

# The genera *Typhula* and *Pistillaria* (Typhulaceae, Aphylophorales) in Finland. A check-list of the species

ANTON SHIRYAEV and HEIKKI KOTIRANTA

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Twenty one *Typhula* (Pers.) Fr. species and one *Pistillaria* Fr. species are reported from Finland. Five species are new for the country, viz. *Typhula capitata* (Pat.) Berthier, *T. culmigena* (Mont. & Fr.) J. Schröt., *T. hyalina* (Quél.) Berthier, *T. spathulata* (Peck) Berthier, and *T. struthiopteridis* Corner. Most of the species are common. The localities, habitats, substrates and short ecological notes for the new species are given.

Key words: Distribution, Finland, *Pistillaria*, *Typhula*.

Anton Shiryayev, Institute of Plant and Animal Ecology RAS, 8 March str. 202, 620144, Ekaterinburg, Russia. E-mail: 26081978@mail.ru

Heikki Kotiranta, Finnish Environment Institute, Research Department, Research Programme for Biodiversity, P.O. Box 140, FI-00251 Helsinki, Finland. E-mail: heikki.kotiranta@ymparisto.fi

## Introduction

Most of the 22 species of *Typhula* and *Pistillaria* found in Finland are saprotrophic, more seldom they are parasites of grasses and herbs. P. A. Karsten published several papers (e.g. Karsten 1879, 1881a, 1881b, 1881c, 1882, 1899) on new species and notes on species which he mostly collected in the vicinity of Mustiala (Tammela). He did not give detailed information on the distribution of the species in Finland, because no other material was available for him. Some more recent papers also list *Typhula* species. Ulvinen et al. (1981) listed species from the province of Koillismaa (Ks), and Ohenoja (1996) from Lapland, and according to Knudsen (1997) 17 species were known in Finland. However, the distribution of most of the species was not given by Knudsen (1997).

## Material and methods

This is the first study where the whole Finnish material, altogether 390 specimens, of Finnish and some other herbaria (H, OULU, TUR, SVER, TAA) was examined.

The biological provinces and collecting sites are according to Heikinheimo and Raatikainen (1981). The provinces are illustrated also in Hansen and Knudsen (1997: 28). The nomenclature of *Typhulaceae* follows Berthier (1976) and that of vascular plants Hämet-Ahti et al. (1998). The following abbreviations for substrates are used: *Epilobium* refers to *E. angustifolium*, *Pinus* to *Pinus sylvestris*, *Picea* to *Picea abies*, and *Populus* to *Populus tremula*. Species new to Finland are marked with an asterisk (\*). Notes of the distribution, hosts and biology of the new species are partly based on Russian material, made by the senior author, and have not been published before. We believe that the biology of the species in Finland is very similar to that in adjacent areas in Russia. The identification of the species is made by the senior author.

**List of species*****Pistillaria paradoxa*** (P. Karst.) Corner

**EH:** Tammela, Mustiala, decayed twigs of *Pinus*, 8.XIII.1865 *Karsten 1297, 1298, 1300* (lectotype, H), decayed twigs of *Pinus*, 5.I.1866 *Karsten 1299* (topotype, H).

***Typhula athyrii*** Remsberg

Syn. *Typhula todei* Fr. : Fr.

**EH:** Tammela, Mustiala, Haarankorpi, dead petioles of *Athyrium* sp., 1.IX.1869 *Karsten 3164* (H).

**\**Typhula capitata*** (Pat.) Berthier

**EH:** Luhanka, Lempää, dead *Calamagrostis arundinacea*, 25.IV.2007 *Shiryayev 7000* (SVER).  
**InL:** Utsjoki, Kevo, dead grasses, 30.VIII.1973 *Ulvinen* (OULU F23311).

***Typhula caricina*** P. Karst.

**EH:** Tammela, Haarankorpi, *Carex vesicaria*, 16.IX.1869 *Karsten 1291* (lectotype, H), Tammela, Mustiala, *C. vesicaria*, 8.IX.1870 *Karsten 1292* (syntype, H). **PH:** Virrat, Hauhuu, Sikosaari, Salmela, decaying leaves of *Carex* sp., 27.IX.1995 *Kytövuori 95-1599* (H).

