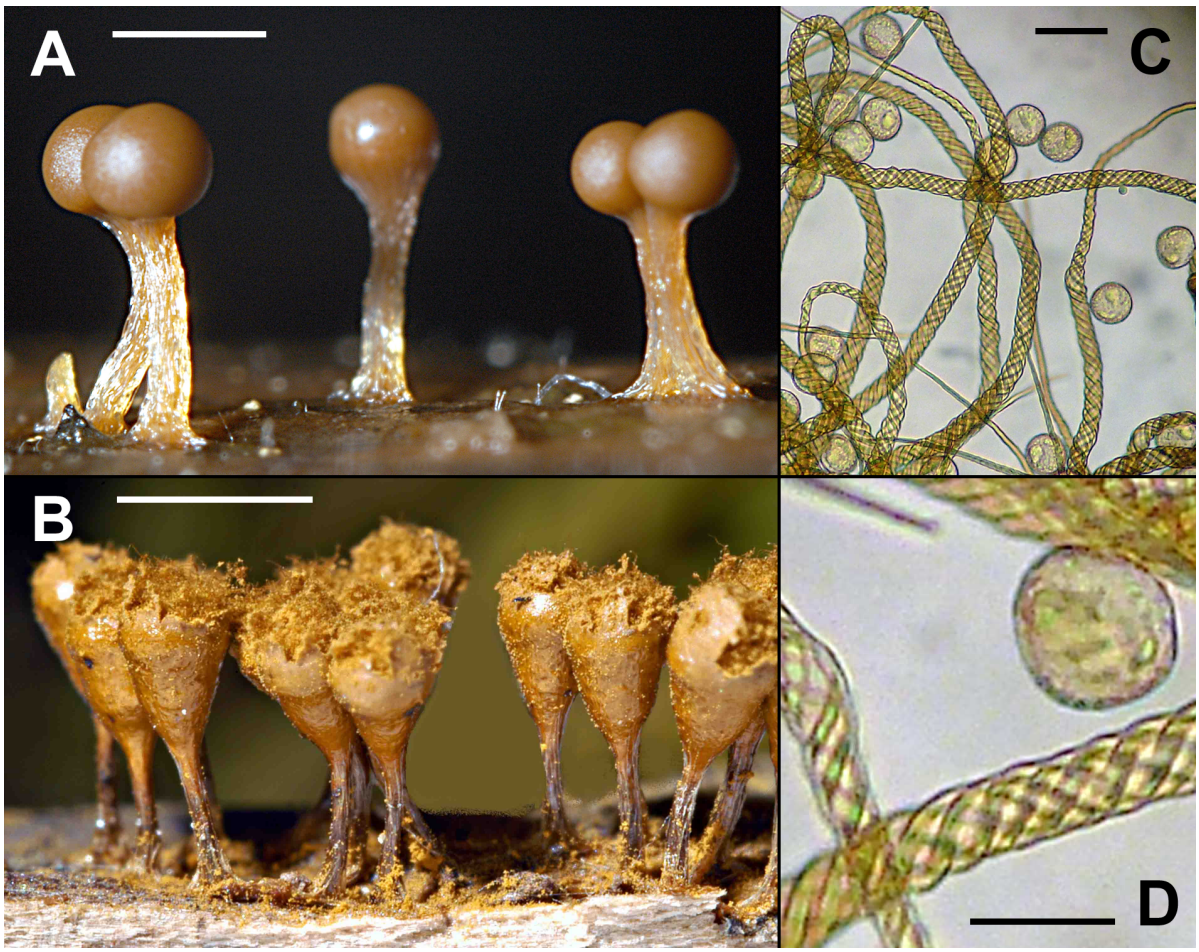

A. Sporocarps, habit (bar = 1 mm). **B**. Sporocarps, detail, showing capillitium (bar = 1 mm). **C**. Capillitium and spores (bar = 20 µm). **D**. Spore and part of capillitium (bar = 10 µm). [Photographs: A. Michaud]

Trichia decipiens (Pers.) T. Macbr., *The North American Slime Moulds*: 218 (1899). [*IndexFungorum* 164198]

Arcyria decipiens Pers., *Annalen der Botanik* Usteri **15**: 35 (1795). [*IndexFungorum* 292924]

Lycoperdon pusillum Hedw., *Sammlungen zur Physik und Naturgeschichte von einigen Liebhabern Wissenschaften* **2**: 276 (1780). [*IndexFungorum* 153096]

