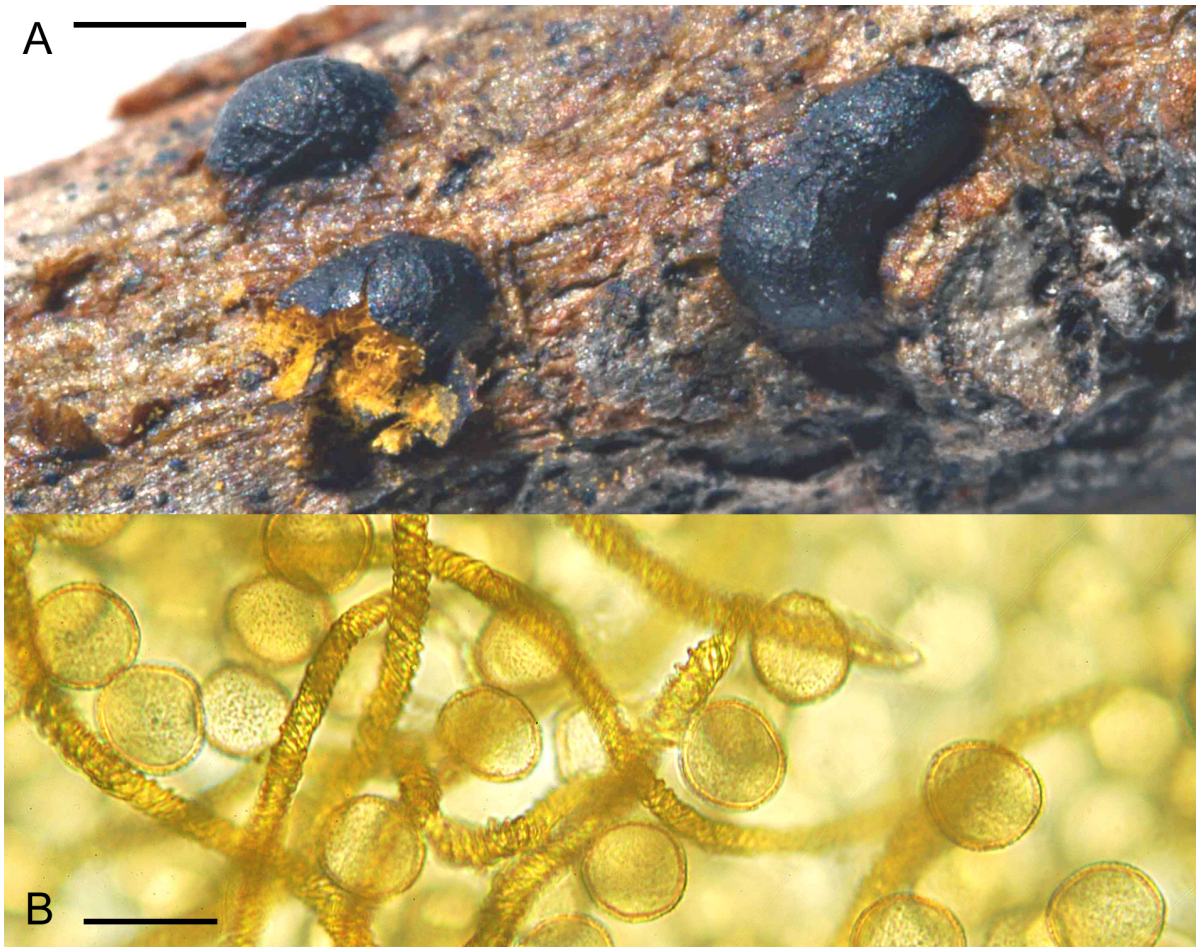

A. Sporocarps (bar = 1 mm). **B**. Capillitium & spores (bar = 10 µm) [Photographs: A. Michaud].

Trichia alpina (R.E. Fr.) Meyl., *Bulletin de la Société Vaudoise des Sciences Naturelles* **53**: 460 (1921). [*Index Fungorum* 256512]

Trichia contorta var. *alpina* R.E. Fr., *Arkiv för Botanik* **6**(7): 5 (1906). [*Index Fungorum* 318295]

Trichia cascadensis H.C. Gilbert, in PECK & GILBERT, *American Journal of Botany* Suppl. **19**(2): 145 (1932). [*Index Fungorum* 141801]

Diagnostic features. The black strong, tough and persistent peridium combined with a bright yellow capillitium and spore mass make this nivicolous species easy to identify in the field.

Sporocarps as individual sporangia, scattered or clustered, sessile, pulvinate and subglobose or forming long curved plasmodiocarps, 0·5–0·7 mm wide, up to 10 mm long, purplish chestnut, purple-black or black. *Hypothallus* thin, membranous, red. *Peridium* double, the outer layer cartilaginous, chestnut or olive-brown, thickened externally with granular deposits, the inner layer translucent olive or yellow. *Capillitium* of bright yellow elaters, 4–8 µm wide, marked with 2–6 regular or rugged and sometimes spinose spiral bands, and

with short-tapered ends. *Spores* in mass bright yellow, tending to orange-yellow, individually verruculose, minutely spinulose, globose or oval, 13–20 µm diam.

