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A contemporary inventory of gathered wild food plants in Liguria and Piedmont (NW Italy) and its implications for the in-situ conservation of plant genetic resources

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Abstract

National inventories of crop wild relatives (CWR) record where a wild relative occurs, but not whether anyone still gathers, manages, or discriminates it. Local knowledge of wild food plants supplies that missing attribute. We pooled four ethnobotanical datasets collected between 2024 and 2026 in three areas of Piedmont, the Chierese, the province of Cuneo, and the Monferrato, and in the Genoese area of Liguria, where the mixed wild-greens preparation known as *Preboggion* is still sold in the city market. Semi-structured interviews and field walks with 48 informants aged 24–89, complemented by participant observation and market surveys, yielded 63 wild taxa in 30 families. Forty-four (70%) fall within the taxon group definition of a CWR and 29 are conspecific with a cultivated plant, among them *Beta vulgaris* subsp. *maritima* (L.) Arcang., progenitor of all cultivated beets and the identity core of *Preboggion*, *Humulus lupulus* L., *Corylus avellana* L. and *Prunus avium* (L.) L.. Every taxon whose use is expanding is a CWR, and no wild-harvested plant without a cultivated counterpart is gaining ground. Only *Urtica dioica* L. and *Taraxacum officinale* F.H.Wigg. were recorded in all four areas, and just under 70% of taxa in one only. In-field transmission has collapsed almost everywhere, and three cases of incipient domestication were documented. We argue that the erosion of foraging knowledge carries a genetic resources cost distinct from its cultural one, and propose that ethnobotanical survey becomes a routine input to CWR inventories.

1 Introduction

Wild relatives of crops are the largest accessible reservoir of adaptive variation available to plant breeding, and their systematic conservation has been a stated international priority for two decades (Maxted et al. 2006, 2012; Heywood et al. 2007). The instruments developed to pursue that priority are, almost without exception, taxonomic and spatial. A national CWR inventory is assembled by applying the gene pool or taxon group concept to a national checklist, filtering by crop importance and by threat status, and then locating the resulting taxa on a map (Vincent et al. 2013). Italy has such an inventory: Landucci et al. (2014) worked out a full CWR and wild-harvested plant checklist for the Italian vascular flora and prioritised it, and the subsequent literature has refined the priority list and assessed the conservation status of its members (Perrino and Perrino 2020). Gap analyses built on this logic have shown, at global scale, how thinly the resulting diversity is represented in genebanks (Castañeda-Álvarez et al. 2016), and how consequential the material that has been used already turned out to be (Dempewolf et al. 2017).

What this approach does not record is whether anyone still uses the taxon. A distribution polygon states that a wild relative occurs somewhere; it does not state that a community walks that slope every March, that it distinguishes two morphotypes within the stand and prefers one of them, that the harvest supplies a named product with an urban market, or that the habitat exists at all only because of a grazing regime that is now being abandoned. Those are ethnobotanical facts, and they bear directly on in situ conservation, because a genetic reserve is a management decision about people as much as about plants (Heywood et al. 2007). The point has been made in general terms that wild foods are actively managed, and the dichotomy between the cultivated and the wild is largely an artefact of how statistics are collected (Bharucha and Pretty 2010), but it is rarely operationalized. CWR checklists and wild food plant inventories are still, in practice, compiled by different communities of researchers who cite each other sparingly.

There is a second reason to bring the two literatures together. Domestication is not a completed historical event but an ongoing process, and wild food plants are its raw material (von Wettberg et al. 2020). The triage that identifies plausible candidates for neo-domestication cultural salience, existing market value, agronomic tractability takes its first two criteria directly from ethnobotanical data (Sulaiman et al. 2023). Where a wild food plant is being transplanted into kitchen gardens, moved from field margin to seedbed, or brought into cultivation to supply a distillery, the early stages of domestication are visible in real time, and the record of them is held by the people doing it.

