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Wild mushrooms : uses, consumption and popular beliefs from Europe to Eastern Siberia

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Abstract

This article presents the uses, consumption practices, and popular beliefs related to wild mushrooms in Europe and Siberia from the Neolithic period to the present day. First, we will introduce various saproxylic mushrooms used for starting fires, as well as the medicinal uses of some species. Then, we will describe the gathering and consumption practices of edible wild mushrooms in Europe and Siberia. These consumption practices, varying by culture, region, and time period, will be specified for six edible species. Finally, we will address popular beliefs and the magical-religious rituals associated with some mushroom species.

Résumé

Cet article présente les usages, les pratiques de consommation et les croyances populaires relatifs aux champignons sylvestres d'Europe et de Sibérie du néolithique à nos jours. Tout d'abord, seront présentés les différents champignons lignicoles utilisés pour allumer le feu, ainsi que les usages médicaux de certaines espèces. Ensuite, les pratiques de cueillette et de consommation des champignons sylvestres comestibles d'Europe et de Sibérie seront décrites d'un point de vue général. Ces pratiques de consommation, différentes selon les cultures, les territoires et les périodes, seront précisées pour 6 espèces comestibles. Enfin, seront abordées les croyances populaires, ainsi que les rituels magico-religieux associés à certaines espèces de champignons.

Keywords

mushrooms, ethnomycology, domestic and medicinal uses, consumption practices, popular beliefs, European continent and Siberia

Mots-clefs

champignons, ethnomycologie, usages domestiques et médicaux, pratiques de consommation, croyances populaires, continent Européen et Sibérie

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Introduction

Since the Neolithic period, wild mushrooms have been perceived, used and consumed differently by different peoples, cultures and territories of the European continent and Siberia. The Ice Man Ötzi, who died between 3300 and 3000 BCE and was discovered in 1991 on the Austro-Italian border, carried with him tinder fungus extracted from *Fomes fomentarius* (L.) Fr. and two different shaped fruitbody

pieces of the polypore *Piptoporus betulinus* (Bull.) Fr. (Peintner *et al.* 1998; Gaudreau *et al.* 2010). The uses, gathering and consumption practices, and popular beliefs related to wild mushrooms, which have been orally transmitted from generation to generation, have clearly evolved as a result of changes in ecosystems, eating habits, international trade, and medicine. In the last few years, a certain mycological interest has emerged in the scientific literature presenting the transformations in traditional knowledge, gathering and consumption practices, trade and existing popular beliefs concerning wild mushrooms in Europe and Siberia (Arntzen 2000; Godina-Golija 2000; Lehr 2000; Boa 2006; Gaudreau *et al.* 2010; Peintner *et al.* 2013; Uzunov & Soyneva-Gärtner 2015; Kotowski 2019; Barbier 2021). In this mycological literature, many articles describe the medicinal or food uses of a single species of wild mushroom. Others present the evolution of collecting, eating and selling practices of wild mushrooms in a specific European country. But few articles present an overview of the changes that occurred in the populations of Europe and Siberia with respect to edible and poisonous wild mushrooms.

We propose, here, to trace the history of domestic and medicinal uses, consumption practices, as well as popular beliefs associated with several species of edible and poisonous wild mushrooms in Europe and Siberia, from the Neolithic period to the present day. First, will be presented the domestic uses of lignicolous mushrooms used, since the dawn of time, to light the fire (Peintner *et al.* 1998; Roussel *et al.* 2002b; Gaudreau *et al.* 2010). Then, will be described the different species of mushrooms used for medicinal or cosmetic purposes. Will be discussed the existence of two population groups identified by Pavlovna Wasson & Wasson (1957: 1) mycophobic populations experiencing strong reactions of rejection or repulsion towards mushrooms and 2) mycophilic populations that appreciate or feel adoration for mushrooms. The peoples identified as mycophobes are the Celts, the Germans and the Scandinavians, "peoples of the North Seas" (Pavlovna Wasson & Wasson 1957 V. 1: XVII). The peoples identified as mycophiles are the Slavs and part of the Mediterranean basin populations (Pavlovna Wasson & Wasson 1957 V. 1: 3). Since Pavlovna and Wasson, several researchers have studied the mycophilic or mycophobic nature of European populations. They have identified various degrees of mycophilic or mycophobic behaviour (Fericgla 1994; Chauvin-Payan 2018). Thanks to the study of European legislation and guildness regarding the marketing of mushrooms (Peintner *et al.* 2013), we will present the evolution of mycophilic/mycophobic behaviours among European populations.

This work will continue with a description of the evolution of wild edible mushroom gathering and consumption practices in Europe and Siberia (Boa 2006; Duhart 2012). Finally, will be presented the popular beliefs associated with mushrooms. The annular mycelia, reproductive structures of macromycetes, commonly known as witch's circles or fairy rings will be evoked. We will finish with the magic-religious uses of the fly agaric and the beliefs associated with it.

Domestic uses

As early as the Mesolithic period (12,000-6,000 B.C.), humans utilized lignicolous fungi to initiate, maintain, and transport fire. Remains of sporophores, reproductive structures of macromycetes, attributed to the tinder fungus *Fomes fomentarius* (L.) FR., have been found at the Star Carr site in England (Corner 1950; Roussel *et al.* 2002b; Robson 2018). The Iceman 'Ötzi', who died between 3300 and 3200 BP and was discovered on the Austrian-Italian border in 1991, kept a fragment of a tinderbox in a small pouch. He most likely used it to make fire (Peintner *et al.* 1998; Roussel *et al.* 2002b; Gaudreau *et al.* 2010; Peintner *et al.* 2013).

The lignicolous fungi

Figure 1: *Fomes fomentarius* (L.) FR.

Polypore fungi such as *Fomes fomentarius* (L.) FR., *Phellinus igniarius* (L.) FR., and *Trametes quercina* (L.) FR., has the ability to ignite and burn slowly, thereby ensuring the preservation of fire (Cordier 1876; Roussel *et al.* 2002b). During the Neolithic period, people used pieces of iron pyrite to start fires. And they struck these pieces of pyrite against a hard rock such as flint or quartz. This percussion process produces sparks to make fire. Starting from the Second Iron Age, pyrite pieces were gradually replaced by steel objects, which were struck against flint to produce sparks. These sparks were used to ignite flammable materials like tinder (Roussel *et al.* 2002b: 352).

Figure 2 : *Lighting the fire*

Figure 2 : *Le champignon allume-feu*

Tinder is a spongy material derived from the upper part of the flesh of some polypore mushrooms, such as the tinder. This tinder had to be prepared and improved for an efficient kindling. Different preparation techniques were used. In the 16th century, some Italian inhabitants boiled fruitbodies in vinegar, which they then beat with a hammer to make tinder (Cesalpino in Paulet 1793). In Germany, another technique consisted in boiling the fruitbodies in a sulphurous lye (Gleditsch in Paulet 1793). But according to Paulet (1793 T. II: 89), the secret of the preparation of the tinder consisted in adding to it a substance like saltpetre or nitre, which increased its ignition:

"Cette addition de salpêtre rend l'une susceptible de prendre feu plus facilement que l'autre. En effet, la substance cotonneuse des agarics-amadou prend feu difficilement sans cette préparation ; mais lorsqu'on la fait bouillir dans une eau nitreuse, alors étant imprégnée de ce sel, elle en est beaucoup plus susceptible, le salpêtre faisant ici le même effet que dans la poudre à canon, c'est-à-dire, pétillant d'une manière sensible, et par ce pétilllement donnant de l'action au feu dont il augmente l'activité."¹

In the 19th century Persoon (1818: 92) described the preparation of tinder as follows:

"[...] Après avoir exposé l'amadouvier dans un milieu frais ou dans une cave, pour le faire ramollir un peu, on le coupe ensuite par tranches minces ; on rejette la partie par laquelle le champignon adhérerait à l'arbre ; on retranche aussi les tuyaux : on bat ces lames sur une pierre unie ou sur un billot de bois avec un marteau de bois ; on les dispose ensuite par lits dans une grande marmite de fer ou un chaudron ; on y verse de l'eau en suffisante quantité pour que le tout surnage, et on ajoute du salpêtre selon la quantité d'amadou : on fait bouillir le tout une demi-heure ou une heure. Après ce temps, on retire ces tranches et on les fait sécher lentement à l'ombre ou dans un lieu médiocrement chaud ; ensuite on recommence à battre ; quelquefois, au lieu de faire bouillir les lames de l'Amadouvier, on se contente de les mettre dans les cendres de lessive, et de leur donner deux ou trois chaudes de cette lessive bouillante."²

In Europe, from the 18th to the beginning of the 20th century, several factories produced tinder industrially and marketed it. These factories were located mainly in Germany in the Black Forest, in Sweden, in the Carpathians and in France in Gironde and Ariège (Roussel *et al.* 2002b: 355). Since the beginning of the 20th century, the tinder used to start fires has been replaced by other substances.

Polypores have been used for other domestic purposes. In the 19th century, Moyen (1863: 272-274) described the various fungi used for dye production: *Polyporus igniarius* (L.) Fr. dyed in dark brown, *Polyporus hispidus* (Bolt.) used for silk, wool, and cotton fabrics, for skins intended for glove-making dyed in brown, the white mulberry polypore or *Hexagona mori* (Poll.) combined with alum dyed fabrics in fawn yellow, jonquil yellow. This tinder extracted from the *Fomes fomentarius* mushroom was used for other domestic purposes, such as making clothes. In the 18th century, tinder could be felted and was used to make hats, or caps (Gleditsch in Paulet 1793 T. II: 86). These headgear were worn in Germany, Romania and Moldavia. Today, they are still made and worn in Romania, particularly in Transylvania (Moinet 1997; Roussel *et al.* 2002b: 359).

