm long (incl. the root) concolorous with the cap, provided with a paler brownish, undulate tap-root. Gills light greyish brown, broad, but almost free. Flesh in cap brown, in stem yellow brown. Taste none. Smell of meal and cucumber.

Cystidia crowded at edge of gills, cylindrical, obtuse. Basidia 4-spored. Spores ovate-oval, $6-7 \times 4-4.5 \mu$.

On the ground under *Picea*.

Z. Svansbjerg Oredrev (40), Oct. 12, 1930.

5. *Phlegmacium corrosum* (FR.) MOSER

Fig. 3 and 6c.

Syn.: *Cortinarius corrosum* FR. 1836.

Icones: MOSER 1960, t. III, fig. 13, sporetavle A, fig. 12.

Lit.: E. FRIES Epicr. 1936, p. 266; MOSER 1960, p. 125.

Cap 5-7 cm broad, ochraceous brown, towards the margin whitish ochraceous, somewhat depressed with downwards and incurved margin. Stem very short, cylindrical, firm, pale, ca. 1.5 cm broad, at base with a globose-depressed, sharply marginate, turbinate bulb,



Fig. 4. *Phlegmacium glaucopus* (SCHAEFF. ex FR.) var. *olivaceum* MOSER.
($\times \frac{2}{3}$).

pale, slightly ochraceous. Cortina whitish, rather plenty. Gills whitish pale, then cinnamon, somewhat distant, adnexed, or rounded behind. Flesh in cap and stem whitish pale.

Spores somewhat lemon-shaped, warty, $9-10 \times 5.5-6.3 \mu$.

In wood.

Z. Nybroskov (45a), Sept. 13, 1953, leg. ELISABETH ANDERSEN.

The species is reported for the first time in Denmark.

6. *Phlegmacium elegantior* (FR.) sensu KONR. et MAUBL.

Fig. 6d.

Syn.: *Cortinarius elegantior* FR. 1836.

Icones: KONRAD & MAUBLANC 1924-32, t. 121; MOSER 1960, t. XXXL, fig. 177, sporetavle D, fig. 174.

Lit.: E. FRIES 1836, Epicr., p. 274; KONRAD & MAUBLANC 1924-32, t. 121; MOSER 1960, p. 319.

Cap 5-8 cm broad, ochraceous brownish with olive tint, convex with sharp margin, compact, somewhat viscid. Stem ca. 5 cm long, above pale, downwards red-brownish, spotted or striate, at base with bulb, distinctly marginate, pale. Gills crowded, first olivaceous

yellow, concolourous with the edge, then cinnamon with olive tint, edge minutely toothed. Flesh in cap white, in stem slightly yellow, in bulb somewhat flesh coloured.

Spores lemonshaped, warty, $11.2-14 \times 6.6-8 \mu$.

In woods of *Fagus*.

Z. Fuglsangskoven (40), Sept. 23, 1941 and Oct. 25, 1942.

The species has not been reported from Denmark before.

**7. *Phlegmacium glaucopus* (SCHAEFF. ex FR.) var.
olivaceum MOSER.**

Fig. 4 and 6e.

Icones: MOSER 1960, t. XXI, fig. 119, sporetavle B, fig. 95; M. P. C. 1942 (C).

Lit.: MOSER 1960, p. 198.

Cap 6-8 cm broad, olivaceous to dark greenish with narrow, brownish to reddish stripes, at first convex, then expanded with broad umbo and incurved margin. Stem 5-7 cm long and 15-18 mm broad, above light blue, downwards coloured like the cap, minutely striate, base bulbous, bulb 2.5-3 cm, indistinctly marginate, below covered by a white or yellow skin. Cortina silky, slightly greenish yellow. Gills azure-blue, then cinnamon, rather crowded, ca. 8 mm broad, tapering towards margin of the cap, rounded behind, or slightly sinuate. Flesh of cap yellowish, above the gills whitish blue, flesh in stem above blue, downwards greenish. Taste and smell none.

Spores oval, minutely punctate, ca. $8 \times 4.5 \mu$.

Z. Fuglsangskoven (40), Oct. 21, 1942.

In woods of *Fagus*, a fairy ring, 3 m in diam.

The variety has not been reported from Denmark before.

**8. *Phlegmacium multifforme* (FR.) var.
coniferarum MOSER.**

Fig. 6f.

Icones: MOSER 1960, t. I, fig. 3; Sporentafel A, fig. 6.

Lit.: MOSER 1960, p. 118.

Cap ca. 7 cm broad, brown-yellow, orange, plane, umbilicate, with undulate-convexo margin, in the middle with several, even, adpressed, white, membranous scale. Stem ca. $6 \times 1,2$ cm, white, slight striate, when touched brown, base with a rounded, whitish bulb. Gills pale, becoming cinnamon, slight sinuate, edge minutely serrulate.

Cystidia clavate, ca. $20 \times 10 \mu$. Basidia 4-spored; Spores ellipsoid $10-11 \times 5-6 \mu$.

In woods of *Picea*.

Z. Valø Storskov, Nov. 13, 1929.

The variety is reported for the first time in Denmark.

9. *Phlegmacium prasinum* (FR.) WÜNSCHE sensu

KONRAD et MAUBLANC, non ss. JAKOB E. LANGE.

Fig. 6g.

Syn.: *Cortinarius prasinus* FR. 1836.

Icones: KONRAD & MAUBLANC 1924-32, pl. 124; MOSER 1960, t. XXIV, fig. 143a, Sporentafel C, fig. 143; M. P. C. 1921 (C).

Lit.: E. FRIES, *Epier.* 1836, p. 268; KONRAD & MAUBLANC 1924-32, pl. 124; MOSER 1960, p. 283.

Cap 5-6 cm broad, olive yellow, $\pm$ greenish, first semiglobate, with incurved margin, then convexplane with downwards and sharp margin, compact. Stem yellow green, short, massive, with a great, almost globose, marginate bulb, lemonyellow. Veil large, silky, connecting the edge of cap with the stem. Gills olive yellow, then cinnamon, crowded, somewhat sinuate. Flesh in cap and stem light green.

Spores ellipsoid, warty, $10-12 \times 5.5-7 \mu$.

On the ground in wood.

Z. Køge Aas (40), Sept. 12, 1921; Valø Purlund (40), Sept. 25, 1922.

The species has not been reported from Denmark before.

Note. MEINHARD MOSER (1960, p. 284) writes: „*Phlegmacium prasinum* FR sensu LANGE non FR. Abb. LGE. 83 C. — Diese interessante Art, die jedoch einen neuen Namen bekommen muss, ist mir nur aus sehr dürftigem Material bekannt. Ich fasse diese hier kurz zusammen, ohne die Art neu zu benennen, da meine Kenntnis der Art zu schwach ist.“

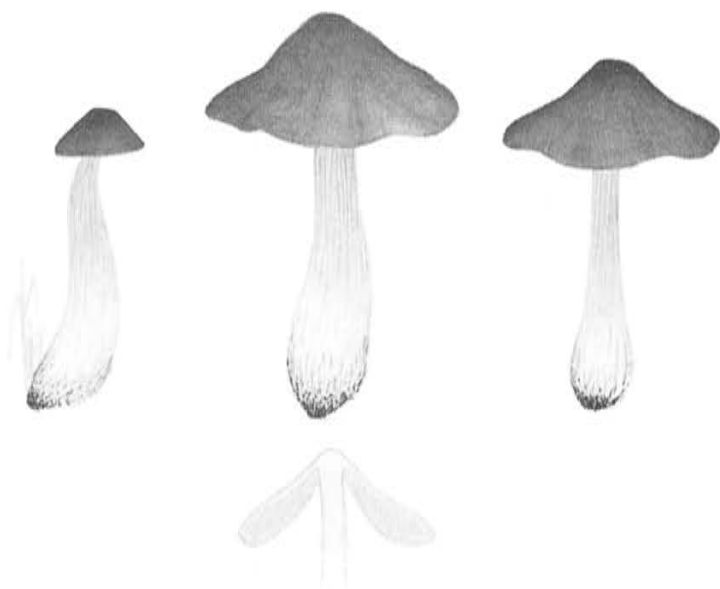


Fig. 5. *Rhodophyllus madidus* (FR.) QUÉL. ($\times \frac{2}{3}$).

10. ***Phlegmacium volvatum*** (A. H. SMITH) MOSER.

Syn.: *Cortinarius volvatus* A. H. SMITH 1939.

Icones: MOSER 1960, t. XIV, fig. 76, Sporentafel B, fig. 87; M. P. C. 1936 (C).

Lit.: SMITH 1939, p. 12; MOSER 1960, p. 216.

Cap ca. 6 cm broad, brown with lilac tint, margin paler, convex plane with broad umbo; remnants of the white and yellow spotted, membranous volva are spread on the cap, especially on the umbo. Stem 4.5 cm long, almost equal, apex lilac, downwards light brown, bulb ca. 2 cm broad, globose and marginate, red brown (by touch?). Gills light lilaceous blue, crowded, narrow, rounded behind, faintly sinuate, edge even. Flesh in cap white, in stem above lilac, at the base light yellow.

In woods of *Fagus*.

Z. Køge Strandskov (40), Aug. 25, 1936.

The species is reported for the first time in Denmark.

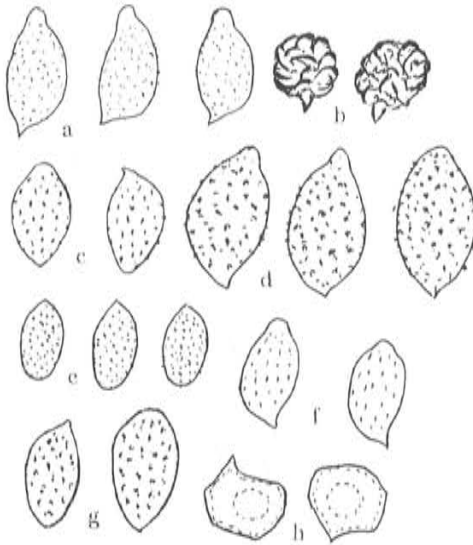


Fig. 6. Spores. a. *Hebeloma birrum* FR. — b. *Lactarius hygginus* FR. — c. *Phlegmacium corrosum* (FR) MOSER. — d. *Phlegmacium elegantior* (FR.) sensu KONRAD et MAUBLANC. — e. *Phlegmacium glaucopus* (SCHAEFF. ex FR.) var. *olivaceum* MOSER. — f. *Phlegmacium multifforme* (FR.) var. *coniferarum* MOSER. — g. *Phlegmacium prasinum* (FR.) WÜNSCHE. — h. *Rhodophyllus madidus* (FR.) QUÉL. ($\times 1335$).

11. *Rhodophyllus madidus* (FR.) QUÉL.

Fig. 5 and 6h.

Syn.: *Agaricus madidus* FR. 1836; *Entoloma madidum* GILLET 1878.

Icones: E. FRIES 1867, Icon. sel., tab. 91, fig. 3; BRRESADOLA 1929, Icon. myc. XII, tab. 555 (*Entoloma nitidum* QUÉL.); KONRAD & MAUBLANC 1924-32, Icon. sel. Fung., pl. 188; M. P. C. 1930 (C).

Lit.: E. FRIES 1936, p. 144; GILLET 1878, p. 399; J. E. LANGE 1921, Agar. Denm. IV, p. 29.

Cap 2-4 cm broad, dark blue, when old towards the margin lighter, first conical, then expanded with large obtuse umbo, edge somewhat involute. Stem 5-6 cm long, fusiform, above 4-8 mm broad and coloured like the cap, towards the base until 16 mm broad, whitish. Gills originally whitish, then somewhat flesh colour, rather broad and somewhat distant, adnate or rounded behind. Taste none. Smell faintly carbolic.

Spores almost globular, indistinctly 5-6 angular, ca. $8 \times 6.5 \mu$; basidia 4-spored, $40-42 \times 8-9.5 \mu$.

On the ground in woods.

Z. Svansbjerg Oredrev, Oct. 12, 1930; F. Bellinge, Oct. 1908, leg. J. E. LANGE.

LITERATURE CITED

- Bresadola, J.: *Iconographia Mycologica*. I-XXVI. — Mailand 1927-33.
- Fries, E.: *Epicrisis systematis mycologici*. — Upsaliae et Lundae 1836-38.
- : *Hymenomycetes Europæe*. — Upsaliae 1874.
- : *Icones selectæ Hymenomycetes*. I-II. — Holmiæ 1867-84.
- Juillard-Hartmann, G.: *Iconographie des Champignons superieurs*. Vol. II. — Paris 1919.
- Karsten, P. A.: *Rysslands, Finlands och den skandinaviska Halföens Hattsvampar*. I. — Helsingfors 1879.
- : *Kritisk öfversigt af Finlands Basidsvampar*. — Helsingfors 1889.
- Konrad, P. & Maublanc, A.: *Icones selectae Fungorum*. — Paris 1924-37.
- Lange, Jakob E.: *Studies in the Agarics of Denmark*. IV. — Dansk Bot. Arkiv 2, Nr.11. 1921.
- : *Flora Agaricina Danica*. III, IV and V. — Copenhagen 1938, 1939 and 1940.
- Moser, Meinhard: *Die Gattung Phlegmacium*. — *Die Pilze Mitteleuropas*. Band IV. Bad Heilbrunn 1960.
- Ricken, A.: *Die Blätterpilze (Agaricaceae)*. — Leipzig 1915.
- Smith, A. H.: *Studies in the genus Cortinarius*. I. — Contr. Univ. Mich. Herb. 2. Ann. Arbor 1939.

København, April 1969.

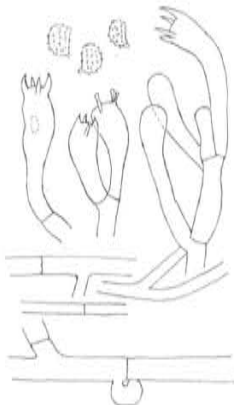
BYSSOCRISTELLA PALLIDO-CITRINA GEN. NOV., SP. NOV.

By M. P. CHRISTIANSEN & J. E. BREGNHØJ LARSEN

Byssocristella g. n.

Fructificatio resupinata, effusa, laxe adnata, arachnoideomembranacea. Hyphae hyalinae, cylindraceae, noduloso-septatae. Basidia clavata vel subcylindracea, racemose fasciculate. Cystidia desunt. Sporae hyalinae, aculeatae.

Genus *Cristella* simile sed differt hyphis non ampullaceis.



Basidia, sporae et hyphae. Coll. M. P. CHR. 3345. ($\times 665$).

Byssocristella pallido-citrina sp. n.

Fructificatio resupinata, effusa, tenuis, laxe adnata, pallidocitrina. Subiculum tenue arachnoideum. Hymenium byssoideum vel submembranaceum. Siccum separabile. Hyphae hyalinae, tenuiter tunicatae, 3-5-6 μ latae, cylindraceae.

Hyphae subhymenialae fibulatae.

Basidia hyalina, clavata vel subcylindracea $18-30 \times 5-7.5 \mu$, 2-4 sterigmatibus.

Basidiosporae hyalinae, ovatae, lateraliter apiculatae, tenuiter tunicatae, $5.7-6.8 \times 3.5-4 \mu$, non amyloideae, asperae.

Hab. Ad ligna putrida *Ulm*i, Dania. Type (C).

Fruit body resupinate, effused, loosely adnate, pale lemon-yellow. Subiculum thin arachnoid. Hymenium byssoid to loosely membranaceous, pallid lemon-yellow. Hyphae hyaline, distinctly cylindrical, thin walled $3-5-6 \mu$ broad. Hyphae of the subiculum with few clamps. Basidia hyaline, clavate to subcylindrical $18-30 \times 5-7.5 \mu$ with 2-4 sterigmata.

Spores hyaline, ovate with lateral apiculus, thin walled $5.7-6.8 \times 3.5-4 \mu$, finely warted, non amyloid.

On rotten wood of *Ulmus*.

Danish finds: Ermelunden 22.X. 1953 on *Ulmus* (M. P. CHR.).

Grønnæssegaard 17.XI. 1963 on *Ulmus* (Br. L.).

In "Danish Resupinate Fungi" (M. P. CHRISTIANSEN) this species is described as *Christella* sp. (no. 88), but the onion-shaped inflations that are characteristic in the genus *Cristella* are lacking; the hyphae are distinctly cylindrical. It is therefore described as a new genus.

LITERATURE

Christiansen, M. P.: Danish resupinate fungi. Part II. Homobasidiomycetes.

— Dansk bot. Arkiv 19, Nr. 2: 57-338. 1960.

Allerød, April 1969.

DIE DREI ÄLTESTEN ABBILDUNGEN VON PILZEN

Von ERIKA LÖHR und D. MÜLLER

Pflanzenphysiologisches Laboratorium der Universität, Kopenhagen

S U M M A R Y

The three earliest pictures of toadstools.

The three earliest known pictures are those of *Lactarius deliciosus* in Herculaneum, painted before anno 79 A. D., *Volvaria gloiocephala* in Timgad, carved in stone about anno 100 A. D., and *Amanita muscaria* in Plaincourault, painted about anno 1300 A. D.

Die Pilze, der letzte Gruss des Sommers in den herbstlich vergilbenden Wäldern, wurden in älterer Zeit nur sehr selten abgebildet. Die drei ältesten einigermaßen zur Art erkennbaren Pilzabbildungen sind die von *Herculaneum* (Abb. 1 und 2) um Jahr 79, von *Timgad* (Abb. 3) um Jahr 100 und von *Plaincourault* (Abb. 4) um Jahr 1300 herum ausgeführten. Ausserdem gibt es in verschiedenen mittelalterlichen Manuskripten Pilzabbildungen, wo die Art der Pilze nicht erkennbar ist.

