

Venturia glacialis, an overlooked species

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Venturia glacialis Lar. Vasilyeva, so far known by the type collection only, on *Betula nana* ssp. *exilis*, from the Magadan district in NE Siberia, is reported on *Betula nana* ssp. *nana* in Scandinavia. It is very similar to *V. subcutanea* on leaves of *Salix reticulata*. A *Venturia* sp. on leaves of *Salix herbacea* and *S. polaris* has hitherto been classified as *V. subcutanea* but is slightly different and seems morphologically indistinguishable from *V. glacialis*.

Key words: Taxonomy, *Venturia*, *Betula nana*, *Salix reticulata*, *S. herbacea*, *S. polaris*

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Venturia glacialis Lar. Vasilyeva, druh až dosud známý z typové lokality na *Betula nana* ssp. *exilis*, z Magadanské oblasti v severovýchodní Sibiři je hlášena z *Betula nana* ssp. *nana* ve Skandinávii. Je velmi podobná druhu *V. subcutanea* známého z listů *Salix reticulata*. *Venturia* sp. na listech *Salix herbacea* a *S. polaris* dosud klasifikovaná jako *V. subcutanea* je nepatrně odlišná a zdá se morfologicky nerozeznatelná od *V. glacialis*.

INTRODUCTION

Betula nana L., the dwarf birch, is a low shrub rarely more than a metre high, in arctic and alpine areas often carpet-like with decumbent branches. It has a boreal circumpolar distribution and is in many places very frequent. In NE Asia and in North America it is represented by the ssp. *exilis* (Sukatsch.) Hultén (= *B. exilis* Sukatsch.).

Since many years we have been interested in the mycoflora of this plant which is an important constituent of Northern Swedish vegetation. As may be expected it is on the whole infested by the same fungi as are other *Betulae*, e.g. *B. pendula* and *B. pubescens*. There are differences, though, thus, to the best of our knowledge, *Gnomoniella nana* Rehm is only found on *B. nana*.

Venturia ditricha versus *V. glacialis*

A common pyrenomycete on decaying leaves of *Betula*, also *B. nana*, is *Venturia ditricha* (Fr.) Karst. For years we have noticed another *Venturia*, too, on *nana*-leaves, differing from *V. ditricha* in a number of characters and also by its northern distribution. For a long time we could not identify it and

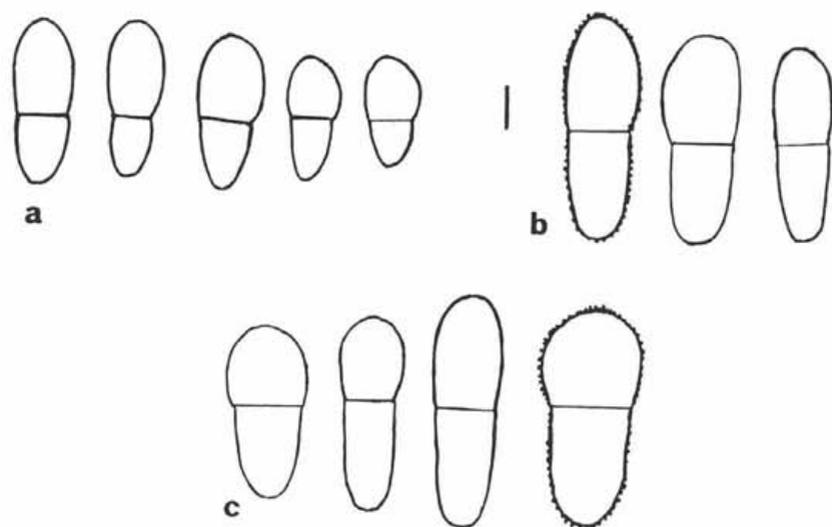


Fig. 1a-c. Outline drawings of *Venturia* spores. Bar = 5 μm . - a. *V. ditricha*. - b. *V. glacialis*. - c. *V. subcutanea*.

a Svalbard collection was published by us as "probably *V. subcutanea*, anyway not *V. ditricha*" (Holm and Holm 1994: 74).