***Typhula crassipes*** Focke

Syn. *T. corallina* Quél. & Pat.

**V:** Turku, Impivaara, decaying leaves of *Populus*, 20.IX.1981 *Huhtinen 81/226* (TUR 68946).  
**EH:** Nokia, Kankaantaka, decaying leaves of *Betula pendula* and *Populus*, 18.IX.1977 *E. Ohenoja* (OULU F49269), Tammela, Haarankorpi, decaying leaves of *Populus*, 2.IX.1869 *Karsten* (H), Tammela, Mustiala, decaying leaves of *Alnus* sp., 20.X.1891 *Karsten 1286* (holotype of *T. cylindracea* P. Karst., H). **OP:** Muhos, Muhosperä, Isterinkoski, dead grasses, 4.VII.1970 *E. & M. Ohenoja* (OULU F49293). **Ks:** Kuusamo, decaying stems of *Actaea spicata*, 29.VIII.1988 *Ulvinen* (OULU F22652).

**\**Typhula culmigena*** (Mont. & Fr.) J. Schröt.

**V:** Korpoo, Bonäs, dead stem of *Verbascum thapsus*, 17.VII.1948 *Kari* (TUR 30810). **U:** Nurmijärvi, church village, dead stems of *Festuca pratensis*, 29.IX.1986 *Askola 1902* (TUR 53340). **EK:** Sippola, Ruotila, *Epilobium*, 7.IX.1947 *Kujala* (TUR 062431). **EH:** Padasjoki, Vesijako Strict Nat. Res., fallen stems of

*Epilobium*, 13.IX.2001 *Parmasto* (TAA(M) 180732). Tammela, Mustiala, decaying grasses, 2.VII.1867 *Karsten* (H). **OP:** Oulu, Nuottasaari, *Equisetum arvense*, 7.X.1965 *Ulvinen* (OULU F49288). Pudasjärvi, Jaurakkajärvi, dead stems of *Epilobium*, 18.VII.1988 *E. Ohenoja* (OULU F45805); **Ks:** Kuusamo, Liikasenvaara, Korvasvaara, spruce dominated herb-rich forest, *Epilobium*, 23.VIII.1978 *E. Ohenoja* (OULU F49299).

***Typhula erythropus*** (Pers. : Fr.) Fr.

**V:** Lohja, Orsnäs, decaying leaves of *Salix caprea*, 1.X.1937 *Laurila* (H). Parainen, Degerholm, decaying leaves, 8.X.1967 *A. & K. Pohjola* (TUR 30812). Turku, Hirvensalo, leaves of *Populus*, 20.IX.1983 *Huhtinen 83/317* (TUR 73707). **St:** Noormarkku, decaying leaves of *Alnus incana*, 20.IX.1937 *Laurila* (H, TUR 30644). **EH:** Lammi, decaying petioles of deciduous trees, 18.IX.1990 *E. Ohenoja* (OULU F34126). Luhanka, Lempää, decaying leaves of *Populus*, 24.IV.2007 *Shiryayev 7001* (SVER). Tammela, decaying leaves of *Acer platanoides*, 15.VIII.1868 *Karsten* (H). Tammela, Haarankorpi, deciduous leaves, 24.IX.1878 *Karsten* (H). Tampere, Peltolampi, decaying leaves of *Alnus* sp., 9.IX. 1988 *Söderholm* (H). Tampere, Rusko, Polunmäki, dead petioles of *Alnus* sp., 18.IX.2005 *Söderholm 3669* (TUR 173242). **EP:** Isojoki, Lauhanvuori, Huhtakorpi, mesic coniferous forest, leaves of *A. incana*, 21.X.2005 *E. Ohenoja* (H). **Kn:** Paltamo, Oikarila, deciduous litter, 22.IX.1974 *E. & M. Ohenoja* (OULU F38685). **OP:** Kiiminki, Kalkkialue, Vasikkasuo, decaying leaves of *Betula* sp., 23.IX.1969 *Ulvinen* (OULU F49317).