Die älteste Abbildung der drei erwähnten ist die von *Herculaneum*. Da diese Stadt durch den Schlammassen des Vesuvs im Jahre 79 zerstört wurde, muss die Darstellung der Pilze älter sein, aber wahrscheinlich auch nicht viel älter. Das Wandbild mit den Pilzdarstellungen wurde in dem Werk: "Pitture di Ercolano e contorni", Vol. II, tab. 56 (Napoli 1757), wiedergegeben. Es zeigt auf einem Tisch drei Vögel liegend und darunter 10 abgeschnittene Pilze, anscheinend einer Mahlzeit bestimmt. In der italienischen Arbeit ist die Darstellung ohne Farbe wiedergegeben, aber COMES schreibt 1879: "Sie (die Pilze) haben einen kurzen, nach oben breiter werdenden Stiel und einen Hut mit einer schwachen Vertiefung. Ein stark rot gezeichneter

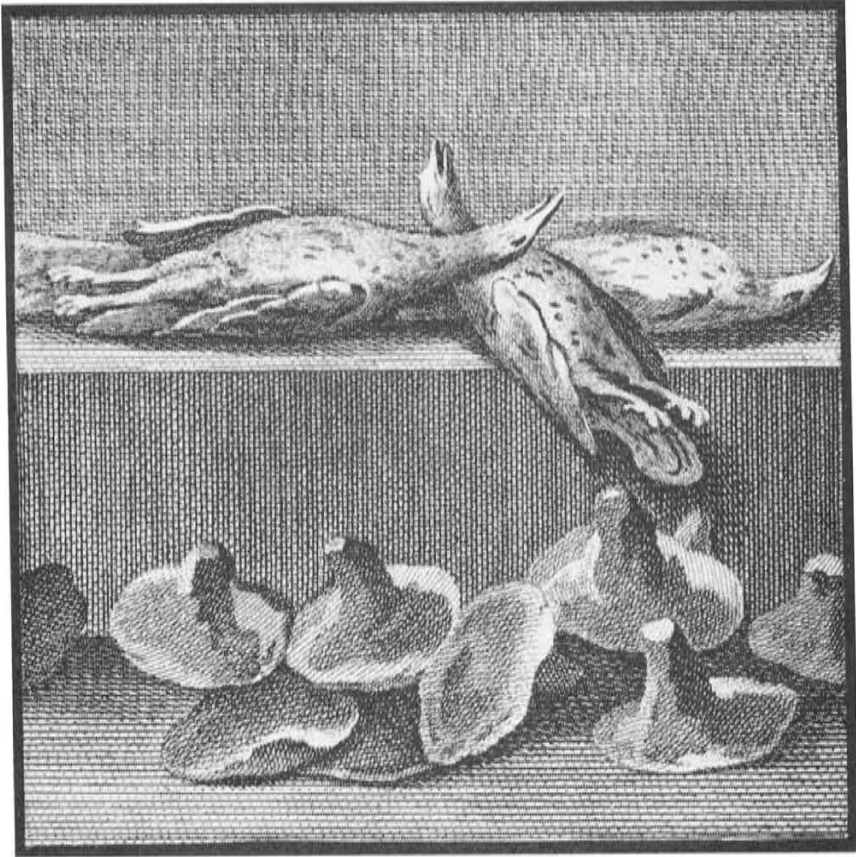


Abb. 1. Der Pilz aus Herculaneum.

Drei Vögel auf einem Tisch und darunter 10 abgeschnittene Pilze nach einem Wandbild in Herculaneum. Die Vögel sehen Misteldrosseln (*Turdus viscivorus*) ähnlich. Die Pilze sind nach O. COMES wahrscheinlich *Lactarius deliciosus*. Das Bild ist vor der Katastrophe im Jahre 79 n. Chr. gemalt.

Nach: Pitture di Ercolano e contorni. Napoli 1757, vol. II, t. 56.

Pilz und zweifellos essbar lässt an *Lactarius deliciosus* (L.) FR. denken". WASSON & WASSON (1957) haben die Herculaneum-Pilze in Farbe wiedergegeben wie Abb. 2 zeigt. — Im alten Römerreich waren Pilze, unter anderem der Kaiserpilz *Amanita caesarea*, beliebtes Essen, worüber BULLER in seiner Abhandlung 1914 alles überliefertes gesammelt hat.

Die zweitälteste der drei erwähnten Darstellungen ist der in einem Stein in Timgad eingehauene Pilz. Timgad, im Altertum Thamugadi

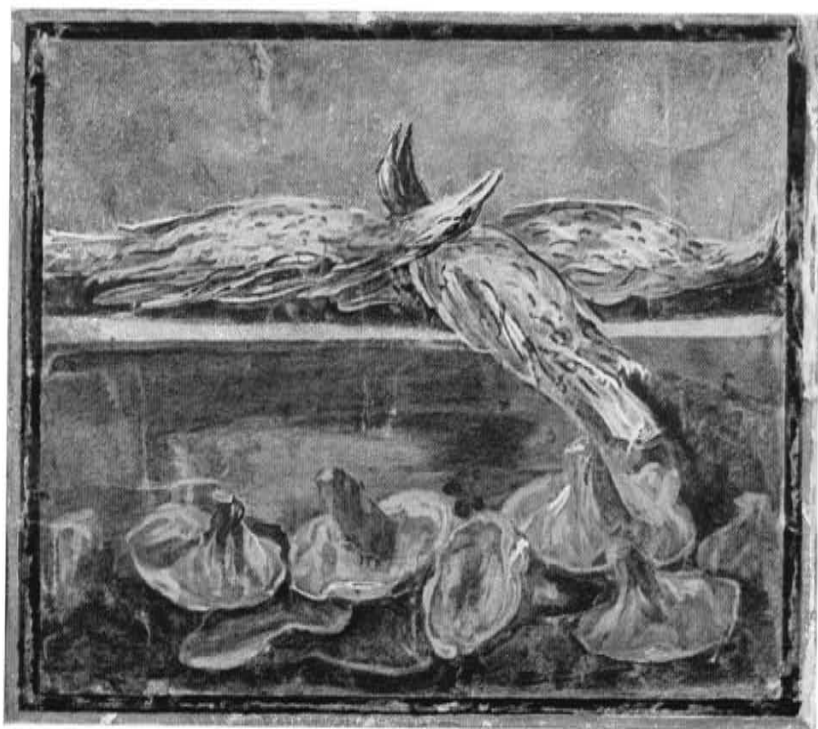


Abb. 2. Der Pilz aus Herculaneum.

Das Bild ist vor der Katastrophe im Jahre 79 n. Chr. gemalt. Vgl. Abb. 1.
Nach WASSON & WASSON, Vol. II, Plate 76.



Abb. 3. Der Pilz von Timgad.

Am Fuss des Stiels ist die Volva deutlich. Nach LOHWAG handelt es sich um *Volvaria gloiocephala*. Die Bildhauerarbeit ist wahrscheinlich um Jahr 100 n. Chr. herum ausgeführt worden. Nach HARSHBERGER (1929).

genannt, wurde von dem Legat P. MUNATIUS GALLUS auf Veranlassung von Kaiser TRAJAN um Jahr 100 herum gegründet. Die Stadt lag auf 6,5° öst. L, 35,5° nördl. Br. in Algérie, 100 km südlich von Constantine. Sie wurde von den Berberstämmen aus dem Aurès-Gebirge im Jahre 534 zerstört. Um 1880 herum veranlasste die französische Regierung die Ausgrabung der Ruinen. Die Arbeit ist heute beendet, und es ist möglich u. a. die gut erhaltenen Ruinen des Theaters, der Bibliothek, des Trajanbogens, der Marktplätze und der warmen und kalten Bäder zu besichtigen; vgl. auch BOESWILLWALD et al. (1891-1905). Auf dem alten Hauptmarktplatz, ursprünglich von Kolonnaden umgeben, liegen zwei grosse Steinblöcke, die durch Bildhauerarbeit verziert sind. Der eine zeigt, wie zuerst von HARSHBERGER (1929) bemerkt, eine Anzahl Acanthusblätter um einen Pilz herum. Die Arbeit ist sehr gut erhalten, und man sieht deutlich die Lamellen, den Stiel und die Volva an der Stielbasis. HARSHBERGER

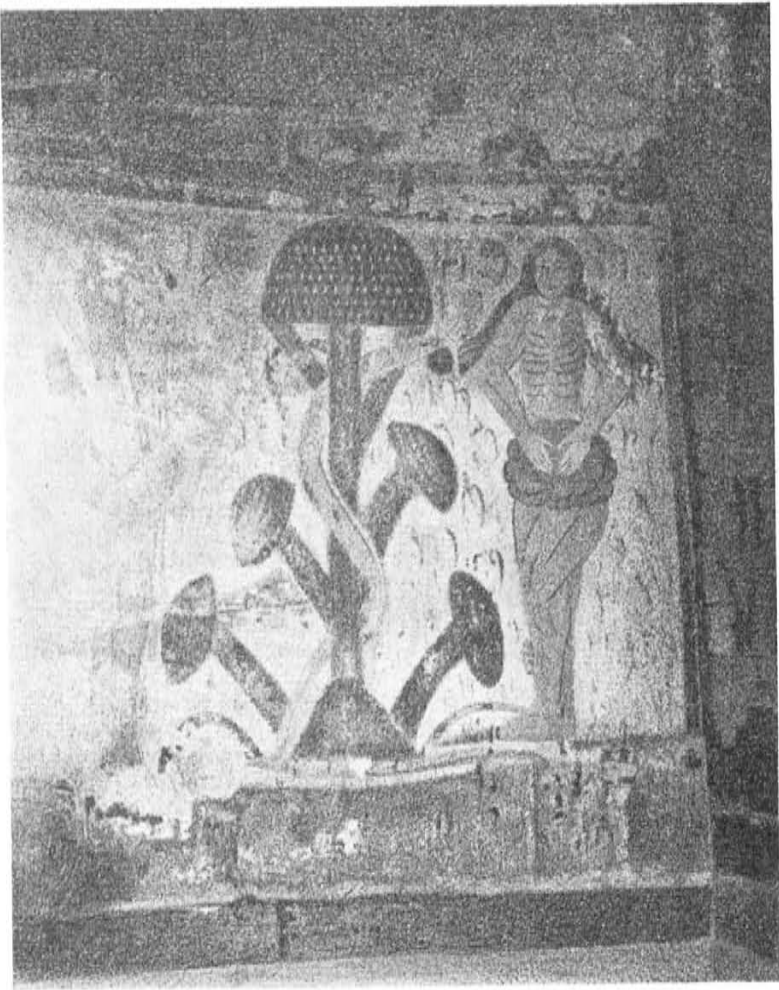


Abb. 4. Der Pilz von Plaincourault.

Nach einer Freske in der Kapelle am Schloss Plaincourault, 200 km südlich von Paris in Depart. Indre in Frankreich. Die Hüte der Pilze sind rot und haben weisse Flecke und stellen wahrscheinlich eine "paradiesische Varietät" von *Amanita muscaria* dar. Die Freske ist um Jahr 1300 herum gemalt. Nach GUÉGUEN et al. 1911.

meinte, dass die Bildhauerarbeit einen giftigen Pilz darstellt, doch LOHWAG hat den Pilz als *Volvaria speciosa* FR. (= *V. gloiocephala* DC.) identifiziert. Dieser essbare Pilz wird nach MAIRE auch noch heute in grossen Mengen auf den Markplätzen in Algérie verkauft.

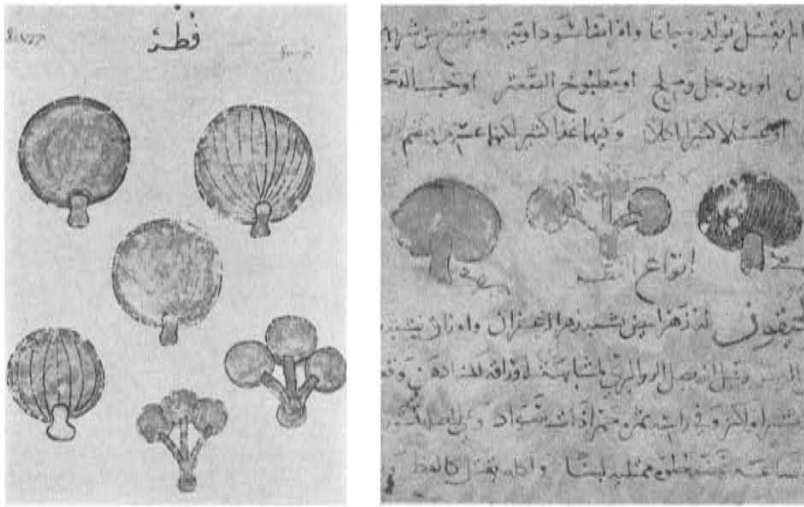


Abb. 5. Nicht zur Art identifizierbare Pilzabbildungen
in mittelalterlichen Manuskripten.

Links: Miniatur aus dem 9. Jahrh. Codex (Griechisch 2179) von DIOSCORIDES. Bibliothèque Nationale, Paris. Nach WASSON & WASSON, II, Plate 57 A. — Rechts: Miniatur aus einem 11. Jahrhundert-Manuskript (Arabisch 4947) von DIOSCORIDES. Bibliothèque Nationale, Paris. Nach WASSON & WASSON, II, Plate 57 B.

Die jüngste dieser drei zur Art erkennbaren ältesten Pilzabbildungen ist eine Freske aus dem Jahre 1291 in der Kapelle am Schloss Plaincourault im Department Indre, 200 km südlich von Paris. Die Abbildung wurde im Jahre 1911 von GUÉGUEN et al. in "Société mycologique de France" veröffentlicht. Die Freske zeigt als Baum der Erkenntnis des Guten und Bösen einen seltsam verzweigten, baumartigen Pilz. Die 5 Pilzhüte sind rot mit weissen Flecken und erinnern dabei an *Amanita muscaria*. Diese "paradiesische Varietät" von *Amanita* ist von einer Riesenschlange umschlingelt, und die daneben stehende Eva hat ihr Feigenblatt mit einem mehrschichtigen aus Trauben bestehenden Kranz vertauscht. Eine nähere Beschreibung der Pilzabbildung gibt C. FERDINANDSEN (1913).

Ausser diesen drei einigermassen zur Spezies bestimmbarsten ältesten Pilzabbildungen, findet sich in mittelalterlichen Manuskripten, älter als Jahr 1300, noch einige grob schematisierte nicht zur Art identifizierbaren Abbildungen. WASSON & WASSON (1957) haben diese Abbildungen wiedergegeben, und eine ihrer Tafeln ist in Abb. 5 reproduziert.

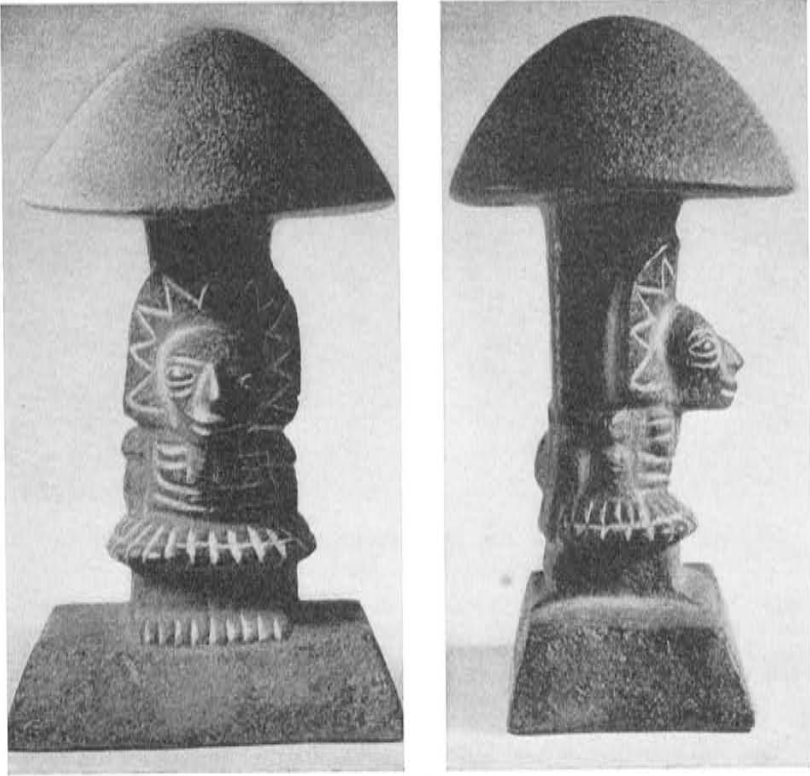


Abb. 6. Pilz-Stein von den Hochland-Mayas.

Ca. zwischen Jahr 300 n. Chr. und 600 n. Chr. Ca. 30 cm hoch. — Zürich, Rietberg Museum. Nach WASSON & WASSON, II, Plate 43.

