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Article

Mushrooming Communities: A Field Guide to Mycology in Community Forests

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Abstract: Forest community connections are crucial to ensure forest stewardship and sustainability. We set to explore the potential of mushrooming to enable such connections in contexts were these were historically broken, alienating local people from forests. Taking the case of the recent devolution of a community forest in central Portugal (*baldios*) to the local population, the authors present a five-year pilot project to rework mycology from a mushroom-centered approach to a mushroom-in-*baldios* approach. Mushrooms were used as an entry-point to connect the forest ecology with the challenges of governance and community building. The devised activities provided an opportunity for people inside and outside the local community to adventure into the woods, find about their socio-ecological history, develop communal and convivial relationships and engage in the responsible gathering of wild mushrooms. However, the hosting of mushroomers to know, value and engage with the community forest recovery is constantly worked against the enclosure of mushrooms to provide marketable forms of leisure. The outcome will depend on the relationships established between mushrooms, mycologists, local administrators, commoners and poachers, operating within a framework that favors the eradication of resources instead of the long-term relationships that sustain places.

Keywords: common lands; *baldios*; wild mushrooms; non-timber forest products; Portugal; multifunctional forestry; community; community forestry; local values; forest governance

1. Introduction

Mushrooming is a naturalistic tradition with the potential to engage its practitioners in a responsible relationship with the environment, especially forests. As the mycelia of mushrooms connect the trees with dead matter and lively microbial others [1], their fruiting bodies provide the ground for people to experience nature, value it and intimately connect it to human sociability [2]. Such valuation of nature and the diverse creatures inhabiting the woods is essential to connect people to the stewardship of forests [3], especially when such connections were broken resulting in the eradication of forest goods, socio-environmental degradation and occasionally, land abandonment [4].

Mushrooming is a recreational practice mostly undertaken by city dwellers that seek refuge from overwhelming and emotionally exhausting lives, in search for communal ways to share the pleasures and wonders of knowing about mushroom secrets, eating wild delicacies and being together in nature. Wild mushrooms are culturally understood by many persons as natural gifts [5], and together with other non-timber forest products (NTFPs) are gathered informally by a wide number of people in unenclosed forests, regardless of the land ownership regimes [6]. However, the official attitudes towards this practice vary substantially within countries. In Europe, while in some northern countries the gathering of wild mushrooms for recreational purposes constitutes everyman's right [7], in some

eastern countries the practice may be against formal rules but informally tolerated [8] and in southern countries this right is exclusively entitled to the forest owner [9].

The responsible mushroomer searches to minimize the damages to the species that he or she meets during its walks. These ethical codes are expressed by many mycological associations in its field guides and field trips. Intimate knowledge between the mushroom wanderer and the space develops through multiple visits that allow finding the "mushroom hot spots" to which he and she can return every year. As a recreational practice, mushrooming is more interested on knowing species diversity and the pleasure of finding a meal in the woods than into making profit out of wild mushrooms [2]. It is also interested in local habits to expand the knowledge on mushrooms for food, medicine and spirituality [10].

However, mushroomers face increasing regulation due to the widespread overpicking of commercially valued species, that can be particularly violent outside capitalist, state and moral forms of control [5]. Simultaneously, they struggle against forest simplification and degradation which fuel the continuous alienation of people from forest spaces. When mushrooms and forests are captured by salvage capitalism, the accumulation of capital becomes the single purpose preventing people from developing substantive and radicative relationships among themselves and the forest [11]. Although mushroomers educate the public about the importance of fungi and press for respectful ways of protecting, using and being in nature, they do not own or manage of the forests. As such, their capacities to engage directly in the stewardship of the fungi and the forests they visit are limited.

The community involvement in forestry has been multiple times presented as a panacea to overcome the past and ongoing mistakes of forest models of development which alienate people and fail to benefit the local populations. This is the case of community forestry, which can enhance local control over common spaces under multiple arrangements and institutional regimes historically established [12]. As higher the local control, higher are the expectations that forests can finally provide for multifunctional purposes, quality jobs and a fair distribution of the revenues. A central aspect for the success of community-based initiatives is its ability to create sustainable connections among themselves and the place they live in [13]. Although challenging, local governance of common spaces can engage local populations in its stewardship, and thus promote sustainable practices.

The pressure for alternative forms of forestry places NTFPs as the best way to reconcile sustainable forestry with rural development. Local communities are thus encouraged to commercially explore these resources to generate sustainable economies. However, when it comes to wild mushrooms, the critique is twofold. On one hand, commercialization of NTFPs disregards that informal practices of gathering wild species are integral to people's lives [6]. On the other hand, the fruiting patterns of wild species are unpredictable with extreme variations over space and time. Thus, the commercial viability of wild mushrooms frequently depends more upon mobile harvesters than upon local residents. In fact, mobile harvesters might come to be the best resource stewards, as they have a deeper knowledge on the variability of mushroom availability across larger areas and may develop a sense of place overtime [14].