Figure 3: *Cap*

Figure 3: *Casquette*

Medicinal uses

Some species of mushrooms have long been used for their medicinal properties. As early as antiquity, Dioscorides (in Rolfe & Rolfe 1925: 130) described the various curative virtues of lycoperdons: "Its properties are styptic and heat-producing, efficacious against colic (stropbous) and sores, fractured limbs, and bruises from falls: the dose is two obols 1 weight with wine and honey to those who have no fever; in fever cases with honeyed water; it is given in liver complaints, asthma, jaundice, dysentery, kidney diseases where there is difficulty in passing water, in cases of hysteria, and to those of a sallow complexion, in doses of one drachma; in cases of phthisis it is administered in raisin-wine, in affections of the spleen with honey and vinegar. By persons troubled with pains in the stomach and by those who suffer from acid eructations, the root is chewed and swallowed by itself without any liquid; it stops bleeding when taken with water in three-obol doses; it is good for pains in the loins and joints, in epilepsy when taken with an equal quantity of honey and vinegar. It prevents rigor if taken before the attack; in one- and two- drachma doses, it acts as a purgative when taken with honeyed water; it is an antidote in poisons in one-drachma doses with dilute wine."

Puff ball fungi (e.g., *Lycoperdon* spp) as well as polypores such as *Fomes fomentarius* were most indicated for cauterization or moxibustion practices. In the 5th century B.C., Hyppocrates described the practice of cauterization which consisted of "[...] à placer des morceaux d'amadou incandescents sur la peau du patient près de l'organe ou de la partie du corps à soigner (Buller 1914 in Roussel *et al.* 2002a : 601)."³ Tinder treated with saltpetre was used by the Siberian peoples to practice moxibustion. According to Paulet (1793 T. II: 90): "Ceux du Kamtchatka et de la Sibérie s'en servent pour former des cônes ou cylindres à feu, qu'ils appliquent, à l'instar des Chinois et des Japonais qui emploient le moxa sur certaines parties, dans la vue de remédier surtout aux douleurs des articulations. [...] Ils forment avec l'amadou serré par une bande, un cône ou cylindre qu'ils appliquent à la partie, en mettant le feu par un bout jusqu'à ce qu'il parvienne à la chair vive. Ce moyen n'a rien d'extraordinaire ; on en trouve l'usage établi depuis très longtemps chez les Orientaux, surtout chez les Egyptiens [...]."⁵ In 1850 in the Himalayas, moxibustion was practiced with pieces of wolf vetch (*Lycoperdon* sp.): "My servant having severely sprained his wrist by a fall, the Lepchas wanted to apply a moxa, which they do by lighting a piece of puff ball, or Nepal paper that burns like tinder, laying it on the skin, and blowing it till a large open sore is produced; [...]. (Hooker 1854 T. 2 : 297)" Moxibustion, used for 2500 years (Deng & Shen 2013), is still practiced to treat of a large number of diseases such as sciatica, paralysis and white tumors (Dorvault & Hazebrouck 1995; Roussel *et al.* 2002b: 356), diarrhea, colitis, urinary, incontinence and dysmenorrhea, knee osteoarthritis (Deng & Shen 2013: 1).

While some lycoperdons were used in the Himalayas for moxibustion, they were also used in Europe for their hemostatic and astringent properties. According to Cooke (1904 : 98): "The great puff-ball has an ancient reputation for the stanching of blood, and consequently dried and preserved by many a good housewife in days gone by, and it still considered by some of the antique dames of the past generations as a sovereign remedy for a cut finger." Like e.g. lycoperdons, the polypore *Fomes fomentarius* was recognized and used for its hemostatic (Roussel *et al.* 2002b: 356), healing and antiseptic properties (Lallet Daher 2019), to treat rheumatic pain, dysmenorrhea, hemorrhoids, and urinary problems (Roussel *et al.* 2002b).

Other polypores have been used for their medicinal properties. In the 19th century, the fragrant *Boletus suaveolens* L. or *Trametes suaveolens* L. was used in some countries as medicine against phthisis. Linnaeus in his *Flora laponica* reported that it was also used for the gallantry of young Lapps, most likely for its aphrodisiac properties (Persoon 1818: 91). At the beginning of the 20th century, the

birch borer *Piptoporus betulinus* (Bull.) P. Karst. was used in Great Britain for its antiseptic and healing properties (Ramsbottom 1923 in Francia *et al.* 2007). In other countries, it was recognized for its antitumoral (Pleszczyńska *et al.* 2016), antiparasitic, laxative, antibiotic, healing, and immunostimulant properties (Lallet Daher 2019). Finally, chaga *Inonotus obliquus* (Fr.) was used by the early peoples of Siberia: Khantis, Mansis, Nenets, Evenks. The Khantis people consumed this mushroom in tonic infusion allowing to face fatigue, hunger and cold. In the Middle Ages, the Khantis sold this mushroom to the Russians known to treat ulcers, gastritis and cancers (Ferdin: 2017). Chaga has also been recognized for its anti-inflammatory, anti-allergic, and anti-oxidant properties (Duru *et al.* 2019; Lallet Daher 2019).

Fly agaric *Amanita muscaria* L. Fr., another well-known mushroom, was used in Sweden as early as the 16th century as an antiparasitic to kill lice, bed bugs, and flies (Svanberg & Lindh 2019). In Siberia, the elders of the nomadic or semi-nomadic communities of the village of Rekinniki consumed fly agaric for its fortifying and doping effects, which allowed them to complete daily tasks much faster and with much less effort (Barbier 2021: 11). In the same region, amanita was used as a cosmetic lotion to make the skin smooth and soft. In the 18th century, amanita was known to treat rheumatism and aches and pains and was prepared in the form of a tincture made with bilberry juice.

Today, mother tinctures, prepared with fly agaric and vodka, are used to rub and relieve aching joints and muscles. Cosmetic creams are also prepared with fly agaric. Other mushrooms such as Reishi, Ling zhi or the mushroom of eternal youth *Ganoderma lucidum* Fr.: Karst are used in the manufacture of cosmetic products.

Consumption practices of edible mushrooms in Europe and Eastern Siberia

From time immemorial, human have consumed mushrooms to meet their nutritional needs. Remains of *Fistulina hepatica* (Schaeff.) With. and Boletes found in Swiss lakeside settlements prove that these species of mushrooms were consumed as early as the Neolithic period (Müller-Beck 1961 quoted by Heim 1963 in Bolay 1967). The consumption practices of wild edible mushrooms have evolved according to periods, territories and cultures. After conducting numerous investigations on vernacular names, consumption practices, medicinal uses, and magico-religious rituals related to mushrooms, Pavlovna and Wasson (1957) identified two distinct populations: 1) mycophilic populations that appreciate or experience adoration for mushrooms and 2) mycophobic populations that experience strong reactions of rejection or repulsion towards mushrooms.

"The peoples identified as mycophiles are the Slavs, and part of the populations of the Mediterranean basin: "We Russians love the whole mushroom world, and what a world it is! Almost endless in variety, every species expressing its individuality by its size and shape and stance, in the beauty of its evanescent colors, in the delicate perfection of its gills or pores or skin that are a joy to touch, and usually too in its scent and taste. The evil kinds, how they flaunt their wicked grace, like the harlots that they are! But we are fond even of them, in a way (Pavlovna Wasson & Wasson 1957 V. 1: 3)."

The peoples identified as mycophobic by Pavlovna & Wasson (1957) are the Celts, the Germans and the Scandinavians, 'peoples of the northern seas': "There is a deep repugnance for 'toadstools' among the folk that dwell around the shores of the North Sea. The persistence of this repugnance bears witness, if witness were needed, to the extraordinary toughness of an emotional heritage coming down from remotest times. The 'mycophobia' of the North Sea peoples remains unshaken in the face of continuous exhortations, stretching over the past hundred years, from well-informed men of science (Pavlovna Wasson & Wasson 1957 V. 1 : XVII)."

European populations with mycophilic traditions

In Poland, due to the great popularity of mushrooms in the old Polish territories, the practices of foraging, and the significant consumption of mushrooms, people are called "Grzybojady" *Mushroom*

eatery (Lehr 2000: 156). In this region, popular knowledge about mushrooms includes information about many mushroom species, their properties, and culinary uses. Mushrooms had a very important food value in daily nutrition. In the 19th century, in times of famine, mushrooms replaced bread: "*Kali chlebno, to nie hrybno, a kali hrybno, to nie chlebno*, which means that when there is a plenty of bread there are no mushrooms and when there are many mushrooms there is no bread (Orzeszkowa 1888 in Kotowski 2019: 7)." At the beginning of the 20th century, mushrooms were a dietary supplement to vegetables. In times of famine, they became a staple food (Lehr 2000: 160). The Poles had a high regard for mushrooms, which were valued as a precious and delicate delicacy and were served during the vacations. For centuries, mushrooms have been an important source of income for rural households. They were sold fresh, dried, salted, fermented or pickled to the wealthier townspeople (Lehr 2000: 166; Kotowski *et al.* 2019: 8). In the past and still today, mushrooms are included in festive Christmas meals (Lehr 2000: 166; Kotowski 2019: 7).

In Slovenia, in the 19th-century, berries, chestnuts and mushrooms were picked mainly for sale. By the early 20th century, the mushroom trade was thriving in urban markets. Regulations had to be adopted to guarantee the quality of the mushrooms offered for sale and the safety of their consumption (Godina-Golija 2000: 212). In Romania, the mushroom-related vocabulary present in riddles, sayings, literature, and place names shows the close relationship that has long existed between Romanians and cryptogams (Dincă *et al.* 2016: 119). "Umbreluțe colorate; Prin păduri împrăștiate; Nu sunt bune pentru soare, Ci pentru... gătit mâncare. (Dincă *et al.* 2016: 123)"⁵

For a long time, the populations in the south of France, Lower Limousin, Gascony and Provence, due to their traditions of foraging and consumption, have been considered as mycophilic populations.

