From Tradition to the Digital Age: The Evolution of Foraging in Slovenia

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Abstract: Wild plant foraging has experienced a resurgence in Slovenia, with foraging educators—namely individuals who organize workshops, courses, or similar activities about foraging—playing a crucial role in knowledge transfer and community building. This study explores how foraging knowledge is obtained, shared, and shaped by foraging educators. We conducted semi-structured interviews via Zoom with 31 Slovenian foraging educators between June and August 2024. Our findings indicate that Slovenian foraging knowledge is increasingly transmitted among people of the same or different generations not belonging to the same family, rather than through traditional intergenerational methods. There is great diversity in the activities offered by the foraging educators, with an increasing number of online activities. Social media platforms, particularly Facebook, play a vital role in the promotion of foragers and their events, though educators remain skeptical of their reliability as a source of botanical knowledge. Emerging events such as the Festival of Foraging and FesDivjal have an important impact on the evolving foraging community, providing the foragers a sense of belonging and promoting important messages related to conservation. This study highlights the evolving nature of foraging in Slovenia, stressing the role of digital platforms in shaping knowledge exchange. It underscores the importance of conservation-oriented education in combating plant blindness and fostering environmental stewardship.

Povzetek: Nabiralništvo je v Sloveniji v zadnjem času doživelo ponoven razmah, pri čemer imajo učitelji nabiralništva (osebe, ki izvajajo različne izobraževalne aktivnosti na področju divjih rastlin in gob) ključno vlogo pri prenosu znanja in oblikovanju nabiralniške skupnosti. V raziskavi smo preučevali, kako nabiralci pridobivajo, delijo in oblikujejo nabiralniško znanje. Med junijem in avgustom 2024 smo prek aplikacije Zoom opravili polstrukturirane intervjuje z 31 slovenskimi nabiralci, ki svoje znanje posredujejo javnosti. Naše ugotovitve kažejo, da prenos nabiralniškega znanja v Sloveniji vse manj temelji na tradicionalnih medgeneracijskih poteh znotraj družin, saj postajajo horizontalni prenosi med ljudmi iste generacije in posredni prenosi med ljudmi različnih generacij, ki si med seboj niso v sorodu, vse pomembnejši. Učitelji nabiralništva ponujajo raznolike

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aktivnosti, pri čemer se povečuje delež spletnih vsebin. Družbena omrežja, zlasti Facebook, igrajo ključno vlogo pri promociji nabiralcev in njihovih dejavnosti ter širjenju nabiralniške skupnosti. Kljub temu so učitelji skeptični glede njihove zanesljivosti kot vira botaničnega znanja. Dogodki, kot sta Festival nabiralništva in FesDivjal, pomembno prispevajo k razvoju nabiralniške skupnosti, saj udeležencem zagotavljajo občutek pripadnosti ter hkrati prenašajo ključna sporočila o varstvu narave. Ta raziskava osvetljuje dinamično naravo sodobnega nabiralništva v Sloveniji in vpliv digitalnih platform na izmenjavo znanja. Poudarja tudi pomen naravovarstveno usmerjenega izobraževanja pri preprečevanju rastlinske slepote ter spodbujanju okoljske odgovornosti.

Keywords: Ethnobotany, Environmental education, Foraging, Sustainable use of wild plants, Wild edible plants

Introduction

In recent years, there has been a marked increase in workshops and courses focused on wild food products, medicinal herbs, sustainable agriculture, and crafts using natural materials (e.g., basketry, weaving) in Europe (de Jong and Varley 2018; Łuczaj et al. 2021), reflecting a growing interest in sustainable living and self-sufficiency. This trend is part of a broader movement toward reconnecting with nature, driven by motivations such as healthier eating (Bellows et al. 2023; Hall 2013), reducing environmental impact (Mina et al. 2023), and spending more time outdoors (Sardeshpande et al. 2021). While this movement has been present for decades, it was significantly amplified by the COVID-19 pandemic (Clouse 2022), when strict lockdowns led many people to seek solace in nature, reinvigorating the practice of wild plant gathering.

Historically, plant gathering was a communal activity (Widlok 2020) that facilitated both vertical (from elders to younger generations within families) and horizontal (among people of the same generation, e.g., friends) knowledge transfer. In some regions, such as Syria, this remains true today, with organized community foraging trips (Aziz et al. 2022). In many European countries, foraging has long been an integral part of cultural and environmental heritage—first as a necessity for survival and later as a recreational practice (Hall 2013; Łuczaj et al. 2021), ensuring the intergenerational transmission of knowledge. Today, survival foraging is primarily associated with societies in the tropics or the far north, or with extraordinary circumstances such as war (Redžić 2010; Sulaiman et al. 2022), while leisure foraging is largely driven by personal beliefs, encompassing motivations such as sustainability, health consciousness, self-sufficiency, and a deeper connection with nature. The diverse motivations behind modern foraging and the way knowledge is transmitted have led Grivins (2021) to categorize foragers into four distinct types: rooted, lifestyle, subsistence, and commercial foragers. While "rooted foragers" have inherited the knowledge and practice of foraging from previous generations, the "lifestyle foragers" have discovered foraging just recently while searching for a more sustainable living and are now strong advocates of this lifestyle. Subsistence foragers collect plants and mushrooms to replenish their stocks and to ensure their food security, not necessarily because of low income of other economic factors, but simply because they continue doing what they have always done. "Commercial foragers" are motivated by profit and seek business opportunities offered by wild products. This classification was developed based on data from Latvia and reflects foraging practices in contemporary European contexts, where foraging is typically recreational, lifestyle-driven, or economically supplemental. It is not intended to describe subsistence foraging in regions where wild foods still play a central role in daily nutrition or survival.

As societies became increasingly disconnected from nature in the late twentieth century, traditional knowledge of wild plants has rapidly declined (Pilgrim et al. 2008). Slovenia, like some other countries (Lövgren and Nordvall 2017), has a well-established system of folk schools dedicated to informal adult education, particularly for older generations (Šantej 2009). These schools,

which emerged in the 1980s, rely on experienced informal teachers—often retirees—to share knowledge on various topics of common interest, including wild plant uses and herbal medicine. In contrast, younger and middle-aged generations, who are typically not involved in these informal education systems, must seek knowledge from alternative sources, such as independent courses and workshops held in diverse settings—classrooms, teachers' private homes, nature, and even urban environments.

The emergence of the Internet and social media has significantly impacted various disciplines, including food science, agronomy (Pafumi and Arimbi 2022), nature conservation (Arts et al. 2015; Chowdhury et al. 2024), and even foraging: "The relationship between social media and foraging makes a surprising amount of sense, considering that one is virtual and the other deeply rooted in nature" (Koenig 2021). Platforms such as Facebook, Twitter, WhatsApp, and YouTube have become valuable resources for biological research, spanning taxonomy (Pomahač et al. 2023; White et al. 2023), conservation (Xu et al. 2020), ethnobotany (Fatur 2021a; Fatur and Kreft 2021; De Meyer and Ceuterick 2022), and others. These developments have led to the establishment of protocols for extracting data from social media (Chowdhury et al. 2023). Despite these technological advancements, research on the impact of social media on the teaching and learning of wild plant and mushroom foraging remains limited. Existing studies indicate that social media can reshape traditional educational relationships, producing both positive effects—such as increased accessibility to information—and negative consequences, including the risk of "de-skilling" (Arts et al. 2015). As these platforms become increasingly influential within foraging communities, understanding their broader impact is important.

Social media platforms are moderated by individuals with varying levels of expertise and motivations, ranging from enthusiastic amateurs to professionals employing strategic marketing techniques. These moderators often collaborate with renowned chefs, provide dietary guidance, and sometimes attain influencer status (Dekoninck et al. 2023). While their online presence enhances knowledge dissemination, it also carries the responsibility of ensuring accurate information about plant uses, highlighting risks associated with toxic species, addressing ethical and legal concerns in foraging, and promoting sustainable harvesting practices (Dekoninck et al. 2023).