In the Iberian Peninsula, landowners are trying to overcome these problems. In Galicia, some local communities are using mycorrhization techniques to enhance fungal productivity and are closing the access to outsiders [15]. In some provinces of Spain, forest administrations are undertaking pilot projects to sale permits to harvesters, which entitle them to pick wild edible mushrooms [9]. The latter aims to satisfy the personal recreational need to gather wild mushroom species through a market form. However, it remains to be known if the need for sociality that emerges from sharing the joys of mushrooms with an empathetic community can be fully satisfied in this format.

In Portugal, we set to explore a different possibility to promote the stewardship of fungi and community forests. To what extent can mushroomers and local communities mutually reinforce each other to strength the connection between people and forests, supporting woodland restoration and the responsible gathering of wild mushrooms, without shutting the access to outsiders?

We detail a five years' pilot project to essay the potential of mushrooming into the stewardship of common lands in Portugal (named *baldios*), along the recovery of a communal forest. This research resulted from a collaboration protocol between the Centre for Social Studies of the University of

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Coimbra and the Community of Commoners from the *baldios* located at Vilarinho, Lousã, with the expertise and guidance of the Regional Center for Multidisciplinary Research of the National Autonomous University of Mexico in academia-community relationships. The authors conducted extensive fieldwork along these years and were actively involved in the design, preparation, implementation and evaluation of the activities mentioned, organized and attended the forays and training courses, conducted focus groups with the participants, attended most of the meetings and commoners' assemblies, and compiled detailed field notes. They also conducted document analysis and in-depth interviews to key forest actors in the common lands and state administration, forest owner associations, forest technicians, lawyers and key scientists to examine and situate community forestry the context of Portugal. Additionally, the leading author is an amateur mycologist and a mushroomer since the last twenty years, participated in mycological associations and diverse forays across the country.

The paper is organized in four sections. In the first section, we provide the context for community forests and access to wild mushrooms in Portugal. In the second section, we characterize the setting where the research activities took place. In the third section, we describe the re-working of the mycological activities and the devices designed in the context of community forestry. In the fourth section, we end by discussing the larger implications for mycology regarding its potential to engage people in the active stewardship and common governance of the land.

2. Regimes of forest ownership and mushroom access in Portugal

Portugal has 35% of its mainland territory covered by forests. Of these, 3% are under public ownership, the lowest percentage in Europe [16] and second lowest in the world [17]. Although this can be singled out as a problem for connecting forest management with the public good, it obscures the actual role of the central state in forest management and nature conservation [18]. In particular, it obscures how the promotion of policies towards forest monocultures can prevents sustainable multifunctional forests from coming into being, as well as alternative solutions to provide public goods, namely through small owner collectives and community forests.

Portugal has an outstanding 400.000 small forest owners [19] that together hold 81% of the forest area, but most of these individually have properties under 4 ha [20, 21]. Local communities hold 10% of the forests mainly in mountain areas [22]. Industrial owners hold the remaining 6% of the lands [20], although they are responsible for the management of a much wider area by holding the lands rented by non-industrial private and community owners. This is especially the case of eucalyptus, the main tree species in the country, where 28% of the plantations are managed by the paper and pulp industry [19]. However, all these are estimates as forest owners are not legally required to register their lands and thus, these numbers do not figure in the National Forest Inventory.

Natural forests and woodlands are residual in the country, and following eucalyptus (*Eucalyptus globulus*), the most predominant species are cork oak (*Quercus suber*) and maritime pine (*Pinus pinaster*) [23]. Apart from cork oak *montados*, which are ancient agroforests still ongoing in latifundiary regimes below the Tagus river [24], most forests result from pine and eucalyptus plantations that disrupted and replaced the complex agro-silvo-pastoral systems that existed in Central and North Portugal, which connected life at the villages with the mountain areas [25, 26]. Agriculture was produced in an intensive regime of polyculture which was made possible through the access to the common lands that were true multifunctional spaces and provided pasture, natural fertilizers (brushland), firewood and a diversity of natural products such as mushrooms, berries, medicinal plants, construction materials, water, among others. Agriculture was practiced in small parcels of land by the families, and thus appeared what at first seems like a paradox: a minifundiary regime of agriculture combined with a communitarian access to the land.

