= Glutinoglossum glutinosum =

Glutinoglossum glutinosum , commonly known as the viscid black earth tongue or the glutinous earthtongue , is a species of fungus in the family Geoglossaceae (the earth tongues) . Widely distributed in the Northern Hemisphere , it has been found in northern Africa , Asia , Europe , and North America . Although previously thought to exist in Australasia , collections made from these locations have since been referred to new species . G. glutinosum is a saprophytic species that grows on soil in moss or in grassy areas . The smooth , nearly black , club @-@ shaped fruitbodies grow to heights ranging from 1 @.@ 5 to 5 cm (0 @.@ 6 to 2 @.@ 0 in) . The head is up to 0 @.@ 7 cm (0 @.@ 3 in) long , and the stipes are sticky . Several other black earth tongue species are quite similar in external appearance , and many can be reliably distinguished only by examining differences in microscopic characteristics , such as spores , asci , and paraphyses . First described in 1796 as a species of Geoglossum , the fungus has gone through several changes of genera in its taxonomic history . It was placed in its current genus , Glutinoglossum , in 2013 .

= = Taxonomy = =

The fungus was first officially described in 1796 as Geoglossum glutinosum by Dutch mycologist Christiaan Hendrik Persoon , who proposed several defining characteristics , including the black color ; the smooth , compressed , club @-@ shaped head (clavula) with grooves ; and the somewhat curved and glutinous stipe . In 1908 , Elias Judah Durand transferred it to Gloeoglossum , a genus he circumscribed to contain species with paraphyses (filamentous , sterile cells interspersed between the asci) present as a continuous gelatinous layer on the stipe ; Gloeoglossum has since been reduced to synonymy with Geoglossum . In 1942 Japanese mycologist Sanshi Imai thought the species should be in Cibalocoryne , a genus name used earlier by Frigyes Ákos Hazslinszky , and so published Cibalocoryne glutinosa . Later authors thought Cibalocoryne to be ambiguous , and the name was synonymized with Geoglossum . Persoon also described the species Geoglossum viscosum (1801) and the variety Geoglossum glutinosum var. lubricum (1822) , but both of these taxa were placed into synonymy with G. glutinosum by Elias Judah Durand in 1908 .

The species was transferred by Vincent Hustad and colleagues to the newly created genus Glutinoglossum in 2013 when molecular analysis revealed that it and the species G. heptaseptatum formed a well @-@ defined clade in the Geoglossaceae . In 2015 , Hustad and Andrew Miller published an emended description of G. glutinosum with a narrower range of spore dimensions , suggesting that material collected in Australia and New Zealand represent unique species , which they referred to G. australasicum and G. exiguum . These species , along with G. americanum and G. methvenii , were added to Glutinoglossum in 2015 . Hustad and Miller noted their new spore size range for G. glutinosum were more closely aligned with those given by Durand in his measurements of Persoon 's type specimen .

The specific epithet glutinosum is derived from the Latin word gluten , meaning " glue " . The species is commonly known as the " viscid black earth tongue " or the " glutinous earthtongue " .

= = Description = =

The club @-@ shaped fruitbodies , which have a distinct blackish head and a more lightly colored stipe (dark brown) , grow to heights ranging from 1 @.@ 5 to 5 cm (0 @.@ 6 to 2 @.@ 0 in) . The head is up to 0 @.@ 7 cm (0 @.@ 3 in) tall and ranges in shape from fuse @-@ shaped to narrowly ellipsoidal to nearly cylindrical , and is somewhat compressed on the sides . The nearly black , somewhat waxy head has a vertical groove down the middle . The stipe has a glutinous , dark grey @-@ brown surface .

The spores are smooth and cylindrical , sometimes with a slight swelling in the middle , and sometimes slightly curved ; they measure 59 ? 65 by 4 ? 5 µm . G. glutinosum spores have between two and seven septa , although three is most typical in mature specimens . The thin @-@ walled

asci (spore @-@ bearing cells) are cylindrical to narrowly club @-@ shaped , eight @-@ spored , and typically measure 200 ? 265 µm long by 12 ? 16 µm wide . Ascospores occupy about the upper two @-@ thirds to three @-@ quarters of the ascus , leaving a hyaline (transparent) base . The paraphyses , hyaline at the base and brown in the upper regions , are 4 ? 11 µm wide , and longer than the asci . Cells at the end of the paraphyses are pear @-@ shaped (piriform) or spherical , brownish , and measure 8 ? 10 µm wide . The sticky material on the stipe is a gelatinous matrix made of a layer of paraphyses .

Although black earth tongue species are generally not worth eating , Charles McIlvaine opined in his 1902 work One Thousand American Fungi that , if stewed , G. glutinosum is " delicious . "

= = = Similar species = = =

Geoglossum nigritum is similar in appearance to Glutinoglossum glutinosum , but lacks a slimy stipe . Trichoglossum species , such as the common T. hirsutum , have a velvety surface texture acquired from thick @-@ walled bristles called setae . Several other earth tongue species are roughly similar in external appearance to G. glutinosum , and can be difficult to distinguish from that species without considering distribution and microscopic characteristics such as the size and shape of the asci , ascospores , and paraphyses . Geoglossum peckianum and G. uliginosum can develop a glutinous stipe ; the former has spores measuring 90 ? 120 by 6 ? 7 µm with 14 septa , while the latter has spores that are 60 ? 80 by 4 @.@ 5 ? 6 µm with 7 septa . The Australasian species Glutinoglossum methvenii is distinguished from G. glutinosum by its short , stout ascospores (mostly measuring 70 ? 80 by 5 ? 6 µm) and the presence of curved to hooked paraphyses tips . G. australasicum , the most abundant Glutinoglossum species in Australasia , has asci measuring 205 ? 270 by 17 ? 20 µm , while those of G. exiguum are 165 ? 260 by 13 @.@ 5 ? 17 µm . The latter species tends to have smaller fruitbodies , up to 3 @.@ 5 cm (1 @.@ 4 in) tall .

= = Habitat and distribution = =

Glutinoglossum glutinosum is a saprophytic species . Its fruitbodies grow scattered on soil in moss beds or in grassy areas . North American collections are typically associated with hardwoods , while European collections are often made in pasture and dune slacks . The fungus has been used as an indicator of medium @-@ quality grassland in the UK . In India , it has been encountered on the soil of oak forests , and among mosses on stony slopes at an elevation of 2 @,@ 000 m (6 @,@ 600 ft) .

A widely distributed species , Glutinoglossum glutinosum has been recorded from northern Africa (Macaronesia and Morocco) , Asia (Bhutan , China , India , Japan , and the Philippines) and Europe . It is listed as vulnerable in Switzerland . In Bulgaria , where it is considered critically endangered , threats to G. glutinosum include " habitat changes as result of agriculture activities (crops , livestock) , atmospheric and land pollution , drought , global warming . " In a preliminary Regional Red List of Dutch macrofungi , G. glutinosum was considered threatened , and it was noted that before 1970 , the fungus was " rather common " , compared to " rather rare " after that year . The North American distribution includes Canada , the United States , and Mexico .

Although G. glutinosum was previously thought to have occurred in Australia and New Zealand , later examination and genetic analysis of collections from these locations showed the material to belong to what have since been described as the new species G. australasicum or G. exiguum .