Zu den nicht zur Spezies bestimmbar Pilzabbildungen gehören auch die aus Mittelamerika stammenden Pilz-Steine, die zwischen 1000 v. Chr. und 900 n. Chr. hergestellt wurden. WASSON & WASSON haben als die ersten darauf aufmerksam gemacht, dass diese Pilz-Steine wahrscheinlich eine Reminiszenz eines Pilz-Kults sein können, ein Pilz-Kult, der noch heute unter den Indianern in Mexiko zu finden ist. Sie schreiben (I. c. II, p. 276): "None of the archeologists who had contemplated the mushroom stones had ever heard of the mushroom cult of the Indians in Mexico". WASSON & WASSON haben in ihrem Prachtwerk schöne Abbildungen dieser Pilz-Steine. Eine davon ist hier in Abb. 6 wiedergegeben.

L I T E R A T U R

- Boeswillwald, E., A. Ballu & R. Cagnat: Timgad, une cité africaine sous l'empire romain. — Paris 1905.
- Buchwald, N. F.: Spise- og Giftsvampe. — København 1937.
- Buller, A.: The fungus lore of the Greeks and Romans. — Trans. Brit. Myc. Soc. 5: 21-66. 1914.
- Chauvin, E.: Contribution à l'étude des Basidiomycètes du Perche et à celle de la toxicité des champignons: *Amanita citrina* Schäffer et var. *alba* Price, *Volvaria gloiocephala* DC. — Thèse. Paris 1923.
- Comes, O.: Illustrazione delle piante rappresentate nei dipinti pompeiani, p. 177-250 in dem Buch: Pompei e la regione sotterrata dal Vesuvio nell'anno 79. Memorie e notizie pubblicate dall'ufficio tecnico degli scavi. — Napoli 1879.
- Ferdinandsen, C.: Fresken fra Plaincourault. — Medd. Foren. Svampekl. Fremme 1: 23-24. 1913.
- Guéguen, F., L. Marchand & E. Boudier: La fresque de Plaincourault (Indre). — Bull. Soc. Myc. France 27: 31-33. 1911.
- Harshberger, J. W.: An ancient Roman toadstool carved in stone. — Mycologia 21: 143-144. 1929.
- Lohwag, H.: An ancient Roman toadstool carved in stone. — Mycologia 28: 396-397. 1936.
- Maire, R.: Les champignons vénéneux d'Algérie. — Thèse. Alger 1916.
- Pitture di Ercolano e contorni. Vol 2, tabula 56. — Napoli 1757.
- Wasson, V. P. & R. G. Wasson: Mushrooms. Russia and History. I-II. — New York 1957.

København, Maj 1969.

GROWTH OF DIPLODIA NATALENSIS POLE EVANS (ORANGE ISOLATE) IN RELATION TO CARBON SOURCES AND C/N RATIO*)

By B. B. LAL¹ and V. N. PATHAK²

SUMMARY

Mycophysiology of *Diplodia natalensis*, the incitant of *Diplodia* stem-end rot of orange fruits, has not been worked out in any detail. The present paper reports the influence of different carbon sources and C/N ratio on the growth of this fungus.

MATERIAL AND METHODS

Sucrose in the basal medium (Richard's medium) was replaced with different carbon compounds. The quantities of carbon compounds added were determined on the basis of their molecular formulae so as to contain an equivalent amount of carbon as was supplied by 50.0 g of sucrose. The polysaccharides were added at the rate of 5.0 g per litre of the medium. The medium was buffered to the optimum pH (7.0) with the help of citrate buffer. Twenty ml of the medium was dispensed in each of the 150 ml conical flasks, which were sterilized at 15 lbs pressure for 20 minutes. Each flask was inoculated with a single disc cut out from the PDA plate bearing 5-day growth of the fungus. Inoculated flasks were incubated at $30 \pm 1^\circ \text{C}$ for 15 days.

Influence of C/N ratio on growth was determined by supplementing the basal medium with 2.5, 5.0, 10.0, 15.0 and 17.5 g per litre of potassium nitrate, which supplied 0.346, 0.693, 1.386, 2.079 and 2.425 g per litre of nitrogen, respectively; and 12.5, 25.0, 50.0, 75.0 and 87.5 g sucrose per litre, which supplied 5.25, 10.52, 21.04, 31.57 and 36.83 g

*) Portion of M. Sc. thesis submitted by the senior author.

1 & 2, P. G. student and Reader, respectively, Department of Plant Pathology, University of Udaipur, College of Agriculture, Jobner, India.

per litre of carbon, respectively. Possible combinations of carbon and nitrogen were made. 20 ml of the buffered medium was dispensed in each of the 150 ml conical flasks, which were sterilized, inoculated (as in Carbon studies) and incubated at $30 \pm 1^\circ \text{C}$ for 15 days.

RESULTS

The mycelium growing on different Carbon sources and on different C/N ratios was harvested after the incubation period. The mycelial mats were washed with lukewarm distilled water, dried and weighed. Whatman filter paper No. 42 was used in dry weight determination. The average dry weight on four replicates of each of the different treatments is presented in Tables 1 and 2.

TABLE 1

Growth of *Diplodia natalensis* on Richard's medium containing different carbon sources.

Carbon source	Average dry weight mg
Monosaccharides	
Pentose	
L-Xylose	332.70
Hexoses	
Dextrose	552.00
D-Fructose	556.00
D-Galactose	279.70
Mannose	450.00
Disaccharides	
Sucrose	443.20
Lactose	370.20
Maltose	540.60
Polysaccharides	
Starch	153.00
Inulin	231.50
Cellulose	107.30
Trihydric alcohol	
Glycerol	277.00
Hexahydric alcohols	
Mannitol	179.00
Sorbitol	294.00
Control (without C)	75.60

TABLE 2

Growth of *Diplodia natalensis* on Richard's medium with different concentrations of carbon and nitrogen.

Concentration of carbon g/l	Concentration of nitrogen g/l				
	0.346	0.693	1.386	2.079	2.425
5.25	247	300	420	320	280
10.52	374	400	586	430	300
21.04	639	700	730	715	610
31.57	885	920	1025	1001	801
36.83	1037	2000	2060	2020	1060

The data of Table 1 clearly indicate that D-fructose was the best source of carbon, the poorest was cellulose. Among the disaccharides, maltose supported best growth. Although lactose was the poorest among the disaccharides tried, it was better than the polysaccharides and trihydric alcohols and hexahydric alcohols.

Glycerol supported nearly the same amount of growth as that observed on D-galactose. Of the hexahydric alcohols tried, sorbitol was better than mannitol.

From Table 2, it is seen that a proper balance of carbon in the culture medium is essential for best growth of the fungus. At a fixed concentration of nitrogen, growth is increased with the increase in concentration of carbon. But, at a fixed concentration of carbon, growth increased with the increase in concentration of nitrogen only up to certain level, after which no increase in growth was observed with the increase in concentration of nitrogen. Maximum growth was observed at the C/N ratio of 36.83 g carbon/1.386 g nitrogen, per litre.

DISCUSSION

TANDON and his coworkers have reported fructose to be a good source of carbon for various fungi studied by them; the present isolate showed maximum growth on this monosaccharide. Similar to the findings of MARGOLIN (1940) on *Diplodia macrospora*, the present isolate made maximum growth on maltose among all the disaccharides. Galactose, differing from glucose, fructose and mannose in its structural configuration (arrangement of fourth carbon atom is different) has been reported to be unsatisfactory source of carbon for many fungi (HAWKER 1939; and LILLY & BARNETT 1951). The present isolate, however, made sufficient growth on galactose.

Unlike *Diplodia zeae* (DURELL 1923), the present isolate could not utilize cellulose; utilization of this polysaccharide by fungi depends upon the excretion of necessary hydrolytic enzymes. Production of cellulolytic enzymes by mango isolate of the same fungus was observed by PATHAK & PRASAD (1968). In their investigations, the *in vitro* production of these enzymes was lower than that *in vivo*. It is possible that the present isolate might be producing cellulolytic enzymes in higher concentrations in orange fruits and the present cultural conditions did not favour the production or activity of these enzymes. However, this all need be proved experimentally. DURELL (1923) concluded amylase production by *Diplodia zeae*; the present isolate utilized starch inefficiently, as the growth on this polysaccharide was only little better than that on cellulose.

The present isolate displayed increase in growth with higher concentrations of nitrogen, when the amount of carbon was also increased in the medium. Similar observations were made by AGARWAL (1958) for *Curvularia penniseti*.

ACKNOWLEDGEMENT

The authors are thankful to Dr. R. PRASADA, Professor and Head of Department of Plant Pathology, University of Udaipur, College of Agriculture, Jobner, for facilitating these investigations.

REFERENCES

- Agarwal, G. P.: Nutritional studies on *Curvularia penniseti*. I. Influence of nutrient media, pH, temperature and carbon nitrogen ratio. — *Phyton* 10: 77-87. 1958.
- Durell, L. W.: Dry rot of corn. — *Iowa Agric. Exper. Stat. Res. Bull.* 772: 347-376. 1923.
- Hawker, L. E.: The nature of accessory growth factors influencing growth and fruiting of *Melanospora destruens* and some other fungi. — *Ann. Bot. (N.S.)* 3: 657-676. 1939.
- Lilly, V. G. & H. L. Barnett: *Physiology of the fungi*. — N.Y., Toronto and London. 1951.
- Margolin, A. S.: The carbohydrate requirements of *Diplodia macrospora*. — *Proc. West Va. Acad. Sci.* 14: 56-59. 1940.
- Pathak, V. N. & N. Prasad: Production of cellulolytic enzymes by *Diplodia natalensis*. *Lloydia* (in pres). 1968.
- Tandon, R. N.: *Physiological studies on some pathogenics*. — U. P. Sci. Res. Comm. Monograph. 1961.

Udaipur, Rajasthan, June 1969.

SEPTOTIS G. NOV. AND OVULITIS G. NOV.
TWO NEW FORM-GENERA OF SCLEROTINIACEAE

By N. FABRITIUS BUCHWALD

SUMMARY

Latin diagnoses are given of the two form-genera *Septotis* g. nov. and *Ovulitis* g. nov. belonging to *Septotinia* WHETZEL and *Ovulinia* WEISS respectively. The names *Septotis* and *Ovulitis* were proposed by the author in 1949, but were not followed by Latin diagnoses. Later two new combinations within *Septotis* were made, namely *S. populiperda* (MOEZ & SMARODS) WATERMAN & CASH (1950) and *S. podophyllina* (ELLIS & EVERH.) v. ARX (1957). The proposal of these two combinations presents a delicate problem of nomenclature, since it was not until this year that *Septotis* was legitimately established.

Latin diagnosis is also given of *Ovulitis perplexa* sp. n., the macroconidial state of *Ovulinia perplexa* (LAWRENCE) SEAVER.

INTRODUCTION

In 1937 H. H. WHETZEL established the genus *Septotinia* with *S. podophyllina* WHETZEL*) as type species and in 1940 FREEMAN WEISS established the genus *Ovulinia* with *O. azaleae* WEISS as type species. The apothecia of these two genera were typical for *Sclerotiniaceae* (Syn. *Ciboriaceae*) and accordingly both WHETZEL and WEISS referred the genera to this family. In the synopsis of the genera and species of *Sclerotiniaceae* by WHETZEL (1945) the two genera were also referred to that family. This classification was also employed by the present author (BUCHWALD 1949).

*) Incorrectly written: *Septotinia podophyllina* (ELLIS and EV.) comb nov.

Both genera are primarily characterized by their macroconidial state. WHETZEL gave this state no specific name and since in the present author's opinion a distinct name for the conidial state of a fungus is of considerable practical value, particularly when the fungus is parasitical and often more common than the perfect state, the author in 1949 proposed a new form-genus termed *Septotis* g. n. for the macroconidial state of *Septotinia*. Furthermore, since FREEMAN WEISS did not give the macroconidial state of *Ovulinia* a name, the author in the same year proposed the name *Ovulitis* g. n. As can be seen, the names *Septotis* and *Ovulitis* are analagous with the *Botrytis-Botryotinia* nomenclature.

The two new form-genera were not, however, followed by a Latin diagnosis and thus were not legitimately described. These two names can in fact be considered *nomina nuda*.

In order to rectify this deficiency the Latin diagnoses of these two genera are given below.

DIAGNOSES

1. **Septotis** BUCHWALD (1949). Sporodochiis minutis, albis, amphigenis, saepius epiphyllis, erumpentibus; conidiophoris dense compactis, hyalinis, ramosis, septatis; conidiis hyalinis, elongatis, rectis curvulisve, 1-3 septatis, basibus truncatis, apicibus acutis, dirumpentibus.

Status macroconidiophorus *Septotinia* WHETZEL (1937). Typus generis: **Septotis podophyllina** (ELLIS & EVERH.) n. n. Syn. *Gloeosporium podophyllum* ELLIS & EVERH. (1888); *Septogloeum podophyllum* (ELLIS & EVERH.) SACC. (1892); *Septoriopsis podophyllina**) (ELLIS & EVERH.) DEARNES.

Illustrations of the sporodochia and macroconidia are given by WHETZEL (1937). In his paper WHETZEL discusses whether the macroconidial state can be included in any of the following form-genera: *Phleospora* (WALLROTH 1833), *Gloeosporium* (ELLIS & EVERH. 1888), *Septogloeum* (SACCARDO 1892, PETRAK 1924), *Septoriopsis* (STEVENS & DALBEY 1919) and *Cercosporina* (PETRAK 1925), but concludes that "since the perfect state of this fungus has now been discovered, and since it is almost certain that the conidial forms referred by STEVENS

*) Non *podophyllum* as stated by VON ARX 1957, p. 122.

and DALBEY to their genus *Septoriopsis* are not congeneric with that of our species, there appears to be no valid grounds in the present case for erecting a new form-genus for the conidial stage of our fungus".

The place of *Septotis* in the *Fungi imperfecti*-system by SACCARDO must be sought within *Melanconiaceae-Hyalophragmiae*.

Another species of *Septotinia* attacking leaves of *Populus* species has been described by WATERMAN & CASH in 1950 as *S. populiperda* and its macroconidial state as *Septotis populiperda* (MOEZ & SMARODS) WATERMAN & CASH comb. n. (Syn. *Septogloeum populiperdum* MOEZ & SMARODS, 1932). In 1957 VON ARX made the new combination *Septotis podophyllina**) (ELLIS & EVERH.) v. ARX.

Since *Septotis* was not legally established as a form-genus in 1949 it would appear that the formation of the two above mentioned combinationes novae: *Septotis populiperda* by WATERMAN & CASH and *Septotis podophyllina* by v. ARX presents a delicate problem of nomenclature which the present author is unable to solve. The legitimacy of these two new combinations is debatable.

2. Ovulitis BUCHWALD (1949). Macroconidiis hyalinis ovoideo-obovoideis vel pyriformibus, unicellularibus, solitariis, de conidiophoris e cellula disjunctori conidio affixa manerenti separantibus.

Status macroconidiophorus *Ovuliniae* WEISS (1940). Typus generis: **Ovulitis azaleae** BUCHWALD sp. n.

With regard to conidium production the genus *Ovulinia* differs from any as yet connected with *Sclerotinia*. Latin description and good illustrations of the conidiophores, conidia and stages in development of conidia of *Ovulinia azaleae* are given by WEISS (1940).

The place of *Ovulitis* in the *Fungi imperfecti*-system of SACCARDO must be sought within *Mucedinaceae-Hyalosporae-Botrydideae*.

Ovulinia azaleae causing petal blight of cultivated *Azalea* and *Rhododendron* species was originally described from the United States, but has later also been collected in different localities in Scotland (MOORE 1959). DENNIS (Myc. Pap. 62, 1956) listed the species as *Sclerotinia azaleae* (WEISS) n. c., but in a footnote said that apothecia received as this species from Scotland did not agree with WEISS's diagnosis.

*) Non *podophyllum* as stated by v. ARX. The name *Septotis* belongs to the feminine gender as does *Septoriopsis*.

In 1961 SEAVER placed *Sclerotinia perplexa* LAWRENCE (1912) attacking a large number of cultivated vegetables in *Ovulinia* as *O. perplexa* (LAWRENCE) SEAVER. Since the macroconidial state has not been given a name the author proposes to call it *Ovulitis perplexa*.

Ovulitis perplexa BUCHWALD sp. n. Conidiophoris rectis vel ramosis; conidiis hyalinis, unicellularibus, ovoideis, $6-10.5 \times 8-15 \mu$.

Status macroconidiophorus *Ovuliniae perplexae* (LAWRENCE) SEAVER (1961).

REFERENCES

- Von Arx, J. A.: Revision der zu *Gloeosporium* gestellten Pilze. — Verh. K. Nederl. Akad. Wet., Amsterdam, Afd. Natuurk., 2de reeks 51 (3): 1-153, 1957.
- Buchwald, N. Fabritius: Studies in the *Sclerotiniaceae*. I. Taxonomy of the *Sclerotiniaceae*. — Contrib. Departm. Plant Pathology No. 32, Roy. Vetr. Agr. Coll., Copenhagen 1949.
- Dennis, R. W. G.: A revision of the British *Helotiaceae* in the herbarium of the Royal Botanic Gardens, Kew, with notes on related European species. — Mycol. Pap. Commonw. Mycol. Inst. 62, 266 pp. 1956.
- Moore, W. C.: British parasitic fungi. 430 pp. — Cambridge 1959.
- Seaver, Fred Joy: The North American cup-fungi (*Inoperculates*). — Supplemented ed. 428 pp. — New York 1961.
- Waterman, Alma M. & Edith K. Cash: Leaf blotch of poplars caused by a new species of *Septotinia*. — Mycologia 42: 374-384, 1950.
- Weiss, Freeman: *Ovulinia*, a new generic segregate from *Sclerotinia*. — Phytopathology 30: 236-244, 1940.
- Whetzel, H. H.: *Septotinia*, a new genus of the *Ciborioideae*. — Mycologia 29: 128-146, 1937.
- : A synopsis of the genera and species of the *Sclerotiniaceae*, a family of stromatic inoperculate *Discomycetes*. — Mycologia 37: 648-714, 1945.