Portugal suffered a significant forest transition due to the result of state forest policies, particularly from the 30s onwards [27,18]. Rural areas suffered a severe depopulation due to peasant migrations into the cities, the colonies and later on, to European countries short in labor in the post-war period. Family agriculture was truly at subsistence level and offered no prospects of increasing the production to live a better live. State forest policies aggravated this condition by submitting the

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common lands to forest regimes [28]. This was often a process imposed from above with limited or no participation of the rural populations and occasionally with violence. However, while the forced afforestation of the common lands was disastrous, the afforestation by initiative of the owners and local communities flourished. What was at stake in afforestation for local communities was to keep the control over the lands; for private owners, afforestation was a way to secure access to forest goods that were otherwise lost by the submission to the state forest regime and an alternative non-agricultural use that allowed to keep land and the forests as a reserve, as some put it, similar to having "money in the bank" [29, 30]. In the 30s and 40s, afforestation was made with pine trees, which were traditionally cultivated in extensive regimes and the decision to cut was more related to family needs than with technical criteria. A curious trait that emerged in the planted pine forests through private initiative was that it allowed or at least tolerated the picking of mushrooms, berries and pine cones by local residents and wanderers as long these were not for profit. Thus, although forests were private, public access was allowed for certain practices which did not collide with the trees well-being. This also resulted from practical difficulties to monitor the entry of trespassers into private forests, which would come at the cost of the landowners to fence their properties.

Between the 90s and 00s, there was a boom of mycological associations in Portugal [31]. Initially these were an expression of the naturalistic interests of urban dwellers, which aimed to connect with nature and find about the potential of wild species for food and health. Its growth was supported by amateur mycological associations in Spain, which attracted a considerable number of mushroom enthusiasts.

However, the situation started to change as products that traditionally had mainly a use value, such as pine cones and mushrooms, acquired market value. In Portugal, these products belong to the landowner. Conflicts started to emerge with forest owners that aimed to diversify and manage forests in a multifunctional perspective, commercializing also non-wooded forest products. More effort was put by the landowners to prevent trespassers, and a general outrage against irresponsible wild mushrooms harvesters emerged, at the sight of scavenged forest soils by harvesters that pick everything on their way to sell to the commercial circuit. Thus, mycological walks became more restricted to areas of public access. However, they are also restricted in conservation areas, as although people may roam the forests, they cannot harvest any species along the way.

Increasingly, private forests are becoming more hostile to wanderers. On one hand, pine trees are facing severe pest attacks and being replaced by other crops in intensive regimes [23]. Multifunctional forest management requires a considerable area to be economically sustainable, and the policies to incentive the collective management of forest areas and the associativism of the small forest owners that planted "minifundiary forests" seem to result in an active failure [29, 32]. On the other hand, fast growing crops, in particular *Eucalyptus* plantations, are being actively promoted by the state since the 80s to support the national industry of pulp and paper, first through the forest services and the public pulp and paper company, and latter through financial incentives to private forest owners [18]. In unfavorable settings for collective action, the plantation of eucalyptus appears to individual forest owners as the rational choice for a fast profit [29]. Although this may be misleading (the cost of a plantation may in fact surpass the income from wood due to a number of reasons, which may lead to its abandonment and the emergence of "zombie forests" - undead eucalyptus stands [33] especially in areas with recurrent fires), eucalyptus plantations have become the dominant landscape. Eucalyptus landscapes managed for profit or abandoned have limited scenic value and are no place for family wandering. Unless there are conditions that allow them to age and mature, through natural regeneration of the autochthonous trees, flora, fauna and mycorrhizal fungi, they remain degraded spaces with reduced biodiversity, suffering the pressure from unsustainable and damaging activities such as motorized sports.

As said previously, although the state only owns 3% of the land, it has an important role in forest policies actively favoring massive eucalyptus plantations. However, its role as forest administrator is frequently overlooked. Actually, the forest services co-administrate 60% of the common lands [4], which corresponds to 412 143 ha [22]. This is the direct result from the devolution policies of the common lands, which took place in the revolutionary framework of 25 April of 1974. The state proposed a democratic form of organization to devolve the lands to the rightful community owners,

and provided the opportunity for them to choose either to manage their forests without intervention of the State Forest Services, or in co-administration. Although the original setting for the devolution was to include baldios in the agrarian reform, short after the process was halted and the state never capacitated local communities directly for forest management. In practice, co-administration corresponded to the forest administration by the state and a share of the forest revenues with local communities.

State forest management is becoming progressively unsustainable, due to a combination of factors. The degradation of the forest services since the 80s due to new public management policies and the neoliberalization of the state severely eroded their capacities to directly manage the forests, finally delegating responsibilities in the private sector [18]. Simultaneously, the Forest Services could never overcome the loss of authority over the common lands to enter in a mindset more favorable to the participatory and collaborative approaches with local communities [27]. The proliferation of fires, invasive species, pests and pathogens in the areas under their control exposed their weaknesses in managing new risks resulting in degraded spaces badly in need of environmental recovery. Of these, forest fires were particularly relevant for the local populations, as it affected them directly through the loss of property, health and their very lives [34]. The situation of the large fires in 2003 and 2005 lead to a shift in the national fire policy, forcing the forest services to collaborate with private owners and local communities in fire prevention for the first time, though a national program of forest prevention, capacitating them with specialized fire brigades. This inadvertently capacitated local populations for forest management, creating an opportunity to engage them in forest administration.