ASSOCIATED ORGANISMS & SUBSTRATA: **Plantae**. *Alnus* sp. (bark); *Cirsium spinosissimum* Scop. (stem); *Cornus stolonifera* Michx.; *Empetrum nigrum* L.; *Gramineae* (litter); *Larix* sp.; *Lycopodiopsida* indet.; *Nardus stricta* L.; *Pinopsida* (bark); *Plantae* (leaf, litter, stalk, twig, wood); *Populus tremula* L., *P. tremuloides* Michx. (wood); *Prunus lusitanica* L. (twig); *Rubus* sp.; *Sorbus* sp.; *Vaccinium myrtillus* L. (leaf, twig). **Other substrata**. Stone.

INTERACTIONS & HABITATS: The ecological rôle played by myxomycetes (see Notes below) remains poorly understood. In general, these organisms are thought to be mainly saprobic, feeding only during their vegetative (also called 'plasmodial') state, and not feeding when in their fruiting state. They may be encountered on living plant material (e.g. leaves and twigs) in both vegetative and fruiting states, but in such cases the plant material is only a substratum, not a source of nutrition. When myxomycetes are found in their vegetative state specifically on dead plant material, that material may be both a substratum and a source of nutrition. It is also possible that, in their vegetative state, myxomycetes feed on dead animal remains, living and dead bacteria, fungal hyphae and spores, and other organic material. Nothing is known about interactions between the present species and other organisms, but its associated organisms, ecological preferences and geographical distribution suggest that, in interactions, it is similar to this general picture. *Trichia alpina* is one of the so-called 'nivicolous' or snowline myxomycetes, found on both living and dead plant material next to melting snow patches in mountainous habitats, typically where there is high insolation in spring. In the 'nivicolous' habitat, snow cover prevents abrupt soil temperature changes between night and day, provides free water and a ground-level microclimate beneath or near the melting snow favourable for development of vegetative and fruiting stages. RONIKIER & RONIKIER (2009), reviewing this ecological group, found they were typically montane, i.e. upland forest zone, in distribution rather than subalpine or alpine. There are records varying in altitudinal range from 60 to 4000 m above mean sea level, but the species is most often found from 1000 to 2000 m.

GEOGRAPHICAL DISTRIBUTION: NORTH AMERICA: Canada (Ontario, Quebec), USA (Arizona, California, Colorado, Idaho, New Hampshire, New Mexico, New York, Oregon, Washington). ASIA: India (Himachal Pradesh), Japan, Russia, Turkey. AUSTRALASIA: Australia (Tasmania), New Zealand. EUROPE: Austria, France, Germany, Hungary, Iceland, Italy, Norway, Russia (Leningradskaya oblast, Komi Autonomous republic, Murmansk oblast), Spain, Sweden, Switzerland, UK, Ukraine.

ECONOMIC IMPACTS: Lack of information makes it impossible to place a monetary value on the ecological rôle of this species. There are no reports of it causing economic damage to crops or other organisms of value to humans, or of its use by humans. Each year, a few field meetings are organized in Europe devoted to the study of nivicolous myxomycetes, which therefore collectively generate low levels of nature tourism.

INFRASPECIFIC VARIATION: None reported.

DISPERSAL & TRANSMISSION: By spores. Insects may play a significant rôle in dispersal, as myxomycete spores are regularly found in their faeces. Other forms of spore dispersal probably include wind and melt water.

CONSERVATION STATUS: **Information base**. Over 500 records from August 1906 to 2007. The species has been recorded in January, February, April, May, June, July, August, September, October, November, with the main fruiting season in the northern hemisphere from April to June. In the UK *Trichia alpina* has been described as 'common and widespread'. The species was described as rare and suitable for inclusion in the 'Red Book' of Leningrad oblast' (DEDOV, 2005). The *Annotated Checklist for the Myxomycota of Germany* described it as 'probably not threatened', and 'fairly common' in a few suitable mountain localities (*http://www.gbif-mycology.de/DatabaseClients/GBIFmyxchecklist/searchresult.jsp*). **Threats**. This species is threatened by climate change. The strong association between 'nivicolous' myxomycetes

and melting snow patches suggests that their distribution is likely to be strongly and negatively affected by global warming as winter snow cover diminishes in mountain regions. This is likely to result in these species gradually moving to higher altitudes and then becoming isolated at the tops of high mountains with no opportunity to move to higher latitudes. **Evaluation**. Using IUCN criteria (IUCN SPECIES SURVIVAL COMMISSION. *2006 IUCN Red List of Threatened Species*, *www.iucnredlist.org*. Downloaded on 15 May 2006), the species is assessed globally as near threatened. **In situ**. There are no known conservation plans or activities specifically prepared for this species. **Ex situ**. No preserved living strains of this species are listed by the *World Federation of Culture Collections* (*http://wdcm.nig.ac.jp/wfcc/datacenter.html*).

NOTES: *Trichia alpina* is a myxomycete, i.e. a member of the protozoan phylum *Mycetozoa*. Although not strictly fungi, myxomycetes (also known as 'slime moulds') have been studied traditionally by mycologists.

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Sources additional to those already cited from literature and the internet include:

- **On-line databases**. *Cybertruffle*, *www.cybertruffle.org.uk/robigalia*, 1 record.
  Fungal Records Database for the British Isles, *http://194.203.77.76/fieldmycology/*, 1 record.

Global Biodiversity Information Facility, *http://data.gbif.org*, 494 records.
USDA Fungal Database, *http://nt.ars-grin.gov/fungaldatabases/index.cfm*, 56 records.

- **Personal communication**. M. Meyer.

See also the following internet pages:

- *http://eumycetozoa.com*;
- *http://slimemold.uark.edu*;
- *www.discoverlife.org/mp/20m?kind=Trichia+alpina*.

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