Slovenia is a biodiversity-rich country in Central Europe with a long tradition of using wild plants and mushrooms. With 44% of the population living in rural areas and 56% in urban areas, it remains one of the less urbanized countries in Europe. However, this trend is gradually shifting as more people move to cities. Despite this, access to nature remains high, and it is a highly valued aspect of life. Many people—especially those from the middle and older generations—still rely on family garden plots. The use of medicinal plants, both cultivated and foraged, remains widespread, particularly among older women (Fatur 2021b). In contrast, younger generations are much less likely to rely on homegrown vegetables or foraged plants.

However, in recent years, foraging—for wild plant foods, mushrooms, and medicinal herbs—has seen a significant resurgence in Slovenia, as in other countries (Łuczaj et al. 2021; Teixidor-Toneu et al. 2023; Volinia et al. 2024). This renewed interest is reflected in the growing number of workshops and events dedicated to wild plant use. Many of these educational opportunities are now accessible online, either freely (e.g., lectures from the Festival of Foraging: https://www.youtube.com/@Festivalnabiralnistva) or for a fee (e.g., the herbalism education platform The Green Witch: https://thegreenwitch.si), reflecting broader trends in digital learning and community building. Alongside these developments, informal networks and associations have emerged, often in the form of festivals and online platforms (e.g., Nabiralci: https://nabiralci.si), where experienced foragers take on educational roles.

This study aimed to explore the current state of foraging in Slovenia, with a specific focus on foraging educators. By examining their educational activities and underlying motivations, this research sought to gain insight into evolving knowledge transmission methods. Specifically, we conducted interviews with prominent foraging instructors, ranging from amateurs to semi-professionals, to: (i) identify who the Slovenian foraging educators are; (ii) understand their motivations and preferred methods of knowledge transfer, both for in-person and online settings;

(iii) assess the role of social media in promoting knowledge about wild plants and mushrooms; and, (iv) evaluate the role of educators in preventing harmful foraging practices.

Through this approach, we aim to contribute to a deeper understanding of how foraging knowledge is shared in contemporary Slovenia and the potential implications for conservation, education, and community-building efforts.

Methodology

Ethical Framework

All interviewees were initially contacted in writing via email, Facebook, or Instagram and asked if they were willing to participate in the research. Before the interviews, all participants provided consent for their names to be used if necessary and for the interviews to be recorded. They were fully informed about the study's purpose and assured that any parts of their responses they wished to exclude from the article would be omitted.

During our work, we followed the Code of Ethics of the International Society of Ethnobiology (ISE 2006). The institutional ethics review was granted by the University of Gastronomic Sciences (UNISG) on September 24, 2024. All participants were informed of the study's findings and received a draft of the manuscript, and the authors remained available for further discussions.

Data Collection

To understand how foraging knowledge is obtained and transferred, we conducted semi-structured interviews with foragers who conduct different educational activities, such as workshops, courses, and walks in nature. Additionally, we attended the festival of wild food *FesDivjal* on September 29, 2024. The study sample consisted of 31 respondents, with 22 women and 9 men. Their ages ranged from 26 to 61 years. Among the respondents, three were in their 20s, eight in their 30s, twelve in their 40s, seven in their 50s, and one over 60. Geographically, the interviewees were fairly evenly distributed across Slovenia, except for the southern and southeastern regions, particularly Primorsko-Notranjska and Jugovzhodna Slovenija (Fig. 1). These areas, characterized by large, densely forested regions of the Dinaric mountains and low population density, present

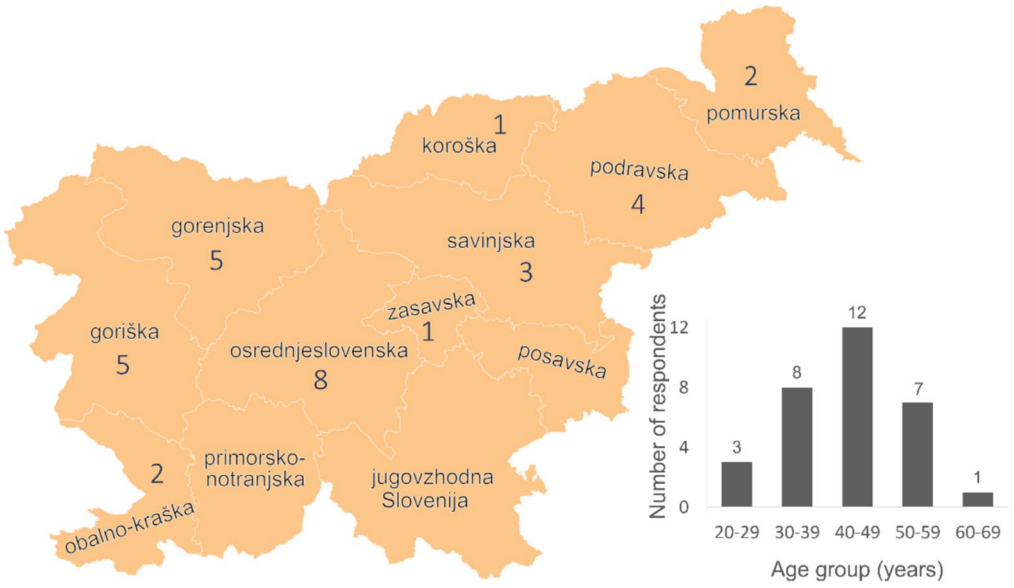

Fig. 1. Map of Slovenia and its regions with the number of participants from each region. The graph on the right represents the age distribution (in years) of respondents ($N = 31$)

high foraging potential due to their unspoiled nature. However, the remote and sparsely populated nature of these areas makes them less attractive for organized foraging events such as workshops or nature walks. Consequently, foraging educators tend to operate in more accessible locations closer to population centers.

The respondents were initially recruited from participants in the 1st and 2nd Slovenian foraging festivals (in Slovenian: *Festival nabiralništva*) held in 2023 and 2024 in Ljubljana, Slovenia. Additional participants were identified using the snowball sampling technique. Contact with participants was primarily made through social media platforms such as Facebook and Instagram, as well as via email.

All interviews were conducted in Slovenian language in the summer of 2024, primarily via Zoom, except for one instance where Viber was used due to Zoom's inaccessibility. The interviews varied in length, lasting between 30 and 90 minutes. Although a pre-defined set of questions guided the conversations, interviewees were allowed to deviate from the script to share their thoughts more freely. The questions were grouped into five key topics: (1) activities related to wild plants (e.g., "Which activities related to wild plants do you engage in?"); (2) the importance of social media and Internet platforms (e.g., "How important are social media for you as a forager? Which platforms do you use, and why?"); (3) educational activities (e.g., "What types of educational activities do you conduct? Do you also offer online educational activities?"); (4) sources of knowledge and inspiration (e.g., "Who has influenced your foraging journey? Have any books, movies, or TV shows inspired you?"); and, (5) importance of conservation issues (e.g., "How important are conservation issues to you? Have you ever observed non-sustainable foraging practices?"). A comprehensive list of questions is available in ESM1 Appendix 1.

The interviews were recorded and transcribed using the automatic transcription service provided by Office 365. After the interview, the responses were organized into a table for further analysis. Additionally, we evaluated each respondent's social media presence and recorded the number of followers where applicable. In cases where two respondents jointly managed the same social media accounts, their follower numbers were recorded together and presented as a single data point. Some responses are quoted throughout the article, with the respondent's age and gender indicated in brackets.

Results

Characteristics of the Foraging Educators and Identification with the Term "Forager"

A majority of the interviewed foraging educators, 87%, hold a university degree or higher (master's or PhD), while 13% obtained a high school diploma. Among those with a university degree, 56% have a background in natural sciences, and 19% have degrees in ethnology, geography, sociology, or anthropology, which they find useful for their teaching. The average age of educators is 43 years, and the majority of them (26%) perform their activities in the Osrednjeslovenska region, followed by 16% from both the Goriška and Gorenjska regions, and 13% from the Podravska region. The remaining regions were represented with one or two respondents, except for three regions from the southern and southeastern Slovenia which had no representatives (Fig. 1).