København, September 1969.

SOMA OCH AMANITA MUSCARIA*)

Av S. HENRY WASSÉN

SUMMARY

Soma and Amanita muscaria

In a message to accompany the new book "SOMA Divine Mushroom of Immortality" by R. GORDON WASSON, Honorary Research Fellow of the Botanical Museum of Harvard University, Dr. RICHARD EVANS SCHULTES, Executive Director of the museum, wrote that "Mr. WASSON's interest in botany and ethno-mycology is of long standing". Dr. SCHULTES added that "in retrospect, the present book on Soma seems an inevitable sequel to the earlier work" (that is "Mushrooms, Russia and History" published in 1957 by Mr. WASSON and his Russian-born wife, VALENTINA P. WASSON, M.D.), "but in 1957 the author had only faint premonitions where his further researches in ethno-mycology would lead him."

The present work has been printed in Italy for Harcourt, Brace & World, Inc., New York (1968), and it has also simultaneously been published by Mouton & Co., The Hague, The Netherlands. The price is \$ 200 or 720 guilders.

The review printed here is an effort to present the principal contents in WASSON's work in which he has tried to elucidate the secrets of the Indo-European Aryan *soma* by identifying it with the *Amanita muscaria* (Fr. ex. L.) QUÉL, "in English the fly-agaric, the *Fliegenpilz* of the Germans, the *mukhomor* of the Russians, the *fausse orange* or *tuemouche* or *crapaudin* of the French, the brilliant red mushroom with white spots familiar in forests and folklore throughout northern Eurasia" (p. 10). In doing this the author has

*) Denna artikel har under rubriken "Soma och den röda flugsvampen" i något kortare skick varit införd som understreckare i Svenska Dagbladet, Stockholm, den 25.8.1969. Då den nu med nämnda tidnings tillstånd återgives i "Friesia" har förf. begagnat tillfället införa några smärre tillägg.

worked with many specialists in various fields, quite naturally so, as he has had to get in touch also with linguistic experts, e. g. as Vedic consultants. One of them, Dr. WENDY DONIGER O'FLAHERTY, lecturer at the School of Oriental and African Studies of London University, has also written Part Two of the book (pp. 93-147), a section which she has called "The Post-Vedic History of the Soma Plant", which she ends by saying that "WASSON's novel solution of this old question" (that is, the speculations of soma's nature) "revivifies a body of speculation that has become encreasingly sterile and repetitive, and throws important problems of Indo-European and even Eurasian cultural history into a new perspective." She ends her chapter expressing her hope that the implications of this welcome contribution "will be exploited in wide-ranging debate and fresh syntheses." WASSON himself has given Part One (pp. 1-92) the title "Soma, Divine Mushroom of Immortality" and Part Three (pp. 150-204) is called "Northern Eurasia and the Fly-Agaric." The rest of the work with 382 pages contains an Epilogue and last but not least an excellent section called "Exhibits and Index." In the exhibits the author has had his most important sources translated.

From a Nordic point of view it is interesting that WASSON absolutely rejects the often repeated statement (after SAMUEL ÖDMAN, 1784) that the berserk-raging of the Vikings should be explained from a consumption of fly-agaric. He takes up this problem in detail on pages 176-180, when he points out that ÖDMAN derived the notion from the accounts of travellers in Siberia earlier in the century. WASSON mentions FREDRIK CHRISTIAN SCHÜBELER, the Norwegian who in 1886 expressed the same view as ÖDMAN, adding that "the opposition has not been without able advocates, notably FREDRIK GRØN, a specialist in the medical history of Norway, and MAGNUS OLSEN, the authority on Norse traditions and literature." No mention is, however, and unfortunately, made of POUL THORSEN's excellent contribution „Rød Fluesvamp (*Amanita muscaria*) og Besærkergangen". (Summary: *Amanita muscaria* and the fury of the Berserks), published in vol. III of Friesia (1944-1948), pp. 333-351, Copenhagen, 1949. In this paper, THORSEN, already twenty years ago clearly stated that there are no facts now known to support the view introduced by SAMUEL ÖDMAN. "We therefore cannot join SCHÜBELER in his optimism that it could have been a secret of the Berserks. There were thousands of Berserks, and in any case the rulers, who employed the Berserks must have known the secret. Nothing has been handed down.

Maybe there was nothing to hand down? Maybe the vocable "berserk" only was meant as a literary flower telling from ancient times about the fury of fighting. However, the fury of the Berserks remains a mystery till new facts come to light" (THORSEN, op.cit., p. 350).

In his new work WASSON continues the discussion already started in "Mushrooms, Russia & History" about the explanation of the Germanic word 'fly-mushroom', the fly, in his opinion, "certainly the fly of madness, of divine possession" (p. 194). He also deals in detail with the supposed insecticide properties of the fly-agaric, with references e.g. to works written by the great LINNÆUS. Speaking of him it is interesting to add that the "Ordbok över Svenska Språket" edited by the Swedish Academy (Vol. 8, F-Fulgurit, Lund, 1925, F 882) has the Swedish word "flugedöda" ("fly-killer" or "to kill flies") for *flugsvamp* from a Swedish text in 1694.

The work by R. GORDON WASSON is of a very great interest and offers a most fascinating reading. Dr. RICHARD EVANS SCHULTES was discussing it from botanical points of view in his paper "Hallucinogens of Plant Origin" ("Science", 17 January 1969, Vol. 163, pp. 245-254). As far as I can understand he has no objections, when he, after presenting the various botanical suggestions for an identification of soma, writes (p. 246) that "the most recent identification as *Amanita muscaria* appears to be the first that satisfies all of the many descriptive details and evidence gleaned from the Vedic hymns, and none seems to contradict it. If correct, it represents a meaningful contribution to ethnobotany in view of the extraordinary religious and social role of soma as emphasized in one of the earlier texts in the Indo-European world."

Efter en 20-årig tjänst som vicepresident i J. P. MORGAN & Co., Inc. drog sig den nu världsberömde amerikanske etnomykologen R. GORDON WASSON år 1963 tillbaka som bankir. Hans förtjänster på det finansiella området är mig obekanta, men han har länge varit ett välbekant namn för mig som amerikanist genom sin ledande roll vid återupptäckten i Mexico av det gamla bruket av hallucinogent verksamma svampar, aztekernas s. k. teonanacatl, "gudarnas föda". För detta verk sökte han och fick samarbete med den franske mästaren på mykologiens fält ROGER HEIM, dåvarande chef för Naturhistoriska museet i Paris. De publicerade 1959 i Paris den stora sammanfattningen "Les Champignons Hallucinogènes du Mexique".

År 1957 hade WASSON och hans ryskfödda hustru VALENTINA PAVLOVNA (död 1958) kommit med ett stort och trots sin svåråtkomlighet uppmärksammat arbete i två volymer med den rätt kuriösa titeln "Mushrooms, Russia and History". Verket är förutom det mykologiska huvudinnehållet av ett utomordentligt allmänkulturellt intresse. Det utgavs endast i en begränsad upplaga, var dyrt i pris men förstklassigt tryckt i Verona. Italien blev också det land där författaren av dessa rader fick första tillfället att se ett originalexemplar av verket, nämligen det som GORDON WASSON skänkt sin vän sedan 1921, den år 1969 bortgångne professor AXEL BOËTHIUS i Rom.

Ett andra tillfälle erbjöd sig i WASSON's hem i Danbury, Connecticut, under ett veckoslut som hans gäst efter ett tredagars tvärvetenskapligt symposium vid Harvarduniversitets botaniska museum i maj 1968, då ämnet gällde växternas roll i utvecklingen av modern medicin. WASSON uppträdde ej där som föreläsare, men det hade han gjort i januari 1967 i Medical Center i San Francisco under ett tvärvetenskapligt symposium gällande det etnofarmakologiska sökandet efter psykoaktiva droger. Vi gjorde där vår första personliga bekantskap, och jag hade tillfälle höra hans med stort intresse emotsedda framställning om flugsvampen och människan ("Fly Agaric and Man"), en föreläsning varunder han lyfte på förlåten till det stora verk han då höll på att slutredigera och som i oktober 1968 färdigställdes i 680 exemplar hos VALDONEGA i Verona för HARCOURT, BRACE & WORLD i New York och MOUTON & Co i Haag (pris 200 dollars resp. 720 floriner).

Det här åsyftade arbetets titel är *Soma* med underrubriken *Divine Mushroom of Immortality*. Läsaren kan redan av det förut sagda ana, att WASSON häri framför som bärande hypotes att den heliga växten och gudadrycken soma med dess intoxikerande egenskaper, varom kännedom kom till Indien genom arierna från nordväst för cirka 3 500 år sedan, enklast och fullkomligt förklaras med att det är fråga om den röda flugsvampen, *Amanita muscaria*. Soma, som fått sig mer än tusentalet hymner tillägnade i Rigveda och om vilken det föreligger rader av hypoteser, skulle vara *Amanita muscaria*, den anglosaxiska världens "fly agaric", karakteristiskt bunden till Eurasiens björk- och barrskogsbälte genom mykorrhiza (svamprot-symbios). Denna svamp, välkänd hos oss för sin lysande röda hatt-hinna med vanligen vita ruvor, har nu av GORDON WASSON ägnats en detaljerad granskning och inplacerats i ett kulturellt globalt sammanhang.

Arbetet bygger på hans och hustruns mångåriga studier hos stammar i Sibirien, hans egna årslånga vistelser i Indien och övriga delar av Asien samt beträffande uppgifterna om soma i vedalitteraturen på ett samarbete med WENDY DONIGER O'FLAHERTY från Harvard-universitetet, nu verksam vid School of Oriental and African Studies vid Londons universitet. Denna expert har skrivit sidorna 95-147 i WASSON's arbete, ett avsnitt som han placerat som "part two" mellan sina egna "part one" och "part three". WENDY DONIGER O'FLAHERTYS viktiga bidrag anges icke vare sig på rygg eller titelblad, men hon hälsar WASSON's nya syn på somaproblemet som ett välkommet nytillskott i en debatt, som hon hoppas nu skall leda till en syntes. Specialbidraget bär titeln "The Post-Vedic History of the Soma Plant".

WASSON har för det språkliga, speciellt det indoeuropeiska, materialet förstått att anlita hjälp från en rad lysande forskare och vänner. Han rör sig även med skandinaviskt material och experter därpå, t. ex. vid det absoluta avvisandet av de alltför lättsinnigt strödda uppgifterna om att nordbornas bärsärkaraseri skulle ha sin grund i förtäring av *Amanita muscaria*. Denna tro härledes enligt WASSON från SAMUEL ÖDMAN's uppsats från 1784, "Försök at utur Naturens Historia förklara de nordiska gamla Kämpars Berserkagång". Det hade varit värdefullt om WASSON här litet mer utförligt uppehållit sig vid oppositionen mot ÖDMAN. Han nämner på sid. 177 i arbetet norrmannen FREDRIK CHRISTIAN SCHÜBELER, som 100 år senare än ÖDMAN propagerade för samma idé som denne. Om oppositionen säger han endast, att den ej varit utan "able advocates, notably FREDRIK GRØN, a specialist in the medical history of Norway, and MAGNUS OLSEN, the authority on Norse traditions and literature." Tyvärr saknar man här liksom i litteraturförteckningen namnet POUL THORSEN, som i sin artikel „Rød Fluesvamp (*Amanita muscaria*) og Bersærkergangen“ („Friesia“, Bd. III, 1944-1948: 333-351) bestämt tagit avstånd från ÖDMAN's uppfattning — och detta redan 20 år tidigare än WASSON. THORSEN har gjort en genomgång av problemet och litteraturen och han har även en utförlig *Summary*, som väl knappast kan ha undgått en sådan forskare som WASSON.

ÖDMAN stödde sig på uppgifter från resenärer i Sibirien på 1700-talets början, vilka berättat om flugsvampsbruket där. WASSON anser troligt, att han även känt den svenske översten FILIP JOHANN VON STRAHLENBERG, krigsfånge i Sibirien och författare av ett först i Stockholm 1730 utgivet arbete på tyska, vari han lämnat viktiga

ögonvittnesuppgifter om koryakernas bruk av *muchomor*, det ryska namnet på svampen. Det är nämligen STRAHLENBERG som först omnämnt det specifika bruket att vissa folk drack urin från en person som ätit flugsvamp, varvid dess verkan kunde utnyttjas en andra gång.

Då denna uppgift från koryakerna (eller som STRAHLENBERG skriver *Koræiki*) är viktig men arbetet ej är lätt att nu komma över citeras här ur en originalupplaga från 1730 av STRAHLENBERG's „Der Nord- und Östliche Theil von Europa und Asia“, etc. uppgiften på sid. 389:

„Die Russen, so mit ihnen handeln und verkehren, bringen ihnen unter andern Waaren auch eine Art Schwämme, die in Russland wachsen, hin, welche auf Russisch *Muchumor* genannt werden, die sie vor Eichhörner, Füchse, Hermelinen, Zobeln &c an sich tauschen, da denn die Reichen unter ihnen eine ziemliche *Provision* von diesen Schwämmen sich zum Winter machen können. Wenn sie nun ihre Fest-Tage und *Collationes* halten wollen, giessen sie Wasser auf diese Schwämme, kochen selbige, und trincken sich davon voll, allsdenn lagern sich um der Reichen Hütten die Armen, die sich dergleichen Schwämme-Provision nicht machen können, und warten biss einer von den Gästen herunter kommt, sein Wasser abzuschlagen, halten ihm eine hölzerne Schaale unter, und sauffen den Urin in sich, worinn noch einige Krafft von den Schwämmen steckt, davon sie auch voll werden, wollen also solche kräftige Wasser nicht so vergeblich auf die Erde fallen lassen.“

Detta är unikt för bruket av *Amanita muscaria*. Enligt WASSON kan det ha att göra med observationer hos med renen nära associerade människor, att dessa djur gärna slickar i sig människourin och främför allt är begivna på den röda flugsvampen liksom även urin från en människa som ätit sådan. Bruket är en viktig detalj för WASSON, som uppdelar sättet att tillgodogöra sig flugsvampens verkan i två former. Den första är att svampen ätes rå eller torkad och att dess saft som utpressats förtäres med olika tillsatser, bl. a. nämnes mjölk. Den andra formen är det nämnda sättet med drickandet av urin. Rigveda har också två former för intagande av soma. Här gives dock ej plats att ytterligare ingå på WASSON's analyser av textställena om detta.

Somaarbetet är på närmare 400 sidor. Det är därför omöjligt att beröra hela innehållet, som säkert i många avseenden kommer att vara revolutionerande. Det får räcka med några huvudpunkter. Först

bör då nämnas att efter vad som framkom vid symposiet i San Francisco 1967 återstår det ännu att lösa komplicerade farmakologiska och kemiska problem rörande *Amanita muscaria*, trots att t. ex. muskarinet, den enligt experten PETER G. WASER i Zürich bäst kända av alkaloiderna i flugsvampen, har studerats farmakologiskt i över 100 år. CONRAD HANS EUGSTER, som 1967 delade ut en trevlig specialbroschyr "Über den Fliegenpilz" till deltagarna i San Franciscosymposiet, uppger att endast under 1954-1965 cirka 50 arbeten utgivits om just muskarinets kemi. WASSON nämner självfallet dessa forskare, ävensom dr. T. TAKEMOTO och hans kolleger vid Sendai-universitetet i Japan. Man har t. ex. isolerat en syra kallad iboten, som uppges ha svagt insekticida egenskaper.

Vi kommer genom detta in på en särskilt intressant detalj i WASSON's arbete, även behandlad i dubbelvolymen från 1957. Det gäller benämningen "flugsvamp", med till betydelsen motsvarande ord i alla germanska språk utom i engelskan. Flera tolkningar har givits. Hyllresterna på hatten skulle ha liknats vid flugor. Svampen skulle ha dödande verkan på flugor, vilket av LINNÉ nämnes från Småland i hans "Flora Svecica" och även finns med i hans reseskildring från Skåne. De diffusa uppgifterna om detta finns på flera håll, men har icke experimentellt kunnat bekräftas, ehuru en viss förlamande verkan i vissa fall kunnat påvisas på flugorna. WASSON presenterade redan 1957 den nya hypotes som han nu ytterligare understryker, nämligen att namnet skall förklaras med att just flugor associerats med besatthet, en gammal föreställning i hela Eurasien. En mängd exempel gives. Själv berättade jag för honom i brev om vårt eget talesätt "att få flugan", "vara flugig" etc. Medeltidens människor tolkade sinnessjukdomar som att insekter fanns lösa i huvudet, och då vi talar om att "sätta myror" i huvudet på någon, lär norrmännen tala om flugor.

Göteborgsvännen SVEN SCHÄNBERG har efter publiceringen av min artikel i Svenska Dagbladet fäst min uppmärksamhet på att "Ordbok öfver Svenska Språket utgifven af Svenska Akademien under *fluga* (F 882 tryckt 1925) har ordet "flugedöda" för flugsvamp i ett svensk belägg från 1694. Beträffande det insekticida kan tilläggas att samma ordbok även har en uppgift från 1790 att "Flug-svampen med Mjölks dödar både Flugor och Vägglöss."