A renewed study of the fungus and of the gold mine Index of Fungi has led us to *V. glacialis* Lar. Vasilyeva (1987: 96). Thanks to the great courtesy of Dr. Vasilyeva we have had the opportunity to examine the type material: Siberia: Magadan, basin of R. Bolshoy Anuy, dead leaves of *Betula nana* ssp. *exilis*, 8 July 1980, L. Vasilyeva (VLA). It confirms our supposition that *V. glacialis* is conspecific with the problematic Scandinavian fungus. In the description Vasilyeva (l.c.) emphasized that her new species is clearly distinct from *V. ditricha* by much larger spores, $19.6\text{--}26 \times 6\text{--}8 \mu\text{m}$. We agree, adding that the spores in *glacialis* can be still larger, up to $29 \times 10.5 \mu\text{m}$. Moreover, the spores in the type material are distinctly verrucose, while smooth is most Nordic samples, exceptions are two very northern collections, Norway, Finnmark, Porsanger (Holm and Holm 2166a); Svalbard, Endalen (5194).

The taxonomic significance of spore wall ornamentation may not be very great in *Venturia*, as indicated by data presented by Barr (1968), she reported smooth as well as verrucose spores in a few species, i.a. *V. chlorospora*, "wall at times minutely roughened in age" (Barr 1968: 813).

Venturia ditricha and *V. glacialis* can be found intermixed in the same leaf but they are hardly ever difficult to distinguish. Good guidance is given by the setae:

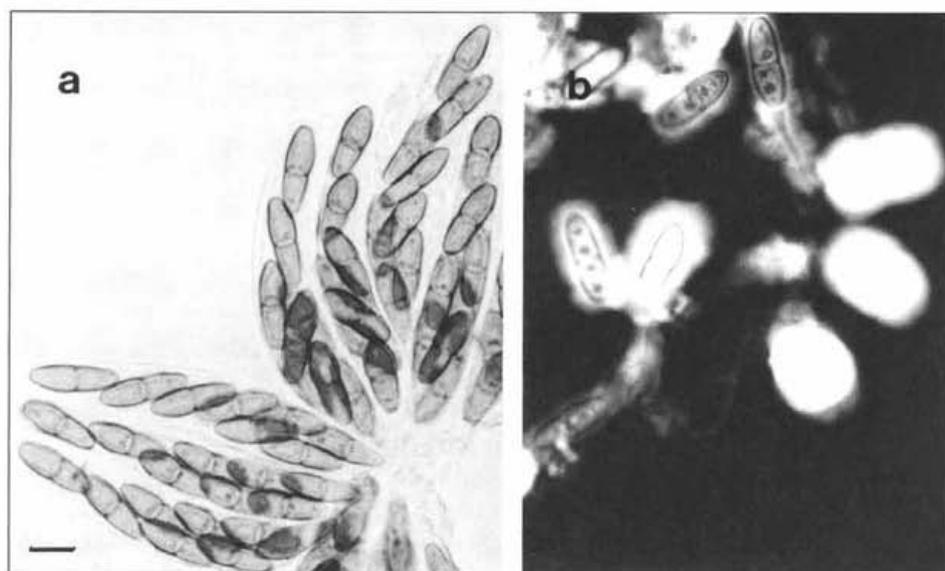


Fig. 2a-b. Spores of *V. glacialis*. Bar = 10µm. - a. Holm and Holm no. 4124a. - b. Holm and Holm no. 6166. Indian ink.

in *V. ditricha* they seem to be always present while reduced or none in *V. glacialis*. The spores, too are dissimilar, to a varying extent. The size alone will generally admit of a safe determination, although the upper limit of the *ditricha* spores will touch upon the lower limit of *glacialis*. Spore form is often rather variable in *Venturia*, even within one and the same ascocarp. A characteristic trait of the *ditricha* spores is the often distinctly submedian position of the septum what we have not seen in *glacialis*. The colour is also different: ripe spores of *ditricha* are olivaceous while *glacialis* spores have a yellowbrown tone. A noteworthy and apparently constant trait of the latter is the presence of a mucous sheath, Fig. 2b. (Certainly, we have not seen it in the type, but that would hardly to be expected in 20 years old material). A survey of these characteristics is given in Table 1. The two species are probably not very related, on the other hand *V. glacialis* obviously is very close to *V. subcutanea*, a taxon whose delimitation has turned out to be unexpectedly delicate.