Trichia pusilla (Hedw.) G.W. Martin, *North American Flora* **1**(1): 53 (1949), *nom. illegit.*, *ICBN* Art. 53·1, non *T. pusilla* J. Schröt. (1885). [*IndexFungorum* 249441]

Trichia fallax Pers., *Observationes Mycologicae* **1**: 59 (1796). [*IndexFungorum* 165111]

Trichia virescens Schumach., *Enumeratio Plantarum in Partibus Sællandiae Septentrionalis et Orientalis Crescentium* **2**: 208 (1803). [*IndexFungorum* 207993]

Trichia fallax var. *dilutior* Alb. & Schwein., *Conspectus Fungorum in Lusatiae Superioris*: 99 (1805). [*IndexFungorum* 499070]

Trichia cerina Ditmar, in STURM, *Deutschlands Flora in Abbildungen nach der Natur mit Beschriebungen* Pilze **1**(2): 51 (1814). [*IndexFungorum* 141779]

Trichia fallax f. *cerina* (Ditmar) Rostaf., *Śluzowce (Mycetozoa) Monografia*: 245 (1875). [*IndexFungorum* 528926]

Trichia fallax var. *cerina* (Ditmar) Berl., in BERLESE, DE-TONI & FISCHER, *Sylloge Fungorum* **7**: 440 (1888). [*IndexFungorum* 528925]

Trichia fulva Purton, *A Botanical Description of British Plants in the Midland Counties* **3**: 290 (1821), *nom. illegit.*, *ICBN* Art. 53·1, non *T. fulva* With. [*IndexFungorum* 172958]

Trichia furcata Wigand, *Jahrbücher für Wissenschaftlicher Botanik* **3**: 30 (1863). [*IndexFungorum* 173607]

Trichia fallax f. *minor* Rostaf., *Śluzowce (Mycetozoa) Monografia*: 245 (1875). [*IndexFungorum* 528923]

Trichia fallax var. *minor* (Rostaf.) Berl., in BERLESE, DE-TONI & FISCHER, *Sylloge Fungorum* **7**: 440 (1888). [*IndexFungorum* 528924]

Trichia nana Zukal, *Verhandlungen der Zoologisch-Botanischen Gesellschaft zu Wien* **35**: 334 (1885). [*IndexFungorum* 157187]

Trichia stuhlmannii Eichelb., *Verhandlungen des Naturwissenschaftliche Vereins in Hamburg* **14**(3): 32 (1907). [*IndexFungorum* 225455]

Trichia fallax var. *olivacea* Meyl., *Bulletin de la Société Vaudoise de Sciences Naturelles* **44**: 300 (1908). [*IndexFungorum* 450279]

Trichia decipiens var. *olivacea* (Meyl.) Meyl., *Bulletin de la Société Vaudoise de Sciences Naturelles* **55**: 244 (1924). [*IndexFungorum* 444051]

Trichia decipiens f. *olivacea* (Meyl.) Y. Yamam., *Myxomycete Biota of Japan*: 237 (1998). [*IndexFungorum* 450225]

Trichia fallax var. *gracilis* Meyl., *Bulletin de la Société Vaudoise de Sciences Naturelles* **46**: 53 (1910). [*IndexFungorum* 504092]

Trichia decipiens var. *gracilis* (Meyl.) Meyl., *Bulletin de la Société Vaudoise de Sciences Naturelles* **58**: 90 (1933). [*IndexFungorum* 569102]

Trichia decipiens f. *rubiformis* Meyl., *Annuaire du Conservatoire et du Jardin Botanique de Genève* **15–16**: 320 (1913). [*IndexFungorum* 174893]

Trichia decipiens var. *hemitrichioides* Brândza, *Annales Scientifiques de la Université de Jassy* **8**: 272 (1914). [*IndexFungorum* 439185]

Trichia decipiens f. *hemitrichoides* (Brândza) Brândza, *Bulletin Trimestriel de la Société Mycologique de France* **44**: 280 (1928). [*IndexFungorum* 174911]

Trichia decipiens f. *nodulosa* Brândza, *Bulletin Trimestriel de la Société Mycologique de France* **44**: 280 (1928). [*IndexFungorum* 175047]

Trichia decipiens f. *bifida* Brândza, *Bulletin Trimestriel de la Société Mycologique de France* **44**: 281 (1928). [*IndexFungorum* 262858]

Diagnostic features. This species is easily recognised by the shining, olivaceous and membranous peridium and translucent stalk filled with spore-like cysts. No other stalked species of *Trichia* has both of these features.