In Corrèze, since the 19th century, the Caesar's mushroom *Amanita caesareae* (Scop.) Pers. and the porcini mushroom *Boletus edulis* Bull. have been highly valued species. "Nous en avons plusieurs espèces, et ce qu'il y a d'heureux, c'est qu'il y en a peu de malfaisants. Le noir et le rouge sont ceux qui surtout ne représentent aucun danger, pourvu qu'ils soient cueillis à temps. [...] Nous mangeons le champignon noir quand il vient d'être cueilli, et alors on l'accommode de plusieurs manières ; on le fait sécher et on fait de bonnes garnitures pour les ragoûts. Le champignon rouge a deux temps, il sort d'abord de terre plié dans une enveloppe blanche, et alors il a la forme d'un œuf plus ou moins gros ; saisi dans cet état qui ne dure que quelques heures, c'est un mets exquis et sain. Quand il a brisé son enveloppe, il paraît comme un parapluie jaune-rouge ; on en trouve depuis 3 jusqu'à 9 pouces de diamètre. On les mange cuits à l'huile ou farcis à la braise. (Béronie 1824 : 220 in Chauvin-Payan 2018 : 348)"⁶ Gascony is a region with a mycophile population. This mycophilic character is reflected through a significant number of sayings related to mushrooms. "*Cëtt, cëtt, cëtoun, Hey-me troubà toun parioun : Cep, cep, petit cep, fais-moi trouver ton pareil.* (Rolland [1914]1967 : 161)"⁷ Mistral (1878: 478) presents several sayings or expressions, including the following: "Ta maire es à Leitouro / Tournara de bouno ouro / Pouraran camparol (Gascogne) : Ta mère est à Leitouro, Reviendra de bonne heure, Portera des champignons. // An de cèpère, an de misère : Année où les cèpes abondent, année de misère."⁸ The south of France is a region where interest in mushrooms has existed for a long time. In 1676, Pierre Magnol authored the first descriptions of mushrooms from the southern part of France. He established a list of 20 species, cited with their local names and a description of their colour and habitat. He proposed a classification and questioned certain beliefs regarding mushrooms such as: "pratentibus optima fungis natura" (Moreau *et al.* 2009: 7-8). Provence is a region where the consumption and sale of mushrooms have been practiced for a long time. In the 19th century, Mistral (1878: 438) wrote: "*La plus-part viéu de rabos Kèchos al foc, amai de campairols.* La plupart des provençaux vivants, aime les champignons cuits à la braise."⁹ During that time, mushrooms are not only consumed but also sold in markets. "*Li boulet an fan la sieu aparicioun sus lou nouostre mercat.* Les bolets/cèpes ont fait leur apparition sur notre marché. (Mistral 1878: 326)"¹⁰

European populations with mycophobic traditions

Since Pavlovna Wasson & Wasson (1957), other authors (Arntzen 2000; Godina-Golija 2000; Lehr 2000; Leivas & Garcia-Garabal 2002; Chauvin-Payan 2018; Kotowski 2019) who have studied mushroom consumption and foraging practices, vernacular names, popular beliefs, magic-religious rituals and legislation related to mushrooms have corroborated the existence of mycophilic and mycophobic peoples and have identified other mycophobic populations.

According to the names given to mushrooms and related sayings, the Galicians can be identified as a mycophobic population. "Preguntei por moitos lugares de Galicia do interior e case só sabem dicer que coñecían os fungos com pan de sapo, pan de culebra ou de cobra, pan de raposo e cando un pregunta se os comen, prodúcelles un evidente asombro e algunha muller aínda se persigna (Leivas & Garcia-Garabal 2002: 2)."¹¹ Several sayings reflect the mycophobic nature of the Galicians: "Mais vale fungo perdido que comido", "Se queres morrer, a cegas fungos coller. (Leivas & Garcia-Garabal 2002: 4)"¹²

In France, several regions have revealed mycophobic populations that have evolved over time. In the region of Brittany, the inhabitants advised children against eating mushrooms, saying "Vous ne devez pas manger cela, les enfants, c'est du poison. Ils sont poison... » (Atlas Linguistique et Ethnographique de Bretagne Romane ALBRAM in Chauvin-Payan 2004: 338)."¹³ In The Maine region, "[...] les champignons presque tous confondus sous le générique de *pis-de-chien*, sont le venin de la terre, sont mauvais sang qui sort en pustules. (Sébillot 1904-1907; reprint 1968: 491)."¹⁴ Between 1900 and 1945, the rural population in the Ile-de-France and Orléanais region and the East of France exhibited a tendency towards mycophobia (Chauvin-Payan 2017-2018: 346). In the Linguistic and Ethnographic Atlas of the Île-de-France and Orléanais (Simoni-Aurambou M.-R. 1973), some collected comments reflect the mycophobic behaviour of rural inhabitants. "Sauf exception, les paysans de notre domaine connaissent mal les champignons, qu'ils ne mangent pas car ils ont peur de s'empoisonner. A titre d'exemples, nous citons quelques réponses de témoins "Chez nous, c'est pas le chantier à champignons, j'aime mieux manger une pomme de terre qu'un champignon."" "Ah ben ça, j'en veux point de ça, j'ai peur de m'empoisonner !" "C'est plutôt pour se guetter (=se méfier)."¹⁵ In Eastern France, in Savoie, until the end of the 19th century, wild edible mushrooms were poorly known and scorned by rural people (Chabert 1897: 33 in Meilleur 1982: 172). Meilleur (1982) describes the changes in mushroom picking and consumption practices in a village in Savoie. From the early 20th century until the Second World War, mushrooms were traditionally not consumed. At the beginning of the 20th century, a few species were gathered to be sold in markets. At the request of the affluent classes, the inhabitants of Allues became familiar with the cep, the chanterelle, and the morel. Today, these mushrooms are regularly sought after but rarely put up for sale. In 1947, Gonon described a change in behaviour among the inhabitants of the Forez region regarding mushrooms. Until around the end of the 1914 war, mushrooms were not gathered. In the 20th century, they were gathered and sold in Feurs. There was even a lot of competition to be the first to reach the woods. In 1944, several people earned up to 12,000 francs by selling mushrooms (Gonon 1947: 59).

In Norway, in the rural areas, people didn't eat mushrooms. There were several reasons for this: fear, disgust and ignorance. People were afraid to eat mushrooms because they could be poisoned. "Poison is connected to danger and death and, therefore, they fear it and try to stay clear of it. (Arntzen 2000: 77)" On the other hand, many people explained that they were disgusted by the appearance of the mushrooms, which resembled no other plant. As a result, they couldn't eat them. Finally, the villagers did not consume mushrooms, as they regarded them as food for animals (Arntzen 2000: 78).

In Sweden, until the pre-industrial period, rural populations showed no interest in mushrooms and did not use them in traditional cooking. They rejected them and would rather starve than eat mushrooms: "It seems that not even a severe famine could overcome the peasantry's reluctance and indifference to mushrooms as a nutrient. In the old days they would eat grass and leaves, sawdust and dirt, almost

anything but not mushrooms, preferring rather to starve to death' (Keyland in Svanberg & Lindh 2019: 2)."

The various testimonies presented above reflect the mycophobic behaviours of some European populations. Since the late 1900s, 'mycophobic' and 'mycophilic' behaviours have evolved across different territories and among various populations.

European mycophilic / mycophobic traditions in 21th century

In 2013, several researchers have relied on guidelines and legislation relating to the marketing of wild mushrooms in Europe to identify and determine mycophobic and mycophilic European populations (Peintner *et al.* 2013: 2). For their study, they processed mushroom marketing legislation in 42 European countries. These researchers identified 4 groups of European populations with different mushroom traditions. They show that mycophobic attitudes are most prevalent in German-speaking countries that have either no legislation or only recent specific legislation on mushrooms: Dutch, English, German, Scandinavia (Denmark, Norway and Sweden). "[...] mushroom picking and commercialisation are not an issue of public interest in such countries, as indigenous people only consume a few mushroom species and, most of them are cultivated (Peintner *et al.* 2013: 3)."

According to Peintner *et al.* (2013), populations with a mycophilic tradition include: Western Europe with a Romance-speaking population (France, Italy, Portugal, Spain) or with Romance-speaking minorities (Belgium, Switzerland), Eastern Europe with a Slavic population (Belarus, Poland, Russia, Slovakia, Ukraine, countries of the former Yugoslavia) and the Nordic Cooperation countries (Peintner *et al.* 2013: 5). Among the Nordic countries, Finland is a special case due to its location on the border between the mycophobic country of Sweden and the mycophilic country of the Russian Federation. Swedish mycophobic culture has influenced the apprehension and perception of the local populations in the western region toward mushrooms. But in the East of the country, the Karelian populations of Russian origin, who settled in Finland, have brought a strong mycophilic tradition for the collection, preparation and consumption of wild edible mushrooms (Boa 2006). "Les Russes sont reconnus pour leur passion (quoique non universelle) pour les champignons sauvages comestibles, comme en témoigne le mouvement à grande échelle des populations vers les forêts durant les week-ends. (Filipov 1998 in Boa 2006: 4)"¹⁶ In Karelia, the Finns are used to say: "Criant comme des Russes dans une forêt de champignons. (Boa 2006: 4)"¹⁷

Practices of gathering, consumption and sale of edible mushrooms in 21th-Europe century

Among these people with a mycophobic tradition, some, such as the Germany and the United-Kingdom, have become importers, while Belgium, Ireland, and the Netherlands have become the leading European exporters of edible mushrooms (Boa 2006: 107).

The European countries with the highest mushroom consumption have a long-standing local tradition of gathering and using wild edible mushrooms. In the case of the Slavic countries, Greece, Italy, Catalonia and the Basque Country in Spain, and Gascony and Provence in France (Boa 2006: 105-107). Globally, a total of 1,154 species of edible and culinary mushrooms have been documented. The species consumed in Europe vary from one country to another and even from one region to another within the same country (Boa 2006: 17). According to Duhart (2012: 6) "Tous les champignons considérés comestibles par une population ne sont pas également appréciés. Quand les uns sont appelés au service des meilleures tables, l'emploi de certains autres ne saurait être envisagé en dehors des cuisines les plus rustiques."¹⁸

In east-central Poland, the Mazovia region is where the mushrooms are most collected (Kotowski *et al.* 2019: 2). Mushrooms are frequently eaten and prepared in boiled or fried dishes. Many species are also preserved dried, pickled, or frozen after a brief boiling. The range of mushroom dishes and their processing techniques is very diverse (Kotowski *et al.* 2019: 8).