Litet vid sidan av kommer jag här in på en annan sak. WASSON anser det helt troligt, att kinesernas urgamla lyckosymbol *ling chih*, "gudasvampen" eller "odödlighetens svamp", icke som sinologerna

ansett är en ursprunglig kinesisk föreställning (begreppet är känt från kejsar SHIH-HUANG, 221-207 f. Kr., även om ordet är äldre) utan kommit från Indien som ett "litterärt" återgivande av Rigvedas soma. Däremot är WASSON icke beredd att söka ett direkt samband mellan flugsvampkomplexet i Sibirien och bruket av heliga svampar med hallucinogen verkan i Mexiko. Svampkulten skulle på båda ställena vara tusenårig och självständigt uppkommen. Detta är nog också troligt, men ibland har det hos indianer påvisats så säregna, uppenbarligen komplicerade och gamla föreställningar med direkta motsvarigheter hos asiatiska folk, att man kan bli böjd för att ana ett samband med ursprungslandet Asien, varifrån dock indianerna av alla allvarliga forskare anses ha invandrat. T. o. m. flugorna spelar därvid en viss roll, då de redan i det förinkaiska Peru associerades med dödssjälar.

GORDON WASSON's nya volym är fylld av lärdom. Hypoteser, bevis och citat gör den till en fascinerande läsning. I huvudsak har hans huvudtes redan framförts. De vedatalande arierna kom under andra årtusendet f. Kr. från nordväst in i nuvarande Afghanistan och Indusdalen. Främst bland deras gudar var Indra (med åskviggen), de dyrkade eldguden Agni och växten soma och dess saft betraktades också som en gud. Prästerna drack för kultändamål soma, och det är deras skatt av inspirerade hymner till somas ära som räddats i Rigveda. Arierna måste ha fått sin kunskap om soma vid kontakterna med folken i norr som för kultändamål använde sig av *Amanita muscaria*. Vilken växt soma var, har man ej vetat. Den reella kännedomen om den förlorades hos arierna själva under en period av 2 000 år. Sentida forskare har framlagt olika idéer. Om jag får följa fackbotanisten R. E. SCHULTES i Cambridge, Massachusetts, har det gissats på ett flertal "köttiga bladlösa eller nästan bladlösa slingerväxttyper av ökenkaraktär (*Ephedra*, *Periploca* och *Sarcostemma*)". Den nu så aktuella *Cannabis* har nämnts. Det har även antagits att soma varit ett uteslutande mystiskt begrepp utan reell motsvarighet.

SCHULTES finner som botanist, att då WASSON infört *Amanita muscaria* i diskussionen, så finns det inget som motsäger detta från sakliga synpunkter. GORDON WASSON själv slutar sin introduktion av problemet med sin tro på att soma, som identifieras med odödlighetens gudasvamp och av honom anses vara den röda flugsvampen, fick ett rykte som mirakulös svamp i Eurasien, långt utöver de områden där den växte och dyrkades, detta under ett mycket tidigt skede av vår kulturutveckling, den tid då Rigveda kom till. Accepteras

hans tes, så menar han att han "lyckats lägga ett nytt och spännande kapitel till vår världs kännedom om ett avlägset förflutet, från förhistorien till vår egen indoeuropeiska kultur".

CITERET LITERATUR

- Heim, Roger & R. Gordon Wasson: Les champignons hallucinogènes du Mexique. Etudes ethnologiques, taxinomiques, biologiques, physiologiques et chimiques. — Paris 1958.
- Schultes, Richard Evans: Hallucinogens of Plant Origin. — Science vol. 163: 245-254, 1969.
- Strahlenberg, Filip Johann von: Der nord- und östliche Teil von Europa und Asia, in so weit solches das ganze russ. Reich mit Sibirien und der grossen Tartarey in sich begreift. — Stockholm 1730.
- Thorsen, Poul: Rød Fluesvamp (*Amanita muscaria*) og Bersærkerang. — Friesia 3: 333-351, 1949.
- Wasson, R. Gordon: Soma. Divine mushroom of immortality. New York 1968.
- Wasson, Valentina Pavlovna & R. Gordon Wasson: Mushrooms, Russia and history. I-II. — Pantheon Books. New York 1957.
- Ödman, Samuel: Försök att ur naturens historia förklara de nordiska kämpars berserka-gång. — K. Vetensk. Akad. nya Handlingar. Bd. 5, Ser. 3. Stockholm 1784.

Göteborg, oktober 1969.

FOMES IDAHOENSIS BROWN
A FOSSIL POLYPORE FUNGUS FROM THE LATE
TERTIARY OF IDAHO, U.S.A.

By N. FABRITIUS BUCHWALD

During a stay in Washington, D.C., U.S.A., in January 1969, I had the opportunity several times to visit the Museum of Natural History of The Smithsonian Institution. On a visit of the magnificent palaeontological collections I noticed in one of the exhibition cases a small, white, hoofshaped stone that attracted my attention, as the label bore the inscription: Cast of a bracket fungus from the late Tertiary of southwestern Idaho. By permission of the curator for plant fossils I was allowed to study the original fossil specimen and my son photographed it.

According to the geologist ROLAND W. BROWN (1940) the fossil fungus was collected in 1939 at a locality south of Boise, the capital of Idaho. Associated with it was much fossil wood which included species of fir, alder, poplar, oak, and hickory. The age of the geological formation is probably not later than early Pliocene, which means that the fossil specimen is about 12 million years old.

The specimen being composed principally of calcium carbonate is 13.5 cm long and 4.5 cm thick. The upper surface (the top figure of the photo) is fairly smooth, with "rings" of growth, the under surface flat and porous. A cross section (the lower figure) displays the corky context separated from the pore area by an irregular dark zone (Plate 4).

According to the well-known mycologist, Dr. JOHN A. STEVENSON the specimen that is described as *Fomes idahoensis* BROWN, resembles the living, widely distributed bracket fungus, *Fomes pinicola* (SWARTZ) COOKE, so closely that no doubt exists as to its affinities. I am in agreement with Dr. STEVENSON.

In all probability the specimen represents the oldest find of a fossil polypore fungus.

REFERENCES

- Brown, Roland W.: A bracket fungus from the late Tertiary of southwestern Idaho. — Jour. Washington Acad. Sc. 30: 422-424. 1940.
Meschinelli, A.: Fungi fossiles. — P. A. SACCARDO: Sylloge fungorum. X: 741-808. 1892.

København, December 1969.



Photo: VAGN F. BUCHWALD

Fomes idahoensis BROWN.

A fossil specimen from the late Tertiary of Idaho, U.S.A.

Above: Upper surface of the fruit-body, $\times \frac{1}{2}$. Below: Side view showing context above and pore area below, $\times 1$.

NEOGYROMITRA CAROLINIANA AND N. GIGAS IN FENNOSCANDIA

By ROLAND MOBERG

Institute of Systematic Botany, Uppsala

When NANNFELDT (1932) drew attention to *Gyromitra gigas* (KROMBH.) CKE. in Scandinavia, he supposed that the North American species, reported by SEAVER (1931), was not identical with the one he knew. Later examinations support his surmise and the two species are nowadays named *Neogyromitra gigas* (KROMBH.) IMAI and *N. caroliniana* (BOSC ex FR.) IMAI (see MAAS GEESTERANUS 1965 p. 131).

Until 1965 *N. caroliniana* was not known in Europe, but in this year MAAS GEESTERANUS published a collection from Central Germany. Later BENEDIX (1968) has reported another collection from Germany and one from Austria.

In 1968 I visited "Häverö prästäng" (Häverö par., Uppland, Sweden) and collected a *Neogyromitra* which was identified as *N. caroliniana* by MAAS GEESTERANUS who was just visiting Uppsala. The material was slightly damaged by frost but fertile and thus easily determined (MAAS GEESTERANUS 1965 p. 130). The following year I visited the same locality and collected additional material.

The specimen was found growing among grasses in a meadow with i. a. *Dactylorhiza sambucina*, *Ranunculus cassubicus*, *Lathyrus vernus*, *Primula farinosa* and a few trees of ash, oak (*Q. robur*) and hazel. Several birches grew there too and near the base of one of these some *Morchella* sp. was found.

Fruit-bodies about 10 cm high and 7 cm broad. Cap dark brown to red-brown with free margin except for a small part. Stalk white, furrowed and hollow. Hymenium not blue in iodine, with clavate paraphyses and eight-spored asci. Spores ellipsoidal, $24-29 \times 11-14 \mu$, verruculose, gradually spiny towards the ends (figs. a-e), usually with one large, central oil drop.

N. caroliniana may perhaps be distinguished from *N. gigas* by the aid of the outer appearance but for a certain identification the spores must be examined. The spores of *N. gigas* are fusiform, $29-35(-40) \times 11-15 \mu$, provided with three oil drops and verruculose with small caps at the ends (fig. f.) Thus the spores of the two *Neogyromitra* species differ from each other regarding shape, size, and content. The differences in shape are very pronounced in the electron microscope photos (figs. g-i) and there the surface structure can be studied. In the spores of *N. caroliniana* (fig. g) the verrucules gradually change into spines towards the ends but in the spores of *N. gigas* these verrucules merge into small caps (fig. h). In both cases the ornamentation seems to be formed by stratification of the ascus sap (fig. i). Cfr. LE GAL 1947.

In the electron microscopical study a piece of the hymenium was fixed in 2 % OsO_4 , stained with 2 % uranylacetat, mounted in 2 % oxoidagar and, after dehydration in ethanol and propylene oxid, embedded in Epon. The material was sectioned on an "Ultratome" equipped with glass knives and the sections were collected on copper grids supported with formvar. The examination was carried out in an Akashi TRS-50 electron microscope.

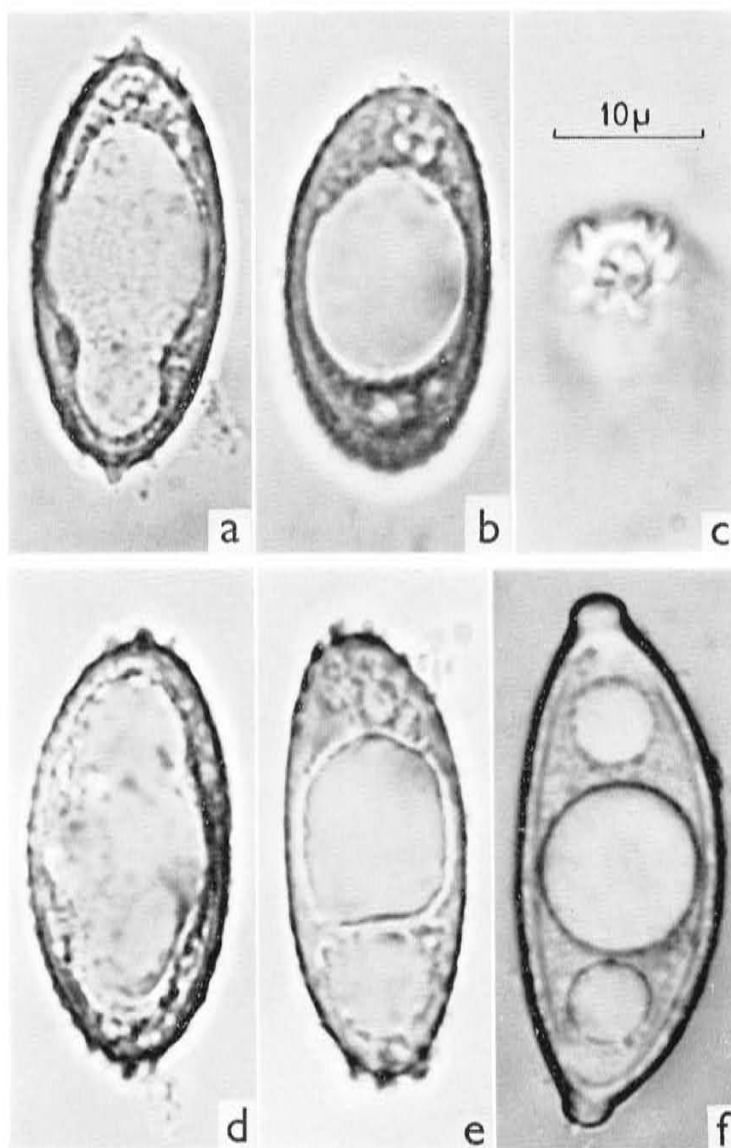
Material of *N. gigas* from the herbaria H, HFR, O, TUR, and UPS has been examined in order to find some other collections of *N. caroliniana*. None of these collections could be related to *N. caroliniana*.

SPECIMENS EXAMINED:

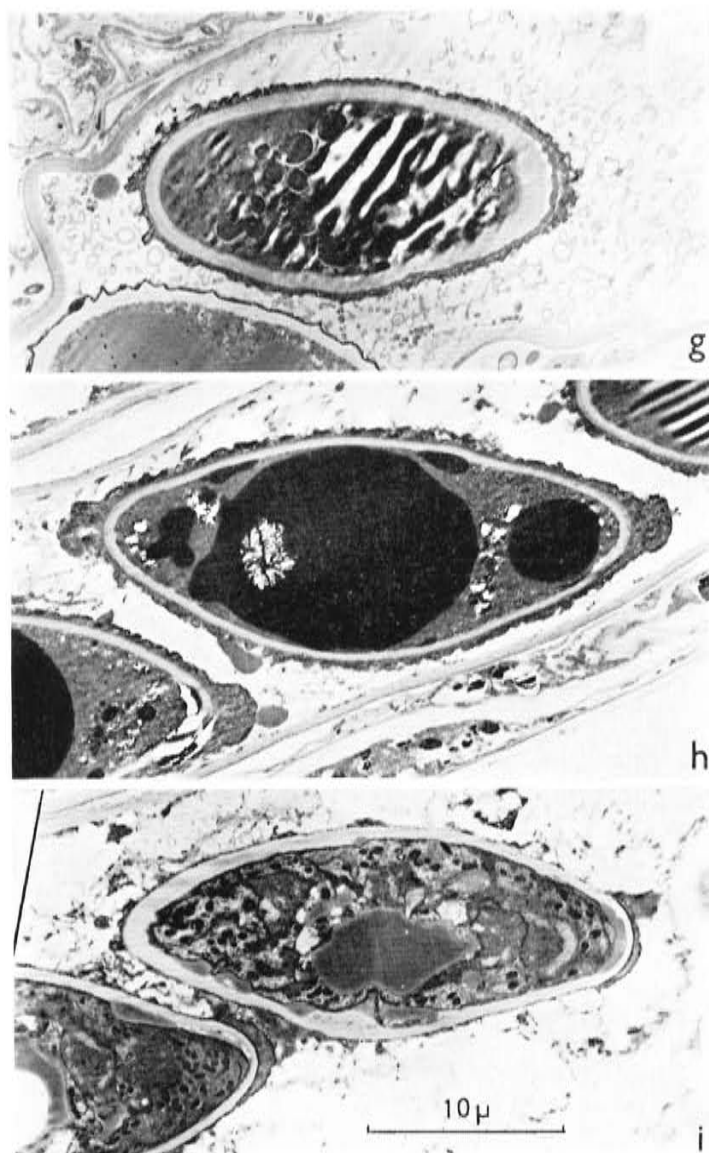
Neogyromitra caroliniana: SWEDEN: Uppland, Häverö par., "Häverö prästäng", in a meadow not far from the sea, 1968 MOBERG 967, 1969 MOBERG 1151 (UPS).

Neogyromitra gigas (fertile, provinces only). SWEDEN: Småland (6 collections), Gotland (1), Östgötland (9), Södermanland (1), Uppland (18), and Dalarna (1, Avesta). — NORWAY: Östfold (2), Akershus (8), Buskerud (4), Sør-Trøndelag (1), and Nord-Trøndelag (2, Stjørdal par. and Skatval par.). — FINLAND: Alandia (1), Regio aboënsis (6), Nylandia (5), Satakunta (2), Tavastia australis (8).

I wish to express my thanks to Professor JOHN AXEL NANNFELDT for valuable help and stimulating discussions. For the technical electron microscopical part I am indebted to Fil. mag. LEIF TIBELL and Miss INGVAR ANDERSSON, and for correcting the English text I am grateful to Mrs. C. HÖRNER. I also want to thank the curators of the herbaria H, HFR, O, TUR, and UPS for the loan of herbarium material.



a-e. *Neogyromitra caroliniana*. Spores in Lactic Blue. Note that the original form of the oil drops has been changed by heating. In c the spore is seen from one end. Moberg 1151. — f. *N. gigas*. Spore in Lactic Blue.
All c. 2000 $\times$.



Longitudinal median sections of spores in electron microscope.
 g. *Neogyromitra caroliniana*. Young spore. The typical oil drop has not yet been formed. MOBERG 1151. — h. *N. gigas*. Mature spore. — i. *N. gigas*. Very young spore. Note the beginning of the end caps. — All c. 2600 $\times$.

REFERENCES

- Benedix, E. H.: Amerikanische Riesenlorcheln in Mitteleuropa. — Acta mycol., Warszawa 4: 209-213. 1968.
- Le Gal, M.: Recherches sur les ornementation sporales des Discomycètes Operculés. — Ann. Sci. Nat., Bot., Ser. 11, 8: 73-297. 1947.
- Maas Geesteranus, R. A.: Einiges über *Neogyromitra caroliniana*. — Proc. Kon. Ned. Akad. Wet., Ser. C, 68: 128-134. 1965.
- Nannfeldt, J. A.: Bleka stenmurklan, *Gyromitra gigas* (KROMBH.) CKE. — Friesia 1: 34-45. 1932.
- Seaver, F. J.: Photographs and descriptions of cup-fungi. XV. The giant *Elvela*. — Mycologia 23: 409, 410, Plate 29. 1931.

