TAXONOMIC POSITION OF THE SMUT FUNGUS USTILAGO ALSINES

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Abstract: Ustilago alsines G. P. Clinton & Zundel on Stellaria praecox A. Nelson (= Stellaria nitens Nutt.) from North America belongs to the genus Microbotryum Lév. emend. Ványk; therefore the new combination M. alsines (G. P. Clinton & Zundel) M. Piątek is proposed. The species is described in detail and also illustrated. Its affinities to similar species are discussed. The geographical range of this taxon is discussed.

Key words: Microbotryales, Urediniomycetes, taxonomy, nomenclature

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INTRODUCTION

Ustilago alsines G. P. Clinton & Zundel was described from North America by Clinton and Zundel (in Zundel 1939: 991, as ‘alsineae’) based on a specimen collected in 1911 by Macbride, infecting ovaries of Stellaria praecox A. Nelson. However, the description of Stellaria praecox was based on a plant (probably Stellaria nitens Nutt.) deformed by a smut fungus, which much later was described as Ustilago alsines (comp. Zundel 1953: 137). This is not an exceptional situation. For instance, some species of the genus Silene L. are known from Asia, which were probably described due to the presence of an anther smut – Microbotryum violaceum (Pers.: Pers.) G. Deml & Oberw. s.l. (Hood & Antonovics 2003). Similarly, the description of a new genus and species Spondylantha aphylla C. Presl was based on samples of Cissus sicyoides L. infected by a species of Mycosyrinx Beck (Ványk 1996).

Ustilago alsines, which parasitizes host plants belonging to the Caryophyllaceae, cannot be retained in the genus Ustilago (Pers.) Roussel because representatives of this genus are known only on host plants belonging to Poaceae. Ványk (1998a) suspected that U. alsines belongs to the genus Microbotryum Lév. emend. Ványk, but he could not examine the type specimen and for that reason did not propose the appropriate new combination. Re-examination of the type and several non-type specimens of Ustilago alsines revealed that this species indeed belongs to Microbotryum. It is also different from the remaining known species in the ovaries of Caryophyllaceae. Accordingly, the appropriate taxonomic and nomenclatural changes are proposed. In addition, the re-examined collections enable the completion of the description and illustration of this species.

TAXONOMY

Microbotryum alsines (G. P. Clinton & Zundel) M. Piątek, comb. nov. (Figs 1–5)


Sori in the ovaries, but apparently restricted to the ovules, ovoid to ellipsoidal, replacing the seeds by a dark brownish-purple, at first agglutinated, later dusty spore mass, sori inconspicuous, hidden by the capsules of the host plants, infection systemic. Spores globose or subglobose, (9–)11–14 × (8–)11–13(–14) µm, dark brownish-purple, wall minutely reticulate, 6–7(–8) meshes per spore.
diameter, muri 0.5–1.0 µm high, in SEM regularly reticulate, interspaces and basal part of the muri with 4–7 club-shaped or round protuberances.


**DISCUSSION**

The type material is very scarce and contains only three small fragments of infected plant. Therefore, the spores for SEM examination were collected from dispersed spores on spore print lying on the envelope of the herbarium packet, while the drawings of infected plants were made from a non-type specimen (Fig. 1). SEM study revealed that *Microbotryum alsines* has characteristic ornamentation of spores, with a regularly reticulate spore wall and the presence of protuberances within interspaces and basal part of the muri. There were known seven species of *Microbotryum* in ovaries of host plants belonging to Caryophyllaceae, namely *M. arenariae-bryophyllae* (Vánky) Vánky, *M. duriaeum* (Tul. & C. Tul.) Vánky, *M. holostei* (de Bary) Vánky, *M. jehudanum* (Zundel) Vánky, *M. moehringiae* (Togashi & Y. Maki) Vánky, *M. moenichiae-manticae* (Lindtner) Vánky and *M. nivale* (Liro) Vánky (Vánky 1998). Amongst them, *Microbotryum holostei* has superficially similar spores, but the muri in this species are 1.0–1.5 µm high and the number of meshes per spore diameter is 4–7. The characteristic protuberances present in *M. alsines* and *M. holostei* are not typical only for this group of smut fungi. They can also be observed in smut fungi belonging to other genera of Microbotryales, for instance in *Bauerago cyperi-lucidi* (J. Walker) Vánky (Vánky 1991: 487 & fig. 5), *B. gardnerii* (McKenzie & Vánky) Vánky (Vánky 1991: 486 & fig. 3), or in *Microbotryum* species infecting other than Caryophyllaceae host families, including *M. tragopogonis-pratensis* (Pers.) R. Bauer & Oberw. on Asteraceae (Vánky 1994: 381 & 440), *M. calyptratae* Vánky on Portulacaceae (Vánky 1998b: 96–97 & fig. 7), *M. scabiosa* Vánky on Dipsaceae (Vánky 1994: 374 & 429) and so on.

**Fig. 1.** Sori of *Microbotryum alsines* (G. P. Clinton & Zundel) M. Piątek in the ovaries of *Stellaria nitens* Nutt. (BPI 157043). Scale bar = 1 cm.
Microbotryum alsines is known only from the United States in North America. The type collection is from Idaho. Further collections are known from Washington. It seems that this species has not been collected again in recent years. All records are from the early 20th century (Zundel 1939: 991), while all later authors (e.g., Fischer 1953; Zundel 1953; Vánky 1998a) only repeat the first reports. The host plant, Stellaria nitens, is scattered throughout North America, and present in British Columbia (Canada), Arizona, California, Idaho, Montana, Nevada, Oregon, Utah and Washington (United States). Therefore, Microbotryum alsines is probably more widely distributed.

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