Today in Bulgaria, the 10 most collected mushroom species are The *Agaricus campestris* L., *Agaricus sylvaticus* Schaeffer, *Amanita caesarea* Scop.: Pers., *Boletus edulis* Bull., *Boletus pinophilus* Pilát &

Dermek, *Cantharellus cibarius* Fr., *Macrolepiota procera* Scop.: Singer, *Marasmius oreades* (Bolton) Fr., *Lactarius deliciosus* (L.) Gray, and *Suillus luteus* (L.) Roussel. These mushrooms are dried, frozen or eaten fresh (Uzunov & Stoyneva-Gärtner 2015a: 3). In Spain, the inhabitants of the The Castilla-La Mancha region have a long tradition of gathering and eating wild edible mushrooms (Fajardo J. *et al.* 2010: 351). Guíscanos mushrooms are preserved in oil, while *Lactarius deliciosus* (L.) Gray are preserved in vinegar. The mushrooms of cardo setas *Pleurotus eryngii* (DC.) are threaded on a string and dried. Some are cooked "a la chapa" with salt and oil, others are cooked with eggs in tortilla form (Fajardo J. *et al.* 2010: 352).

Figure 4 Map: Practices of gathering, consumption and sale of edible mushrooms in 21th-Europe century based on the work of (Boa 2006 : 105-107) and (Peintner *et al.* 2013)

Figure 5: Map legend (figure 8)

Food uses and culinary preparations of some wild edible mushrooms

All edible mushrooms are appreciated differently by different populations: "Fondées sur des critères de texture, de saveur ou de parfum, ces différenciations reposent uniquement sur l'exercice de l'arbitraire culturel propre à un lieu et à une époque. (Duhart 2012: 5)"¹⁹ In the 19th century Roques wrote: "Les champignons sont d'une grande ressource pour les Tartares, les Russes, les Polonais, les Allemands. En Italie, et surtout en Toscane, on fait usage d'une infinité d'espèces. Dans le Nord, on mange l'agaric poivré et quelques autres champignons laiteux, malgré leur saveur âcre et piquante. Dans nos départements, les ceps, les mousserons, les oronges, les champignons des prairies, les clavaires, etc., servent d'aliment au pauvre comme à l'homme riche. À Paris, où l'on ne mangeait, il n'y a pas longtemps, que les champignons de couche et les morilles, on voit maintenant les ceps sur les tables les plus délicates, et quelques amateurs y joignent la chanterelle, l'agaric élevé, la verdettes des Béarnais et l'agaric à feuilletés roses des pâturages. Nos soldats, qui ont parcouru en vainqueurs les principales parties de l'Europe, ont appris, en Italie, en Allemagne, en Pologne, en Russie, à faire usage d'un grand nombre de champignons, et cette nourriture leur a été quelquefois d'un grand secours. (Roques 1832: 25)"²⁰

Among Europe's best-known basidiomycete edible wild mushrooms, we've chosen boletes, morels, chanterelles and Caesar's mushrooms.

Among the best-known wild edible mushrooms in Europe, we've chosen to describe, here, the uses of 4 species of basidiomycete mushrooms: Porcini mushrooms and boletus, Morels, Chanterelles and Caesar's mushroom (Boa 2006; Peintner *et al.* 2013).

In addition, we will present recipes or culinary preparations specific to some regions or countries, which reflect the very high regard that some consumers have had for mushrooms for several centuries. In the 19th century, Roques wrote: "Les champignons ne fournissent pas seulement une nourriture substantielle et facile à préparer ; les grands maîtres de l'art leur font subir en outre une multitude de métamorphoses, les mêlent, les incorporent avec toutes sortes de viandes, de poissons, de légumes ; etc., et il en résulte de ces combinaisons diverses de mets délicieux dont les gourmands prédestinés connaissent tout le prix. Tourtes, pâtés de toute espèce, hachis, salmis, sautés, ragoûts variés de mille manières ; en un mot, tout ce qui fait l'ornement des festins s'embaume du parfum de ces cryptogames, et devient une source inépuisable de voluptés gastronomiques. (Roques 1832: 29)"²¹

Porcini mushrooms and boletus

Figure 6: The Cepe, Porcini mushroom *Boletus edulis* Bull.

Figure 6: Le Cèpe *Boletus edulis* Bull.

In contrast to the Caesar's mushroom, boletes were not favored by the Romans (Gaudreau *et al.* 2006: 19). In one of his epigrams, the poet Martial complained that he was only offered ordinary food: "Pourquoi ne me sert-on pas les mêmes plats qu'à toi ? Tu savoures des huîtres engraisées dans le lac Lucrin ; moi, je suce une moule dont l'écaille m'écorche la bouche. Tu manges de fins champignons [oranges], et l'on me sert qu'on donnerait aux pourceaux. (Verger *et al.* 1864 T. I : 148 in Gaudreau *et al.* 2006: 19-20)"²² In Pliny's book, the *Suilli porcini* mushrooms were considered as poisonous (Pliny the Elder L. XXII, XLVII § 1 par Littré 1850). According to André (1970), the term 'porcini' derived from the term 'suilli', which refers to boletus mushrooms.

In the 19th century, in the southwestern region of France, the Cep mushroom *Boletus edulis* Bull. became a sought-after and prized delicacy with a high market value. The women and children sold them fresh in baskets or strung on ropes (Duhart 2012: 8). Dried mushrooms, marinated in oil or preserved in vinegar and salt, formed a significant part of the trade. They were shipped in large quantities from southern France to Paris (Cordier 1876: 117-120).

Figure 7: Porcini mushrooms sellers in Pau

Figure 7: Vendeuses de Cèpes à Pau

In the southwest of France, several mushroom species were consumed with great relish. The residents of this region knew a multitude of ways to cook porcini mushrooms, their favorite mushroom species. In the farms of the Basses-Pyrénées, the masters, servants and workers used to feast on ceps cooked in the oven on a dish, and seasoned with oil, garlic and parsley (Cordier 1876: 142). For the recipe of *Cèpes à la Bordelaise*: " choisit les plus jeunes individus, ou du moins ceux dont la chair est ferme, blanche, parfumée, et après en avoir retranché l'hyménium ou la partie poreuse, ainsi que le pédicule, on les fait revenir pendant quelques instants sur le grill pour en dégager l'humidité surabondante. Puis on les presse légèrement entre deux linges, on les essuie et on les fait cuire avec de l'huile d'olive, du persil et de l'ail haché, du poivre et du sel. On ajoute, vers la fin, un peu de jus de citron. (Roques 1932: 63)"²³

In the same region, the bronze bolete *Boletus æreus* Bull. was highly sought after due to its pleasant flavour. Consumed as food and as a seasoning, it was sometimes eaten raw with pepper. The rural poor prepared it on the grill with a pinch of salt. The richer ones prepared it with olive oil, fresh butter, fat, salt, pepper and spices. It was served on the best tables: " apprêtés à la sauce blanche, en fricassée de poulet. (Noulet & Dassier 1838 : 24)"²⁴ They were prepared mushrooms in crusts, in matelote and in fritters. In Provence, dried boletes are used as a seasoning. It accompanies stews. It was served in soup accompanied by vermicelli, semolina or barley (Noulet & Dassier 1838: 25).

In Italy, boletes are currently among the best known and most sought-after mushrooms. They are included in the list of species that can be marketed fresh, dried or preserved and are very present in the markets (Sitta *et al.* 2021: 103). "Les italiens dominant le commerce intérieur (usines) et à l'étranger comme commerçants. Des volumes énormes sont importés de Chine, d'Europe de l'Est et d'Afrique du sud. (Boa 2006: 44)"²⁵ In Bulgaria in the early 1990's, a significant change took place with regard to mushrooms. After important political and economic changes, people became interested in mushrooms as food. In some mountainous regions, boletus *Boletus edulis* Bull., due to their commercial value, have become an important source of income for local people (Uzunov & Stoyneva-Gärtner 2015a: 3). In Siberia in the village of Tymlat, The Cep or Porcini mushroom and Rough Boletus have a great role for local people. They are an important food source, collected during the summer by all the families in the village, and consumed throughout the winter (Barbier 2021: 4).

Morels

Figure 8: Morel *Morchella esculenta* (L.) Pers.

Figure 8: La Morille *Morchella esculenta* (L.) Pers.

In France, morels have been highly sought after and prized for several centuries. When consumed fresh, marinated in oil, or dried, they add flavor to various sauces or accompany typical dishes. In the 19th century, the reputation of *Morchella esculenta* (L.) Pers. was widespread, and it delighted gourmets everywhere. It was widely consumed in Normandy, in the departments of Nord, Pas-de-Calais, Indre-et-Loire, Sarthe, etc... (Roques 1832: 40). Various methods of preservation were employed for them: "Les Morilles se gardent facilement entières et, si l'on veut, avec leur forme naturelle. Pour cela, on fait un trou à l'extrémité inférieure du pédicule ; on remplit le champignon, lequel est creux, comme l'on sait, de sable fin, et on le suspend la tête en bas ; lorsqu'il est sec, on fait tomber le sable. Le champignon préparé de la sorte conserve à peu près sa forme et son volume. (Cordier 1876: 122)"²⁶ However, more often than not, this morel was consumed fresh. One common preparation method involved cooking them with butter or fat, and sometimes with ham and spices. Another recipe was to stuff them, cook them in ham juice and serve them very hot in a sauce. In Toulouse, they were eaten stuffed like eggplants. They were garnished with breadcrumbs, parsley and garlic (Noulet & Dassier 1838: 179-181). In Agen, the cooks of the best restaurants included them in their recipes to prepare them in a very noble way: "Après les avoir lavées et bien essuyées, on les ouvre au bout du pédicule et on les remplit d'une farce fine où l'on fait entrer à volonté de la volaille, des anchois, de la chapelure de pain, des fines herbes, etc. On les fait cuire au jus de jambon et on les sert brûlantes. (Duhart 2012: 13)"²⁷ Even to this day, morels continue to enjoy great prestige and are consistently celebrated and elevated in the recipes of renowned chefs. "Au début des années 2000, *La terrine de foie gras à la compotée de canard, aux morilles et aux poires* ou *Le feuilleté aux asperges et aux morilles* figuraient notamment dans le répertoire printanier de Michel Lestrade, le chef du Phare de Moncrabeau. (Duhart 2012: 13)"²⁸

In Italy all morels are marketable fresh, dried, and canned. Today, morels are the most consumed genus of edible mushrooms in the world with an international commercial market of 1.5 billion Euros (Sitta *et al.* 2021: 145).