Uppsala, February 1970.

FIVE NEW MYXOMYCETES RECORDED IN DENMARK

By PER ONSBERG

SUMMARY

Brief descriptions are given of the species *Lycogala conicum* PERS., *Physarum oblatum* MACBRIDE and *Didymium anellus* MORGAN together with more detailed descriptions of *Didymium serpula* FR. and *Dianema nivale* (MAYLAN) G. LISTER, all species recorded for the first time in Denmark. The material is deposited in the Botanical Museum of the University of Copenhagen.

Interest in the Danish Myxomycete flora has undergone a renaissance during the last decennium, chiefly due to the efforts of K. BJØRNEKÆR and the late A. B. KLINGE. Their collections, supplemented by other sources, resulted in their treatise "Die Dänischen Schleimpilze" (Friesia 7: 149 A-296, 1963).

During the past four years the present author has collected a number of Myxomycetes and, in addition, has received a number of specimens from other collectors for identification. In this material several species were found which have not previously been recorded in Denmark; these species are briefly described in this report.

1. *Lycogala conicum* PERS. 1801.

This species can be readily distinguished by its habit; the aethalia are conical or elliptical, 1.0-2.0 mm high and 0.5-1.5 mm thick, dark brown in colour, located singly or in pairs on a thin, dark brown hypothallus.

The species was found as coral-red immature aethalia on a piece of a deciduous tree on the floor of a wood at Munkebjerg near Vejle (Jutland), August 22, 1967 (PO. no. 37).

2. **Physarum oblatum** MACBRIDE 1893.

Identification of this species by means of BJØRNEKÆR & KLINGE (1963) might possibly lead to *P. psittacinum* DITM. *P. oblatum* can, however, be distinguished from this species by its pure yellow peridia clumps and by spore size, the spores of *P. oblatum* measuring 11-12 μ while those of *P. psittacinum* are only 7-9 μ in diameter.

The species was found on wood in Paradisdalen in Rørvig (Zealand), August 12, 1966 by OLE TERNEY.

3. **Didymium anellus** MORGAN 1894.

This species is chiefly characterised by the plasmodiocarp which is ring-shaped, frequently oblong, occasionally branched and only 0.3-0.5 mm wide. The stalk is either poorly developed or absent. The peridium is coated with large white chalk crystals. The columella is absent and the spores are only 7-8 μ in diameter. This species is easily identified on the basis of these characteristics.

The species has been found in Denmark on two occasions, the first in Sorø Sønderkov (Zealand), September 1, 1965 (PO. no. 36), and on the second occasion in Ganløse Orned (Zealand), October 29, 1967, by HENRIK ENGHOFF.

4. **Didymium serpula** FR. 1829.

This *Didymium* species is relatively rare and shows a very characteristic form.

The plasmodiocarp is grey, 100-200 μ thick, with a net-like form and a horizontal distribution of up to 20 mm². The peridium is hyaline, iridescent and coated with white chalk crystals. The spore mass is dark greyish-brown in colour.

The spores are round, 9-10 μ in diameter and with a warty, uniform surface structure. The capillitium consists of dichotomous, branched light threads with a diameter of approx. 1 μ . Small protuberances approx. 1 μ in width are found on this capillitium. Attached to the capillitium are large vesicles approx. 50 μ in width, the surface structure and colour of which resemble that of the spores.

The presence of these vesicles attached to the capillitium is extremely characteristic for this species which, by its habit, differs from all other Danish species of *Didymium*.

The species was found in Rørvig (Zealand) on September 17, 1967, by K. HAUERSLEV.

5. *Dianema nivale* (MEYLAN) G. LISTER 1925.

In 1910 CH. MEYLAN described a new Myxomycete, *Lamprodermopsis nivalis*, from two localities, Prise Bornand (1200 m) and La Gittaz (1280 m), near Ste. Croix in the Swiss Jura. Both finds were made in May 1909.

An enquiry to Musée Botanique Cantonal in Lausanne, where CH. MEYLAN's collection of Myxomycetes is located, revealed that the type material of *L. nivalis* was not included in this collection. Two other collections, however, were found; a collection from Joux de Baulmes (1280 m), May 1915, and a collection from La Siltay (1250 m), April 1934, both localities in the neighbourhood of Ste. Croix.

On April 21, 1967 *Lamprodermopsis nivalis* MEYLAN was found in Denmark at Basnæs near Skælskør (Zealand) by K. HAUERSLEV.

In the 3rd edition of A. LISTER: Mycetozoa, G. LISTER refers *Lamprodermopsis nivalis* MEYLAN (1910) to the genus *Dianema* REX (1891) under the name *Dianema nivale* (MEYLAN) G. LISTER (1925).

MACBRIDE & MARTIN (1934) retained *Lamprodermopsis* as an independent genus with *L. nivalis* as the only species, while in G. W. MARTIN's description of the North American Myxomycete flora (1949) this species is named *Dianema nivale* (MEYLAN) G. LISTER. Since this latter flora formed the basis of that of BJØRNEKÆR & KLINGE, it is thus appropriate to employ G. LISTER's combination in the present report.

Since this species appears to be relatively rare — the present author knows only of the four finds of CH. MEYLAN and that of K. HAUERSLEV — it will be described in greater detail.

The sporangia are round, sessile, 0.5-1.5 mm in diameter, growing singly. The specimen consisted of three sporangia under 4 mm in size. These sporangia were attached to a beech branch lacking bark, partly on the wood, two being attached to the prominent pith seams. The sporangia are grey to yellowish-brown in colour.

The peridium is completely smooth, hyaline with a yellow tinge and very thin. In direct light it shows an iridescence in blue, red and green colours. At maturity the peridium is shed in flakes.

The columella is absent.

The capillitium fills the entire sporangium with a dense network of solid threads which are emitted from the base of the sporangium, possibly only from that part which is attached to the substrate as a hypothallus. Above the basis the threads narrow to 3-4 μ in thickness and then become thinner and thinner until they either end freely or become attached to the peridium. This attachment is particularly evident in the lower part of the peridium. The capillitium threads branch and form numerous anastomoses such that the entire capillitium forms a dense network.

The capillitium threads are yellowish-brown with smooth surfaces. Spore masses are yellowish-brown to grey/yellowish-brown, almost colourless in incidental light. The surface structure is uniform, dense and finely warted. The diameter of the round spores is almost constant, 9.0 μ . This measurement is somewhat less than that recorded by CH. MEYLAN (10-12 μ), but agrees well with that reported by MACBRIDE and MARTIN (1934).

ACKNOWLEDGEMENT

The author wishes to express his gratitude to K. BJØRNEKÆR for his verification of the identification of *Didymium anellus*, to Dr. ROLF SANTESSON for his study of the material of *Dianema nivale*, and to BRIAN H. DENNIS for the translation of my Danish text into English.

REFERENCES

- Bjørnekær, K. & Axel B. Klinge: Die dänischen Schleimpilze. Mycomycetes Daniae. — Friesia 8: 149 A-296, 1963 (1964).
Lister, Arthur: A monograph of the Mycetozoa. Ed. 3 by GULIELMA LISTER. London 1925.
Macbride, Th. H. & G. W. Martin: The Myxomycetes. New York 1934.
Martin, G. W.: The Myxomycetes. — North American Flora 1, part 1. New York 1949.
Meylan, Ch.: Myxomycètes du Jura. — Bull. Soc. Vaudoise Sci. Nat. 46: 49-57. 1910.

København, Marts 1970.

NOTITSER



Fot. ca. 1950

ROBERT E. FRIES

11. juli 1876 — 29. januar 1966

I den høje alder af næsten 90 år er svensk botaniks grand old man, professor ROBERT E. FRIES afgået ved døden og dermed en af Sveriges mest kendte botanikere i dette århundrede.

KLAS ROBERT ELIAS FRIES fødtes i Uppsala, hvor faderen, den kendte likenolog og Linnéforsker, THEODOR MAGNUS FRIES (1832-1913) var professor i botanik ved universitetet. Denne var atter ældste søn af botanikeren, mykologen og likenologen, den store ELIAS FRIES, som således er far-fader til ROBERT E. FRIES. Som mange af ELIAS FRIES' efterkommere var botanikere*), således var ROBERT E. FRIES det også. Han blev fil. dr. og docent i Uppsala 1905 og lektor sammesteds 1913. Fra 1915 til 1944 var han professor Bergianus og forstander for Bergianske trädgården (*Hortus Bergianus*), for hvis udvikling han udførte et stort arbejde (Acti Horti Bergiani 1919-44), ligesom han skrev en biografi om dens stifter, P. J. BERGIUS.**)

*) Se stamtavle side 353.

**) Den Bergianske stiftelsen grundlagdes 1781 af lægen og botanikeren, professor P. J. BERGIUS (1730-90) og testamenteredes efter dennes død til det svenske Vetenskapsakademi. Institutionen, som nu ligger ved Brunsviken, Stockholm, omfatter en havebrugsskole med en praktisk og videnskabelig afdeling, en botanisk have, et stort herbarium, et anseeligt bibliotek og en betydelig samling portrætter af kendte botanikere.

I sine unge dage deltog han som botaniker i en svensk ekspedition til Argentina og Bolivia (1901-02) og skrev kort efter sin doktorafhandling om Argentinas alpine flora (1905). Senere var han med på to ekspeditioner til Afrika, således i 1911-12 til Congo og Rhodesia og i 1921-22 — sammen med broderen, professor THORE C. E. FRIES — til Østafrika. Resultaterne af sine botaniske rejser og indsamlinger har han nedfældet i talrige publikationer. Flere af dem handler om den systematisk interessante, meget primitive familie *Annonaceae* (tidligere *Anonaceae*), der står *Magnoliaceae* meget nær, og hvis talrige arter er udbredt overalt i troperne. Han har behandlet familien monografisk i 2. udg. af ENGLER & PRANTL: „Die natürlichen Pflanzenfamilien“ (1959).

Men ROBERT E. FRIES har også interesseret sig stærkt for mykologien. Han har således skrevet adskillige afhandlinger om både Sveriges og Sydamerikas *Myxomycetes*, bl. a. den store afhandling: Den svenske Myxomycet-floran (1912), vigtig, fordi de svenske slimsvampe ikke havde været monograferet siden midten af 1800-tallet, da ELIAS FRIES behandlede dem i „Summa vegetabilium Scandinaviae“. En anden svampegruppe, der havde hans store interesse, var *Gasteromycetes*. Han har skrevet om flere mærkelige arter, nye for Sverige, f. eks. *Polysaccum crassipes* (1899) og *Bovistella echinella* (1909), og om fund af Gasteromyceter i Bolivia og Argentina. Han har endvidere behandlet udviklingen af peridiolerne hos rede-svampen *Nidularia* (1910) og de cytologiske forhold ved sporedannelsen hos den samme svampeslægt (1911).

ROBERT E. FRIES interesserede sig endvidere meget stærkt for den svenske botaniks historie, og i særlig grad for LINNÉ, en interesse, han havde taget i arv fra faderen, der bl. a. skrev en monumental LINNÉ-biografi i to bind (1903). Da den 7. internationale botaniske kongres afholdtes i Stockholm 1950, udarbejdede ROB. E. FRIES en fortrinlig oversigt over den svenske botaniks historie („A short history of botany in Sweden“, 162 s., Uppsala 1950). Om LINNÉ skrev han i 200-året for dennes fødsel 1907 flere mindre afhandlinger, og i 1917 var han medstifter af „Svenska Linné-Sällskapet“ og 1923-1944 dets meget aktive præsident. Han skrev jævnligt om LINNÉ i selskabets fornemme årsskrift, således „Linné i Holland“ (1919), „Linné-växter i Bergli herbarium“, og „Tvåhundraårsminnet av utgivningen av Systema Naturae“ (1936). Af særlig stor interesse er hans afhandling „De linneanska „apostlarnas“ resor“, ledsaget af et detaljeret kort over deres mange og lange rejser (1950). „Apostlene“, som LINNÉ selv benævnte sine elever, udgjorde soldaterne i den botaniske armé, hvis general han var, og de hjembragte ham rige planteskatte fra fjerne lande. Rejser på den tid var både besværlige og farlige, og flere af „apostlene“ endte deres liv på rejserne som martyrer, f. eks. FORSKÅLL og TÄRNSTRÖM. Det var derfor med fuld føje, når LINNÉ knyttede navnene på de berømteste elever til planteslægter, som han opstillede, således FORSKÅLL (Arabien), KALMAN (Nordamerika), SPARMAN (Afrika) og TÄRNSTRÖM (Ostindien) og den berømteste af dem alle, C. P. THUNBERG (Sydafrika og Japan), der blev LINNÉ's efterfølger som professor (1784-1828).

Endelig nærede ROB. E. FRIES en dyb veneration for ELIAS MAGNUS FRIES, hvis sønnesøn han var, og omfattede dennes ætlinge med den største interesse, og i hans senere leveår betragtedes han ganske naturligt som slægtens overhoved. Det var ham, som i overværelse af talrige ætlinge af ELIAS FRIES, stævnet hid fra alle dele af Sverige, holdt hyldestalten i 1932 ved afsløringen af den store mindesten, som rejstes i Femsjö præstegårdshave i anledning af, at slægten FRIES og Femsjö gennem fire generationer havde været nært forbundet i 140 år.

Når ROBERT E. FRIES mindes i „Friesia“, er det ikke blot som den kyndige mykolog, men først og fremmest, fordi „Foreningen til Svampeskabens Fremme“ på denne måde ønsker at bevidne sin dybfølte taknemmelighed over for den, som gav sin varme tilslutning til, at tidsskriftet

måtte bære navnet „Friesia“, og som siden omfattede det med en aldrig svigtende interesse.

Da udgivelsen af foreningens lille tidsskrift med det lange navn, „Meddelelser fra Foreningen til Svampekundskabens Fremme“ ophørte med 4. bind i 1930, besluttede bestyrelsen at fortsætte tidsskriftet på en noget bredere basis, idet man ønskede at gøre det til et centralorgan for udforskningen af nordiske svampe, i særdeleshed storsvampe, og samtidig at give det navnet „Friesia“ til ære for ELIAS MAGNUS FRIES, nordens berømteste mykolog, hvis arbejder, ikke mindst på storsvampenes område, må betragtes som grundlæggende for den mykologiske videnskab. Forinden den endelige beslutning toges, rettede bestyrelsen en henvendelse til en række førende svenske mykologer, først og fremmest ROBERT E. FRIES, og anmodede dem om at udtale sig i anledning af den påtænkte stiftelse af et nyt mykologisk tidsskrift med navnet „Friesia“. Fra alle modtog bestyrelsen et glædeligt tilsagn om velvillig støtte, og hvad der navnlig glædede bestyrelsen særlig meget, var det varmfølte brev, den modtog fra ROB. E. FRIES, og hvori han takkede hjerteligst for „den vakra minnesgård som ågnast hans farfaders minne“. For denne uforbeholdne tilslutning, ROBERT E. FRIES gav henvendelsen, og for den store interesse, han senere ved mange lejligheder har givet udtryk for, er „Foreningen til Svampekundskabens Fremme“ ham megen tak skyldig.

Ære være hans minde!

N. FABRITIUS BUCHWALD.

ELIAS FRIES' ÆTLINGE INDEN FOR MYKOLOGIEN

Der findes slægter, som har talt kendte botanikere i to eller flere slægtled. Som eksempler på, at både fader og søn er blevet verdenskendte botanikere, kan nævnes schweizerne A. P. DE CANDOLLE og sønnen ALPHONSE DE CANDOLLE og englænderne W. J. HOOKER og sønnen J. DALTON HOOKER. Botanikere i tre slægtled er langt sjældnere. Eksempelvis kan nævnes den oprindelige østrigske slægt VON WETTSTEIN med faderen RICHARD, sønnen FRITZ og sønnesønnen DIETRICH VON WETTSTEIN. I fransk botanik dominerede gennem hele det 18. århundrede slægten DE JUSSIEU. Dette navn har været båret af ikke færre end fem berømte botanikere i tre slægtled, de tre brødre ANTOINE, BERNARD og JOSEPH, deres nevø ANTOINE-LAURENT og endelig dennes søn ADRIEN. Et endnu mere prægnant eksempel frembyder den danske slægt LANGE, som har talt botanikere gennem fire generationer, ja i fem, hvis HORNEMANN-slægten indbefattes (CARL CHRISTENSEN 1924-26).

Men den svenske slægt FRIES, hvis mest kendte navn er den verdensberømte mykolog ELIAS FRIES (1794-1878), er utvivlsomt det mest stor-slåede eksempel på en slægt, som har dyrket den botaniske videnskab gennem fire generationer, ofte af flere medlemmer inden for samme slægtled og som tilmed tæller adskillige navne, som er blevet berømt langt uden for deres fødeland. Dette turde være enestående! Og hvad der er særlig interessant for dette tidsskrifts læsere, er det faktum, at mange af de pågældende botanikere først og fremmest har gjort sig gældende inden for mykologien. Og dette forhold i forbindelse med, at mange af fornavnene på slægtens medlemmer, f. eks. ELIAS, MAGNUS, ROBERT og THEODOR (TORE), går igen i forskellige kombinationer gennem generationerne, gør det meget vanskeligt for udenforstående at blive klar over de nærmere slægtsskabsforhold og „hvem der er hvem“. Ved citering og katalogisering kan det give anledning til megen tvivl. Undertegnede har forsøgt at råde bod herpå. I den følgende fortegnelse er givet ganske korte biografiske oplysninger om de mest kendte af slægtens døde eller nulevende mykologer (botanikere). Det førstnævnte med halvfede typer trykte navn an-

giver den pågældendes kaldenavn, der som regel også er autornavnet. De derpå følgende med kapitæler trykte navne er den pågældendes fulde navn. I omstående stamtavle er kaldenavnet (autornavnet) understreget.