***Typhula graminum*** P. Karst.

**EH:** Luhanka, Lempää, decaying *Calamagrostis arundinacea*, 24.IV.2007 *Shiryayev 7002, 7003* (SVER). Tammela, Mustiala, X.1867 *Karsten* (H, holotype);

**\**Typhula hyalina*** (Quél.) Berthier

**EH:** Tammela, Mustiala, dead stems of *Dactylis glomerata*, 18.VIII.1869 *Karsten* (H), meadow, dead stems of *Carex* sp., 21.IX.1869 *Karsten* (H).

***Typhula incarnata*** Lasch ex Fr.

Syn. *T. elegantula* P. Karst.

**EH:** Luhanka, Lempää, decaying leaves of *Calamagrostis arundinacea*, 23.IV.2007 *Shiryayev 7004* (SVER). Tammela, Mustiala, *Elytrigia repens*, VIII.1868 *Karsten 1294, 1295* (isotype of *T. elegantula*, H), *Calamagrostis* sp., 6.X.1867 *Karsten 1477, 1478* (H). **PS:** Kiuruvesi, Mäenpää, *Secale cereale*, 9.V.1948 *Huttunen* (H). Maaninka, *Festuca pratensis*, 15.V.1948 *Jamalainen* (H). **OP:** Oulu, Hintta, decaying grasses, 2.X.1975 *E. Ohenoja* (OULU F49351). Ylistaro, *Phleum pratense*, 5.VI.1946 *Jamalainen* (H).

According to *Jamalainen* (1957) and *Mäkelä* and *Mäki* (1980) *T. incarnata* is frequent in some years on cultivated winter cereals. However, the herbarium material is scanty.

***Typhula ishikariensis*** Imai var. *ishikariensis*

**ES:** Mikkeli, *Secale cereale*, 3.V.1948 *Ylimäki* (H), Mikkeli Agr. Stat., *Secale cereale*, 29.IV.1948 *Koskinen* (H). Savonlinna, Nojanna, grasses, 1947 *Ylimäki* (H). **PH:** Karstula, Vastinki, *Phleum pratense*, 1.V.1948 *Marttinen* (H). **KP:** Ruukki, *Secale cereale*, 31.V.1946, 3.VI.1946, 31.VI.1946 *Jamalainen* (H). **PeP:** Rovaniemi, Apukka, decaying grasses, 11.V.2000 *Piippa Wäli* (TUR 159943). **KiL:** Kolari, *Phleum pratense*, 7.VI.1946 *Jamalainen* (H).

***Typhula lutescens*** Boud.

**PH:** Keuruu, Pihlajavesi, decaying *Equisetum* sp., 28.IX.1995 *Kytövuori 95-1664* (H). **Kn:** Puolanka, Paljakka, Jatkonsuo, decaying herbs and mosses, 7.IX.1979 *Eurola* (OULU F49274). **OP:** Kiiminki, Isohalmeenmaa, decaying *Equisetum* sp., 5.IX.1968 *M. Ohenoja* (OULU F49307). Kiiminki, limestone area, *Equisetum*, 23.IX.1969 *Ulvinen* (OULU F49308), Raivio spring, calcareous soil, *E. palustre*, 5.IX.1968 *Ulvinen* (OULU F49306). **PeP:** Tervola, Peura, *Equisetum* sp., 3.IX.1970 *M. Ohenoja* (OULU F49310). **InL:** Utsjoki, Kevo, *E. fluviatile*, 30.VIII.1973 *Ulvinen* (OULU F23320). Utsjoki, Njallajärvi, mosses and decaying herbs, 13.IX.1967 *Kankainen* (TUR 30815).