Chanterelles

Figure 9: Chanterelle *Cantharellus cibarius* (Fr.)

Figure 9: Chanterelle *Cantharellus cibarius* Fr.

In the mid-19th century, in some regions of southwestern France, *Cantharellus cibarius* Fr., the chanterelle, was considered a delicacy with its firm flesh and pleasant flavor. This mushroom was often dried to accompany stews. It was highly sought after in the vicinity of Pontacq (Dufour 1840: 127 in Duhart 2012: 6; Bergeret 1909: 872 in Duhart 2012: 6), while it was less appreciated by the people from Landes, who consumed it mainly as an omelet when other mushrooms were not available. At that time, there were several ways to prepare this mushroom: "Après avoir lavé et épluché les Chanterelles, on les passe à l'eau bouillante; ensuite on les fait cuire avec du beurre frais, un peu d'huile d'olive, de l'estragon, du poivre, du sel et un peu de zeste de citron. Lorsqu'elles sont cuites, on les laisse mijoter sur un feu doux pendant quinze ou vingt minutes, et on les arrose de temps en temps avec du bouillon ou de la crème, ou bien on les lie avec des jaunes d'œufs. (Roques in Cordier 1876: 141-142)"²⁹ In the south of France, chanterelles were often used in dishes that included candied duck legs (Roques in Cordier 1876: 142).

In Italy, chanterelles have been popular for a long time. They are harvested and consumed in many regions of the country. They are part of the list of species that can be sold fresh, dried and preserved. In Europe, these mushrooms are now very popular and are consumed in large quantities (Sitta *et al.* 2021: 121).

The Caesar's mushroom

Figure 10: The Caesar's mushroom *Amanita caesareae* (Scop.) Pers.

Figure 10: L'amanite de Césars *Amanita caesareae* (Scop.) Pers.

The Caesar's mushroom was very sought after and appreciated by the Romans. The Romans became very greedy, even gluttonous, when consuming it. Seneca described this attitude as follows: "Si rien n'est assez froid, rien non plus n'est assez chaud pour ces gens-là. Ils engloutissent presque fumants des champignons [*boletos*] qu'ils ont retirés du feu pour les avaler brusquement avec leur enveloppe. (Sénèque in Oltramare 1961: 206; Gaudreau *et al.* 2006: 18)"³⁰ One of the epigrams of the poet Martial (Marcus Valerius Martialis) also evokes this gluttony:

"Dis-moi quelle démente t'a frappé! Sous les regards de tes nombreux invités, / Seul, Cécilianus, tu manges gloutonnement des champignons [*boletos*]! / Que te souhaiterais-je qui soit digne d'une si vorace bedaine et d'une pareille goinfrerie? / Que tu avenes un champignon [*boletum*] du genre de celui qu'avalait Claude ! (Gaudreau *et al.* 2006 : 19)"³¹

Today, in Italy, Caesar's mushroom, which is still picked and consumed (Gaudreau *et al.* 2006: 18), is included in the list of species that can be marketed fresh, dried, or canned (Sitta *et al.* 2021: 34). Since ancient times, consumption practices have evolved. Currently, the prevailing trend is to consume Caesar's mushroom raw when it is in the form of an egg. The *ovoli* are very popular. In most regions of Italy, the law (L. 352/92) prohibits the harvesting of this species in the wild, but it does not prohibit its commercialization (Sitta *et al.* 2021: 34). In France, as early as the 17th century, Caesar's mushroom was a sought-after delicacy and considered a distinguished mushroom (Duhart 2012: 12). In the 19th century, Cordier describes the one way to prepare Caesar's mushroom: "[...] : en les coupant par tranches, qu'on enfile et qu'on expose à une douce chaleur dans un poêle, dans un four ou dans une étuve. Mais, dans cet état de dessiccation, elles perdent presque tous leurs principes odorants. On les conserve encore assez bien dans l'huile, après les avoir fait passer à un feu doux, afin de leur enlever leur humidité. Dès que l'huile paraît bouillonner dans le vase et que la surface se couvre d'une espèce d'écume, il faut les ôter et s'en servir. (Cordier 1876: 123)"³² Cordier mentions several recipes for cooking: "La meilleure manière d'apprêter l'Oronge consiste, après l'avoir dépouillée de sa peau et enlevé sa tige, à la faire cuire sur un plat, ou la lèchefrite ou autre vaisseau, sa cavité garnie de fines herbes, de mie de pain, d'ail, de poivre, de sel, et des hachures de sa tige, le tout arrosé d'huile. C'est ce qu'on appelle à la barigoule ou à la provençale. On ne peut rien manger de plus délicieux. (Paulet in Cordier 1876: 139)"³³ Today, Caesar's mushroom is still featured on restaurant menus in the southwestern region of France (Duhart 2012: 12).

Mushrooms and popular beliefs

According to some ancient beliefs, mushrooms sucked venom from the earth and could be poisoned by snakes and toads. Among the Romans, in the 1st century AD, some like Pliny, thought that the mushrooms called *boletes* were poisonous: "[...] s'ils se sont trouvés auprès du trou d'un serpent, s'ils ont été frappés de son haleine en commençant à s'ouvrir, par une affinité pour les poisons qui les dispose à prendre le venin. Aussi qu'on se tienne sur ses gardes jusqu'à ce que les serpents se cachent ! On aura pour signes tant d'herbes, tant d'arbres et d'arbrisseaux qui demeurent verts depuis leur sortie jusqu'à leur retraite [...]. (André 1970: 55)"³⁴ In Brittany in the 19th century, it was believed that: "Le venin de la terre, quand il s'accumule sur un point, donne naissance à des champignons. (Sébillot 1906 T. 3: 482)"³⁵ Other beliefs suggested that mushrooms, due to their sudden and mysterious appearance, were associated with toads and witches. According to some in Brittany: "Les champignons

croissent toujours auprès de la demeure des crapauds... Quand le crapaud veut prendre le frais, c'est sous un champignon qu'il s'abrite. (Rolland [1914] 1967 : 132)³⁶ In this region, mushrooms, toads and witches are closely related and are part of the infernal world. The mushrooms are called: "[...] Ronds de sorcières, et en dessous se trouvent des crapauds ; le nom de Trônes de crapauds, qu'ils portent en pays bretonnant, semble indiquer que ces batraciens, dont les accointances avec les sorcières sont fréquentes [...] s'en servent en guise de sièges. (Sébillot 1906 T. 3: 482)³⁷

Fairy rings

Mushroom rings, or annular mycelium, take the form of a colony of sporophores arranged in a more or less circular formation. Currently, the formation of fairy rings is scientifically explained. According to Moreno & Hernández (2005: 162) the spores of fungi are ejected at high speed from the gills arranged radially in the hymenium of the cap. When the spores fall to the ground and germinate, they form mycelium that spreads through the soil in search of nutrients. Typically, the hyphae of the mycelium grow equally in all directions and die in areas where the soil's nutrients are depleted, resulting in the living part of the fungus forming a ring that extends radially. When conditions are favourable (appropriate temperature and humidity), new mushrooms will grow in the new areas away from the centre, forming a circle, thus originating the so-called fairy rings. But for a long time, fairy rings or witch rings gave rise to all kinds of beliefs and superstitions. Hence the popular names: Fairy rings (Hartland 1913 in Dugan 2008: 31), "Cercles mystérieux" Mysterious circles, "Cercles de fées" Fairy circles or "Cercles de sorciers" Wizard circles (Sébillot: 1904-1907 re-ed. 1968: 202-204), "Ronds de fées" Fairy rounds or "Ronds de sorcières" Witch rounds (Rolland [1914] 1967: 179), "Corros de hadas" Fairy circles or "Corros de brujas" Witch circles (Fericglà 1994; Niell 2017: 61).