Both arguments run into the same obstacle. Across Europe, the knowledge in question is disappearing faster than it is being written down. Reviews of contemporary wild food plant use have documented the collapse of subsistence-driven traditions alongside the emergence of new, aesthetically driven cuisines built on wild edibles (Łuczaj et al. 2012; Turner et al. 2011), and Italy in particular has been mapped in detail, with hundreds of taxa recorded in traditional vegetable mixtures (Ghirardini et al. 2007; Sansanelli and Tassoni 2014; Guarrera and Savo 2016). Diachronic studies that revisit the same territory after decades consistently report contraction: in the Southern Occitan Alps the number of families in active use narrowed markedly between the 1970s and 2022 (Alrhmoun et al. 2025b), in the upper Susa Valley half a century of change produced a similar picture (Sulaiman et al. 2024b), in the western Alps the medicinal repertoire of the pastoral economy has largely given way to synanthropic taxa (Alrhmoun et al. 2025c), and in central Tuscany a twenty-year comparison recorded a clear reduction in recognised taxa (Alrhmoun et al. 2025a). In three Mediterranean coastal areas, the erosion has gone so far that the authors describe their search for a living foraging tradition as a search for a ghost (Sulaiman et al. 2026).

North-West Italy is a good place to examine these processes together. Its foraging traditions are unusually well described for the Alpine margin (Pieroni and Giusti 2009; Cornara et al. 2009; Vitalini et al. 2013); two of its wild plant preparations, the Ligurian *Preboggion*, a variable mixture of wild greens, and the Piedmontese *Luvertin*, the young shoots of wild hop, *Humulus lupulus* L., have survived as named, marketable culinary artefacts rather than as loose knowledge about individual species. The region contains, within less than two hundred kilometres, high Occitan valleys at 2,000 m, an intensively cultivated plain, peri-urban hills under pressure from Turin, and a dense coastal city where wild greens are sold daily in a covered market. It is also a region of considerable agricultural specialisation, so that several of the wild taxa gathered there are the conspecific wild populations of locally important crops.

This paper draws together four independent field datasets collected in these settings between 2024 and 2026. Our aims are: (i) to compile an inventory of the wild taxa currently or, until recent times, traditionally gathered across the four areas; (ii) to assess how many of them are crop wild relatives or wild harvested plants, and what the ethnobotanical record adds to what a checklist already states about them; (iii) to describe how gathering practices and the transmission of gathering knowledge have changed over the last two to three generations, as reported by the gatherers themselves; and (iv) to draw out the consequences of that change for the in situ conservation and future use of the genetic resources concerned.

2 Materials and methods

2.1 Study areas

Four areas were investigated (Fig. 1). The Chierese (CH) is the south-eastern portion of the Metropolitan City of Turin, a transition zone between the Po plain and the Turin hills, between roughly 200 and 600 m a.s.l., historically farmed by small family holdings and now increasingly peri-urban; cherry orchards, vineyards, arable fields, residual woodland and field margins form a fine-grained agro-ecological mosaic.

The province of Cuneo (CN) is the largest and most heterogeneous area, and was investigated at two contrasting altitudes: the Occitan-speaking valleys of Varaita, Maira and Po, where gathering was historically tied to a pastoral economy and to the cross-border herb trade towards France, and the plain around Racconigi, Caramagna, Savigliano and Cavallermaggiore, where intensive, largely monocultural agriculture has replaced the older mosaic.

The Monferrato area (MO) was investigated around Cioccaro and Penango in the province of Asti, a hill landscape of vineyards, fields and woodland with an ageing resident population, and with a two-Michelin-star restaurant operating within the same municipality, an unusually direct juxtaposition of domestic and haute-cuisine uses of the same plant.

The Genoese area (GE) comprises the rural quarter of Bavari, on the hills above the city, where traditional horticulture persists, and the Mercato Orientale in central Genoa, one of the main covered markets of the city, where *Preboggion* is sold ready-mixed by specialised vendors. This pairing allowed us to follow the same plants from the gathering ground to the urban point of sale.

2.2 Field data collection

Fieldwork was carried out between 2024 and 2026. Data were collected through semi-structured interviews, informal group conversations and focus groups, participant observation during gathering walks, and market surveys, following standard ethnobotanical practice. In total 48 people were interviewed: 11 in the Genoese area (5 men, 6 women, aged 65–82), 20 in the province of Cuneo (5 men, 15 women; traditional knowledge holders aged 65–81 and restaurateurs aged 30–50), 6 in the Monferrato (aged 38–81), and 11 in the Chierese (aged 24–89). Informants were selected purposively for their direct, long-term experience of gathering. They included farmers, market gardeners, nursery growers, retired agricultural workers, herb sellers, a biologist specialised in *Preboggion*, an agronomist, and chefs. Interviews were conducted in Italian, in Piedmontese and Genoese dialect, and in Occitan where appropriate.