***Typhula micans*** (Pers. : Fr.) *Berthier*

Syn. *T. anceps* P. *Karsten*

**V:** Kakskerta, Harjattula ön, *Trifolium montanum*, 17.VIII.1936 *Kari* (TUR 72321); **St:** Tyrvää (Tyrvis), decaying *Cirsium arvense*, 14.IX.1859 *Karsten 1289* (H); **EH:** Kangasala,

Vihtinen, decaying leaves of *Angelica sylvestris*, 07.VIII.1994 *Söderholm 2229* (TUR 113330), Luhanka, Lempää, dead stems of *Tussilago farfara*, 25.IV.2007 *Shiryayev 7005, 7006* (SVER), Tammela, Mustiala, decaying leaves of *Salix* sp., 14.IX.1870 *Karsten 1285* (holotype of *T. anceps*, H), decaying *Cirsium arvense*, 30.VI.1871 *Karsten 1290* (H), *Sedum acre*, 23.IX.1872 *Karsten 1306* (H).

Unlike *Berthier* (1976) and *Knudsen* (1997), we believe that *T. anceps* is a synonym of *T. micans*, because we could not find reliable distinguishing characteristics between these species.

***Typhula phacorrhiza*** (Reichard : Fr.) Fr.

**V:** Koski, Hongisto, litter in mixed forest, 30.IX.1990 *Heinonen 99-90* (TUR 101595). Kustavi, Kiparuoto, Riihivainio, decaying leaves and other plant remnants, 25.IX.1994 *Mäkinen 94-1124* (TUR 114336). Turku, dead leaves of *Betula* sp., 17.X.1993 *Vauras 9021* (TUR 109955), compost heap, 17.X.2006 *Vauras 25584 F* (TUR 176466). **U:** Nurmijärvi, church village, litter, 15.IX.1986 *Askola 2022* (H), deciduous litter, 22.IX.1990 *Askola 2735* (H). Sipoo, Hindsby, decaying leaves of *Populus*, 23.09.1978 *Saarenoksa 32578* (H). **St:** Noormarkku, decaying leaves of *Betula* and *Alnus* sp., 18.IX.1937 *Laurila* (TUR 30785). **EH:** Kalvola, Taljala-Niemi, Kalliomaa Nat. Res., decaying leaves, 23.IX.1980 *Alho* (TUR 97507). Lammi, Hauhiala, litter, 3.IX.1984 *Harmaja* (H), Pappilankylä, decaying leaves of *Populus*, 7.IX.1983 *Harmaja* (H). Tammela, decaying leaves of *B. pendula*, 1.V.1972 *E. Ohenoja* (OULU F49272). Tampere, Peltolampi, deciduous litter, 31.VIII.1988 *Söderholm 1513* (OULU F49315). **OP:** Kiiminki, Murtoinsaaret, deciduous litter, 5.IX.1968 *Ulvinen* (OULU F49345), 8.IX.1968 *M. Ohenoja* (OULU F49352). Muhos, Muhosperä, deciduous litter, 17.IX.1976 *E. Ohenoja* (OULU F49349).

***Typhula quisquiliaris*** (Fr. : Fr.) *Henn.*

**U:** Kirkkonummi, mixed forest, with *Corylus*, *Picea*, *Populus*, *Sorbus*, decaying petioles of *Pteridium aquilinum*, 25.08.1982 *Saarenoksa 46282* (H). **EH:** Kangasala, Vatiala, Kisapirtti, dead petioles and leaves of *P. aquilinum*, 29.VIII.1995 *Söderholm 2439* (TUR 115285). Tammela, Mustiala, *P. aquilinum*, VIII.1866 *Karsten* (H). **KP:** Siikajoki, Paavola, decaying petioles of *P. aquilinum* 29.VIII.1965 *Kankainen* (TUR 97944).

***Typhula sclerotioides*** (Pers.) Fr.

**V:** Merimasku, decaying herbs, VIII.1860 *Karsten 1803* (H). **U:** Espoo, decaying grasses, IX.1937 *Frey* (H). **EH:** Tammela, Mustiala, herbs, VIII.1865 *Karsten* (H). **Kn:** Paltamo, Oikarila, deciduous litter, 22.IX.1974 *E. & M. Ohenoja* (OULU F49344). Sotkamo, Kontinjoki, Lauttolampi, decaying leaves of *Populus*, 10.IX.1986 *Ulvinen* (OULU F49275). **OP:** Oulu, Toppila, Eteläsatama, deciduous litter, 1.X.1965 *Ulvinen* (OULU F49346). **Ks:** Posio, Livojärvi, herb-rich forest, decaying leaves of *Prunus padus*, 28.IX.1982 *Ulvinen* (OULU F49350). **InL:** Utsjoki, Tsharsjoki, delta island, decaying leaves of *Betula* sp. and *Salix lanata*, 15.VIII.1962 *Kankainen* (TUR 28665).