While the administrators of the common lands became progressively more aware of the forest issues, the local populations were unaware of their own collective rights and responsibilities. With the loss of traditional practices and uses and the long-term state administration of forests, the inhabitants typically consider forest management out of their control. In fact, baldios in the popular imagination and lexicon remain as synonym of wastelands, empty abandoned spaces, environmentally degraded which no one cares about. Thus, the emergence of community forestry faces at least two gigantic challenges: 1) the full devolution of the forests in the common lands; 2) the connection between forest and its inhabitants. Here we detail the potential of mushrooms to provide a favorable setting precisely for such connection. We will make these challenges more explicit in the description of the case study.

3. The case of the Community of Commoners from the *Baldios* of the Places of the Extinguished Parish of Vilarinho, Lousã

Vilarinho is located in the central interior of Portugal, in the Serra da Lousã mountain range and the study area is a part of the municipal territory of Lousã [36]. The very name of the community reflects the policies to extinguish local forms of organization. The parish is the lowest level of territorial administration in Portugal and was a contested place when local identities were formed. With the progressive loss of communitarian life at the places, it became a common denominator for the inhabitants within a geographical area. However, in 2013, the administrative reorganization of the parishes territory extinguished 27% of the parishes, some of which, including Vilarinho, are still struggling to regain their status.

In Portugal, the commoners' rights to common lands are pending on the resident status of a place with traditional usufruct rights [35]. What counts as residents differed over the years, but typically consists on the citizens able to vote in local elections, which live or work there most of the time. In Vilarinho the commoner status is firmly associated to the voters of the extinguished parish [37]. There are over 3000 due to the proximity of the Municipality of Lousã, and most of it are urban dwellers, although some are also engaged in agro-silvo-pastoral activities.

The constitution of the local power of the Municipality historically affected the surrounding villages, parishes and places. The socio-economic and political life of Vilarinho is deeply dependent from Lousã, and although its inhabitants may imagine themselves as descendants from past mountain villagers, they identify mostly with town dwellers, as the attitude towards village people was and is still depreciative today [28].

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Most of the Vilarinho households are located below 250 m altitude. The common lands comprise close to 1000 ha of mountain territory with a maximum altitude of 1000 m, which were submitted to the forest regime about eight decades ago. The forest services planted trees unfamiliar to the local populations, such as *Pseudotsuga menziesii* (Douglas fir) and *Chamaecyparis lawsoniana* (Lawson cypress), as well as five species of pine trees. Prior to the state afforestation, commoners planted chestnuts (*Castanea sativa*) for their personal use, some of which are centenary and are still alive today [35]. The traditional uses were discontinued by the majority of the population, as agricultural activities nowadays consume commercial fertilizers and there are no herds in the area. There is a large consumption of firewood for heating, but this is ensured through commercial circuits by local providers. Deadfall is not typically harvested by the local populations due to the physical effort required.

Current uses concern apiculture, hunting, leisure activities, mountain and radical sports (such as mountain trails and paragliding). Mountain territories also support diverse uses outside the scope of agro-silvo-pastoral and related activities. In Vilarinho, the most economically relevant are the concession to a wind park at the higher altitude areas and infrastructures, namely an aerodrome and research facilities related to forest fires.

After the devolution, the forests of the baldios of Vilarinho continued to be co-administered by the State. However, conflicts between the local managing council and the Regional Forest Services emerged due to the authoritarian culture of the Services, that materialized in everyday disputes such as the full prohibition of cutting and removing felled trees. The managing council searched to become more capacitated for forest management and adhered to the fire brigades program, hiring a team of forest workers. They also sought technical advice from the regional office of the national federation of the common lands and made significant investments in machinery, partially made possible through the concessions that provided them monetary incomes. Since 2006 they tried to put an end to the co-administration regime, but the state denied their requests. With the support of a lawyer, they finally saw their claim recognized by the Court of Law in 2012 [36]. Immediately they hired the forest engineer that previously worked with them full time. Their need for professional support came not only from the increased amount of work due to the autonomous forest management, but also from the failure of the regional office of the National Federation of the Common Lands to ensure technical support to its associates.

The forest engineer envisioned a multifunctional management plan for the common land forests, consisting of a productive forest capable to address the multiple needs of the commoners and the public. This vision was fully in line with the will of the president and the remaining members of the local council to support local jobs, produce revenues and goods for the forthcoming generations. However, they had to overcome gigantic socio-ecological challenges.

As a start, the local people involved in the common lands administration were mostly elderly retired from active life. These people experienced the democratic revolution and participated in the workers movements and citizens associations, the social background of the common lands devolution. They were aware of the social importance of *baldios* for the local populations, especially for those most in need. At the moment of devolution, traditional uses have already been discontinued in the *baldios* but they have become an important source of revenues for local welfare, through the works of the parish and the local institutions for social care. Although the elected council has management roles, by law all the strategic decisions of baldios are taken in the general commoner assemblies, where all commoners can vote regardless of their gender or socio-economic status. Thus, due to its democratic form of governance, baldios are an important place for experimenting democracy and community-building. However, apart from forest workers and the associates from the social care institutions that benefit from the incomes, no one participates. Discussions on forest management are considered too technical by the commoners and promptly relegated to the forest engineer.

