

TAXONOMY AND ECOLOGY OF ECTOMYCORRHIZAL MACROFUNGI IN THE VICINITY OF GRAND TETON AND YELLOWSTONE NATIONAL PARKS

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♦ OBJECTIVES

The long-term objectives of this study are (1) to determine which species of higher fungi grow in forest, range, and pasturelands in and around Grand Teton and Yellowstone National Parks; (2) to gain a better understanding of the role of fungi in the ecosystem; (3) to prepare descriptions, keys, and illustrations for as many species as possible; and (4) to compare the fungal communities of this area with those of similar vegetation types in Europe. Fieldwork in the 1991 and 1993 seasons concentrated on the mushroom genus *Cortinarius* Fries, although other macrofungi are studied when permitted by time and availability of specimens.

♦ METHODS

Standard methods of collecting, processing, and annotating specimens are used throughout the continuing studies. Specimens collected in the areas outside the National Parks by each investigator are deposited at the herbarium of his sponsoring institution. Where material is adequate, replicate specimens are deposited at the herbarium of Yellowstone National Park (YELLO) along with specimens collected within the parks. Following the 1991 summer field studies, Moser examined types and other significant collections of Smith, Kauffman,

and others at the University of Michigan. Laboratory and herbarium study continues on previous collections from the study area, both at Innsbruck and in Utah.

♦ RESULTS

There was a significant increase in the inventory of mushroom species known from the study area (McKnight, K. H., 1982, McKnight, Moser, et al., 1989). These are mostly from study of the 1991 collections, but some are from collections of earlier years as well. Although the two species which we specifically sought in 1993 did not appear, the unexpectedly prolific fungus fruiting during the very brief field studies of 1993 enabled us to contribute to our objective of improving our files of illustrations, descriptive data, phenology, and species distribution. The forty-one species and subspecific taxa added to the inventory are listed below. Fifteen previously undescribed taxa designated in this list as "sp. nov." are in manuscript or in the publication process.

Chrysomphalina chrysophylla (Fries)

Clavariadelphus pistillaris (Fries) Donk

Cortinarius atroalbus Moser sp. nov.
atroalbus Moser var. *nigripes* Moser var. nov.
cephalixoides Moser & Thiers sp. nov.
elegantior Fries var. *americanus* Moser &

- McKnight var. nov.
 expallens Moser sp. nov.
 favrei Moser ex. Henderson fm. pallidus Moser
 & McKnight forma nov.
 ferrugineifolius Moser sp. nov.
 flavaurora Moser & McKnight sp. nov.
 fulvoochrascens R. Henry var. subcaninicolor
 R. Henry
 galerinoides Lamoure
 guttatus Henry
 hinnuleus Fries var. favreanus Bon
 ionemus Moser & Ammirati sp. nov.
 laetus Moser sp. nov.
 minutalis Lamoure
 paraphaeochrous Moser sp. nov.
 pauperculus Favre
 phaeochrous Favre
 phaeopygmaeus Favre
 pusillus Moller
 resinaceus Moser & McKnight sp. nov.
 stenospermus Lamoure
 subrigidipes Moser sp. nov.
 subtorvus Lamoure
 umbilicatus Karsten
 umbilicatus Karst. forma alpigenus
 Moser fm. nov.
 umidicola Kauffman forma coeruleus Moser &
 Ammirati forma nov.