***Typhula setipes*** (Grev.) Berthier

Syn. *T. gyrans* Fr., *T. ovata* P. Karst., *T. pusilla* Fr.

**V:** Turku, Yliopistonmäki, decaying herbs, 11.X.1999 *Huhtinen 88/110* (TUR 127939). **U:** Helsinki, leaves of *Salix fragilis*, autumn 18?? *Karsten 1304* (H). **St:** Noormarkku, Poosjoki, decaying leaves of *Populus*, 25.IX.1937 *Laurila* (H). **EH:** Tammela, Mustiala, decaying leaves of *Betula* sp., 22.X.1868 *Karsten 1479* (H), leaves of *Salix viminalis*, 20.X.1891 *Karsten 1480* (H). Tampere, Koivistonkylä, decaying leaves of *Betula* sp., 6.X.1987 *Söderholm 1476* (H). **KP:** Pietarsaari (Jakobstad), decaying leaves of *Populus*, 21.X.1862 *Karsten 1301* (H). **OP:** Muhos, Lepiniemi, dead leaves of *Prunus padus*, 29.X.1974 *E. Ohenoja* (OULU F49291). Oulu, Korkeasaari, decaying leaves of *Alnus* sp., 19.X.1969 *Ulvinen* (OULU F49287), Orikari, beach, decaying leaves of *Alnus* sp., 24.IX.1965 *Ulvinen* (OULU F49289, 49290).

**\**Typhula spathulata*** (Peck) Berthier

Syn. *T. fruticum* P. Karst.

**OP:** Oulu, decaying petioles and stems of *Rubus idaeus*, 5.X.1965 *Ulvinen* (OULU F49285).

The type material of *T. fruticum* is missing from H.

**\**Typhula struthiopteridis*** Corner

**St:** Kankaapää, Venesjärvi, Sinahmi, on decaying petioles of *Matteuccia struthiopteris*, 1.IX.1936 *Laurila* (TUR 30807, 30811). **EH:** Tammela, Haarankorpi, dead petioles of *M. struthiopteris*, 1.IX.1869 *Karsten* (H).

***Typhula* cf. *subvariabilis*** Berthier

**OP:** Muhos, Muhosperä, Pekkala, dry herb-rich forest among mosses, 14.VIII.1968 *M. Ohenoja* (OULU F49296). **KiL:** Kittilä, Aakenus, Hom-evuotso Forest Res., old herb-rich spruce forest, decaying leaves of *Sorbus aucuparia*, 12.IX.1983 *Ulvinen* (OULU F49303).

***Typhula uncialis*** (Grev.) Berthier

Syn. *Clavaria typhuloides* Peck, *Pistillaria petasitites* Imai

If otherwise not stated, the substrate is decaying stem of *Epilobium angustifolium*.