Interviews revealed that the foraging community in Slovenia is growing, with a stronger sense of community emerging in recent years, particularly following the establishment of certain festivals. Among these, the *Festival nabiralništva* (Foraging Festival) and *FesDivjal* (WildFest), established in 2023 and 2022, respectively, were frequently mentioned as pivotal in fostering a foraging community. Eighteen out of 31 interviewees previously participated in at least of one of the festivals, and all those who participated, with the exception of one, stated that they feel a sense of belonging to the foraging community.

In Slovenian language, the noun that describes the activity of collecting plants and other living beings or their parts for food or other uses is "nabiralništvo," and the person performing the act is "nabiralec" (male) or "nabiralka" (female). This term is used in the phrase "hunting and gathering" (in Slovenian: "lov in nabiralništvo"), describing activities that have enabled sustenance of humans through animal and plant food that they hunted and gathered

for all of human evolution up to today (Widlok 2020). For the purpose of this paper, we from now on use the name forager as the translation of the term "nabiralec." Due to the fact that this term is widely connected to the activities of early humans, some people feel a strong connection to it, while some other feel a strong disconnection with the term. Since the Slovenian language does not provide a clear definition what a present-day forager is, this ambiguity leads to personal interpretations.

Out of 31 respondents, 19 identify with the term forager (slo. nabiralec, nabiralka). Some participants stated that they do not consider themselves foragers because they do not collect enough to warrant the label, while others identify as foragers even though it was clear from the interviews that they collect only occasionally. Additionally, some participants, including those actively involved in sharing their knowledge about wild plants, prefer to call themselves "(foraging) educators" (slo. učitelj, učiteljica) rather than foragers:

> "I feel that I belong to the foraging community, but I don't consider myself as forager—I don't collect plants to sell them, I teach about them, but even more about medicinal herbs…" (respondent 5, 52 years, male).

Others identify more with the term herbalist (slo. zeliščar, zeliščarka), as their activities focus primarily on medicinal herbs, which can be cultivated in gardens rather than exclusively collected in the wild. One of them prefers the term developer (slo. ustvarjalka), because she uses herbs to produce cosmetics. Some also mentioned that they do not like labels, so they would not call themselves forager:

> "Am I a forager? In the sense of how I live, yes, but I don't call myself that. I am more than that, I am a forager, an herbalist, a nurse, a worker in a factory, a mother, a grandmother—I am all of this" (respondent 3, 46 years, female).

For 12 respondents, activities related to wild plants and mushrooms represent their main source of income, while for the remaining 19, it is an additional activity that they perform in addition to their regular job. One-fifth of the participants have no income whatsoever from those activities. The activities organized by foragers are summarized in Table 1.

Among the respondents that have other primary jobs, two are pharmacists, one is a pharmacy professor, one is a medical doctor, two work in a cosmetic business, three are farmers, and two work in nature protection–related jobs. The remaining seven work in other fields not in any kind related to wild products.

The most common profitable activity performed by the interviewees is organizing workshops (done by 17 educators), selling products (including fresh plants—nine respondents). Five respondents also write books, articles, and columns; some of the books written by the respondents are bestsellers. Three provide wedding and other flower decorations.

Although most of them are present on social media, at the moment, none of them obtain any money from their contents, even though this is an option in most social media (Facebook, Instagram, YouTube). However, three of them occasionally have sponsors who pay them.

Motivations and Knowledge Sources of Slovenian Foraging Instructors

Vertical and Horizontal Knowledge

When asked about the sources of knowledge and inspiration, almost all interviewees mentioned their relatives, usually grandparents, parents, or aunts and uncles. In Slovenia, foraging was widely present in the past, not necessarily for subsistence but also as a family activity aimed at spending quality time in nature. Some decades ago, many families regularly collected some wild plants, such as rosehips or linden flowers for herbal teas, different forest berries (strawberries, blueberries, raspberries, and blackberries) for jams, spruce tips for medicinal syrups, and mountain herbs such as thyme and oregano for herbal teas. Families who engaged in such activities transferred this basic knowledge about the plants to their children. For example, one of the interviewees (respondent 8, 29 years, female) mentioned:

Table 1. Examples of activities, organized by foragers

Type of activity	Examples
Organizing educational activities	Workshops (for restaurants, herbal workshops, permaculture, wild food collecting, wild food fermentation, cosmetic products from herbs and wild plants, garden design, integration of herbalism and foraging) Short lectures Longer courses (e.g., on medicinal herbs, phytotherapy) Guided visits and tours (to herbal gardens, forest, etc.) Mentoring in student camps
Organizing leisure activities	Workshops (culinary, cocktail making, wild food workshops combined with yoga or storytelling, food preparation for children) Activities for women (women circles, baby showers, bachelorette parties—e.g., preparation of herbal teas, making head wreaths…) Lectures in doctrine of signatures Team buildings Private walks for couples
Selling plants	On markets: fresh wild plants, combination of wild and cultivated plants, dry wild plants Delivering plants to restaurants
Producing wild plant–based products	Decorations (dry flower decorations such as crowns, dry and fresh bouquets, fresh decorations for weddings) Cosmetic and healthy lifestyle products: tinctures, dental pastes, lip balms, soaps, essential oils, medicinal creams, incense Food products (pestos, jams, spices, pastes, spreads, syrups) Other: business gifts
Engaging in media	Writing articles and regular columns in magazines and newspapers Writing books Attending TV shows Drawing illustrations Managing web platforms
Other	Collaboration in projects Mini caterings with wild plants

> "A few years ago, I attended a workshop in Germany with three other Slovenian participants and I realized how much knowledge we have. The workshop was quite basic for us, and we—some of us were not even so much into foraging—realized that we had a lot of knowledge which we obtained only from our grandparents."

Among the influential figures in foraging, both living and deceased, Slovenian and foreign, and fictional and non-fictional, one name stood out. Mentioned by over half of the respondents, Dario Cortese emerged as a key advocate for foraging in Slovenia. Cortese authored several books on the use of wild plants long before foraging became a widespread trend across Europe. His bestselling books were widely cited by the interviewees. Many respondents also credited Cortese for significantly shaping their foraging knowledge and skills through his courses and workshops. Often referred to as the "father of foragers," Cortese left a permanent mark on the Slovenian foraging community. His influence extends beyond just foragers, as his name is widely recognized even among those less familiar with foraging. In addition to Cortese, other noteworthy Slovenian figures who served as sources of inspiration and information include Katja Rebolj ("Rožma"), Luka Kristanc and Andreja Papež Kristanc ("Divji vrt"), Tina Mele ("The green witch"), Karmen Gajšek ("Kje so tiste rožice"), and Uroš Švigelj ("Domača.si"), all of whom also participated in this study. In contrast, foreign foragers or other influential figures were mentioned only sporadically, with

no single individual standing out as a significant influence.

Written Sources: Books and Articles

Books, and to a lesser extend movies and TV shows, were also mentioned as a source of knowledge and inspiration by some. The participants listed 59 books (or book series), movies, TV shows, and various online resources (Fig. 2, ESM2). Books written by the respondents of this research (Katja Rebolj, Samo Kreft, Luka Kristanc) were also mentioned stressing the importance of written resources for inspiration or knowledge transfer. Most of the books cited are non-fiction (popular), covering topics such as edible and medicinal wild plants, plants used in cosmetics, sustainable agriculture, permaculture, and cooking. Slovenian and foreign non-fiction books are represented in roughly equal measure. Additionally, several respondents, although all grown-up, mentioned children's books and children's TV shows as influences that shaped their interest in foraging either at their early age or later on, when they were reading those books to their (grand)children.

Learning from Social Media?