Entoloma cucullata Favre
 sphagnum Romagnesi & Favre

Geastrum quadrifidum Persoon

Hebeloma alpinum Bruchet

Hygrophorus flavodiscus Frost apud Peck
 atroalboides Hesler & A. H. Smith

Lyophyllum connatum (Schumm. ex Fries) Singer
 Otidea abietina (Fries) Fuckel

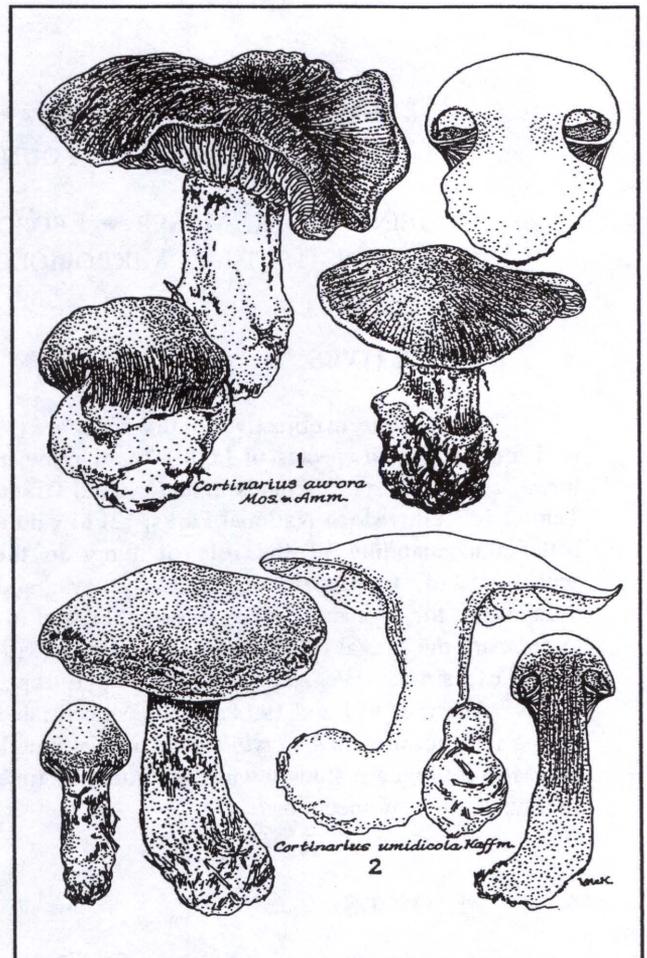
Russula norvegica

Suillus borealis A. H. Smith, Thiers, & Miller
 pallidiceps A. H. Smith & Thiers

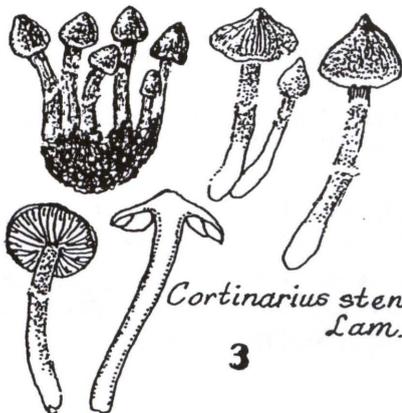
Tricholoma atrosquamosum (Chev.) Saccardo

Among the more interesting new species is *Cortinarius aurora* (Fig. 1) which was placed in a new subsection, *aurantiovelati*, of the *Cortinarius* subgenus *Phlegmacium* on account of its orange universal veil. Some of the species reported have alpine and higher subalpine forms noticeably different from the lower elevation forms, e. g. *C. umbilicatus*

Karsten = *C. adalberti* Favre ex Moser (Fig. 4, see McKnight, et. al., 1989), *C. hinnuleus* Fries (Fig. 6), *C. stenospermus* Lamoure (Fig. 3, *C. subtorvus* Lamoure (Fig. 5). On the other hand, *Cortinarius atroalbus* Moser (Fig. 8) is one of the most striking species, readily identifiable in the field and known only from the alpine zone under dwarf willow, whereas its variety *nigripes* Moser (Fig. 7) is found at slightly lower elevations under shrubby willows.

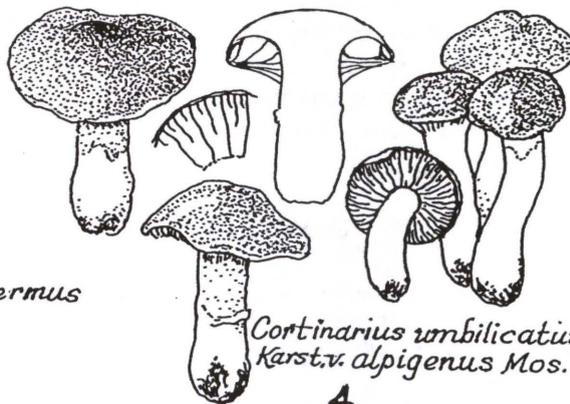


Following the western field studies in 1991 Moser visited the herbarium at the University of Michigan in Ann Arbor, Michigan where he studied collections, including types, of A. H. Smith, C. H. Kauffman, and others deposited there. He also made some collections of his own in that vicinity. With data obtained in these and previous studies he confirmed misidentifications by American mycologists for a number of European species and verified synonymy which he had suspected for some of our



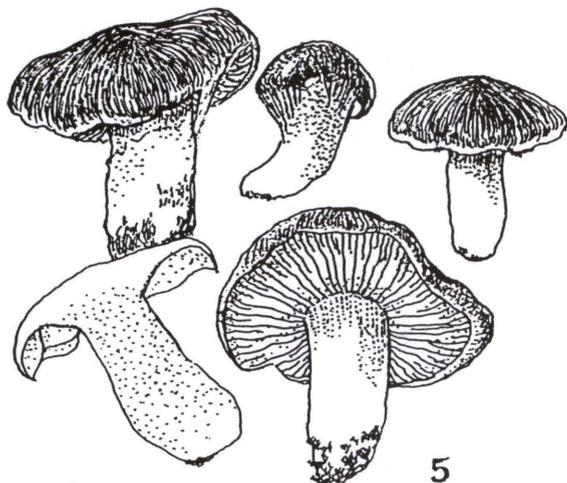
Cortinarius stenospermus Lam.