In order for the forest to contribute for the wellbeing of future generations, it requires significant investments for its recovery from a poor system of defense for forest fires, massive invasive species (predominantly *Acacia dealbata* and *Acacia melanoxylon*), pine tree pests and diseases (notably pine wilt disease). The products of preventive silviculture and sanitation harvests, namely firewood and

pine wood stands, were sold to partially fund new plantations and also donated to local schools and institutions for the heating. However, the urgent needs of the current populations under austerity policies are more pressing each day, due to the financial cuts of the governments on the public spending for social support, and each euro that goes to the forest does not go to social welfare. Common lands, once the provision for the poor and landless to cultivate rye, make a living from charcoal, gathering brushes or herding sheep and goats [28], now face the moral obligation to provide welfare when the state fails to do so.

Although the commoners' regulation protects the traditional usufruct rights in the common lands, including mushroom picking, it was essential to promote new uses and devices for the commoners to meet the forest and its species. If the commoners fail to recognize these as common goods that must be recovered and managed sustainably, then the only value that will guide collective decisions is the short-term maximization of revenues.

The willingness of the local administrators to recovery a forest for the well-being of the community attracted the sympathy of academics related to forestry and social sciences which aimed to provide them support to their cause. As the administrators wished to know more about their mycological resources, they invited a colleague that was interested in social aspects of forestry and simultaneously was an amateur mycologist.

The common land administrators were interested in mycological resources because some parcels were being intensively scavenged by non-local harvesters to feed the wild mushroom commercial circuit. Now that they gained control over the forests, they aimed to include mushrooms in their forest plan. However, researchers framed mushrooms in the larger framework of the full devolution of the common lands, which included the challenges of recovering not only the forest, but also the community. The forest engineer was deeply in line with this framework, perfectly aware that forest recovery can only take place if there is a wide support from community members. The local council was also acutely aware that community engagement was a key feature of an intergenerational project as their own, and vital to the very social reproduction and defense of the common lands in the future. Thus, in 2013 we established a collaboration protocol between the Community of commoners from Vilarinho and the CES centered on the production of applied knowledge for the governance of the common lands, and one of the lines of work was the creation of devices to facilitate the connection of commoners with the common lands. Thus, mushrooms were the beginning of a larger collaboration. The "wild harvest" of mushrooms for commercial purposes that motivated the first visit was disrupted, due to the clear cut of sick pine trees infected with pine-nematode disease and other afflictions, and replaced by a new plantation; however, mycological wandering and community building in the common lands had just begun.

4. Re-working devices for community mycology

The first visit to Vilarinho was a true mushroom hunt. Several members of the local council, including the president, were hunters very excited to know which species were edible and find a good catch for a meal. Thus, the focus was on tuning the eyes to find hidden mushrooms and quickly swipe the forests for mushroom "hot spots" to fill the basket. However, when confronted with the biodiversity of species, it progressively became clear to them that an accurate identification takes time and requires the development of observation skills. We indeed found enough mushrooms to share a meal at the table, where they ate mushroom species of which they had no previous traditional knowledge. This was a moment for meeting the common lands resources and building trust, reinforced by good digestions and the invitation for a 50-hours training course held at the *baldios* headquarters, funded through the National Confederation of Agriculture training program.

The training course was attended by the several members of the local council, the forest engineer, forest workers, curious commoners and urban dwellers. Some had never attended a training course before. The participants were a heterogeneous mixture, all sharing a true interest on the matter. The training approach was inspired in the ecologies of knowledge, where traditional and experience-based knowledge meet with professional and scientific knowledge to mutually enrich each other [11]. Thus, the locals were introduced to the biology, ecology and diversity of mushrooms,

and they confronted this information with their own contextualized observations about the occurrence of the species - places of occurrence, seasonal dynamics and habitats. Each time we found contradictory information, this was further researched, which lead to situated knowledges about species dynamics off the international field guides, such as the potential for a symbiotic relationship between *Lactarius delicious* with *Arbutus unedo* (strawberry tree), which was recently confirmed in vitro by a Portuguese research team [38], or unusual patterns of fructification regarding the influence of altitude in climate.

Knowledge about the edibility and toxicity of mushroom species was also approached on the same manner. We attempted to identify the edible species that had local names, some of which were very similar to toxic species (such as *Ramaria flava*, easily confused with other mildly poisonous species within the genus), thus requiring precaution. Gradually there was a shift to eat species more easily recognized with distinctive traits and more information worldwide about its safety. This was a bumpy road, as some of the species recently described as toxic on field guides, namely *Tricholoma equestre* [39], are very well established in the regional habits of consumption. The process that leads to accidental misidentifications and poisonings were also scrutinized, as some participants had cases of mushroom poisoning in the family or friend circles. This resulted in the final elaboration of rules for mushroom picking, regarding ecological sustainability and safety.