A great majority of foraging educators use social media, primarily Facebook and Instagram. Social media do not only represent a marketing platform but can be also used by foragers as a source of information and inspiration. While books and certain (reliable) webpages seem to be still the main source of (written) information for the Slovenian foraging educators, several respondents stated that they do not trust information on social media. If they see something interesting, they will seek confirmation in books. On the other hand, they would use social media as a source of inspiration:

> "We have a profile on social media. And, of course, you sometimes check other profiles to see what kind of posts are they publishing. And sometimes you find something interesting. And it's already the algo-

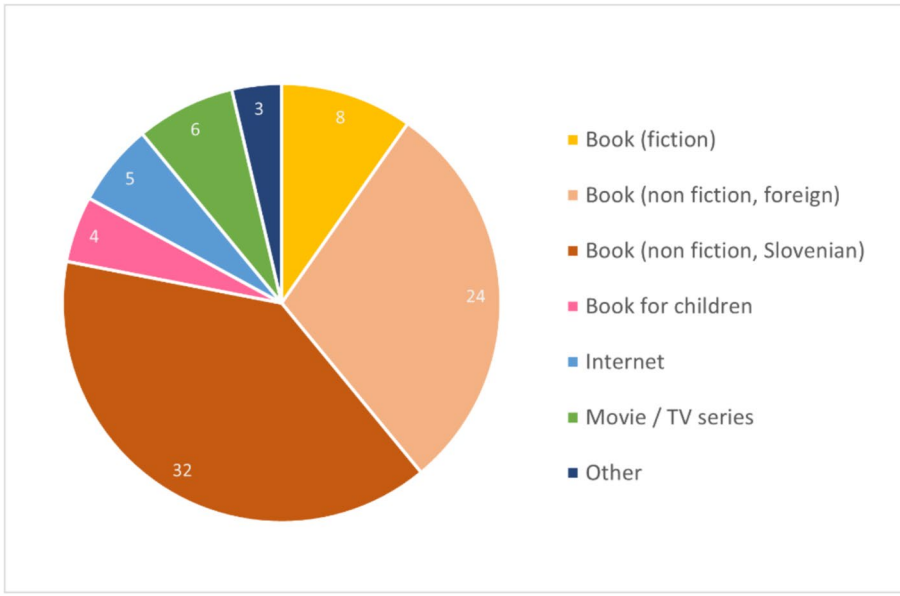

Fig. 2. Sources of inspiration mentioned by foraging instructors divided into categories. In total, 82 resources were mentioned by 29 respondents

rithms running in the back—they offer you things on their own. So, professionally, this is useful for me. I don't even have to search for ideas because the computer is already proposing them to me!" (respondent 9, 50 years, female).

The story is, however, different when it comes to mushrooms. Although only two respondents come from the mycological community, they both stressed the importance of social media in learning. Determination of mushrooms is particularly difficult, and the similarities between mushrooms species, sometimes even between edible in poisonous ones, can be extensive. There are several Facebook channels with international participants dedicated to different mushroom groups, for example, to the genus *Amanita* Pers. or *Boletus* L., to *Polyporus* mushrooms, etc. While in the more general Facebook groups dedicated to mushrooms (e.g., the Slovenian channel "Gobje kraljestvo," translated as "Mushroom Kingdom"), participants post many pictures of bags full of foraged mushrooms; these specialized groups are focused on determination, and experienced mycologists help to solve difficult taxonomic problems.

Learning by Experimenting

Learning by experimenting is a way to learn commonly used by the so-called lifestyle foragers (Grivins 2021). Respondent 21 (34 years, female) stressed that she did not obtain knowledge from her own family, but from her partner's family. More importantly, a very important share of knowledge came from her own research and experiences and observing herself:

> "I am a professor of geography and sociology, and I obtained a qualification in herbalism, but I don't consider myself an herbalist, nor a forager. Mostly, I would say I am a researcher of habitats and their peculiarities and means of use for co-natural sustainable survival. That's it. In the past I was teaching in school, but for some time now, I have only been engaged in delving into the characteristics of nature and also in the creation of various sustainable products."

Blending Tradition with Technology: How Foragers Educate Through Workshops and Social Media

Organization of Educational Activities

The educational activities organized by foragers are diverse and not strictly confined to wild plants and mushrooms used for food (Fig. 3, ESM3 Appendix 3), but they also cover topics such as product preparation (e.g., cosmetics, such as soaps, creams, scents), distillation techniques, herbalism, and specialized food preparation methods like fermenting wild foods and creating cocktails from wild ingredients. In addition to these educational activities, some foragers provide non-educational activities, such as combining foraging workshops with yoga classes, women's circles, storytelling events, making midsummer flower wreaths, thematic baby showers or bachelorette parties, and healing walks in the woods. Some participants of this study, mainly those who have obtained a degree in sciences (PhD in pharmacy, PhD in veterinary science, degree in medicine), have specialized in advanced courses, particularly in the field of medicinal plants, and offer specialized training for professionals, including medical doctors, pharmacists, and veterinarians. Several of these courses have received accreditation, allowing professionals to use them as part of their continuing education requirements. A list of activities is provided in Table 1.

The plants and mushrooms presented in educational activities are plentiful and diverse. The list of the most frequently presented species comprises 113 plant and 19 mushroom taxa. *Urtica dioica* L., *Achillea millefolium* L., *Plantago* spp. L., and *Taraxacum officinale* F.H.Wigg. were the most frequently mentioned taxa. While the educators usually present the most commonly known and widely distributed taxa with plenty of different uses, they also show some poisonous plants that could be mistaken for useful ones (e.g., *Colchicum autumnale* L., *Convallaria majalis* L., *Atropa belladonna* L.). Most of the presented plants are native (85%), followed by cultivated ones (12%). Some foragers like to present invasive or non-native plants, such as *Solidago* spp. L., *Reynoutria* spp. Houtt., *Galinsoga parviflora* Cav., or *Impatiens glandulifera* Royle, and stress their potential uses (4%).

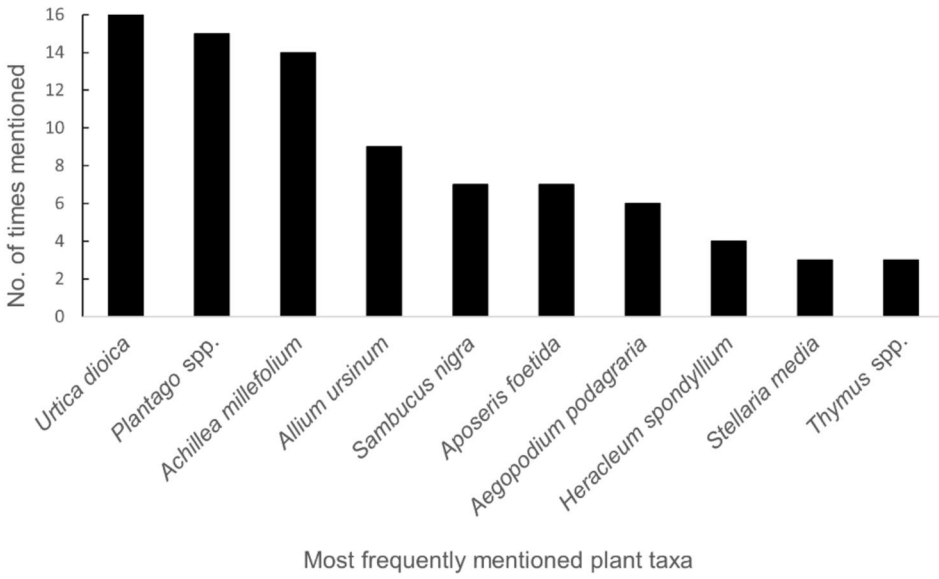

Fig. 3. Plant taxa most frequently mentioned by foraging instructors. Altogether, 29 respondents mentioned 113 plant taxa. Only taxa mentioned more than twice are presented in the graph

They also advocate the sustainability of using invasive plants and weeds. In most cases, foragers present herbaceous plants (78%), followed by bushes (including climbers, 14%) and trees (8%).