Interview schedules differed slightly between areas but converged on the same core domains: local wild plant names; gathering sites and seasons; parts used; culinary, medicinal (internally administered) and other domestic preparations; the boundary between “resource” and “weed”; whether the plant was ever transplanted, sown, tended or otherwise managed; how gathering was learnt and whether it is being passed on; and perceived changes in plant availability. Where informants agreed, interviews were audio-recorded and transcribed; otherwise, notes were taken during and immediately after the encounter. Free listing of the components of *Preboggion* was used in the Genoese area, and citation frequencies were calculated on that sample.

2.3 Plant identification, voucher specimens and nomenclature

Plants were identified in the field from morphological characters and habitat, with photographic documentation. Preliminary field determinations were supported by the Pl@ntNet application (Joly et al. 2016) and were then verified against Flora d'Italia (Pignatti et al. 2017–2019).

No new voucher specimens were collected in the course of the present study, which was designed as a non-extractive survey of use and knowledge rather than as a collecting mission. Field determinations were instead cross-checked against the voucher specimens collected and deposited by our research group during two earlier collecting expeditions in the same and immediately adjoining areas: the upper Varaita valley (Pieroni and Giusti 2009) and the Brigasc, Kye and Provencal communities of the Gesso, Grana and Ellero valleys (Mattalia et al. 2013). Those specimens are deposited at the Herbarium of the University of Gastronomic Sciences, Pollenzo, Italy, and the voucher code of each taxon is reported in the species table of the corresponding publication; the codes are given in Table 1. Three further diachronic studies carried out by our group in the same portion of the Western Alps were used for comparison of uses and folk names. Still, they did not themselves generate vouchers: the upper Borbera valley (Fontefrancesco et al. 2022), where plants were identified from informants' own specimens, the upper Susa valley (Sulaiman et al. 2024b), which relied on material deposited during the earlier fieldwork, and the Southern Occitan valleys of Maira, Stura and Grana (Alrhmoun et al. 2025b), which re-analysed existing datasets.

For the taxa in Table 1 for which no voucher specimen exists, identification rests on three converging lines of field evidence. The first is photographic documentation of the plant in situ, taken at the phenological stage at which it is actually gathered, since several of the taxa concerned are collected at rosette or young-shoot stage and are hardest to determine precisely then. The second is the morphological and ecological description given by the informant, covering habitat, slope, season and, in particular, the characters the gatherers themselves use to discriminate the plant from its look-alikes. The third is the dialect name, compared both with the phytonyms elicited for the same taxa during our earlier expeditions in the same and adjoining areas (Pieroni and Giusti 2009; Mattalia et al. 2013) and with those documented in the ethnobotanical literature for Liguria, Piedmont and the Occitan Alps (Cornara et al. 2009; Fontefrancesco et al. 2022; Alrhmoun et al. 2025b). Where these three lines did not converge unambiguously, the record was retained only at the level at which it was secure, that is at genus level or as a folk category spanning more than one botanical species, and is reported as such in Table 1. We regard this procedure as weaker evidence than a deposited specimen, and the distinction is visible in Table 1, where determinations resting on it can be told apart from those backed by a voucher.

Botanical nomenclature only was standardised afterwards: because the four datasets used different naming conventions, each name was checked individually against Plants of the World Online (POWO; Govaerts et al. 2021) and, where the name used in the field was a synonym, replaced by the currently accepted one. POWO was used as a nomenclatural authority and played no part in the identification of the specimens. Author citations are given at the first mention of each binomial in the abstract and in the main text, and for every taxon in Tables 1 and 2. Families follow the same source. Several folk categories are deliberately broader than botanical species.

2.4 Assignment of crop wild relative and wild harvested plant status

Each of the 63 taxa in the inventory was assigned a crop wild relative (CWR) status following the taxon group concept of Maxted et al. (2006), which uses the existing taxonomic hierarchy as a proxy for relatedness where crossing and genetic diversity data are unavailable. Three classes were used. Taxa conspecific with a cultivated plant, that is, wild or feral populations of a species that is itself grown as a crop, were assigned to taxon group 1b (TG1b); taxa congeneric with a crop but not conspecific with it were assigned to taxon groups 2 to 4 (TG2–4), without attempting to resolve the section- and series-level distinctions, which are not available for all of the genera concerned; taxa with no cultivated congener were classed as wild harvested plants (WHP) in the sense of Landucci et al. (2014), that is, wild taxa of direct socio-economic value that are not relatives of a crop.