The ecology of knowledges approach served as a basis for the collaboration protocol established a few months later, with the aim to produce knowledge relevant for the governance of the common lands. Although the course was a primordium where commoners and local administrators took the time to meet with diverse mushroom species, share knowledge, laughs and meals, it became clear that mycological activities had to be expanded to include: 1) commoners not directly related to the administration or forest work; 2) a connection to the challenges of forest management, community governance and the socio-ecological narrative of the common lands. Thus, two devices were jointly elaborated in the following years: mycological walks and training courses.

4.1. Mycological walks

The purposes of the walk were to: 1) provide an opportunity for the commoners to meet the territory, its species, management and governance; 2) introduce the walkers in the socio-ecological narrative of the common lands; and 3) provide an opportunity for students and researchers to visit the *baldios* of Vilarinho. Thus, although mycological walks had different objectives and target publics, they were open to everybody who was interested in participating. Care was taken to keep the walks deliberately open and avoid exclusions based on socio-economic status. The price was kept below five euros mostly to cover for logistic expenses concerning transportation for those who could not walk all the way and lunch. A difference in price was introduced between commoners and non-commoners to highlight the existence of people with differentiated rights and responsibilities (2 euros for commoners, 4 euros for non-commoners, no charge for children under 12).

The evolution on the number of participants along the last five years was fairly positive. The participants compose a heterogeneous mixture of people who share an interest in mushrooms and common lands: mountain hikers, vegetarians, wilderness survival practitioners, activists engaged in environmentalist and radical democracy movements, neo-rurals, urban dwellers, PhD students and social researchers, amateur photographers, school professors, middle-aged and elderly people interested in the collection of mushrooms, *Arbutus unedo* fruits, pine cones and chestnuts, among others. The walk was intergenerational and a family activity, and people felt comfortable to bring their children and dogs. It was also international, as counted with the participation of foreigners residing or visiting the region. The culture of inclusion and acceptance was present from the start, and the walk quickly turned into a communal space for conviviality.

The walk begun by welcoming the participants and presenting the people who would guide them: the mycologist, the forest engineer and the president of the managing council. Along the way, some strategic stops were made where participants made a circle and the guides introduced a topic about the mushroom species, the habitat and territory. Lunch was offered to all, together with home-made liqueurs and roasted chestnuts typical of the St Martin feast [40]. In the end of the walk, the

collected mushrooms were identified with the help of international field guides and information was provided about their edibility, toxicity and other uses.

The route was planned to be of medium-low difficulty, and was backed by land rovers to support those who could not go all the way. Almost all the route was in the common land territory, apart from the private lands at the beginning/end of the trail located at lowest altitudes. Walkers were not allowed to wander or collect mushrooms outside the established trail.

Whenever possible, mushrooms along the way were used to introduce the socio-ecological narrative of the common lands. This was done through storytelling, starting by situating the mushroom species in popular culture and ecology, to expand their connections to the habitat, its ecological relationships and interdependences with trees and animals. Mushroom fruiting bodies are taken as an entry point to an invisible world of connections that must be in place for its emergence, which are critical for its sustainability and resurgence. The code for responsible and respectful harvest is explained through the biology of the species, its requirements for growth and reproduction and how can we collectively minimize damages to safely meet again next year.

By using the socio-ecological biography of mushrooms as an entry point, one could navigate on its complex ramifications into the situated biographies of the trees - how they arrived and radicated in the common lands territory. Thus, forest and its species became historicized, no longer the result of a natural process without human intervention, but the active result of struggles for the control of the territory that materialized in different property regimes and ecosystems along the route: the communal usufruct, the state forest regime, the co-management, autonomous management and current challenges. Then, the route becomes the physical expression of an ongoing tale that results in the improvement and degradation of the common lands. The narrative is developed along the way in the circle stops, and opens way for all the guides to share their stories. It typically ends in a memorial for Frankelin, a commoner and firefighter that lost its life in the large fire of 2005, to demonstrate the importance of forest management for the defense against fires and the respect for the commoners responsible for civil protection and the common lands preservation.

Participants approach the guides along the way and during lunch time for informal conversations to exchange more information about the topics of their interest. It is during these walks that new commoners unfamiliar with the *baldios* administration find about their usufruct rights. Mushroom identification is the moment where the participants can fully contemplate the biodiversity of the species found, know their names, edibility, toxicity and potential uses. It is also when field guides are used and compared, and additional information and resources are exchanged.