Venturia glacialis and *V. subcutanea*

V. subcutanea was described by Dearness (1917) from Alaska. *Salix reticulata* is the type host, one collection was reported on *S. arctica*. Earlier this fungus had been identified as *V. chlorospora*, e.g. by Lind (who, moreover continued to do so

Table 1. Survey of some diagnostic characters

	<i>V. ditricha</i>	<i>V. glacialis</i>	<i>V. subcutanea</i>
Setae	generally present and well developed	absent or \pm reduced	generally present and well developed
Spore size	13-17(-18) \times 6-7 μ m	(18-)19 - 26(-29) \times 6-10.5 μ m	19-25 \times 7-11 μ m
Septum	often submedian	median	often suprmedian
Spore wall	smooth (always?)	sometimes verrucose	often verrucose
Spore colour	olive green	olive brown	olive brown
Mucous sheath	absent	present	present

also in his subsequent publications). Nüesch (1960) reported it from Switzerland, on *Salix reticulata*, and further on *S. herbacea*, *S. retusa*, and *S. serpyllifolia*. Nograsedk (1990) found it to be common in Swedish Lapland, and Holm and Holm (1994) recorded it as common in Svalbard on *S. reticulata* and *S. polaris*. *V. subcutanea* was to be recognised on the large, often verrucose spores. Nograsedk pointed out the presence of a mucous sheath (1990: 227).

We have now subjected "*V. subcutanea*" to a renewed study arriving at the conclusion that, in Scandinavia at least, the taxon is heterogeneous: the typical form on *Salix reticulata* deviates from the form on *S. herbacea* and *S. polaris* by some rather subtle differences. And, moreover, the latter form seems morphologically indistinguishable from *V. glacialis*! The existence of different *Venturiaceae* in leaves of *S. reticulata* and of *S. herbacea* (and *polaris*) respectively, is, in fact, not surprising. These two substrates are quite dissimilar, each having its particular ascomycete flora with hardly any species in common.

The morphological differences between *V. subcutanea* s.str. and *V. glacialis* are minute, as already emphasised, but they appear to be reliable. They are summarised in Table 1. At least in Scandinavia the setae give good guidance for discriminating between them. In *V. subcutanea* they are always well developed, while in *V. glacialis* absent or \pm reduced. [In North America this may not always be true: according to Dearness (1917) and Barr (1968) setae are often absent in *V. subcutanea*, what, however, is not indicated by Corlett and Egger (1992)]. The spores of *subcutanea* and *glacialis* are much like but, it seems, a dependable character can be found in the position of the septum: in *subcutanea* it is, not always but often, distinctly suprmedian what hardly ever (never?) is the case in *glacialis*. Cp. Fig. 1b and 1c.

SUMMARY

Venturia glacialis is probably rather common on *Betula nana* in the alpine and subalpine areas of Scandinavia: we have found it in 13 samples (all UPS), 9 from Sweden and 4 from Norway, including Svalbard. It can (exceptionally?) infest *B. pubescens*, too, as proven by a sample from Sweden, Torne Lappmark, Abisko area, Holm und Holm 4144a. Outside Scandinavia it is so far known only from Magadan in NE Asia but surely it is coextensive with *Betula nana* in arctic Russia, probably in arctic North America as well.

The *Venturia* on *Salix herbacea* and *S. polaris* is apparently common. It seems indistinguishable from *V. glacialis* and is preliminarily referred to this species. Molecular methods may permit a definite decision.

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