Figure 11: Plucked from the fairy rings

Figure 11: Cueilli dans le rond de sorcière

Since the 17th century, fairy or witch circles have been the subject of numerous stories and legends in France. According to local beliefs, fairies danced in circles in meadows, leaving circular imprints devoid of vegetation. In some regions, people believed that grass no longer grew where fairies had danced. In Berry, the fairy rings were considered as safe havens: "[...] les ronds formés par les pas des fées, sont regardés comme des asiles inviolables, toutes les fois que, sous le coup d'un danger quelconque, tel que poursuite de bête malfaisante, embûches ou attaques du diable ou de ses suppôts, on est à même de s'y réfugier. (Sébillot 1904: 205)³⁸ In other regions, on the contrary, these circles belonged to the infernal world: "C'est là, disent les vieillards, que se tient le sabbat, où lutins et sorciers, fées et diables se réunissent au clair de la lune et dansent des rondes qui forment ces cercles magiques où l'herbe se dessèche sous leurs pieds. (Sébillot 1904: 202)³⁹ Seen as omens of evil, these witches' circles filled the local people with dread. In the Creuse, lost travelers avoided with great care the magic circles where evil fairies had danced, for they risked being torn to pieces by these angry ladies (Sébillot 1904: 203). In another part of Basse-Bretagne: "[...] l'herbe brûlée en rond dans le pré montre que les *courils* y ont dansé au clair de lune. Les cercles où la puissance des exorcistes enfermait les conjurés, c'est-à-dire ceux qui, n'étant pas morts en état de grâce, venaient tourmenter les vivants, étaient toujours dépourvus de végétation à l'intérieur. (Sébillot 1904: 203)⁴⁰

In Wales, in the region of Breconshire, one should not enter a fairy circle: "When Anne Thomas was a girl, the children and she were all warned never to go inside a fairy-ring. When we was going to school, in the Celyn's meadow, there was fairy-rings, and grandfather did say we must mind and not put our foot inside the fairy-rings, else the fairies would have us" (Hartland 1913 in Dugan 2008: 31). As it transpired, this narrator knew of a man, who when coming home intoxicated from a fair, had heard music in the rings, had trespassed, and danced there in the ring. When he finally came out and went

home, years had elapsed, and all he knew were not to be found. Even worse could happen" (Dugan 2008: 31).

At times, these mysterious circles were seen in a positive light: "An ancient tradition has it that after the wee people had joined hands and danced together in a ring on a midsummer evening, their tracks were to be seen as fairy-rings on the meadows, and the toadstools growing in them did but serve as seats for tired elves

And nightly, meadow-fairies, look you sing

Like to the Garter's compass, in a ring

Th' expressure that it bears, green let it be

More fertile fresh than all the field to see" (Rolfe & Rolfe 1925: 8).

In England, the mysterious circles were thought to mark the path of dancing fairies and bring good luck to the houses situated in the fields where they appeared (Ramsbottom 1923 in Rolfe & Rolfe 1925: 10-11). In Germany, the clear part of the ring marked where a glowing dragon had rested after its nightly wanderings. A widespread belief was that these rings indicated the presence of treasures that could not be obtained without the help of fairies or witches (Ramsbottom 1923 in Rolfe & Rolfe 1925: 10-11).

Today, in the Monts d'Arrée in Brittany, a mushroom-shaped stone is one of the sites in the Legendary Huelgoat Forest (De Parades 1959). The fact that this mushroom-shaped stone site is adjacent to the sites of the Devil's Cave, the Household of the Virgin, the Cave of Artus and the Fairy Pool may be a sign of the special significance that the locals attributed to mushrooms.

Figure 12: Mushroom panel (Brittany: Forest of Huelgoat)

Figure 12 : Panneau champignon (Bretagne: Forêt de Huelgoat)

Figure 13: The "mushroom rock" (Brittany: Forest of Huelgoat)

Figure 13 : La pierre champignon (Bretagne: Forêt de Huelgoat)

Sacred mushrooms and magico-religious rituals

The use of mushrooms in magic-religious rituals dates back to the dawn of time. The oldest representations of these rituals are Paleolithic rock paintings found in the Sahara (Uzunov & Stoyneva-Gärtner 2015: 2). In Europe, a Neolithic-era rock painting was discovered in Spain in the cave of Selva Pascuala. In Bulgaria, two other rock paintings, dating to the Neolithic and Bronze Age, were found in the Magurata Cave (the Vidin District) and in Cave Number 2961, located near the village of Baylovo (the Sofia District) (Uzunov & Stoyneva-Gärtner 2015: 2)

Figure 14: Rock painting

© (Uzunov & Stoyneva-Gärtner 2015) *Ithyphallic scenes and fungus fromcaveMagurata, guano paintings*

Figure 14: Fresque rupestre

© (Uzunov & Stoyneva-Gärtner 2015) *Ithyphallic scenes and fungus fromcaveMagurata, guano paintings*

In Bulgaria, a substance extracted from some mushrooms was consumed during sacred ceremonies. The fact that the image of a mushroom appears twice in the depictions of the religious rituals indicates the great importance of these practices (Uzunov & Stoyneva-Gärtner 2015: 2). If there are doubts about the identification of the species of the mushroom represented in the fresco in the cave of Magurata, it is certain that some mushrooms, such as *Amanita muscaria* (L.) Lam. or *Psilocybe semilanceata* (Fr.), were used in Europe during magic-religious rituals.

Figure 15: The fly agaric *Amanita muscaria* (L.) Lam

Figure 15: L'amanite tue-mouche *Amanita muscaria* (L.) Lam.

The first reports of the ritual use of *Amanita muscaria* (L.) Lam date back to the 18th century. They were documented by the Swedish geographer Philip Johan von Strahlenberg upon his return from a journey to Kamchatka. For the first time, the Western world discovered the circumstances under which the Korjak tribes of Kamchatka consumed fly agaric and its effects (Pavlovna Wasson & Wasson, 1957, Vol. 1: 190). Later, it was discovered that the consumption of *Amanita muscaria* was also prevalent among the Ostyak tribes along the Ob and Yenisei rivers in Western Siberia. The ingestion of fly agaric allowed them to enter trance states and communicate with the supernatural world during sacred rituals led by a shaman. The shaman, considered the sacred leader and medicine-man of the community, was the only one to possess "*la maîtrise du feu*" and to practice "*le vol magique*" (Sueur *et al.* 1999: 15)" During sacred rituals, the shaman, who was aware of the hallucinogenic effects of the mushrooms, would directly consume *Amanita muscaria*. Community members participating in the ritual, without the shaman's experience, would ingest the shaman's urine containing diluted alkaloids (Meyers & Paring in Sueur *et al.*, 1999: 15).

In the early 19th century, Georg Heinrich von Langsdorff, in turn, observed the uses and consumption practices of *Amanita muscaria* among the Koryak and Kamchadal peoples. Unlike the Kamchadals, who replaced the amanita with vodka, the Koryaks still cherish Amanita and are willing to trade their reindeer to obtain it. What Langsdorff precisely described were the uses and effects of urine after consuming amanita. A person who has ingested *Amanita* can, after consumption, drink its urine to prolong the hallucinogenic effects of Amanita for several days (Gaudreau *et al.*, 2010: 97-98). In 1871, Paolo Mantegazza described other uses of the *Amanita muscaria*: "Presso di noi l'agarico moscato è un veleno o per caso o dietro particolari manipolazioni gastronomiche un cibo innocente; mentre in Siberia e nel Kamtschatha forma la delizia narcotica dei Tongusi, degli Jakuti, degli Jukagiri e degli Ostiaki, sotto il nome di muchumor. [...] Una o due ore dopo aver preso l'amanita, sene provano i primi effetti di eccitamento. Si è allegri e tumultuosi, or si balla, ed or si canta, si ciarla di tutto, ma soprattutto di cose liete; si hanno singolari allucinazioni, per cui si fanno salti enormi per passare oltre un fuscello di paglia, e simili altri esercizi ginnastici. Pare che nello stesso tempo la forza muscolare sia di molto accresciuta (Mantegazza 1871, II: 589-590; Samorini 2001: 17-18)."⁴¹ "La cosa più singolare nell'ebbrezza del fungo siberiano è questa: che il principio narcotico passa nelle orine e che queste si sogliono bere da quella gente per rinnovare l'ebbrezza con piccola spesa. Ora sono i servi, che bevono le orine dei loro pa droni; ora sono alcuni amici che messisi assieme con molta economia si vanno ubbriacando per parecchi giorni di seguito, dacchè è provato, che l'orina che ha fatto il giro di quattro e fin di cinque organismi, conserva sempre le stesse preziose virtù inebbrianti. (Mantegazza 1871, II: 589-591; Samorini 2001: 17-18)"⁴²

In the 1990s, Maret Saar, an ethnomycologist at the Estonian Academy of Sciences, conducted new ethnographic research in Siberia. His research revealed that *Amanita muscaria* (L.: Fr.) was still being consumed by the Chuka, Coriachim Itelmen, Eskimo, Chuvanian, Yukaghir, and Eren peoples during magic-religious rituals. Regarding the Khanty and the Yungan, he reported: "Quando un bambino è malato, i genitori vogliono conoscere se si tratta di un flagello di Dio o cos'altro. Il padre del bambino mangia l'agarico muscario per evocare una formula magica. Egli cade nel sonno e nei suoi sogni vede manichini alti metà dell'altezza umana. I manichini chiedono all'uomo perché ha mangiato il fungo. L'uomo spiega il suo desiderio e inani danno la risposta (..) Durante un singolo sogno i nani possono apparire molte volte, ogni volta dando un poco di informazione in più (Saar 1991 in Samorini 2001: 19-20)."⁴³

Even today, in the northern Kamchatka Peninsula, *Amanita muscaria* is central to many aspects of daily life. The mushroom, known as V'apaq, plays an important social and intergenerational role. Through the practices of gathering, drying, preparing, and consuming it, it helps to weave and maintain the bonds of mutual aid and solidarity within the community (Barbier 2021: 3). In this culture, fly agaric is

said to possess great powers. The fly agaric possesses great powers. It has memory, sensory and communication abilities, and it sees and perceives everything: "elle est comme une éponge [...], comme le cerveau d'une personne, [...] elle pousse [ou grandit] et garde toutes les informations. (Barbier 2021: 9)"⁴⁴ It functions as a collector of images and sounds, gathering everything "on vsě sobiraet" (Barbier 2021: 9). For all these reasons, it is important to be in good spirits and to respect this mushroom during all stages of handling, preparation, and consumption. Before picking it, one must dance and sing. Then, during the gathering, it is necessary to unearth the entire Amanita with caution and gentleness, without damaging or harming it. "Les cueilleurs de Tymlat expliquent qu'une personne qui mangerait un chapeau (šapka) sans son pied (noga) se trouverait sans jambes au moment des hallucinations ; au contraire, manger un pied seul aurait pour conséquence de 'perdre la tête' pendant l'expérience. Si l'une de ces parties était arrachée ou abîmée pendant la cueillette, le consommateur ferait l'expérience désagréable de voir cette lésion apparaître sur lui-même. (Barbier 2021: 8)"⁴⁵ Subsequently, the mushrooms are dried in the open air or in a dry and warm place by the elder women of the village. Finally, the Amanita is consumed for visionary purposes during ceremonies or festivals. During these festivals, the consumption of Amanita is not reserved solely for the shaman. All members of the community can consume the mushroom and communicate with entities from the invisible world. These collective visionary experiences allow the reception and interpretation of information about the future. Today, it is often the elderly, particularly women, who possess the ability to understand and interpret the messages of the Amanita visionary mushroom. It is frequently these women who pass down the traditions to the younger generation. This signifies an important transformation in the traditions related to the use and consumption of fly agaric. Although fly agaric is still consumed during rituals or ceremonies, the practices of picking, drying, and consumption have evolved, partly due to Sovietization. Many traditions have disappeared or been transformed.