Habit. On dead wood and bark. *Plasmodium* white, rose, pink or orange. *Sporophores* comprising stalked (or rarely subsessile) sporangia, either gregarious to crowded or scattered, (0·8–)1·5–3 mm high. *Hypothallus* membranous, thin, inconspicuous, discoid and individual or effuse and common to the whole fructification, colourless or brown. *Stalks* plicate, cylindrical, erect, furrowed, longitudinally striate, broadening imperceptibly into sporangium, dark brown below and paler above, strong yellowish brown by transmitted light, gradually merging into the sporotheca, (0·2–)0·5–1·5 mm long, at the base filled with spore-like cysts 12–20 µm diam. *Sporangia* turbinate, obovate or pyriform, top-shaped, ochraceous, dull yellow to olivaceous yellow or brown, very shiny, 0·6–0·8 mm diam., with a deep funnel or trumpet-shaped or sometimes rather shallow calyculus which has a border usually rolled backwards and/or torn. *Peridium* single, membranous, thin but firm, yellow or ochraceous yellow by transmitted light, often translucent when thin, the inner surface smooth, sometimes areolate, pleated towards the stalk, dehiscing in an irregular fashion or circumscissile at about mid-height and remaining as a basal cup, either by a preformed fissure, leaving a cap below and a lid above, or in a more irregular fashion. *Capillitium* elastic, flexuous, entangled,

without attachments to the peridium, consisting of free simple elaters, these usually unbranched or branched, olivaceous yellow, ochraceous yellow, or light greenish yellow by transmitted light, 4·5–7 µm diam. in the middle, frequently spirally twisted, bearing 4 or 5 smooth, rather thick spiral bands, gradually tapering into very long slender points, 75–150 µm, the free ends without longitudinal striae. *Spores* olivaceous yellow, ochraceous or ochraceous brown in mass, individually pale yellow by transmitted light, 10–13 µm diam., delicately reticulate over much of the surface, the reticulations only seen easily under oil immersion, the rest of surface minutely warted, decorated with short irregular ridges and a broken small-meshed reticulum of bands up to 1 µm high, showing as a border in optical section.

ASSOCIATED ORGANISMS & SUBSTRATA: **Animalia**: *Agathidium pulchellum* Wankowicz. **Plantae**: *Abies alba* Mill. (wood), *A. borisii-regis* Mattf. (branch, wood), *A. pinsapo* Boiss. (wood), *A. sibirica* Ledeb.; *Acer campestre* L. (bark, wood), *A. platanoides* L. (bark, wood), *A. stevenii* Pojark. (bark, wood); *Alnus glutinosa* L. (wood); *Arbutus unedo* L. (bark, wood); *Betula pendula* Roth (bark, wood); *Carpinus betulus* L. (bark, wood); *Castanea sativa* Mill. (wood); *Cornus sanguinea* L. (wood); *Corylus avellana* L. (bark, wood); *Fagus sylvatica* L. (branch, stump, trunk); *Fraxinus excelsior* L. (bark, wood); *Larix sibirica* Ledeb.; *Muscopsida* indet.; *Nothofagus* sp.; *Picea abies* (L.) H. Karst. [also as *P. excelsa* Link] (stump, trunk, wood), *P. obovata* Ledeb., *P. schrenkiana* Fisch. & C.A. Mey.; *Pinus halepensis* Miller (branch, wood), *P. nigra* J.F. Arnold (branch, wood), *P. pallasiana* Lamb. (bark, wood), *P. radiata* D. Don (wood), *P. sibirica* Mayr, *P. sylvestris* L. (bark, wood); *Plantae* indet. (stump, wood); *Platanus orientalis* L. (branch); *Populus nigra* L. (wood), *P. tremula* L. (wood); *Quercus faginea* Lam. (wood), *Q. ilex* L. (wood), *Q. pedunculata* Ehrh. (bark, wood), *Q. petraea* (Mattuschka) Liebl. (bark, wood), *Q. pyrenaica* Willd. (wood), *Q. pubescens* Willd. (branch, twig), *Q. robur* L. (bark, wood), *Q. suber* L. (wood); *Rhopalostylis baueri* var. *cheesemanii* (Hook. f.) H. Wendl. & Drude (wood); *Salix lasiolepis* Benth. (wood); *Thelycrania* sp. (wood); *Tilia tomentosa* Moench (branch).