Foragers organize both online and in-person workshops and lectures and are aware of the positive and negative elements of each. Among the benefits of in-person activities are those related to the identification of plants, where participants can use all senses to learn about them (see, feel, taste, smell), but also the interactions among participants and between the participants and the teachers: the participants are more open to ask questions, and the educators receive immediate feedback about their courses. In online courses, communication among the participants is less, and learning about plants relies only on the pictures, but not on other senses. However, several interviewees mentioned that online courses are becoming increasingly popular and attended by far more participants than in-person activities. One respondent, for example, mentioned that for a specific online lecture, 500 people asked for the link and 200 participants attended; in similar in-person lectures, 13–14 people usually attend. Ironically, participants are also willing to pay more for online courses than for in-person courses.

As this study did not focus on the experiences of the attendees, it is difficult to evaluate the direct impact of workshops and other activities on the learning experiences and to which extent the activities help preventing plant blindness. By reading the reviews of participants, it is clear that the activities do provide new information on the taxonomy, uses, and conservation aspects of plants. For example, two attendees of the course organized by Katja Rebolj wrote:

> "Last year at this time, I didn't even know wild carrots existed, let alone how to recognize them in the wild, but then I attended Katja's course on wild roots… and now I'm picking them, and so much more! Wonderful course!"

and:

> "My aha moment was, that there are so many alliums. Until now, I was collecting only wild garlic, which doesn't grow now, but now I know what I can collect in this time. Thank you!"

But besides learning, these activities also stimulate the appreciation of nature and provide

a refreshing change from their daily routine. One of the attendants of Karmen Gajšek's workshop commented:

> "In recent years, I have been enjoying collecting wild thyme, dandelions, and nettles, which nature gives us every spring as a free gift to invigorate us with new energy. Last year, nature 'called' me even more and I came across an interesting workshop by Karmen (Gajšek) on the topic of learning about edible wild plants and preparing a meal from them. I would never have thought that so many plants were edible, but with Karmen we learned about many of them, collected them, heard about their many medicinal properties, and together we prepared a delicious meal. For me, this was the most natural and beautiful form of socializing that nourishes the body and soul, so I would highly recommend it to everyone. Along with all this knowledge, Karmen reveals to the participants the hidden corners of our beautiful country in the always good company of lovers of primitive knowledge and the beauties of nature."

Use of Social Media for Educational Purposes

Nearly all participants use social media platforms and emphasize their importance in reaching their target audience (Fig. 4). Facebook and Instagram are the most widely used platforms, with 94% and 65% of participants utilizing them, respectively. Some foragers also use other channels such as websites, YouTube, LinkedIn, mailing lists, and Linktree. Although a few considered adopting newer platforms like TikTok, none of them is actually using it and stated that they are unlikely to do so. The reasons cited include a lack of time, a lack of interest, and a belief that their followers or target audience are not part of the younger generation that primarily uses these newer platforms, but rather the older generation accustomed to Facebook.

Social media is used both for self-promotion and for educational purposes, such as presenting information on useful and poisonous species, and alternative uses of various species. Most foraging educators combine both approaches in their online presence. All in all, most respondents claim that social media is nowadays an indispensable means of communication between the participants of the study and their target audience, replacing the traditional means, such as TV, radio, or newspapers and magazines. To a lesser extent, other social media platforms are used for teaching and transferring knowledge. A small group of foragers, who also participated in this survey, developed a web platform called "Nabiralci" which provides advice, lectures, and other resources about wild plant uses for consumption to the registered participants. The participants need to pay an annual fee, which enables them access to many useful materials, prepared or provided by the platform owners.

The Role of Foraging Educators in Promoting Sustainable Practices and Identifying Conservation Issues

As foraging educators are often immersed in nature, we sought to understand how frequently they encounter unsustainable practices and their perspectives on major conservation challenges. To do so, we asked whether they incorporate conservation topics in their teaching and to share their observations and examples of unsustainable practices.

Based on the responses obtained from the interviewees, the vast majority of educators incorporate the topic of conservation into their educational activities. For some, this is a central focus, with workshops or nature walks often beginning with discussions on the ethics of collecting plants and mushrooms. Educators emphasize the following key practices: they introduce the concept of "harvesting etiquette" at the beginning of their activities, stress the importance of mindfulness in foraging, and advocate avoiding the collection of plants when they are not abundant. Furthermore, they do not gather in areas with restrictions, such as protected zones, or collect protected species. A principle of moderation is also emphasized—participants are encouraged to always collect only what is needed.

In respect to unsustainable foraging practices, of the 27 respondents who provided answers, 44% reported that they believe the overall

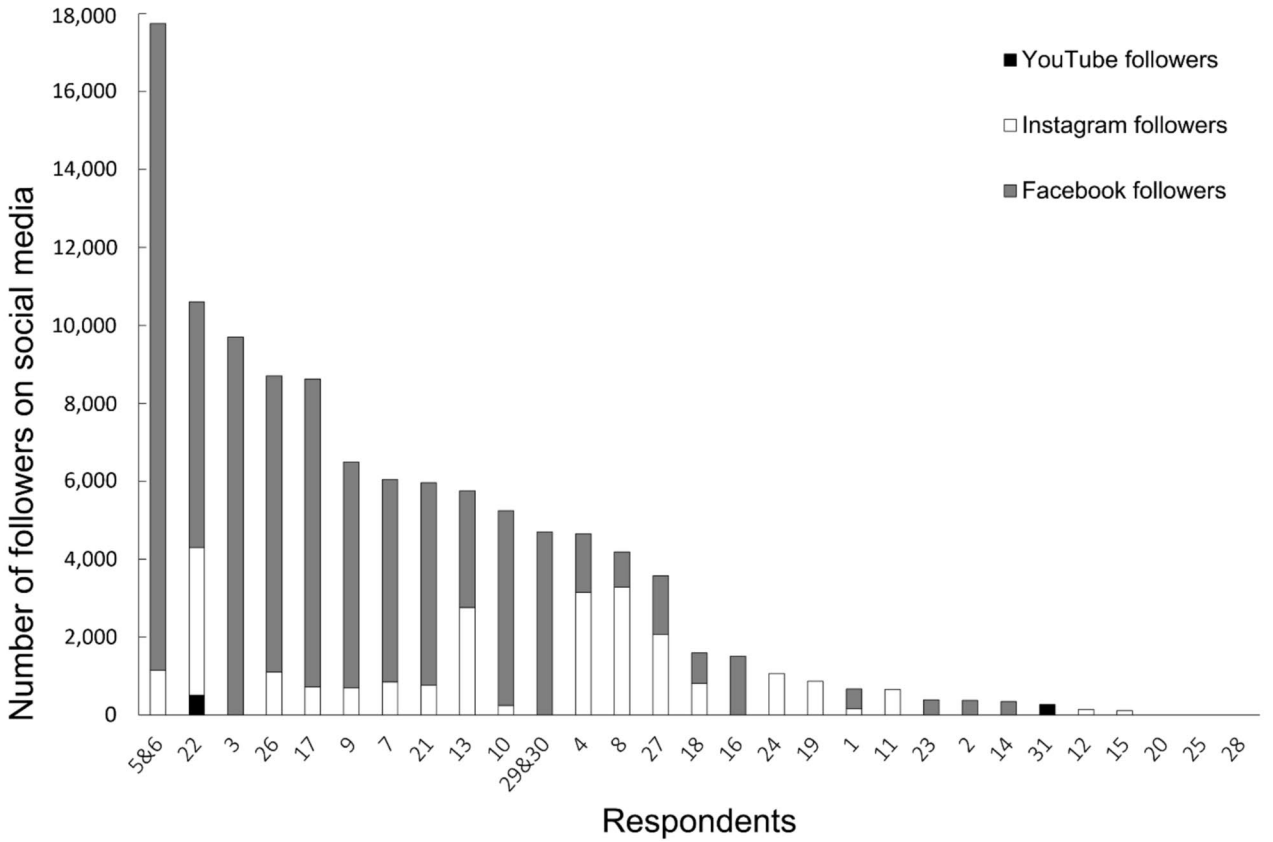

Fig. 4. Visibility of foraging educators on social media: Facebook, Instagram, and YouTube. Axis *y* represents the number of each educator's followers on different social media. The numbers on the *x*-axis correspond to the particular respondent (1–31). Respondents 5 and 6, as well as respondents 29 and 30, are grouped together because they jointly manage the same social media accounts. As such, their follower numbers represent a shared presence rather than individual profiles

situation is positive and have not observed any significant problematic foraging practices:

> "I am generally very satisfied. Those who collect without care tend to be occasional collectors, and there is a risk they may collect the wrong plants (e.g., *Colchicum autumnale* L. instead of *Allium ursinum* L.). These individuals also break the most important rule: collecting species they are not familiar with" (respondent 2, 52 years, male).

