

Another poisonous species discovered in the genus *Gyromitra*: *G. ambigua*

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HARMAJA, H. 1976: Another poisonous species discovered in the genus *Gyromitra*: *G. ambigua*. — *Karstenia* 15:36–37.

A case of intoxication in Sweden caused by *Gyromitra ambigua* (Karst.) Harmaja (Ascomycetes: Pezizales), a species previously not known to be poisonous, is reported. The fresh fruit bodies were boiled but the boiling water was taken with the dish and eaten, too. Three other cases of poisoning, occurred in Alaska and Finland and caused by fruit bodies of *G. infula* (Fr.) Quél. coll. (i.e., either *G. ambigua* or *G. infula*) which were fresh prepared for dish without boiling and rinsing, are also discussed. On the other hand, two different cases are known when fruit bodies of *G. ambigua* kept in boiling water (the water not being used for the dish) did not cause any effects of intoxication. Dried or boiled and rinsed fruit bodies of *G. infula* coll. apparently have never been reported to have caused poisonings. The symptoms of the present cases are very similar to those known to occur in intoxications caused by the famous relative species, *G. esculenta* (Pers.) Fr. These facts suggest that the toxically effective substance of *G. ambigua* is the same as (or chemically closely related to) that in *G. esculenta*, i.e. gyromitrine. *G. infula* s. str. is apparently intoxical.

In October of 1974 I received a letter from Prof. Bengt Pettersson of the University of Umeå, Sweden, in which he told about a case of fungal poisoning in a family near Umeå town in northern Sweden. At the same time he sent a fruit body of the fungus that, according to the report of the father of the family, a dentist, who collected the specimen, was the only kind of fungus used for the harmful dish and thus caused the intoxication. The fruit body had mature spores and I could confirm the opinion of prof. Pettersson according to which it concerned *Gyromitra ambigua* (Karst.) Harmaja, a species which only a few years before had been proved to be distinct from *G. infula* (Fr.) Quél. (HARMAJA 1969). So far *G. esculenta* (Pers.) Fr. is the only species of the genus *Gyromitra* Fr. which conclusively has been proved to be toxic.

It is to be noted that, in the case mentioned above, the same fungi were prepared for food on two occasions. In the first time they were kept for 4 minutes in boiling water and the water was poured away and none of the

family consisting of father, mother and a daughter of eight years had any harmful effects afterwards. In the second time the water, in which the fruit bodies had been boiled for a while, was used for the dish and thus became eaten with the fungi. It was in this latter case that, after a long latent period without any unusual effects, the father, a friend of the family and most severely the daughter became ill and suffered the symptoms of intoxication.

I wrote a newspaper article about this case and it inspired two Finnish mycophagists from Helsinki to contact me. In both cases exclusively fruit bodies of *G. infula* coll., used fresh without boiling and rinsing for dish, had caused intoxication with symptoms very similar to those of the Swedish case.

In the literature there is at least one well-documented case of intoxication caused by *G. infula* coll., namely that reported by WELLS & KEMPTON 1968 about an Alaskan case. Since besides *G. infula* s. str. also *G. ambigua* occurs in Alaska (HARMAJA 1969; KEMPTON & WELLS 1973), I already had in

a semipopular article discussed this case and warned public to boil fruit bodies of *G. infula* coll. and throw away the water as it was to be suspected that *G. ambigua*, macroscopically not with certainty distinguishable from *G. infula* s. str., could be poisonous (HARMAJA 1973). My judgement that *G. ambigua* and not *G. infula* might be the poisonous species was based on the fact that of these two species *G. infula* s. str. is the only (or by far the more frequent) one in major part of Europe and U.S.A. in which densely populated areas *G. infula* appearing fungi have for a very long time and by very many people been eaten without preceding treatments. The Swedish case appears to confirm that supposition of mine.

No lethal cases are known to me, and in the cases commented in the present paper recovering followed in time without consulting medical help.

The symptoms of a certain or apparent *G. ambigua* poisoning appear only after a long (ca. 8-20 hours) latent period and include gastro-intestinal illness, vomiting, diarrhoea, and, in two cases, diminishing of muscular control, or some kind of paralyzing. Mr. Ilkka Kytövuori, Lic. Phil., of the Department of Botany of the University of Helsinki, in August of 1971 in a trip in Lapland, prepared with his wife a whole dish of fruit bodies of

G. ambigua (a herbarium specimen of these fungi was collected; it is deposited in the Botanical Museum of the University of Helsinki and has been examined by me!); they boiled the fungi first in ample amount of water and poured then the water away, and suffered no harmful effects. Dried or boiled and rinsed fruit bodies of *G. infula* coll. have apparently never been reported to have caused poisonings. All the above facts suggest, that the toxine of *G. ambigua* is the same — or at least chemically closely related — compound which is responsible for the toxicity of the famous *G. esculenta*, i.e. gyromitrine (cf. LIST & LUFT 1967).

G. infula s. str. is apparently intoxical or contains only small amount of toxine.

In the literature there has during years been certain indications, apparently never conclusively proved, also upon the toxicity of the congeneric species *G. gigas* (Krombh.) Cooke (e.g. KUBIČKA 1966). Now that advanced analysis methods, such as gas chromatography, have been developed, all the *Gyromitra* species, including the *Discina* group with e.g. *G. perlata* (Fr.) Harmaja, should be searched for gyromitrine.

Acknowledgements. — I am obliged to Prof. Bengt Pettersson, Umeå, and other people for providing information for the present contribution.

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