The structure of the mycological walks was re-worked along the years. The variable elements were the route and the lunch. Initially, the route leaded to the heart of the common lands, the hazel park in the middle of the old-growth forest. This is a leisure park in an area of prized beauty built by the local administrators where participants could enjoy the sight of some notable centenary chestnuts planted by the commoners, the oldest *Pseudotsuga menienzii* planted by the forest services and diverse broadleaf trees. This park is underused by the commoners who typically do not go up the mountain. However, this route had a medium level of difficulty and was more suited to mountain hikers. Thus, the difficulty of the trail was lowered by re-routing to areas of lower altitude, to avoid excluding people due to the harshness of the terrain, especially the elderly commoners and the children. Lunch variations concerned the food and the place served. Initially it was served in the hazel park, which implied a considerable amount of logistic effort. This prevented some local council members, their wives and the workers (there are only two women with administration roles and two women workers on the common lands) from participating in the walk, by having to focus on preparing and transporting the meal. Typically, large meals were offered as is traditional in the region, consisting on soup and a meat dish. However, this excluded the vegetarians from eating, and was replaced by two pots of rice with mushrooms, one with meat and another without. By re-routing, lunch was served in a park built by the parish administration and later on, with the increase on the number of participants, was served in the facilities of the recreational club of Vilarinho. The weather was also an unpredictable variable which lead to some adjustments to provide shelter for the walkers, specially during lunch, but the walk itself was not conditioned by climate variables once scheduled. Unless there are safety warnings emitted by the civil protection, the walk is done with rain or shine.

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Also, the presence of wild mushrooms is erratic, and while in some occasions they were so abundant that allowed us to grill them and serve it to the walkers on the parks, in another year they were practically absent, apart from a dozen species that can be found yearlong. Thus, the meals are usually prepared with cultivated mushrooms bought in commercial circuits.

Non-commoners always outnumbered the commoners. Non-commoners that identified with communitarian ways of organization aimed to support the *baldios* efforts to recover the forest and the community of commoners. A core nucleus attended each year and brought their family and friends. A network of supporters started to emerge and helped to give visibility to the ongoing work, namely through news in the media. The walk also allowed the local council to recruit new commoners previously unaware of their usufruct rights and responsibilities. One in particular was invited to the General Assembly Board and accepted the invitation. Also, it is an opportunity to meet professors, researchers and students interested in the topic working in other places of the country.

During the first years, the presence of the elderly commoners was disappointing. However, their number is increasing. Their presence lead to some re-workings, namely the public recognition of the names of the commoners engaged in the organization and the manifestation of feelings of communion and identity. Invariably, the walk ends with farewells and the same greeting from participants: see you next year!

4.2. Training courses

The courses were also re-worked in close collaboration with the forest engineer to move from a mushroom-centered approach to a mushroom-in-*baldios* approach. The course was announced together with the mycological walk and occurred in the same month. We easily managed to recruit participants previously unrelated to the *baldios* administration, both commoners and non-commoners, but members of the local council were regular participants. The courses were lectured after working hours in the *baldios* headquarters. The syllabus started with an introduction to the biology and ecology of fungi and mushrooms, explaining its cellular organization in hyphae - filamentous structures that branch and grow radially, collectively composing the mycelium. This biological network is not capable of producing its own food, and according to the species and ecological circumstances, feeds by decomposing dead matter, establishing mutual associations with plant roots (mycorrhiza), cyanobacteria and algae (lichens), or parasite plants, other fungi or animals, including humans (mycoses). We present mushrooms as "the tip of the iceberg", erratic fruiting bodies from invisible mycelia that exist yearlong and lay down on the soil, essential to the existence of forests. After presenting its most common species, we take the case of mycorrhizal edible mushrooms and follow its mycelial connections to the trees to expand the theme into forest management. Then, the forest engineer presents practical exercises taken from situations actually taking place in the common lands, such as the reforestation of forest areas damaged by the pine nematode disease, to calculate the possible costs and benefits of using trees inoculated with edible fungi intended to increase the production of wild mushrooms for commercialization in the future. The socio-ecological dilemmas regarding this technology are further expanded into forest governance, by collectively inquiring the implications of favoring particular wild mushroom species for market purposes. Some of the issues raised were: who would be excluded from common usufruct rights, who would profit from the commercialization of mushrooms, how to ensure a fair distribution of the benefits and the costs of monitoring the resource to prevent poaching, among others.

At the end of the course, the monitors openly discussed with the participants the experimental approach taken to expand the syllabus and asked for their critical evaluation. Some expressed the feeling of being "caught" by mushrooms and drawn into topics that would not have called their attention in the first place or even caused them adverse reactions, such as governance and politics, but valued the experience very positively. The group also expressed the wish to meet again and continue to be engaged in activities related to mushrooms and the common lands.