However, the majority of respondents still shared some examples of unsustainable foraging practices or threats to wild plants and mushrooms that they observed or heard of (Fig. 5). Nine respondents mentioned collecting large quantities of plants and/or mushrooms, while other practices were less frequently cited. These included collecting protected species, harvesting the wrong parts or uprooting entire plants, foraging in inappropriate locations (such as protected areas, tourist spots, or botanical gardens), collecting unknown plants, picking young or unripe individuals, and damaging vegetation. Among the plant and mushroom taxa connected to unsustainable practices, the most frequently mentioned were mushrooms, *Arnica montana* L., *Allium ursinum* L., and *Vaccinium myrtillus* L.

Interestingly, 33% of respondents felt that other environmental issues, such as unsustainable agricultural practices (e.g., intensification, early mowing, forest clearing), invasive species, loss of pollinators, pollution, noise creation, and the spread of plant diseases, pose greater threats to biodiversity than foraging itself.

Social media, especially Facebook, was identified as a double-edged sword in the context of foraging. Several persons, such as respondent 7 (47 years, female), raised concerns about the negative impact of social media:

> "I think the situation is quite horrible, especially in the mountains, where some people dig out entire chests of plants. They then show off on Facebook with full chests of *Arnica*. This is why I like to promote the use of weeds! Based on Facebook posts, people are still collecting too much."

This behavior not only promotes excessive harvesting but also creates pressure on specific

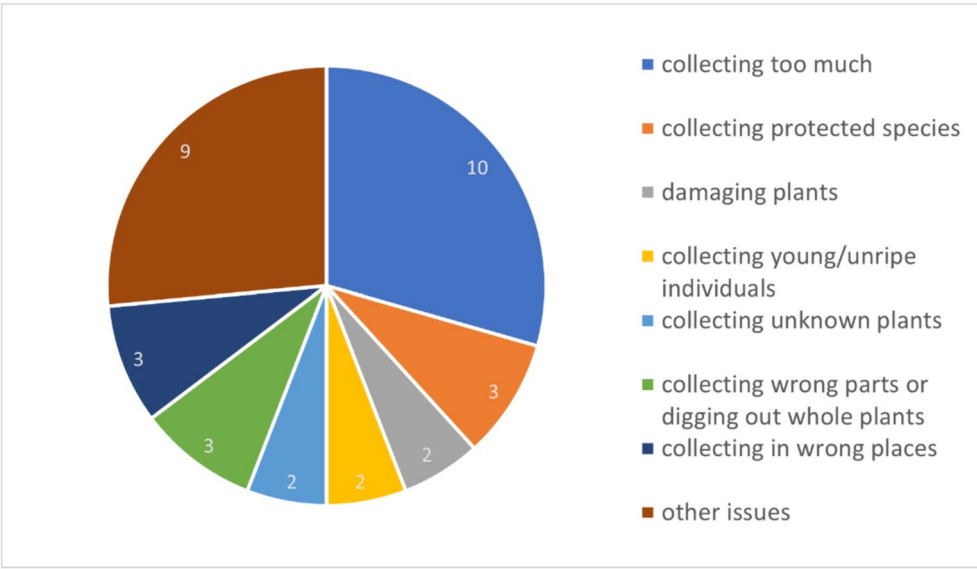

Fig. 5. Unsustainable foraging practices and other threats to plants and ecosystems as identified by the respondents. A total of 34 distinct threats were mentioned by 27 respondents

locations when posts encourage others to visit the highlighted areas.

Discussion

The results of our study highlight four key messages: (a) The modern Slovenian foraging community appears to be expanding, with foraging educators playing a pivotal role in driving this growth; (b) the motivations behind foraging and the methods of knowledge transfer are diverse, with online activities gaining increasing prominence in recent years; (c) social media platforms have emerged as significant tools in the foraging community; however, their influence is multifaceted, presenting both opportunities and challenges; and finally, (d) Slovenian foraging educators place considerable emphasis on promoting biodiversity and fostering nature conservation. This focus positions them as valuable contributors to combating plant blindness and raising ecological awareness.

Foraging in Slovenia—Past, Present, and Future

In Slovenia, the growing popularity of foraging began in the late 1990 s with the increasing influence of Dario Cortese, often regarded as the "father" of Slovenian foraging. For over a decade, he was one of the few individuals actively promoting the use of wild food plants. Another key figure was Jelena de Belder-Kovačič, a Slovenian-Belgian botanist and horticulturist, who played a central role in two popular television series on Slovenian national TV in the 1990 s. These programs focused on the culinary uses of plants, particularly flowers. Both Cortese and de Belder-Kovačič introduced wild plant–based cuisine to a broader audience, including those who did not forage themselves. Their contributions significantly influenced public awareness and played a crucial role in the early popularization of foraging in Slovenia.

Today, foraging continues to grow in popularity, but the way knowledge is transferred has undergone significant changes. Instead of the classic vertical transmission—from elders to younger generations within families—knowledge is now increasingly shared through horizontal (among people of the same generation, e.g., friends) and oblique transfer (between people of different generations not belonging to the same family, e.g., scholars to students) (van den Boog et al. 2017; Łuczaj et al. 2021; Volinia et al., 2024), as foragers seek information beyond their family circles. This shift is further amplified by media personalities and social media influencers, who leverage digital platforms to promote foraging, build communities of like-minded individuals, and facilitate knowledge exchange. In every country with modern foraging communities, there appear to be a few influential figures—the new educators—who play a pivotal role in shaping the country's foraging culture.

In recent years, large-scale events, such as the Festival of Foraging and FesDivjal, organized by the prominent foragers, have played an important role in shaping Slovenia's modern foraging community (Fig. 6). As one organizer put it, these events have "put foraging on the Slovenian map." The primary goal of these festivals is to promote foraging as a sustainable and environmentally friendly activity with potential health benefits. Importantly, they have helped set a precedent for the future of the foraging movement in Slovenia, emphasizing conservation and responsible harvesting.