ELIAS FRIES-slægtens medlemstal er meget stort, op imod 200, når sidegrenene, f. eks. de to klokkestøberlinier, Jönköping- og Kristianstad-linien, medtages. Slægten kan føres tilbage til JOEN BRYNIELSSON, der var medlem af dronning KRISTINA's livvagt og døde 1679. Hvorfra navnet FRIES er kommet, og hvorfra slægten stammer, vides ikke med sikkerhed.

Ved udarbejdelsen af stamtavlen har jeg haft stor hjælp af TORE ALMÉN & GUNHILD FRIESIA ALMÉN's skrifter: „ELIAS-FRIES-slæktens historia“ (1945, 1953). TORE og GUNHILD ALMÉN er begge børn af ELIAS FRIES' datter SUSANNA, kaldt „SANNA“, som blev gift med lægen og kemikeren AUGUST ALMÉN (1833-1903), professor i fysiologisk kemi i Uppsala, senere generaldirektør i den svenske medicinalstyrelse. Hans søn, TORE ALMÉN (1871-1919), var dr. jur., docent i civilret og forfatter til vigtige juridiske værker. Han nærede stor interesse for slægten Fries og efterlod sig ved sin død et omfattende materiale til et arbejde om slægten. Søsteren, GUNHILD FRIESIA ALMÉN, i mange år rektor for den Brummerske skole i Stockholm, bearbejdede og kompletterede materialet og udgav det som en slægtshistorie i 1945; et tillæg fulgte i 1953.

BIOGRAFISKE OPLYSNINGER

1. **Elias Fries** (ELIAS MAGNUS F.) (1794-1878), født i *Femsjö* i det sydvestlige Småland, hvor faderen (THORE FRIES, 1762-1839) var præst (provst); professor regius i Lund 1824; Borgströmiansk prof. i praktisk økonomi (d. v. s. naturvidenskab) 1835 i Uppsala, tillige prof. i botanik 1851-59 (LINNÉ's lærestol; FRIES efterfulgte WAHLENBERG); også som emeritus udgivet betydelige mykologiske og likenologiske værker. — ELIAS FRIES havde 8 børn: 4 sønner og 4 døtre; den ene datter, LINNEA, blev kun 4 år, en anden, JUNIA (født i juni!) døde ugift 1906; de 3 sønner og den ene datter („Sally“), som har Interesse i Forbindelse med Mykologien (Nr. 2-5), er opført i stamtavlen.*). (Se i øvrigt FRIES's selvbiografi „Historiola studii mei mycologici“, oversat til engelsk i „Friesia“ 5: 135-160, 1955).**)

2. **Thore M. Fries** (THEODOR MAGNUS F.) (1832-1913), født i *Femsjö*; prof. i botanik og praktisk økonomi i Uppsala 1877-99 (ARESCHOUG var prof. 1859-76 mellem ELIAS og THORE FRIES); fremragende likenolog („Lichenographia Scandinavica“ 1871-74); også mykolog (Skandinaviens tryfflar och tryffelliknande svampar, 1909); fuldendte sammen med broderen OSCAR ROBERT FRIES faderens store værk: „Icones selectae Hymenomycetum“ (se Friesia 5: 136, 1955). LINNÉ's biograf („Linnée“, I-II, 1903). Rektor ved Uppsala Universitet. — Hans ældste søn ELIAS AUGUST FRIES (1875-1922) var læge, bl. a. et par år i *Femsjö*; tre andre sønner er nr. 6, 7 og 8.

3. **Elias Petrus Fries** (1834-1858), fil. dr. 1857 („Anteckningar öfver svamparnas geografiska utbredning“); skønt han kun blev 24 år, fik han dog publiceret 4 arbejder.

4. **Robert Fries** (OSCAR ROBERT F.) (1840-1908), med. dr., docent i Uppsala, prakt. læge i Göteborg 1869-1898; død i Uppsala, flere afhandlinger om Göteborg-egnens *Hymenomycetes*. — Danskeren SEV. PETERSEN stod i livlig mykologisk korrespondance med ROBERT FRIES, hos hvem han

*) Om den fjerde datter, SUSANNA („SANNA“), se ovenfor side 351.

**) ELIAS FRIES var første svenske professor, der blev kommandør med storkorset af K.N.O. (Nordstjerneordenen); kemikeren BERZELIUS blev også kommandør med storkorset, men „kun“ af K.V.O. (Vasaordenen).

også arbejdede i 1890 og 1896; gennem ROBERT FRIES lærte SEV. PETERSEN også LARS ROMELL at kende. Det er ROBERT FRIES, der har ført ELIAS FRIES' mykologiske traditioner videre til LARS ROMELL og denne dem atter videre til SETH LUNDELL! (Se i øvrigt F. H. MØLLER i „Friesia“ 2: 144-145, 1941). — Af ROBERT FRIES's børn er i stamtavlen opført datteren LINNEA (nr. 9) og sønnen HARALD FRIES (nr. 10).

5. **Sally Fries** (SARA LOVISA ULRIKA F.) (1836-1905), gift med godsejer, greve CARL ROBERT STELLAN MÖRNER, der døde 1875 kun 42 år gammel på Hosta i Södermanland. — Hun var døbt SARA, men kaldtes af faderen „SALLY“.

6. **Rob. E. Fries** (KLAS ROBERT ELIAS F.) (1876-1966), født i Uppsala; fil. dr. 1905 („Zur Kenntniss der alpinen Flora im nördlichen Argentinien“); prof. Bergianus og forstander for Bergianska trädgården 1915-1944; mange rejser; Sydamerikas og Afrikas flora; også mykolog (*Myxomycetes* (1912) og *Gasteromycetes*); medlem af svampeforeningen siden 1932; har sønnerne CARL MAGNUS ELIAS FRIES (f. 1917), (nr. 12) og SIGURD FRIES (f. 1924). (Se i øvrigt nekrologen i nærværende hæfte af „Friesia“, s. 348-50).

7. **Thoralf Fries** (THORALF GUSTAF ELIAS F.) (1882-1963), født i Uppsala; juridisk uddannelse; akademiräntmästara ved Uppsala Universitet. Kun skrevet en notits om: *Sedum villosum* återfunnen i Torne Lappmark (1912). Floristiker og samlede et stort herbarium. Fader til NILS FRIES (Nr. 13).

8. **Thore Fries** (THORE CHRISTIAN ELIAS F.) (1886-1930), født i Uppsala; fil. dr. 1913 („Botanische Untersuchungen im nördlichsten Schweden“); prof. i Botanik i Lund 1927 (efter MURBECK); som plantegeograf og -økolog publiceret banebrydende arbejder for skandinavisk vegetationsforskning; (prof. DU RIETZ er elev af THORE FRIES); også likenolog og mykolog (*Tulostoma* 1921); død af en lungeinfektion i Syd-Rhodesia nytårsaften 1930, kun 44 år! (Se Svensk botan. Tidskr. 25: 442-451, 1931).

9. **Linnéa Fries** (LINNÉA MARGARETA F.) (1873-1945), gift med sin fætter greve CARL MÖRNER (se nr. 11).

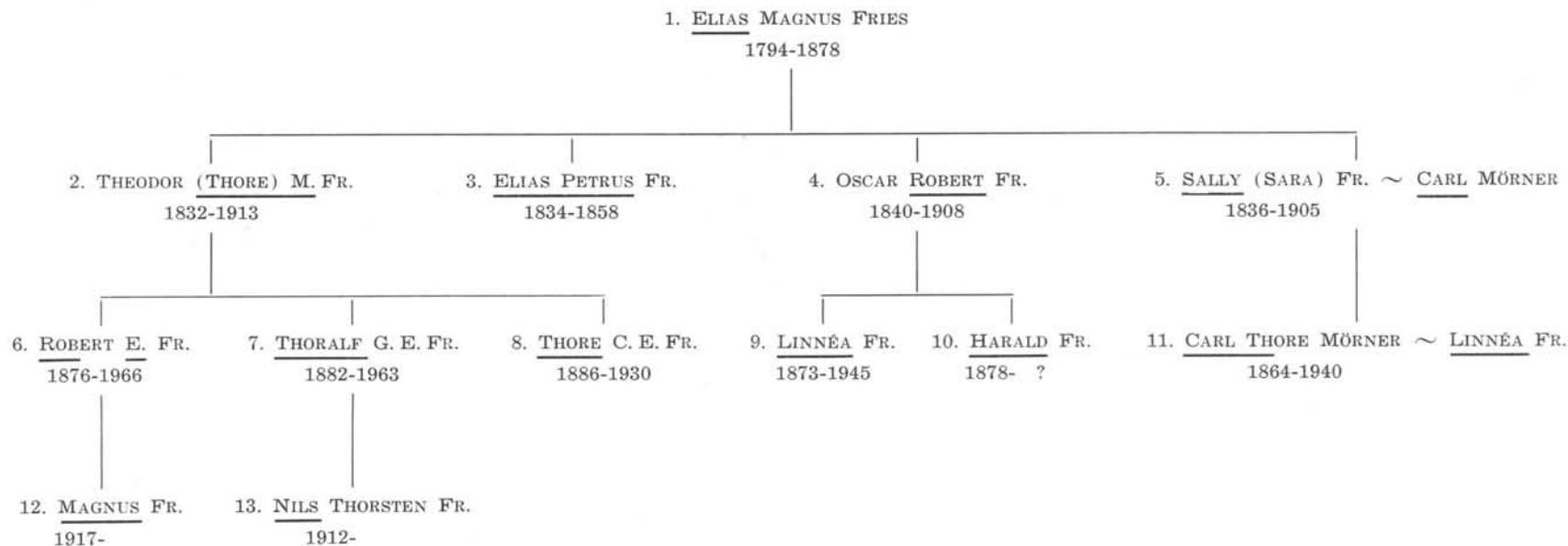
10. **Harald Fries** (ELIAS HARALD F.) (f. 1878), med. lic. i Stockholm 1906; praktiserende læge i Göteborg. Foruden en del mindre botaniske arbejder udgivet „Göteborgs och Bohus läns fanerogamer och ormbunkar“ (1945) med tillæg i „Acta Horti gotoburgensis“ (1947).

11. **Carl Th. Mörner** (CARL THORE MÖRNER) (1864-1940), greve af Morlanda; med. dr. 1892; professor i medicinsk og fysiologisk kemi ved Uppsala Universitet 1894-1929; forfatter til mange biokemiske arbejder, bl. a. om svampenes næringsværdi; også botanisk og mykologisk forfatter; gift med LINNÉA FRIES, sin kusine, og dattersøn af ELIAS FRIES. (Se i øvrigt „Friesia“ 1: 51-52, 1932 (om *Urnula craterium*) og ibid. 2: 173-174, 1941 (nekrolog)).

12. **Magnus Fries** (CARL MAGNUS ELIAS F.) (f. 1917); docent i botanik ved Uppsala Universitet; senere laborator (biträdande professor) i „nordisk skoglig växtgeografi“ ved Skogshögskolan i Stockholm.

13. **Nils Fries** (NILS THORSTEN F.) (f. 1912); fil. dr., docent i plantefysiologi ved Uppsala Universitet 1939 („Über die Bedeutung von Wachstumsstoffen für das Wachstum verschiedener Pilze“). Professor i plantefysiologi 1956 i Uppsala (efter professor ELIAS MELIN); har publiceret talrige fysiologiske afhandlinger både om *Ascomycetes* (især *Ophiostoma*) og *Basidiomycetes* (bl. a. *Polyporus*-arter, *Cyathus* m. fl.) vedrørende sporespiring, mycelvækst, vitaminkrav, multipolær seksualitet, mutationer, termoresistens m. m.; også fysiologiske arbejder om de højere planter og mosser.

STAMTAVLE OVER ELIAS FRIES' ÆTLINGE INDEN FOR MYKOLOGIEN (BOTANIKKEN)



LITTERATUR

- Almén, Tore & Gunhild Friesia Almén: Elias-Fries-släktens historia. Anteckningar av Tore Almén bearbetade och något kompletterade av hans syster Gunhild Friesia Almén. Stockholm. 1945.
- Almén, Gunhild Friesia: Tillägg till Elias-Fries-släktens historia. Stockholm 1953.
- Christensen, Carl: Den danske Botaniks Historie med tilhørende Bibliografi. I-II. København 1924-26
- Fries Elias: Autobiography, „Historiola studii mei mycologici.“ — Friesia 5: 135-160. 1955.
- Fries, Rob. E.: A short history of botany in Sweden. — Seventh International Botany Congress, Stockholm 1950, Uppsala 1950.

N. FARBITIUS BUCHWALD.



Fot. 1965

KJELD BÜLOW

20. april 1917 — 25. november 1967

Den 25. november 1967 afgik speciallæge KJELD BÜLOW, Slagelse, ved døden. KJELD BÜLOW var søn af stiftskasserer Knud Bülow og blev født på Frederiksberg den 20. april 1917. Han blev student i 1936 fra Sct. Jørgens Gymnasium og cand. med. ved Københavns Universitet i 1942. Som led i sin uddannelse virkede han bl. a. ved Rigshospitalet og Finsensinstituttet, hvor han fik sin autorisation som speciallæge; derefter var han reservelæge ved Marselisborg Hospital, indtil han i 1954 nedsatte sig som praktiserende hudspecialist i Slagelse.

KJELD BÜLOW var rigt begavet, og havde mange interesser. Han var meget musikalsk og spillede bl. a. cello, men ellers var det naturstudier, der var hovedinteressen, og her blev mykologien hans speciale. Han var en utrættelig søger og gjorde gennem årene mange sjældne fund. Han tegnede og malede, og fra hans hånd foreligger en smuk samling akvareller af svampe forsynede med notater.

Om sine fund af storsvampe i egnen omkring Tarm beretter han i „Mykofloristiske iagttagelser i Vestjylland“ („Friesia“ III: 102-106, 1945). Hans bidrag til festskriftet til professor ØJVIND WINGE var den originale opsats: „Ornamentation of spores of *Russula lauroceraci* and *R. foetens*“

(„Friesia“ V: 204-206, 1956). Endvidere har han — sammen med F. H. MØLLER — skrevet om sit fund af den for den danske svampeflora hidtil ukendte Karry-Ridderhat (*Tricholoma helviodor*) („Friesia“ VI: 13-15, 1959). Endelig kan nævnes tre notitser: Klit-Stinksvampen (*Phallus hadrianus*), Klitsvampe i Vestjylland og Nyere Fund af Rodmorkel (*Rhizina inflata*) i Danmark, alle publiceret i „Friesia“ VI: 383-387, 1961.

Ved KJELD BÜLOW's død har danske mykologer mistet en trofast medarbejder. Vi vil mindes ham som en fremragende mykolog og som det fine og sympatiske menneske, han var.

VALD. PEDERSEN.



Fot. 1943

CARL FERDINANDSEN

Nedenstående fødselsdagshilsen til foreningens tidligere formand, professor C. Ferdinandsen, da han den 18. februar 1929 fyldte 50 år, stod samme dag i „Politiken“ under „Dag til Dag“. Artiklen er karakteristisk for såvel professor Ferdinandsen som for dens forfatter, redaktør Vald. Koppel og fortjener at gengives i „Friesia“. Den er optrykt i *Vald. Koppel: Medmennesker. Skildringer og Portrætter gennem 40 År*, 1947.*)

Prof. Ferdinandsen, der sit ynglingeagtige Udseende til Trods tillader sig at fylde 50 Aar i Dag, er ikke blot Professor (i Plantesygdomme) ved Landbohøjskolen (populært kaldet Landbyhøjskolen); det er hans mindste Adkomst til Berømmelse. Sin egentlige Navnkundighed skylder han sine Fortjenester som Mykolog. Eller, hvis De ikke forstaar Græsk, som Svampolog! Det ved De da, hvad er. Et godt hjemmelavet Ord, men ikke nær højtideligt nok ved denne Lejlighed; naar Ferdinandsen bliver 50, bøjer vi os dybt for *Mykologen*. De kan slaa det efter i Konversationsleksikonet!