The associated crop or crops were identified from the use recorded in the field together with the standard literature on Italian plant genetic resources (Landucci et al. 2014; Perrino and Perrino 2020). Two conventions should be stated. First, “crop” is used broadly, and includes food, aromatic, medicinal and beverage crops, since several of the taxa in our material are grown commercially in Piedmont for liqueur or herbal production rather than as vegetables; purely ornamental cultivation was not treated as sufficient. Second, the assignment is indicative rather than definitive: it rests on the taxon group concept and not on documented crossing behaviour, and for several genera the relationship with the crop gene pool is remote. Where a taxon is conspecific with a crop but the gathered populations are more plausibly feral escapes than genuinely wild ones, this is stated in Table 2 rather than silently resolved.

For each taxon, informants were also asked whether the plant was, or had been, transplanted, sown, tended in place, protected from cutting or otherwise deliberately managed. Reports of such management were used to identify cases of incipient domestication, in the sense of a wild-gathered taxon undergoing a documented transition towards cultivation.

2.5 Statistical analysis

Trends in use were coded from informants’ own accounts as increasing or newly commercialised (+), persisting (=), or declining or no longer gathered (−). The association between vegetation belt and reported trend was tested with Fisher’s exact test, using the two-by-two contingency of belt (montane–subalpine and alpine, broadly above about 1500 m, versus hill and lowland) against trend (declining versus not declining). Given the small numbers involved, these tests are reported as descriptive rather than confirmatory.

2.6 Ethics

The research was conducted in accordance with the Code of Ethics of the International Society of Ethnobiology (ISE 2006). The Ethics Committee of the University of Gastronomic Sciences, Pollenzo, Italy, granted ethical approval under protocol number UNISG 24092024.

Prior informed consent was obtained verbally from every participant before each interview. The aims of the research, the intended use of the data and the possibility of withdrawing at any moment were explained in advance in the participant’s own language, and permission to record was requested separately. No personal data beyond age, occupation and locality are reported here; informants who were interviewed in a private capacity are identified by initials or by first name only, whereas the professional figures who explicitly agreed

to be named are cited in full. Free, prior and informed consent covered both the interview itself and the publication of anonymised quotations.

3 Results

3.1 The ethnobotanical inventory

Pooling the four datasets and harmonising the nomenclature yielded 63 wild taxa belonging to 30 families (Table 1). Asteraceae dominate the inventory with 14 taxa, followed by Rosaceae (6), Lamiaceae (4), and Amaryllidaceae and Plantaginaceae (3 each); the remaining families contribute one or two taxa each. This is the expected signature of a European leafy-greens tradition, in which the composite rosettes gathered before flowering carry most of the culinary weight.

The distribution across areas is strikingly uneven. Cuneo contributed the largest repertoire (38 taxa), reflecting both its altitudinal range and the presence of a distinct Alpine liqueur tradition; the Chierese contributed 21, the Genoese area 17, and the Monferrato 15. Only two taxa Urtica *dioica* L. and *Taraxacum officinale* F.H. Wigg. were recorded in all four areas. Five further taxa were recorded in three areas each: *Borago officinalis* L., *Fragaria vesca* L., *Humulus lupulus*, *Malva sylvestris* L. and *Silene vulgaris* (Moench) Garcke. Forty-four taxa, just under 70% of the inventory, were quoted in a single area only. Given the short distances involved, this is less a matter of flora than of culinary tradition: *Reichardia picroides* (L.) Roth and *Urospermum dalechampii* (L.) Scop. ex F.W.Schmidt are perfectly available in Piedmont but are not thought of as food there. At the same time, the Alpine *Artemisia* complex has no counterpart in the Ligurian repertoire.

Nomenclature and folk taxonomy diverge in instructive ways. In the Genoese sample, 14 botanical species were designated by 17 dialect names: *Scixerboa* and *Cardelle* both denote *Sonchus oleraceus* L., *Talegua* and *Gattalevre* both denote *R. picroides*, and *Piscianletto* and *Garatun* both refer to the *Hyoseris radiata* L. group. Rather than imprecision, this granularity indicates a folk taxonomy fine enough to discriminate among the many edible-leaved Asteraceae that make up the mixture.

Table 1 Wild taxa gathered in the four study areas of Liguria and Piedmont, NW Italy. Botanical nomenclature follows Plants of the World Online (POWO); identifications were made as described in the Methods. Area codes: CH = Chierese (Turin); CN = province of Cuneo; MO = Monferrato (Asti); GE = Genoa and Bavari (Liguria). Trend, as reported by informants: + increasing or newly commercialised; = persisting; − declining or no longer gathered.