INTERACTIONS & HABITATS: Nothing specific is known about interactions between *Trichia decipiens* and other organisms, but myxomycetes in general, in their plasmodial state, are known to feed on bacteria, yeasts and other single-celled organisms, and they themselves provide food for insects, particularly beetles, and other animals. Some beetle species are known only from myxomycetes, and for some of these there may be a close symbiosis. Myxomycetes may also be found in association with fungi, and some fungi have been found only on myxomycete sporocarps and, presumably, derive their nutrition from them either as parasites or as saprobes. *Trichia decipiens* sporocarps are generally observed on dead parts of plants, using the plant material as a substratum, but probably not as a nutrient source. The species is very widely distributed and very common throughout its range, but occurs in the tropics only at higher altitudes. It has been recorded on branches, fallen logs and decaying wood of angiosperms and gymnosperms.

GEOGRAPHICAL DISTRIBUTION: AFRICA: Algeria, Burundi, Democratic Republic of the Congo, Rwanda, Tunisia. CENTRAL AMERICA: Costa Rica. NORTH AMERICA: Canada (Alberta, British Columbia, Nunavut, Ontario, Québec), México, USA (Alaska, Colorado, Iowa, Maine, Montana, North Carolina, Washington, Virginia). SOUTH AMERICA: Argentina, Brazil (Goiás, São Paulo), Chile, Colombia, Ecuador, Venezuela. ASIA: China (Guangxi, Hebei, Heilongjiang, Sichuan), India (Himachal Pradesh), Indonesia, Israel, Japan, Kazakhstan (Alma-Atinskaya oblast, Vostochno-Kazakhstanskaya oblast), Georgia, Nepal, Pakistan, Philippines, Russia (Altaiskyi krai, Chukotka autonomous okrug, Kamchatka oblast, Krasnoyarskyi krai, Sverdlovsk oblast, Taimir autonomous okrug, Tiumen' oblast), Turkey. AUSTRALASIA: Australia (Western Australia), New Zealand. CARIBBEAN: Jamaica, Puerto Rico. EUROPE: Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Moldova, Netherlands, Norway, Poland, Portugal, Russia (Bashkortostan, Kalininskaya oblast, Komi autonomous republic, Leningrad oblast, Moscow oblast, Murmansk oblast, Volgograd oblast), Romania, Slovakia, Slovenia, Spain, Sweden, Ukraine, United Kingdom. PACIFIC OCEAN: USA (Hawaii).

ECONOMIC IMPACTS: No evaluation has been made of any possible positive economic impact of this myxomycete (e.g. as a source of useful products, as a provider of checks and balances within its

ecosystem, or of other ecosystem services such as recycling, etc.). No reports of negative economic impacts have been found.

INFRASPECIFIC VARIATION: This species is very variable, and the many varieties and forms which have been published for it reflect the different attempts to describe that variation. All are listed in the synonymy above. Most are not in current use. The exceptions are *T. decipiens* var. *olivacea* (Meyl.) Meyl. (which differs from the typical variety in having sporangia that are globose, more olive and less yellow, with distinct circumscissile dehiscence as if by a preformed lid, spores which are warted, with no trace of a reticulum, and a pink plasmodium) and *T. decipiens* var. *hemitrichoides* Brândza (which differs from the typical variety in having smaller and scattered sporocarps, less than 1·5 mm high, and a spore mass which is bright yellow rather than ochraceous, overall resembling a small version of *Hemitrichia calyculata* but without elaters branching into a network).

DISPERSAL & TRANSMISSION: Nothing specific is known about *Trichia decipiens*. Myxomycete spores are produced in dry dusty masses inside sporocarps. The sporocarp outer wall fragments to expose the spores which are then, most probably, primarily dispersed by wind. This dispersal is likely to be totally random unless there is a strong prevailing wind in the vicinity. Insects are known to graze on myxomycete sporocarps, and spores have frequently been found in their faeces. This is therefore also likely to be an important part of their dispersal mechanism. Insect dispersal has the potential to be less random than wind dispersal, but there seem to be no studies of how long spores may remain in an insect digestive tract or of insect movements in relation to myxomycete spore dispersal. After the spores have landed on plant material, each may germinate to produce a single-celled zoospore with one or two flagella. This zoospore may then use its flagella to disperse locally. The zoospores subsequently transform into amoeba-like cells which reproduce by mitosis and aggregate, forming groups which are sometimes sufficiently large as to be seen with the unaided eye. These groups, which are called plasmodia, can also migrate, often in response to light. For almost the whole life cycle, therefore, myxomycetes are mobile organisms, with only the sporocarp stage being fixed in a single location. Unlike members of the kingdom *Fungi*, myxomycetes do not form hyphae, and do not derive nutrition from the plant substrata on which they are found. As a result, it is not meaningful to describe them in terms of transmission. There is no infection stage, and no colony formation inside plant material. Instead, the individual amoebae derive their nutrition by engulfing bacteria, yeasts and other single-celled organisms.