Currently, only a few individuals in Slovenia are able to make a living solely from foraging and the activities connected with it. Many educators earn minimal financial benefits from their work, and maintaining a presence in both traditional and social media requires significant effort and strategic marketing. While some foragers are reluctant to commercialize their activities, they acknowledge that a stronger media presence—possibly adopting influencer-like roles—may be essential for financial sustainability. The general consensus among the interviewed foragers is that the effectiveness of social media platforms depends on the target audience. Several Slovenian foragers indicated that Facebook is more effective, as it is primarily used by people over 30, who are more interested in wild plants and form the main target group for educators. However, in some other countries, such as Italy (Volinia et al. 2024), more foraging influencers post on Instagram than on Facebook. A blog post by Koenig (2021) highlights Alexis Nicole Nelson, known as the "reigning queen of the online

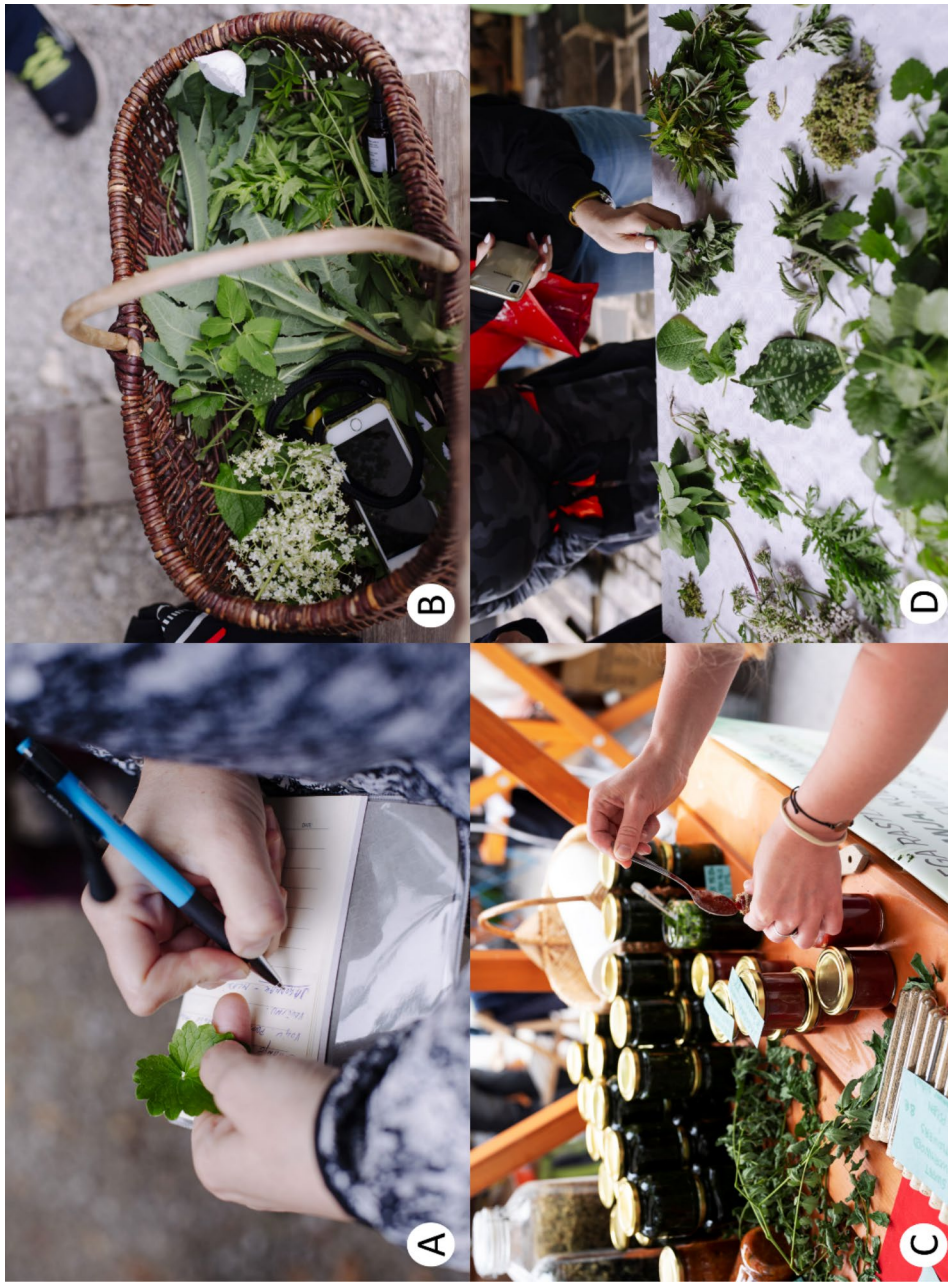

Fig. 6. A collage of photos taken at the 1st Festival of Foraging in Ljubljana, held on June 3–4, 2023. **A**, **B**, **D** Simultaneous workshops were held across Slovenia on the first day of the festival. **C** Stands in the center of the capital of Slovenia, Ljubljana, offering local products from wild plants and mushrooms. Photographs by Ekspresija (**A**, **B**, **D**) and K. Goljat (**C**)

foraging kingdom," who at the time of the blog post had 1.6 million followers on TikTok and 0.5 million on Instagram (now 4.5 million and 1.8 million, respectively). She draws a largely younger audience, particularly those in their 20 s and early 30 s. This challenges the perception among Slovenian educators that foraging does not appeal to younger generations; instead, it suggests that a different approach may be necessary to engage them in wild plants and foraging.

Among Slovenia's foraging educators, few are trained botanists, but many come from related fields such as pharmacy, medicine, and biochemistry. Several are or have been actively involved in scientific research, working at universities and publishing academic articles. This scientific background enables them to present the plants and their uses in a more rigorous, evidence-based manner, distinguishing the Slovenian foraging community from those in other countries (Łuczaj et al. 2021; Volinia et al. 2024). Similarly to British foragers (Łuczaj et al. 2021), Slovenian foragers have limited contact with their international counterparts, use literature as one of their main sources of information, and are inspired primarily from prominent foragers within their own country.

Interestingly, foraging educators in Slovenia seem more eager to engage with professional botanists and botanical societies than vice versa. To bridge the gap between the scientific community and the general public, foraging educators actively engage with botanists and conservationists, inviting them to contribute to foraging festivals with topics connected to foraging, such as invasive species, protected areas, and legal regulations. A notable example of this collaboration is Katja Rebolj, one of Slovenia's most prominent foragers, who attended the BioBlitz event in 2024 and actively promoted it through her communication channels. This demonstrates the potential for meaningful partnerships between foragers and scientists. With their specific knowledge and experiences, foragers could contribute to citizen science initiatives, enriching botanical knowledge and environmental awareness.

Despite its current informal nature, the Slovenian foraging community has the potential to evolve into a more structured organization, similar to the Association of Foragers established in Great Britain in 2015 (https://foragers-association.org/). A formal association would represent "a visible body witha public voice" (Łuczaj et al. 2021) and could provide members with opportunities for community building, knowledge exchange, and professional networking, as well as function as an intermediary between different stakeholders.

This formalization process may already be underway. Foraging festivals have successfully connected many educators who were previously unacquainted, promoting new relationships and business opportunities. A key development in this context is the creation of the online platform "Nabiralci" (eng. Foragers), which brings together educators and "foraging students" in a shared virtual educational space. These advances suggest that a structured foraging society could naturally emerge in the near future.

Social Media Proved to be Important, but its Effect is Complex

Based on many discussions with foraging educators, one thing has become very clear: there is no doubt that the Internet and social media are useful in promoting events, enhancing the communication between foragers and the instructors, and can be helpful in creating new communities that connect people with similar ideas, opinions, and values. Some participants of the study even said that they would not be able to find enough participants for their workshops without social media. This is similar to the findings of Volinia et al. (2024), who found that social networks mainly serve to reach/attract participants for in-person events.

However, the impact of social media on knowledge transfer is less clear, particularly because social media has switched the roles of the teacher and learner. According to our study, many foraging educators combine the use of social media for their self-promotion and for educating their followers, which is similar to the situation in the UK (Łuczaj et al. 2021). At the same time, only a few of them stated that they themselves also obtain information about wild plants from social media, and, if they find the information interesting, they check it in books or even scientific papers. The majority, however, responded that social media is not a reliable source of information. The situation thus seems

quite controversial, as foraging educators do not trust information on social media platforms, yet they educate through them.