Family	Recorded taxon	Local folk name(s)	Part(s) used	Recorded traditional and current uses	Areas; trend	Voucher
Amaranthaceae	*Beta vulgaris* subsp. *maritima* (L.) Arcang.	gea, bietoa sarvaega (GE)	Leaves	Core ingredient of preboggion; soups, savoury pies, pansoti and ravioli fillings	GE =	—
Amaranthaceae	*Blitum bonus-henricus* (L.) Rchb.	spinaci selvatici (CN)	Leaves, shoots	Boiled as a vegetable; fillings for capunet	CN −	UNISG-CHI-BIE
Amaryllidaceae	*Allium schoenoprasum* L.	erba cipollina selvatica (CN)	Leaves	Flavouring; preserved in walnut oil	CN −	UNISG-CHI-POU
Amaryllidaceae	*Allium ursinum* L.	aglio orsino (CN, MO)	Leaves	Aioli-type sauce for boiled vegetables and cheese; preserved in oil; recent pesto-type preparations	CN, MO +	—
Amaryllidaceae	*Allium vineale* L.	aj sarvaj (CH)	Bulbs, leaves	Flavouring	CH −	—
Apiaceae	*Coriandrum sativum* L.	coriandolo (MO)	Flowers, leaves	Garnish and flavouring (escaped from cultivation)	MO +	—
Apiaceae	*Foeniculum vulgare* Mill.	finocchietto selvatico (GE)	Shoots, leaves	Preboggion; flavouring	GE =	—
Asparagaceae	*Asparagus officinalis* L.	asparagi selvatici (CH)	Young shoots	Boiled, omelettes; currently sold at farmers' markets	CH +	—
Asteraceae	*Achillea erba-rotta* All. subsp. *moschata* (Wulfen) I.Richardson	canamio, erba rotta (CN)	Flowering tops	Liqueurs (substitute for genepì); evening tisane for sleep and digestion	CN =	UNISG-CHI-CAN

Family	Recorded taxon	Local folk name(s)	Part(s) used	Recorded traditional and current uses	Areas; trend	Voucher
Asteraceae	*Artemisia absinthium* L.	assenzio (CN)	Aerial parts	Liqueurs; tisanes (used empirically during the 1918 influenza pandemic)	CN −	UNISG-CHI-BIO
Asteraceae	*Artemisia umbelliformis* Lam. (and *A. glacialis* L.)	genepì maschi, fumelo (CN)	Flowering tops	Genepì liqueur; formerly traded across the French border	CN =	UNISG-CHI-GEF2
Asteraceae	*Artemisia vulgaris* L.	artemisia comune (CN)	Aerial parts	Historical bulk herb trade	CN −	UNISG-CHI-ART
Asteraceae	*Bellis perennis* L.	margheritina (MO)	Whole plant with root	Minestra di fiori (spring soup of mixed wild greens and flowers)	MO −	—
Asteraceae	*Hyoseris radiata* L.	piscianletto, garatun (GE)	Leaf rosettes	Preboggion	GE =	—
Asteraceae	*Leontodon hispidus* L.	tageinetti (GE)	Leaf rosettes	Preboggion	GE −	—
Asteraceae	*Leontopodium nivale* (Ten.) Huet ex Hand.-Mazz.	stella alpina (CN)	Flower heads	Liqueurs (species under legal protection; gathering now prohibited)	CN −	—
Asteraceae	*Matricaria chamomilla* L.	camomilla (CH, CN)	Flower heads	Tisanes; in the Racconigi plain shifted from field weed to transplanted crop	CH, CN +	UNISG-DIS004
Asteraceae	*Reichardia picroides* (L.) Roth	talegua, gattalevre (GE)	Leaf rosettes	Preboggion; raw in salads	GE =	—
Asteraceae	*Sonchus oleraceus* L.	scixerboa, cardelle (GE)	Leaf rosettes	Preboggion	GE =	—