CONSERVATION STATUS: **Information base**. More than 1500 records (specimens, databases, bibliographic sources and field observations combined, excluding duplicates) from 1780 to 2011, with observations in February, March, April, June, July, August, September, October and November, with the main fruiting season in the northern hemisphere from June to October. The species is widely regarded as very common. Most of its known associated organisms are common and likely to be classified as Least Concern by the IUCN (but see information in **Notes** below about the rare beetle *Agathidium pulchellum*, which is listed in the EU's Habitats Directive). **Estimated extent of occurrence** [calculated using *http://geocat.kew.org*]. Nearly 81·4 million km^2 (Africa: 5·1 million km^2; Central America: insufficient data; North America: 11·2 million km^2; South America: 7·0 million km^{2}Asia: 46·2 million km^2; Australasia: insufficient data; Caribbean: insufficient data; Europe: 11·9 million km^2). **Estimated area of occupancy** [calculated using *http://geocat.kew.org*]. About 332 km^2. The method for estimating area of occupancy has probably produced an artificially low figure. **Population trend**. Not reported, but sufficient records exist for some analysis to be possible. **Threats**. No specific threats have been identified. **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 Least Concern. ***In situ* conservation actions**. None noted. Many recent records, however, originate from protected areas. ***Ex situ* conservation actions**. Two nucleotide sequences were found in a search of the NCBI GenBank database [*www.ncbi.nlm.nih.gov*]. No living strains of this species were found in a search of the ATCC, CABI, CBS and ICMP culture collection on-line catalogues.

NOTES: Some authors have regarded this species as typically associated with coniferous forest, but fuller consideration of available data suggests that it is more often found on broadleaf substrata. Unusually for myxomycetes, there is some high quality research information on this species indicating the complex interactions between it and other components of its habitat (LAAKSONEN *et al.*, 2010). The beetle genus *Agathidium* is the largest insect group documented that principally feeds on slime moulds, and *A. pulchellum*, one of the rarest members of this genus in Europe (and listed in the EU's Habitats Directive) was studied in 44 sites located in old-growth and managed forests in eastern Finland. *Agathidium pulchellum* occurred exclusively on *T. decipiens* which was itself associated with mid-decayed aspen, spruce and birch logs. The incidence of *T. decipiens* grew with both increasing log diameter and stand-level log density of spruce and aspen. Even when *T. decipiens* was present, the beetle was absent from sites with less than 80 aspen and spruce logs per hectare. All sites with the myxomycete and beetle were natural forests of high conservation value. Results of that work demonstrated that the complex interactions occurring in myxomycete ecosystems can have unexpected conservation impacts for totally different organisms – in this case beetles.

Trichia decipiens was also used in a study of the mechanism by which taenia are formed on the capillitium of members of the *Trichiales*. Polymerization of elater wall material forms spiralling fibrils, releasing water which passes by osmosis into the lumen. This extends the bulbous extremities of *T. decipiens* elaters, producing the characteristically tapered tips. The edge of the elater shrinks as water is lost, and is moulded by the fibrils into a system of taenia (MCHUGH *et al.*, 2000).

The distribution map of this species on the *Eumycetozoan Project* website [*http://slimemold.uark.edu*] provides further georeferenced records but some errors may have occurred in allocating latitudes and longitudes. The record on that map, apparently from southwest Kazakhstan, is in reality from Germany, and several records in the northern part of the Pacific Ocean are, in reality, from New Zealand.

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See also the following internet pages:

- *Checklist of Fungi of the British Isles* [*www.fieldmycology.net/GBCHKLST/gbchklst.asp*].
- *Cybertruffle* [*www.cybertruffle.org.uk*].
- *GBIF* [*http://data.gbif.org/welcome.htm*].
- *Google* [*www.google.co.uk*].
- *Landcare Research New Zealand* [*http://nzfungi.landcareresearch.co.nz*].
- *Myxomycetes of Ukraine* [*www.myxomycet.com.ua/eng*].
- *National Center for Biotechnology Information* [*www.ncbi.nlm.nih.gov*].
- *Nomen.eumycetozoa.com* [*www.nomen.eumycetozoa.com*].
- *The Eumycetozoan Project* [*http://slimemold.uark.edu*].
- *USDA Fungal Databases* [*http://nt.ars-grin.gov/fungaldatabases/index.cfm*].

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