**V:** Koski, Halikkola, 5.VII.2000 *M-L. & P. Heinonen 567-2000* (TUR 136891). Koski, Hongisto, 8.VII.1990 *Heinonen 27-90* (TUR 101269), 31.VII.1993 *Heinonen 61-93 F* (TUR 112433). Paimio, Kruuvainen, 22.VII.2002 *M-L. & P. Heinonen 16-2002* (TUR 160278). Parainen, Kirjalaön, Trollgårda, 2.IX.2005 *M-L. & P. Heinonen 108-2005* (TUR 174325). Särkisalo, Förby, 23.IX.1994 *Huhtinen* (TUR 111165). **EK:** Sippola, Ruotila, 19.VII.1947 *Kujala* (OULU F49268). **EH:** Kangasala, Lehtola, 27.VII.2006 *Söderholm 3721* (TUR 178523). Korpilahti, Oittila, 20.VIII.1986 *Ulvinen* (OULU F49327). Luhanka, Lempää, 25.IV.2007 *Shiryaev 7008* (SVER). Pälkäne, Mallasvesi, 18.VIII.1993 *Kytövuori 93-292* (H). Sysmä, Onkiniemi, Uotila, *Epilobium* sp., 11.VIII.1987 *Haikonen 8730* (H). Tammela, Mustiala, 4.IX.1867 *Karsten 1288* (H), 10.X.1881 *Karsten 1476* (H). Tampere, Kaukajärvi, Selkämäki, 31.VII.1976 *Söderholm 147* (H), Rusko, 28.VII.1985 *Söderholm 1202* (TUR 80222). **ES:** Kangasniemi, 18.IX.2004 *Jakobson 4310* (H). Rantasalmi, Kolkonpää, 8.VIII.1998 *Huhtinen 98/60* (TUR 124413); **EP:** Vimpeli, Moskovankallio, *Epilobium* sp., 18.VIII.1993 *Jakobson* (H); **PH:** Äänekoski, Parantala, Aittoniemi, 17.VII.1981 *Storbacka* (OULU F49273). **PS:** Heinävesi, Vihtari, Lehtomäki, *Epilobium* sp., 12.VIII.2003 *Haikonen 22697* (H). Lapinlahti, Haminanharju, 17.VIII.1971 *Pohjola 71-528* (TUR 76489). **PK:** Ilomantsi, Mekrijärvi, 26.VIII.1996 *M-L. & P. Heinonen 68-96* (TUR 116902). **KP:** Haapavesi, Mieluskylä, VIII.1970 *Koskela* (OULU F49333). **OP:** Kiihimäki, 19.VIII.1967 *Ulvinen* (OULU F49337), limestone area, 4.X.1966 *Ulvinen* (OULU F49332). **PeP:** Kemi, Ajos, 19.VIII.1986 *Kamula* (OULU F49294). Rovaniemi, Jaatila, 17.VIII.1999 *E. Ohenoja* (OULU



F46574). Rovaniemi, Tennilä, Vieno Viiri, 22.VII.1981 *E. Ohenoja* (OULU F49301). **InL:** Utsjoki, 25.VIII.1964 *Mäkinen* (TUR 71527). **Russia. Murmansk Region. Ks:** Salla, Kisajoki, 22.VII.1937 *Laurila* (H).

#### *Typhula variabilis* Riess

**U:** Helsinki, Käpylä, decaying leaves of *Acer platanoides*, 15.XII.2002 *Shiryayev 7009* (SVER). **EH:** Vilppula, Keuruu, Ukonselkä lake, decaying *Equisetum fluviatile*, 30.VII.1999 *Järvinen 1641* (TUR 131531). **OP:** Kiiminki, Pöksälänkangas, deciduous litter, 22.IX.1968 *M. Ohenoja* (OULU F49347). Oulu, Hupisaaret, decaying leaves of *Prunus padus*, 29.IX.1965 *Ulvinen* (OULU F49343, TUR 30746). **Ks:** Kuusamo, Oulanka, Liikasenvaara, rich brook-side forest, litter of *Betula* and *Salix*, 24.VIII.1978 *Ulvinen* (OULU F49321). **InL:** Utsjoki, Kevo, deciduous litter, 28.VIII.1973 *Ulvinen* (OULU F23322).

### Notes on some species

Knudsen (1997) reports two species, viz. *Typhula muelleri* (Sauter) Corner and *Typhula trifolii* Rostrup to occur in Finland, but because no herbarium material of them was available, we could not confirm their existence in Finland. According to Knudsen (1997), *T. sclerotioides* sensu Karsten (1882) is *T. muelleri*. Karsten (1882) reports *T. sclerotioides* to occur in Norway on *Gentiana purpurea*, which does not belong to the flora of Finland.