3



Cortinarius umbilicatus Karst. v. *alpigenus* Mos.

4



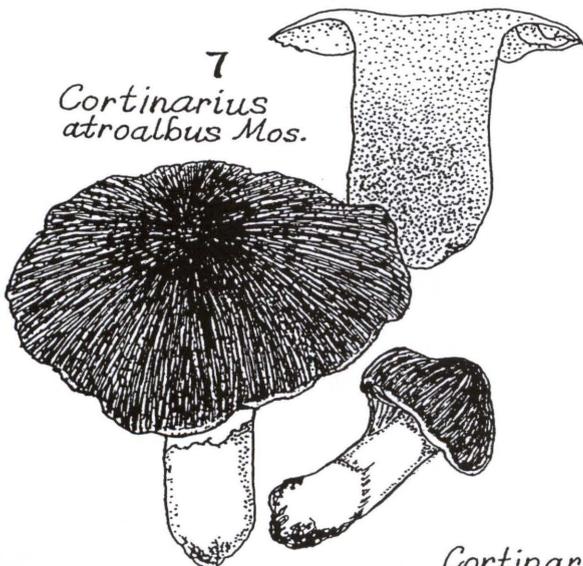
Cortinarius subtorvus Lam.

5



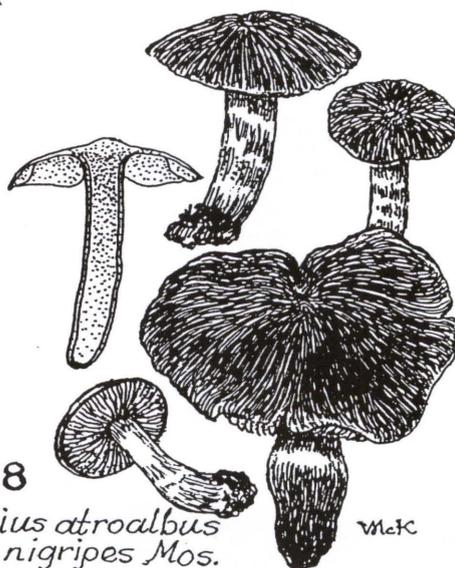
Cortinarius hinnuleus Fr. var. *favreanus* Bon.

6



Cortinarius atroalbus Mos.

7



Cortinarius atroalbus Mos. var. *nigripes* Mos.

8

McK

Wyoming species. This is an extremely important contribution to American mycology, as it resolves some very difficult nomenclatural problems. Some of these involve common species in the western American flora, e.g. *Cortinarius umidicola* Kauffman (Fig. 2), *C. umbilicatus* Karsten (Fig.4).

◆ **NOMENCLATURAL NOTES:**

- Cortinarius alnetorum* Velenovsky = *C. glandiclor* Fries.
var. *curtus* Fries ss. A. H. Smith.
- Cortinarius aureofulvus* Mos. = *C. cedretorum* R. Maire
ss. A. H. Smith
- Cortinarius badiovinasceus* Moser = *C. nigrellus* Peck var.
occidentalis A. H. Smith
- Cortinarius croceus* J. Schaeffer = *Cortinarius malicorius*
Fries sensu A. H. Smith et. al.
- Cortinarius fulvoochrascens* R. Henry = *C. fuscomaculatus*
J. Schaeffer, = *C. pseudoarquatus* A. H. Smith, = *C.*
riederi Weinm. ss. Melot
- Cortinarius fuscoperonatus* Kühner = *Hydrocybe tigrina*
Moser nomen inval., non Johns
- Cortinarius incisus* Fries = *C. impolitus* Kauffman
- Cortinarius pseudopraestans* Moser & Ammirati = *C.*
pseudobalteatus Blatto nom. subnud.
- Cortinarius pusillus* Moeller = *C. inops* Favre
- Cortinarius renidens* Fries = *Gymnopilus terrestris* Hesler
- Cortinarius umbilicatus* Karsten = *C. adalberti* Favre ex
Moser = *C. depressus* Fries ss. Brandrud et al., = *C.*
paterioformis (Fries) Ricken, = *C. nigrelloides*
Kauffman nom. nud.
- Cortinarius umidicola* Kauffman forma *coeruleus* Moser &
Ammirati = *C. canababra* Moser, = *C. plumiger* Fr.
ss. Kauffman

◆ **REFERENCES**

- McKnight, Kent H. 1982. Check-list of Mushrooms and Other Fungi of Grand Teton and Yellowstone National Parks. Moran, Wyoming, Univ. Wyo-NPS Res. Center. 21 pp.
- McKnight, Kent H., M. Moser, H. D. Thiers, & J. F. Ammirati. 1989. Taxonomy and Ecology of Ectomycorrhizal Macrofungi of Grand Teton National Park. In Univ. of Wyo-NPS 1989 Annual Report. 105-106.