Conclusion

Through this article, we have demonstrated that wild edible and poisonous mushrooms have been known and used by humans since time immemorial. Knowledge and the uses of mushrooms have evolved over the centuries in response to cultural, medicinal knowledge, dietary behaviours, economic, and ecological changes. As far back as the Neolithic period, in Europe and Siberia, lignicolous mushrooms were employed for igniting and carrying fire. Over the centuries, lighting practices were refined, particularly through the use of tinder primed with saltpetre, and they were superseded at the beginning of the 20th century by lighters and other lighting methods.

The medicinal uses of mushrooms have also undergone significant evolution. Some mushrooms, such as lignicolous mushrooms, were utilized for cauterizing wounds until the early 20th century. Their use ceased with the advent of new cauterization methods. During the 20th century, "modern European medicine" abandoned the use of mushrooms and showed only limited interest in their medicinal properties. However, a shift has occurred in the last twenty years. Today, much research is focused on the cosmetic properties or the antitumoral potential of some species, such as the reishi or immortality mushroom. The integration of some mushroom species in medicine and cosmetics reflects the growing interest in fungi. This renewed interest in mycology is associated with a transformation in the way certain populations perceive and understand fungi. Until the 1950s, the existence of mycophobic and mycophilic European populations identified by (Pavlovna Wasson and Wasson 1957) was real and significant. Today, this cultural and behavioural dichotomy has clearly evolved.

As a consequence of changes in the way wild edible mushrooms are harvested, consumed, and traded, many countries now serve as importers, exporters, and consumers of wild and cultivated edible mushrooms (Boa 2006). This signifies a significant transformation in these populations. On the other hand, among populations identified as mycophiles and mycophagous, the practices of gathering and consumption have been preserved. They have sometimes evolved with respect to the species consumed and the number of gatherers, which has significantly increased in some regions or countries. Finally, if the perception and understanding of mushrooms have evolved over the centuries, it is

especially in the realm of popular beliefs that this evolution has been most profound. It is highly unlikely that any European countryman or farmer now avoids a witch's circle for fear of being ensnared by a demonic being from the infernal world. Nevertheless, there are still inhabitants of Siberian villages who continue the rituals of gathering, preparation, and ceremonies involving the fly agaric *Amanita muscaria*, a sacred mushroom considered to be the great spirit. The cultural and behavioural dichotomy has clearly evolved.

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Figure 1: *Fomes fomentarius* (L.) FR.



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Figure 2: Lighting the fire

Figure 2 : Champignon allume-feu



Photo © Bertrand Roussel

Figure3: Cap

Figure 3: Casquette



Photo © Bertrand Roussel

Figure 4 Map: Practices of gathering, consumption and sale of edible mushrooms in 19th-Europe century based on the work of (Boa 2006 : 105-107)



Map modified from Pixabay License-Europe carte la géographie
<https://pixabay.com/fr/illustrations/europe-carte-la-géographie-587511/>

Figure 5: Map legend (figure 8)

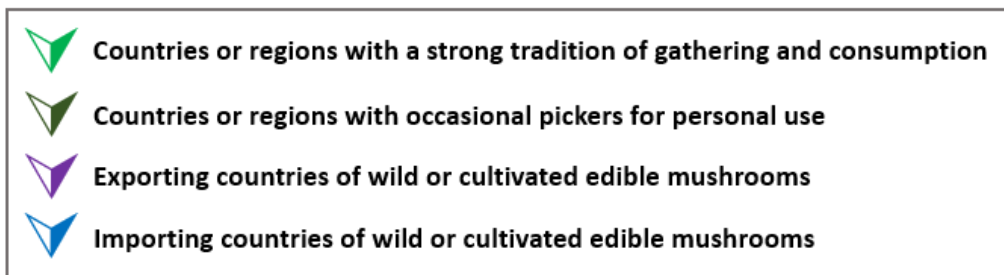


Figure 6: The Cepe, Porcini mushroom *Boletus edulis* Bull.

Figure 6: Le Cèpe *Boletus edulis* Bull.



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Figure 7: Porcini mushrooms sellers in Pau

Figure 7: Vendeuses de Cèpes à Pau



© Edouard Pingret 1834
 Wikimedia-<https://fr.wikipedia.org/wiki/Cèpe#/media/Fichier:Pyrénées>

Figure 8: A species of morel

Figure 8: Une espèce de Morille



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Figure 9: Chanterelle *Cantharellus cibarius* (Fr.)

Figure 9: Chanterelle *Cantharellus cibarius* (Fr.)



© Pierre Roux

The Caesar's mushroom

Figure 10: The Caesar's mushroom *Amanita caesareae* (Scop.) Pers.

Figure 10: L'amanite de Césars *Amanita caesareae* (Scop.) Pers.



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Figure 11: Plucked from the Fairy Circle Figure 16: Cueilli dans le cercle des fées



© T. H. Thomas 1880

[https://commons.wikimedia.org/wiki/File:Plucked from the Fairy Circle.png](https://commons.wikimedia.org/wiki/File:Plucked_from_the_Fairy_Circle.png)

Figure 12: Mushroom panel (Brittany: Forest of Huelgoat)

Figure 12: Panneau champignon (Bretagne: Forêt de Huelgoat)



© Carole Chauvin-Payan

Figure 13: The "mushroom rock" (Brittany: Forest of Huelgoat)

Figure 13: La pierre champignon (Bretagne: Forêt de Huelgoat)



© Carole Chauvin-Payan

Figure 14: Rock painting

Figure 14: Fresque rupestre



Ithyphallic scenes and fungus from cave Magurata, guano paintings

© Uzunov & Stoyneva-Gärtner 2015

Figure 15: The fly agaric *Amanita muscaria* (L.) Lam

Figure 15: L'amanite tue-mouche *Amanita muscaria* (L.) Lam



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Notes

¹ "This addition of saltpetre makes one more prone to catching fire than the other. Indeed, the cottony substance of agaric-amadou ignites with difficulty without this preparation; but when boiled in a nitrous water, being impregnated with this salt,

it becomes much more susceptible, saltpetre here having the same effect as in gunpowder, that is, sparkling in a noticeable manner, and by this sparkling giving action to the fire, thereby increasing its activity." (Paulet 1793 T. II: 89)

2 "After exposing the tinder fungus in a cool environment or in a cellar to soften it slightly, it is then sliced into thin slices; the part where the mushroom adhered to the tree is discarded, and the tubes are also removed. These slices are then beaten on a smooth stone or a wooden block with a wooden mallet. They are then arranged in layers in a large iron pot or cauldron; enough water is added to ensure that everything floats, and saltpetre is added according to the amount of tinder fungus. The mixture is boiled for half an hour or an hour. After this time, the slices are removed and allowed to dry slowly in the shade or in a moderately warm place; then the beating process is repeated. Sometimes, instead of boiling the tinder fungus slices, they are simply placed in lye ashes and given two or three heats of this boiling lye." (Persoon1818: 92)

3 "[...] to place glowing pieces of tinder fungus on the patient's skin near the organ or part of the body to be treated." (Buller 1914 in Roussel *et al.* 2002a: 601)."

4 "Those from Kamchatka and Siberia use it to form cones or cylinders of fire, which they apply, following the example of the Chinese and Japanese who use moxa on certain parts, in order to remedy especially joint pains. [...] They shape a cone or cylinder with tinder tightly bound by a band, which they apply to the area, lighting one end until it reaches the live flesh. This method is nothing extraordinary; its use has been established for a very long time among the Easterners, especially among the Egyptians [...]" (Paulet 1793 T. II: 90)

5 Colourful umbrellas; Scattered through the woods; Not good for the sun, But for... cooking food. (Dincă *et al.* 2016 : 123)

6 "We have several species, and what is fortunate is that there are few harmful ones. The black and the red ones are particularly harmless, provided they are picked in time. [...] We eat the black mushroom when it has just been picked, and then it is prepared in several ways; it is dried and makes good garnishes for stews. The red mushroom has two stages; it first emerges from the ground folded in a white envelope, and then it has the shape of an egg more or less big; seized in this state which lasts only a few hours, it is an exquisite and healthy dish. When it has broken its envelope, it appears like a yellow-red umbrella; they can be found from 3 to 9 inches in diameter. They are eaten cooked in oil or stuffed and grilled." (Béronie 1824 : 220 in Chauvin-Payan 2018 : 348)

7 "Boletus, boletus, little boletus, help me find your equal." (Rolland [1914]1967 T. XI: 161)

8 "Your mother is in Leitouro, Will return early, Carrying mushrooms. // Year of abundance of cep mushrooms, year of misery." (Mistral 1878: 478)

9 "Most Provençal people enjoy mushrooms cooked on the grill." (Mistral 1878: 438)

10 "The boletes/ceps have made their appearance on our market." (Mistral 1878: 326)

11 "I asked about many places in the inland of Galicia and almost everyone just said they knew mushrooms as 'pan de sapo' (toad bread), 'pan de culebra' or 'pan de cobra' (snake bread), 'pan de raposo' (fox bread), and when someone asks if they eat them, it surprises them visibly and some women still cross themselves." (Leivas & Garcia-Garabal 2002: 2)

12 "Better a lost mushroom than eaten" "If you want to die, gather mushrooms blindly." (Leivas & Garcia-Garabal 2002: 4)

13 "You must not eat that, children, it's poison. They are poisonous..." (Atlas Linguistique et Ethnographique de Bretagne Romane ALBRAM in Chauvin-Payan 2004: 338).