Der burde skrives et Eventyr om Ferdinandsens Fødselsdag. Tænk blot paa, hvad han (sammen med nu afdøde Dr. Mundt, med sin mangeaarige Værkfælle Dr. Winge og med Dr. Vald. Hertz — lad os blot nævne Hertz ogsaa; han kan godt være med i Vognen!) har gjort for at udbrede rigtig og korrekt Oplysning om det tidligere saa oversete, ringeagtede og af-skyede Svampefolk. I Bøger (som f. Eks. det Værk om danske Storsvampe,

*) Artiklen er ikke nævnt i „Dansk bot. Litteratur 1912-1939“ eller „Dansk bot. Litteratur 1940-1959“.

han nys har udsendt — sammen med Winge, naturligvis*), i Tidsskrifter, i Foredrag og paa Svampeture. Det skulde være et Eventyr om, hvorledes i Dag alle de gode og velsindede Svampe kommer til Fødselaren med Lykønskninger og Gaver og Taksigelser, fordi han har tilintetgjort gammel Fordom og draget dem frem til en Plads i Lyset. Allesammen, i et stort og rørende Optog; de stovte og kraftige og selvbevidste Rørhatte, de statelige og korrekte Parasoller, nydelig gulfligede Kantareller, Pigsvampene (skønt de nu er lidt skarpe), den yndefulde, violette Taagetragthat, den groteske flade, tykke Oksetunge ... allesammen, allesammen. Var det ikke noget for *Elsø Beskow* at illustrere? Midt paa Billedet Fødselaren, dybt rørt over saa megen Opmærksomhed. Han lover, at han ogsaa fremtidig skal vie sit Liv til at forherlige Svampenes gode og ædle Egenskaber. Og han trækker frem fra Baggrunden *Winge* og den modstræbende *Vald*. *Hertz*. — Uden de to var det aldrig gaaet, siger han og peger paa dem. Og de faar begge to et lille Hurra fra spæde Svampe-Struber. Men helt langt borte ser man de onde og skadelige Svampe paa vild Flugt, forrest den logknoldede Fluesvamp, hin lumske Morder, der har saa mange Menneskeliv paa sin Samvittighed, men som *Ferdinandsen* har demaskeret og stemplet og overgivet til almindelig Foragt og givet et saa træffende Signalement af, at man skal være et stort Fæ, hvis man lader sig narre af dens uskyldige gulhvide Udseende. *Ferdinandsen* har saa godt som nogen bidraget til at drage det skarpe Skel indenfor Mykologiens (der har De det græske Ord igen) — Mykologiens store, brogede Rige og overvaager endnu stadig med ungdommelig Energi de rene og klare Linjer. Ham skyldes en Masse god og sund Føde, som man kan nyde frygtløs, ogsaa Menneskene bør derfor i Dag slutte sig til Svampene og hylde ham varmt og hjerteligt. Her slutter Eventyret om *Ferdinandsen*.

VALD. KOPPEL.

Om professor *C. Ferdinandsen*, se i øvrigt „*Friesia*“ 3: 83-93, 1945.

Professor N. Fabritius Buchwald æresmedlem. På foreningens generalforsamling den 7. marts 1969 vedtoges det på bestyrelsens forslag med akklamation at udnævne til æresmedlem formanden, professor N. FABRITIUS BUCHWALD, som ønskede at trække sig tilbage fra formandsposten. I den anledning udtalte næstformanden, professor dr. phil. ANDERS MUNK følgende:

„Jeg håber, at jeg altid vil huske dette øjeblik — det er i sjælden grad på én gang en ære og en glæde for mig at få ordet nu.

Jeg skal nu ganske kort tale til to personligheder. De har ganske vist til huse inden for det samme skind.

Den første er den internationalt kendte svampeforsker og plantepatolog N. FABRITIUS BUCHWALD, der fyldte 70 år i august sidste år. Forskere fra 12 forskellige lande har forenet sig i ønsket om at hilse nævnte personlighed på den værdige og lodige måde, som man af og til bruger, når der er grund til det, nemlig med et festskrift. At dette festskrift så overrækkes i dag og ikke på selve fødselsdagen, det har sin nærliggende årsag i, at den anden personlighed også eksisterer — det skal jeg komme tilbage til.

Der er set festskrifter, som bærer præg af, at bidragyderne allesammen har hentet en tilfældig sag op af deres skrivebordsskuffe. Det gælder ikke for dette. De mange facetter af hædersmodtagerens personlighed afspejler sig ganske godt i emnevalget: Der er godt med *Sclerotinia*; der er godt med plantepatologi; der er godt med udvidelser af vort kendskab til Nordens svampeflora; og der er en del historie, deriblandt et bidrag fra MORTEN LANGE, som professor BUCHWALD sikkert vil værdsætte ganske særligt, fordi det handler om tilblivelsen af *Flora Agaricina Danica*, det

*) Mykologisk Ekskursionsflora, 1928.

værk, som professor BUCHWALD var så intimt impliceret i udgivelsen af. Og så er der et lille causeri af et „menigt“ medlem af denne forening, ikke at forglemme! Jeg ved i grunden ikke, om jeg nogensinde har set så *personligt* et festskrift. At det er „Friesia“, der har formidlet udgivelsen, gør det jo ikke mindre personligt!

På foreningens og de mange bidragyderes vegne har jeg da den glæde at overrække til Dem: „Friesia“, Bind IX, hæfte 1-2, side 1-288. „Til professor NIELS FABRITIUS BUCWALD i anledning af 70-årsdagen den 10. august 1968 og med tak for formandsskab i Foreningen til Svampekundskabens Fremme 1944-1969“.

Det var forskeren N. FABRITIUS BUCWALD. — Nu kommer jeg til „professoren“ — ja, der er jo aldrig tvivl om, hvem der menes, når et medlem af denne forening spørger efter „professoren“. Og det sker tit!

Jeg er så gammel, at jeg kan huske, at der har været en anden formand for foreningen end professor BUCWALD. Så kan De sige én gang til, at jeg er en „ung mand“, nu har jeg ført bevis for det modsatte! — Men jeg kan *ikke* huske så langt tilbage, at det ikke var professor BUCHWALD, der trak læsset i foreningen.

I disse dage har professor BUCHWALD været formand for foreningen i 25 år. Jeg ønsker Dem til lykke med dette „sølvbryllup“! Og for nu at blive i det ægteskabelige billede: De har jo gjort det grundigt! Det kan formodes, at De er blevet mere og mere „forelsket“ i løbet af årene 1917-1926. I 1926 blev De indvalgt i bestyrelsen som sekretær, og dermed begyndte „forlovelsestiden“, der skulle vare i samfulde 18 år. Og det var ikke det, man ville kalde en særlig kysk og ærbar forlovelsestid! Hvad slæb og arbejde angår, var det i høj grad et kødeligt forhold — alene F.A.D. kan nævnes som eksempel.

Det må være professor BUCHWALD, der har gjort sekretariatet til et begreb — ja til foreningens kraftcentrum. Jeg kender ikke andre foreninger, hvor sekretariatet spiller en sådan rolle. Også i perioder, hvor foreningens sekretær ikke hørte til på Rolighedsvej 23, forblev dette sekretariats adresse. Det var ligesom det faste holddepunkt.

Jeg kunne blive ved — men jeg *skal* ikke blive ved. I løbet af 43 år som medlem af denne forenings bestyrelse har professor BUCHWALD i enestående grad gjort sig til ét med foreningen. Det er godt, at De ikke går helt fra os ved denne lejlighed, det ville være *for* svært at få *så* mange og *så* stærke bånd kappet over på én gang.

Når et mangeårigt medlem af en forenings bestyrelse trækker sig tilbage, så giver det ligesom et lille „klik“ i historiens urværk. Hvis klikket er tilstrækkelig kraftigt, så hænder det, at foreningen udnævner vedkomende til æresmedlem.

Vi har i bestyrelsen haft lejlighed til at drøfte „klik“ uden professor BUCHWALD's tilstedeværelse. Fordomsfri, som vi er, har vi bl. a. diskuteret betimeligheden af, at professor BUCHWALD blev udnævnt til æresmedlem til sin tid, når han trækker sig helt tilbage fra bestyrelsen. Men den diskussion blev sandt at sige kort, og den nåede ikke at komme ned på jorden fra det luftige akademiske plan, hvor sådan en diskussion altid vil starte. Allerede det klik, som giver gjaldende genlyd i foreningen nu, hvor professoren trækker sig tilbage som formand, er stærkere end nogen andre, jeg har hørt i min tid.

Der er da enighed i bestyrelsen — ÷ formanden, som ikke er blevet hørt mere end højest nødvendigt — om, at vi her og nu proponerer professor BUCHWALD som æresmedlem af Foreningen til Svampekundskabens Fremme. Det er generalforsamlingen, der skal udnævne æresmedlemmer — jeg beder nu alle, der stemmer for dette forslag, om at rejse sig op.“

Professor N. F. BUCWALD rettede derefter en tak til professor ANDERS MUNK for talen, til bestyrelsen for festskriftet og til generalforsamlingen for æresmedlemsskabet.

J. KOCH.

Kejser-Champignon. To eksemplarer af Kejser-Champignon (*Psalliota augusta* FR., Syn. *P. subrufescens* PECK) blev søndag den 31. juli 1966 fundet i skovbrynet ved Frederiksdal Slot, nærmere betegnet på Frederiksdalsvej nær hjørnet af Hummeltoftevej i Virum. De voksede tæt sammen på en bunke af blade, der øjensynlig er lempet over gærde fra vejen. Bevoksningen på stedet er bøg, kastanie, røn og tjørn. Begge eksemplarer var på det stadium, hvor sløret er ved at briste. Beskrivelsen i øvrigt som i C. FERDINANDSEN og Ø. WINGE: Ekskursionsflora (1943). Lugten meget behagelig, kraftig, bittermandelagtig. Stok og hat gullig ved skarp berøring. Begge eksemplarer blev hjembragt i nogenlunde renset stand. Det ene vejede da 600 (seks hundrede) gram og det andet 510 gram. Hatbredden 17-18 cm, højde ialt 21-22 cm, stok 5 cm bred, i den fortykkede nederste del 7 cm.

Foldtrøffel (*Hydnотrya tulasnei*). Tirsdag den 2. og onsdag den 3. august 1966 fandtes ved Prinsessestien i Spurve-skjulsskoven ved Frederiksdal Slot, på to forskellige lokaliteter, adskillige eksemplarer af Foldtrøffel (*Hydnотrya tulasnei*), både enkeltvis og gruppevis voksende. Begge lokaliteter var karakteriseret ved næsten nogen morbund under gamle bøger, tæt ved stien. Enkelte frugtleger var svagt frembrydende af jorden, andre fandtes under ganske svagt opskudte små forhøjninger af jorden. Kun en minutløs undersøgelse af overfladen afslørede, hvor svampen befinder sig. På begge steder virkede jorden særdeles fast og nedtrampet.

Sorgenfri, august 1966.

BØRGE RØNNE.

Pholiota mutabilis på *Malus communis*. I fortsættelse af notitsen om *Pholiota mutabilis* på et gammelt stød af æbletræ („Friesia“ 7: 111-112, 1963) kan følgende meddeles om tidspunkterne for svampens fruktifikation. Desværre er notaterne for årene 1958-61 bortkommet, men det er sikkert, at svampen har fruktificeret hvert år, første gang i foråret 1958. For de følgende fem år, 1962-66 er mine notater sammenstillet i nedenstående oversigt.

År	Iagttagelsesdata		
	I.	II.	III.
1962	?	24/6	7/10
1963	10/5	21/7	28/9
1964	?	25/7	25/10
1965	16/5	18/7	3/10
1966	25/5	9/8	25/9

Fruktifikationen er ikke altid noteret på det samme udviklingstrin, men for det meste er der dog tale om et så tidligt stadium, at frugtlegerne endnu har været lukkede. Et spørgsmålstegn angiver, at der ikke er sikkerhed for, at en fruktifikation er overset i løbet af året.

Af oversigten fremgår det, at *Pholiota mutabilis* har tre tydeligt adskilte fruktifikationsperioder: 1. Vårfruktifikation i maj; 2. sommerfruktifikation i (juni) juli (august) og 3. høstfruktifikation ult. september-oktober. Notaterne er i overensstemmelse med foreningens ekskursionsberetninger, af hvilke det fremgår, at *Pholiota mutabilis* kan indsamles

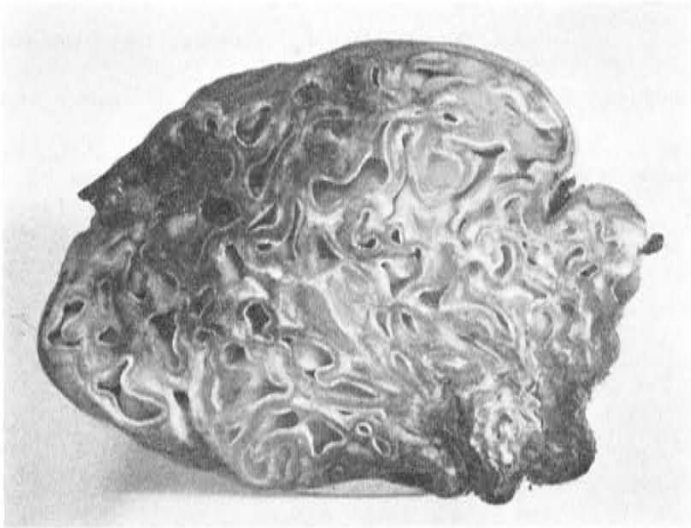
både om foråret (maj), højsommeren (juli) og efteråret (september-oktober).

Det skal gentages, at det synes, som om det vand, fuglene dagligt plasker ned over stødet, er medvirkende til at holde myceliet levende og dermed give anledning til fruktifikationer. Svampen har nu holdt sig i live i stødet i 9 år (1958-66).

Vanløse, april 1967.

E. TRYEL.

Hydnотrya tulasnei BERK. et Br. funnen i Umeå-trakten. Varje fynd av en tryffel i Sverige har intresse, eftersom dessa kalkålskande svampar i allmänhet föredrar sydligare breddgrader. Den 7 september 1969 hittade jag i närheten av Bobäck, Östra Taveljö, ca. 3 mil NV om Umeå ett välutvecklat exemplar av *Hydnотrya tulasnei*. Arten har tidigare vid några tillfällen påträffats i de sydligare landskapen. Svampen, som till hälften var nedsänkt i marken, växte i ren sand mitt på en skogsväg i blandskog. Den mätte $3,7 \times 3,2 \times 2,7$ cm. Bestämningen bekräftad av professor J. A. NANNFELDT, Uppsala.



Hydnотrya tulasnei. — Ca. $2 \times$

Ett fynd av *Hydnотrya tulasnei* så langt norrut, på 64° nordlig bredd, måste betraktas som exceptionellt och det är också — så vitt jag vet — det hittills nordligaste fyndet i Skandinavien.

Umeå i november 1969.

L. HJORTSBERG.

Giftstoffer og antigiftstoffer i Amanita. Der skal her gøres opmærksom på tre nylig udgivne afhandlinger om giftstofferne i *Amanita*, alle tre oversigter over mange års undersøgelser.

WIELAND har gennemgået giftstofferne i *Amanita muscaria* og i *A. phalloides*. Det er dels 4-kulstof-aminer med 4 kulstofatomer og et ilt-

atom i en femledet ring og med en tilhægtet kvælstofgruppe (*A. muscaria*), dels peptider med otte aminosyrer hægtet sammen i en ring, såkaldte cyclopeptider*). WIELAND har også opdaget, at der i *A. phalloides* forekommer et antitoxin, *antamanid*, der hos mus ganske ophæver virkningen af de to ellers dødelige gifte *phalloidin* og *alfa-amanitin*, begge fra *A. phalloides*. Men betingelsen er, at modstoffet antamanid indgives senest samtidig med giftstofferne. Koncentrationen af antamanid i svampen er desværre så lille, at giftvirkningen er helt dominerende. Antamanid er et cyklisk dekapeptid, d. v. s. 10 aminosyrer hægtet sammen i en ring. Den dag, da det kan fremstilles i større mængde, kan man måske bruge *A. phalloides* som spisesvamp!

EUGSTER har givet en oversigt over giftstoffet *muscarin* og dets forekomst i *Amanita muscaria*, i 27 forskellige *Inocybe*-arter og i et par *Clitocybe*-arter. Til undersøgelserne over *Amanita muscaria* har EUGSTER anvendt 6 tons svampe.

L I T T E R A T U R

C. H. Eugster: Wirkstoffe aus dem Fliegenpilz. — Naturwissenschaften 55: 305-313. 1968.

Th. Wieland: Poisonous principles of mushrooms of the genus *Amanita*. — Science 159: 946-952. 1968.

— : Antamanid. Seine Entdeckung, Isolierung, Strukturaufklärung und Synthese. — Angewandte Chemie 80: 209-213. 1968.

København, august 1968.

ERIKA LÖHR.

Et kort referat af WIELAND's undersøgelser over *Antamanid* er også givet under titlen „Gift og modgift“ i „Dansk Kemi“ 1969, nr. 12, s. 191. — Red.

*) Se også „Friesia“ 6: 52, 1959.

Friesia udkommer i hefter med tvangfrit mellemrum. Årskontingent er 40 kr. Ny tiltrædende medlemmer af Foreningen til Svampekundskabens Fremme får gratis tilstillet, hvad der er udgivet i indtrædelsesåret.

Foreningens og sekretariatets adresse: Thorvaldsensvej 40, 1871 København V. Her modtages såvel ind- som udmeldelser af foreningen som anmeldelser om flytning.

Redaktionens adresse: Dalgas Boulevard 68, 2000 København F. Al korrespondance vedrørende „Friesia“ rettes til denne adresse.

Af det afsluttede „Meddelelser fra Foreningen til Svampekundskabens Fremme“ haves endnu et restoplæg, der kan afgives til en pris af 5 kr. pr. bind. (Bd. I (1912—15) og II (1916—20), inkompl.; Bd. III—IV (1921—39), kompl.)

Friesia is published at irregular intervals.

Subscription price: Danish crowns 40.00 per year.

Address of Friesia: N. F. BUCHWALD, Dalgas Boulevard 68, 2000 Copenhagen F., Denmark.

PRICE: Danish Crowns 40.00.