All the species new for Finland are known also in adjacent areas in Russia (Archangel Region, Murmansk Region, Leningrad Region and Karelian Republic) and the notes of their ecology are largely based on that data. It must be noted that many of the species range also much further to the south (even semi-deserts), but here only the biological requirements in boreal zone and subarctic or subalpine areas are described.

#### *Typhula capitata*

A common boreal species with a holarctic distribution. It grows from hemiboreal zone in the south to the subarctic/subalpine areas in the north up to the Barents sea but is rare in the north. Its habitat requirements are not especially strict, but mostly it has been collected from southwestern slopes (on *Alopecurus*, *Calamagrostis*) or an-

thropogenic sites (on *Deschampsia*). It prefers wet, open habitats close to rivers or lake shores, and has not been found inside coniferous forests. Fruiting time in hemiboreal zone is October, and in more northern areas from mid-August to the first frosts.

#### *Typhula culmigena*

A common boreal species with a holarctic distribution. It grows from hemiboreal zone in the south to subarctic/subalpine areas in the north, where it is not as common as in the boreal zones. It prefers open, sunny sites, like coasts, meadows, road sides etc., and has a very wide range of substrates, if compared with the closely related *T. uncialis*, which almost exclusively grows on *Epilobium*. *Typhula culmigena* has been found from herbs and grasses like *Actaea*, *Angelica*, *Cicerbita*, *Dactylis*, *Epilobium*, *Heracleum*, *Festuca* and *Secale* and on dead leaves of *Alnus*, *Betula* and *Populus*. Fruitbodies can be found from spring to the first snow cover.

#### *Typhula hyalina*

A common boreal species, known only in Eurasia. It is widely distributed from hemiboreal zone to subarctic areas, where it has, however, been found only twice from *Carex* species. In subalpine area in Murmansk region on Khibiny Mountains (Gory Hibiny) it grows on *Carex* spp. and *Juncus* spp. but is not common. In boreal *Pinus* forests it prefers *Melica nutans*, and in *Picea* forests *Carex* spp., *Juncus* spp. and *Dactylis glomerata*. The fruiting period in south boreal–north boreal zones is from late August to the first snow cover. In hemiboreal forests it infests *Allium*, *Bromus*, *Dactylis*, *Carex*, *Melica* and *Juncus* in wet localities. The fruiting starts in the beginning of October.

#### *Typhula spathulata*

A common species from temperate zone to subarctic areas, but is more common in the south. In hemiboreal zone *T. spathulata* grows on twigs of several deciduous trees and bushes, like *Acer platanoides*, *Alnus glutinosa*, *A. incana*, *Cytisus*, *Salix* spp., *Syringa* spp., *Quercus robur*, *Ulmus* spp. and *Rubus idaeus*. It favors western and north-western, somewhat moist slopes and the substrate is not covered by decaying leaves. The fruiting period is from the mid-September to the mid-October.

In southern boreal to northern boreal zones *T. spathulata* prefers twigs of *Alnus* spp., *Prunus padus*, *Salix* spp. and *Rubus idaeus*, but is never collected from *Populus*, *Betula* spp. or *Tilia cordata*. The habitats are moist slopes, hill tops and openings in coniferous forests. The fruiting period begins at the end of August and continues till the middle of September.

In subarctic areas *T. spathulata* is rare, but grows on *Alnus incana*, *Salix* spp. and *Rubus idaeus*. It prefers shady northern or north-western slopes and grows sometimes under leaf litter. It has never been collected from bogs or permanently wet habitats. The fruiting period is short, from the middle to the end of August.

### *Typhula struthiopteridis*

A common boreal species, and known at least from Estonia, European part of Russia, Ural Mountains, the Caucasus, and Siberia. In eastern Fennoscandia collected from hemiboreal and southern boreal zones exclusively from dead petioles of *Matteuccia struthiopteris*.

In hemiboreal zone it prefers humid hill tops, and is never found close to water courses. In this zone it is also more frequent than in the north and the fruitbodies are larger. From southern boreal zone northwards the habitats are normally coniferous forests, less often deciduous forests, and it is very rare along brook-sides or lake shores. Fruiting period begins at the end of August and continues till the first frosts.

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