14 "[...] mushrooms almost all lumped together under the generic term of 'dog's piss', are the venom of the earth, are bad blood that comes out in pustules." (Sébillot 1904-1907; reprint 1968: 491).

15 "Except for exceptions, the farmers in our area are not well-versed in mushrooms, which they do not eat because they fear poisoning themselves. As examples, we cite a few responses from witnesses: 'Around here, it's not mushroom country, I'd rather eat a potato than a mushroom.' 'Oh, I don't want any of that, I'm afraid of poisoning myself!' 'It's more about being cautious.' (ALIFO)"

16 "The Russians are known for their passion (although not universal) for wild edible mushrooms, as evidenced by the large-scale movement of people towards forests during weekends." (Filipov 1998 in Boa 2006: 4)

17 "Screaming like Russians in a mushroom forest." (Boa 2006: 4)

18 “Not all mushrooms considered edible by a population are equally appreciated. While some are called upon to grace the finest tables, the use of certain others could only be contemplated in the most rustic kitchens.” (Duhart 2012: 6)

19 “Based on criteria of texture, taste, or fragrance, these differentiations rely solely on the exercise of cultural arbitrariness specific to a place and time.” (Duhart 2012: 5)

20 “Mushrooms are a great resource for the Tartars, Russians, Poles, and Germans. In Italy, especially in Tuscany, an infinity of species is used. In the North, people eat the peppered agaric and a few other milky mushrooms, despite their bitter and pungent taste. In our departments, ceps, fairy-ring mushrooms, porcini mushrooms, meadow mushrooms, coral mushrooms, etc., are used as food for the poor as well as the rich. In Paris, where not long ago only cultivated mushrooms and morels were eaten, ceps are now seen on the most delicate tables, and some enthusiasts add chanterelles, wood blewits, greengills from Béarn, and pink-gilled agarics from pastures. Our soldiers, who have marched victoriously through the main parts of Europe, have learned, in Italy, Germany, Poland, and Russia, to make use of a large number of mushrooms, and this food has sometimes been of great help to them.” (Roques 1832: 25)

21 “Mushrooms not only provide substantial and easy-to-prepare food; the great masters of the culinary art also subject them to a multitude of transformations, mixing them, incorporating them with all kinds of meats, fish, vegetables, etc., resulting in various combinations of delicious dishes that connoisseurs appreciate. Pies, pastries of all kinds, minced dishes, fricassees, sautés, varied stews in a thousand ways; in short, everything that adorns feasts is imbued with the fragrance of these cryptogams, becoming an endless source of gastronomic delights.” (Roques 1832: 29)

22 “Why am I not served the same dishes as you? You savor oysters fattened in Lake Lucrin; I, on the other hand, suck on a mussel whose shell scrapes my mouth. You eat fine mushrooms [porcini], and I am served what one would give to pigs.”

23 “The youngest individuals are chosen, or at least those with firm, white, fragrant flesh, and after removing the hymenium or the porous part, as well as the stem, they are briefly grilled to release excess moisture. Then they are lightly pressed between two cloths, dried, and cooked with olive oil, parsley, chopped garlic, pepper, and salt. A little lemon juice is added towards the end.” (Roques 1932: 63)

24 “Prepared in white sauce, as chicken fricassée.” (Noulet & Dassier 1838: 24)

25 “The Italians dominate both domestic (factories) and international trade as merchants. Enormous volumes are imported from China, Eastern Europe, and South Africa.” (Boa 2006: 44)

26 “Morels can easily be kept whole, and, if desired, in their natural form. For this, a hole is made at the lower end of the stem; the mushroom, which is hollow, as is known, is filled with fine sand, and then it is suspended upside down; when dry, the sand is shaken out. The mushroom prepared in this way retains its shape and volume almost perfectly.” (Cordier 1876: 122)

27 “After washing and drying them well, they are opened at the end of the stem and filled with a fine stuffing which can include poultry, anchovies, breadcrumbs, herbs, etc., as desired. They are cooked in ham juice and served piping hot.” (Duhart 2012: 13)

28 “In the early 2000s, dishes such as the terrine of foie gras with duck compote, morels, and pears or the puff pastry with asparagus and morels were notably featured in the spring repertoire of Michel Lestrade, the chef of Phare de Moncrabeau.” (Duhart 2012: 13)

29 “After washing and peeling the Chanterelles, they are blanched in boiling water; then they are cooked with fresh butter, a little olive oil, tarragon, pepper, salt, and a bit of lemon zest. Once cooked, they are allowed to simmer over low heat for fifteen or twenty minutes, and are occasionally basted with broth or cream, or thickened with egg yolks.” (Roques in Cordier 1876: 141-142)

30 “If nothing is cold enough, nothing is hot enough for these people either. They gulp down almost steaming mushrooms [boletos] that they have taken off the fire to swallow them abruptly with their skin.” (Seneca in Oltramare 1961, Gaudreau *et al.* 2006: 18)

31 “Tell me, what madness has struck you! In front of your numerous guests, / Alone, Cécilianus, you greedily devour mushrooms [boletos]! / What could I wish for you that would be worthy of such voracious gluttony? / May you swallow a mushroom [boletum] akin to the one that choked Claudius!” (Gaudreau *et al.* 2006: 19)

32 “[...] by slicing them, threading them onto skewers, and exposing them to gentle heat in a pan, oven, or drying oven. However, in this dried state, they lose almost all of their aromatic properties. They can also be preserved quite well in oil, after being gently heated to remove moisture. As soon as the oil appears to bubble in the vessel and the surface is covered with a kind of foam, they should be removed and used.” (Cordier 1876: 123)

33 “The best way to prepare the Porcini mushroom is, after removing its skin and stem, to cook it on a dish, or roasting pan, or other vessel, its cavity filled with herbs, breadcrumbs, garlic, pepper, salt, and chopped stem, all drizzled with oil. This is what is called 'à la barigoule' or 'à la provençale'. There is nothing more delicious to eat.” (Paulet in Cordier 1876: 139)

34 “[...] if they have been found near a snake hole, if they have been struck by its breath as they begin to open, by an affinity for poisons which predisposes them to absorb venom. So be on guard until the snakes retreat! You will have as signs so many herbs, so many trees and shrubs that remain green from their emergence to their retreat [...]” (André 1970: 55)

35 “The venom of the earth, when it accumulates in one spot, gives rise to mushrooms.” (Sébillot 1906 Vol. 3: 482)

36 “Mushrooms always grow near the dwelling of toads... When the toad wants to cool off, it is under a mushroom that it seeks shelter.” (Rolland [1914]1967 Vol. XI: 132)

37 “[...] Witch's rings, beneath which toads are found; the name 'Toad Thrones', as they are called in Breton-speaking regions, seems to indicate that these amphibians, who frequently associate with witches [...] use them as seats.” (Sébillot 1906 Vol. 3: 482)

38 “[...] the circles formed by the footsteps of fairies, are considered inviolable sanctuaries, whenever, under the threat of any danger, such as being chased by a malevolent beast, traps or attacks from the devil or his minions, one can take refuge there.” (Sébillot 1904: 205)

39 “There, say the elders, is where the Sabbath is held, where goblins and witches, fairies and devils gather in the moonlight and dance in circles that form these magical rings where the grass withers beneath their feet.” (Sébillot 1904: 202)

40 “[...] the grass burned in a circle in the meadow shows that the korrigans danced there in the moonlight. The circles where the power of exorcists enclosed the conjured, that is to say those who, not having died in a state of grace, came to torment the living, were always devoid of vegetation inside.” (Sébillot 1904: 203)

41 “Near us, the fly agaric is either a poison by chance or, through particular gastronomic manipulations, an innocent food; while in Siberia and Kamchatka, it forms the narcotic delight of the Tongus, Yakuts, Yukaghirs, and Ostyaks, under the name of muchumor. [...] One or two hours after taking the Amanita, the first effects of excitement are experienced. One is cheerful and tumultuous, now dancing, now singing, chatting about everything, but above all about happy things; there are singular hallucinations, whereby enormous jumps are made to cross over a blade of straw, and similar other gymnastic exercises. It seems that at the same time muscular strength is greatly increased.”

42 “The most peculiar thing about the intoxication caused by the Siberian mushroom is this: that the narcotic principle passes into the urine, and this is customarily drunk by those people to renew intoxication at little expense. Now it is the serfs who drink the urine of their masters; now it is some friends who, having gathered together with much economy, continue to get drunk for several days in a row, since it is proven that urine that has circulated through four or even five organisms always retains the same precious intoxicating virtues.” (Mantegazza 1871, II: 589-591; Samorini 2001: 17-18)

43 “When a child is sick, parents want to know whether it is a scourge of God or something else. The child's father eats the fly agaric to evoke a magical formula. He falls asleep and in his dreams sees dolls half the height of humans. The dolls ask the man why he ate the mushroom. The man explains his desire, and in vain they give the answer (...) During a single dream, the dwarfs can appear many times, each time giving a little more information.” (Saar 1991 in Samorini 2001: 19-20)

44 “It's like a sponge [...], like a person's brain, [...] it absorbs [or grows] and retains all the information.” (Barbier 2021: 9)

45 “The Tymlat gatherers explain that a person who would eat a cap (šapka) without its stem (noga) would find themselves without legs during hallucinations; conversely, eating only the stem would result in 'losing the head' during the experience. If either of these parts were torn off or damaged during harvesting, the consumer would have the unpleasant experience of seeing this injury appear on themselves.” (Barbier 2021: 8)