There are, however, some examples where social media proved unequivocally useful. This is especially the case for mushrooms. Due to their taxonomic complexity coupled with potentially deadly poisonous effects, mushroom enthusiasts took advantage of social media and formed many mycological groups, either more general ones (sometimes focusing on the country) or highly specialized ones, focused on taxonomic groups (genera or families). Depending on the popularity of mushroom foraging in a certain country, national mushrooming groups gather tens of thousands of participants. In Finland, mushroom picking is very popular, and more than a third of adults report picking mushrooms (Santaoja 2022); this translates to very active national mushrooming pages on social media (Facebook); the largest has—at present—approximately 60,000 group members (Suomen Sieniseura–Finlands Svampvänner ry, n.d.), which represents 1.1% of the Finnish population. Similarly, mushrooming is extremely popular in Slovenia, and the largest mushrooming Facebook channel has over 34,000 members (Gobje kraljestvo, n.d.), which corresponds to 1.6% of the Slovenian population.

Most foraging educators are rather cautious when it comes to obtaining information about plants from social media, and if they do, they want to check the information in books or even scientific papers. They even point out several problems that might emerge from using or relying on social media, such as misidentifications, and the potential negative effects of social media on nature, such as releasing detailed information about locations of rare or protected species. Another issue with social media is the high level of aggressive behavior (Sbragaglia et al. 2022) and pseudoscience (Pongiglione and Martini 2022), especially when it comes to global issues such as climate change or health-related issues; such issues escalated during the COVID-19 pandemic (Desta and Mulugeta 2020; Escolà-Gascón et al. 2020; Naeem et al. 2021). Relying on Internet resources may have a de-skilling effect among people (Santaoja 2022), which was also pointed out by one of the Slovenian participants of the study. However, despite the popularity of social media, there is still a knowledge gap in understanding the impact of social media on learning in general (Kusuma Ningtyas et al. 2024), but also more specifically on nature.

Protecting Nature Through Foraging: The Slovenian Educators' Approach

Foraging for wild food plants represents both an opportunity for sustainable development (Svizzero 2016; Teixidor-Toneu et al. 2025) and a potential conservation challenge (Borelli et al., 2020; Lamrani-Alaoui and Hassikou 2018; Teixidor-Toneu et al. 2023). Slovenian foraging educators are aware of the potential damages caused by excessive foraging, and most of them emphasize the importance of sustainability in their workshops, with conservation ethics frequently being a primary topic.

The conservation-oriented nature of Slovenian foraging is likely influenced by the backgrounds of those promoting it. A significant number of these individuals have academic training in natural sciences, providing them with a deeper understanding of ecological processes and the environmental impacts of foraging. Their expertise helps shape the foraging community, reinforcing values of sustainability and biodiversity conservation. For example, respondent 2 (52 years, male) highlighted their selective harvesting method:

"When I collect, I only take the best part of the plants, such as the tip, ensuring the plant continues to grow. Respect for nature is essential to me, and I pass this on to the workshop participants."

Numerous studies indicate that foragers are a diverse group, differing in age, gender, education, and ethnicity (Bharucha and Pretty 2010; McLain et al. 2014; Shrestha and Dhillion 2006), all of which influence their foraging behaviors. They collect different kinds of products, in different locations, and with different methods, and also have different motivations for gathering, as suggested by Grivins (2021), who classified foragers into four groups based on their motivation and history of knowledge frames. According to this subdivision, there is, among others, also a difference in the foragers' approach toward nature.

Similarly to other studies (Łuczaj et al. 2021; Volinia et al. 2024), all four categories of foragers exist within the interviewed Slovenian

foragers, but classification proved difficult and only a few respondents fit perfectly to one of the categories. Łuczaj et al. (2021) and Sharman (2025) mention that within British foragers, *lifestyle foragers* dominate, and it seems that the picture is similar in Slovenia. *Lifestyle foragers* forage with the purpose of becoming healthier, having a sustainable diet, and engaging responsibly with nature; they want to live a greener or a more unique life with minimal environmental impact. These foragers tend to be more attuned to the ethical considerations of foraging, further underscoring the strong conservation ethos within the community. Respondent 21 (34 years, female) exemplifies the *lifestyle forager* archetype, fitting Grivins' description perfectly: she is deeply motivated by the foraging process itself, driven by a desire for health, sustainability, and minimal environmental impact. She did not always identify as a forager, but embraced this lifestyle to align more closely with her values of sustainability. Unlike some who inherit knowledge from ancestors, her expertise has developed through self-directed learning, interactions with other foragers, and personal observation. Her foraging knowledge has grown significantly over time, enabling her to identify and harvest a wide variety of species. While she primarily forages locally, she also explores other regions in Slovenia and even further away. This aligns with Grivins' observation that lifestyle foragers are not bound to a single location, highlighting the adaptability and expansive curiosity that characterizes this group.

Commercial foragers are those who forage mostly for profit; therefore, this group should be the most problematic when it comes to conservation issues, as they may not follow principles of nature conservation and look for products that can be commercialized. Commercial foraging is banned in some countries or areas, such as in England or Wales (de Jong and Varley 2018), although the definition of the term "commercial" becomes complex in the context of foraging courses and workshops: should foragers who earn profit mostly from educational activities and not from foraging itself be classified as commercial foragers or not? Grivins (2021) notes that many *commercial foragers* prioritize profit over conservation, often seeking products with high market value, which can lead to environmental degradation. In the Slovenian context, the true *commercial foragers* are rare. Some could be classified as partly commercial, as they (among other activities) also sell foraged plants to renowned cooks.

The fact that reality in Slovenia is more nuanced can be illustrated in the case of one of the country's leading foragers, Katja Rebolj. For her, foraging and practices related to wild plants are the sole source of income, with activities ranging from supplying plants to chefs to leading both in-person and online workshops, team-building sessions, and more. Despite these commercial aspects, she forages exclusively in her local environment, focusing on micro locations, and places a strong emphasis on conservation and could be thus hardly be classified as a commercial forager. As she puts it:

"Conservation is always first. I avoid collecting in crowded areas and never harvest protected plants like *Arnica montana*. I focus on agricultural weeds and invasive plants, which minimizes environmental impact and promotes sustainability."

This approach demonstrates that, even among foragers who could be classified as commercial, there is a deep commitment to ethical foraging and environmental stewardship. Many commercial foragers actively work to mitigate their environmental impact, prioritizing sustainability alongside their economic pursuits. Additionally, the role of educators in shaping responsible foraging behavior cannot be understated. By emphasizing conservation in their teachings and addressing emerging challenges, foraging educators contribute significantly to sustainable land-use practices in Slovenia.

Conclusion

This study represents the first focused investigation into the foraging community in Slovenia, providing valuable insights into the activities and practices of foraging educators. However, these educators constitute only a small subset of the broader foraging community. Many possess university-level degrees in natural sciences and exhibit a strong awareness of conservation issues related to foraging. Despite this, little is known about how their conservation values and knowledge are received or internalized by participants in their educational activities, whether conducted online or in person. Future research exploring the

perspectives and experiences of "foraging students" could provide valuable insights into the effectiveness of educational efforts in fostering sustainable foraging behaviors.

While foragers in different countries tend to have limited communication across borders, new foraging cultures appear to evolve in similar ways. With the rise of social media, certain high-profile foragers—often those well-versed in digital platforms—become trendsetters, shaping the way foraging is perceived and practiced within their countries, particularly among younger generations. Investigating the influence of these individuals could offer important insights into how foraging knowledge is disseminated and how emerging trends impact conservation efforts.

Social media platforms also play an increasingly significant role in the dissemination of information about natural resources, providing a rich source of data on contemporary and historical uses of plants and mushrooms. Advances in digital ethnobiology—especially tools for extracting and analyzing information from social media—present exciting opportunities to explore shifts in natural resource use. By leveraging these tools, researchers can gain a deeper understanding of evolving foraging practices, values, and potential conservation challenges within the community.

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Author Contributions

A.P. conceived the study, designed the methodology and provided critical feedback on the manuscript. Ž.F. designed the methodology, performed the interviews, analyzed the data and wrote the draft of the manuscript. Both authors have read and agreed to the published version of the manuscript.

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Data Availability

No datasets were generated or analysed during the current study.

Declarations

Competing Interests The authors declare no competing interests.

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