5. Discussion

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In the previous sections, we exposed the setting for the mushroom enclosure that is taking place in Portugal, which compromises mushroom harvest by wanderers. This is backed by law which considers mushrooms as property of the landowners. Thus, we set to inquiry the possible role that common lands may have to keep some spaces open to mycological practices traditionally carried by local populations, further expanded by amateur associations within a naturalistic spirit. This implies the preservation of spaces for the collection of mushrooms without lucrative purposes of any sort, either be the sale of fruiting bodies or the creation of touristic mushroom hunting areas. Thus, the wanderer is not framed as a tourist that consumes a set of experiences previously packed and made available to him or her, but as someone who can engage in responsible and respectful relations with the ones he or she meet. However, local administrators cannot allow unregulated access to the common lands and face the risk of endangering the sustainability of common resources. In contexts that favor cooperation for profit-seeking over the provision of common goods, strangers are potential enemies. Thus, encounters "in the wild" require precautionary measures, while keeping an open space for respectful engagements.

The mycological walk is a device that provides an opportunity for non-pressurized forms of cooperation [41]. By allowing informal conversations along the way outside the lecture circles, it creates an opportunity for face-to-face interactions to occur between the participants and with the local administrators, where no one is forced to give all the details at once. Thus, while it is a tool for conviviality, it is also a place where persons can mark and observe at a distance the behavior of each other, to become acquainted and know each other, mutually testing, challenging and daring before making any further commitments or alliances. In this sense, the walk establishes a relationship of commensalism, where local administrators are the hosts and the walkers are the commensals.

This structure necessarily implies a loss of movement from the wanderers, which although may explore the route at their own pace, must all stick to the trail that was previously established. Given the heterogeneity of the participants, this causes a constant tension for those that aim to explore freely the territory in search for the best mushroom hot spots or landscapes. Simultaneously, this loss of movement defines a common space for people that otherwise rarely meet, such as the home-schooled children of the foreign neorurals and the local children educated in public schools, or the environmentalist vegetarians with the hunter commoners.

The expansion from a mushroom-centered approach to a mushroom-in-*baldios* approach results in a kind of snare where participants fall "down the rabbit hole" into a socio-ecological web of relations they would probably not anticipate or meet otherwise. This opens space for the participants to respond to more than mushrooms, and cultivate their abilities to respond to each other as well. This web of relations must provide for the resources that otherwise would be gathered through movement. Otherwise, it is no longer possible to stick together and the web dissociates. A good example is the meal: wild mushrooms cannot secure food to all the participants because their abundance is unpredictable in time and place. One year, *Lepista nuda* (blewits) were present in the Hazel Park and were enough to feed all the vegetarians and be tasted by all the participants. This experience was in the memory of all, as well as the chestnuts that were collectively picked during the walk and then roasted and enjoyed together. However, as the walk does not respond to mushrooms abundance alone, but to a communing experience in a territory, the provision of goods must be secured from other sources, including through commercial circuits.

The responsibility to secure the provision of goods is disproportionate among the participants, as it falls upon the local administrators and organizers of the walk. However, what is interesting is the constant tension created by participants that would like to reduce this distance by contributing more to the organization of the event. Suggestions such as organizing a potluck meal, using food locally grown, washing their own dishes or paying a higher fee were expressed by some voluntarily. However, like wild mushrooms, these contributions are erratic, given freely and unless they become institutionalized, are not enough to secure the organization tasks implied for the success of the event. Nevertheless, there is resistance to the idea of delegating the meal into a restaurant or professional catering service precisely for reducing their duties as hosts.

There are several aspects that distinguish this mycological walk from others, being its most distinctive traits the connection to the territory and the process of community building. Mycological

walks that are mushroom-centered are focused on the catch - the abundance and diversity of mushrooms found, the identification of the species and its potential for use and commercialization: nutritional properties, gastronomic value and market price. Typically, they involve professional chefs or local restaurants, lectures by scientists or keynote speakers, and show cooking. Thus, mushrooms are framed as a resource ready to be eradicated from places and generate revenues for those involved in the commercial circuit. However, when the connection to the territory and ownership is lost, this may result in conflicts with the local landowners that are not involved in the circuits and see their properties scavenged.

Although mushroom centered activities are still there, the expansion into mushroom-in-*baldios* radicates its mycelium deep into the territory bringing other topics to the surface. This is more in line with the approach of radical mycology, a grassroots movement and social philosophy that respectfully uses the lifecycles of fungi and their ecological relationships as tools for humans to learn how best relate to each other and steward the world they live in [10]. By situating mushrooms in relation to community and societal challenges, the syllabus changes and training people in mycology becomes a tool to educate people for social responsibility [42].

The governance of mushrooms in the common lands of Vilarinho is in the open. It is not clear if they will be able to resist the constant temptation of enclosing mushrooms. The outcome will depend on the response of mushrooms, mycologists, local administrators, commoners and poachers, operating within a legal and economic framework that favors the eradication of resources instead of the long-term relationships that sustain places. Devices will have to be worked out locally to provide opportunities for the long-term engagement of mushroom enthusiasts on the stewardship of places to secure their presence in the wild.

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