Family	Recorded taxon	Local folk name(s)	Part(s) used	Recorded traditional and current uses	Areas; trend	Voucher
Asteraceae	*Taraxacum officinale* F.H.Wigg.	latussa (GE); muriun, sicoria di pra (CN); tarassaco (CH, MO)	Rosettes, roots, flowers	Raw in salads when young, boiled when mature; depurative decoction; roasted root as coffee surrogate; flower syrup (amel de virasuleil)	GE, CH, CN, MO =	UNISG-CHI-MOU
Asteraceae	*Tragopogon pratensis* L.	barbabuch, barbaboc (CH, MO)	Roots, young shoots	Boiled or in salads; a war-time and post-war staple	CH, MO −	UNISG-CHI-BAR
Asteraceae	*Urospermum dalechampii* (L.) Scop. ex F.W.Schmidt	bell'omu (GE)	Leaf rosettes	Preboggion	GE =	—
Betulaceae	*Corylus avellana* L.	nocciole (CN)	Seeds	Pressed for oil used to dress wild greens	CN −	UNISG-DIS025
Boraginaceae	*Borago officinalis* L.	borragine (GE, CN, MO)	Leaves, flowers	Preboggion; agnolotti and ravioli fillings; fritters; tisane for headache	GE, CN, MO =	—
Brassicaceae	*Nasturtium officinale* W.T.Aiton	crescione delle fontane (CN)	Leaves	Salads; flavouring for fresh cheeses	CN −	UNISG-CHI-CRE
Brassicaceae	*Sinapis arvensis* L.	senape selvatica (GE, MO)	Leaves	Preboggion; boiled greens	GE, MO −	—
Cannabaceae	*Humulus lupulus* L.	luvertin, uvertin, invertin (MO); luvertin (CN, CH)	Young shoots; female cones	Shoots steamed, in omelettes, risotti, fresh-pasta fillings and salads; cones for beer, liqueurs and sedative infusions; local fair at	CH, CN, MO +	UNISG-DIS010

Family	Recorded taxon	Local folk name(s)	Part(s) used	Recorded traditional and current uses	Areas; trend	Voucher
				Sant'Albano Stura		
Caprifoliaceae	*Valerianella locusta* (L.) Laterr.	salezet, valeriana selvatica (CN)	Leaf rosettes	Salads dressed with walnut or stone-pine oil	CN −	—
Caryophyllaceae	*Silene vulgaris* (Moench) Garcke	scipuelli (GE); coujet, cuiet (CH, CN)	Young shoots, leaves	Preboggion; risotti, omelettes, minestra d'erbette	GE, CH, CN =	UNISG-DIS011
Cornaceae	*Cornus mas* L.	corniolo (CH)	Fruits	Eaten raw; preserves	CH −	—
Ericaceae	*Vaccinium myrtillus* L.	asaires, mirtilli neri (CN)	Fruits	Raw and cooked; preserves; liqueurs	CN =	UNISG-DIS017
Ericaceae	*Vaccinium vitis-idaea* L.	mirtilli rossi (CN)	Fruits	Historically rejected as indigestible; eaten only after cooking	CN −	—
Fabaceae	*Robinia pseudoacacia* L.	fiur de ghersia, fiori d'acacia (CN)	Flowers	Fritters served with honey	CN =	UNISG-DIS019
Fabaceae	*Trifolium pratense* L.	trifoglio dei prati (CH)	Flowers, leaves	Occasional food; fodder	CH −	—
Gentianaceae	*Gentiana acaulis* L.	gensianela, chause del cucù (CN)	Flowers	Decoctions and tisanes, including for evening anxiety	CN −	UNISG-CHI-CHC
Gentianaceae	*Gentiana lutea* L.	genziana maggiore (CN)	Roots	Bitter liqueurs and amari	CN =	UNISG-CHI-ERG
Grossulariaceae	*Ribes rubrum* L.	ribes (CN)	Fruits	Jams; seedlings transplanted into kitchen gardens	CN −	—

Family	Recorded taxon	Local folk name(s)	Part(s) used	Recorded traditional and current uses	Areas; trend	Voucher
Juglandaceae	*Juglans regia* L.	noci (CN)	Seeds	Pressed for oil used to dress wild greens; liqueurs	CN −	—
Lamiaceae	*Melissa officinalis* L.	melissa (CH, CN)	Leaves	Tisanes; lemon note in dandelion-flower syrup; capunet fillings	CH, CN =	—
Lamiaceae	*Mentha spicata* L.	menta selvatica (CN)	Leaves	Omelettes, soups, syrup, liqueur; frozen syrup (toc de giasa); later cultivated at Pancalieri	CN =	—
Lamiaceae	*Salvia pratensis* L.	salvia dei prati (CH)	Leaves	Flavouring	CH −	UNISG-DIS023
Lamiaceae	*Thymus serpyllum* L. s.l.	serpoul, timo (CN)	Aerial parts	Flavouring meat and Saras cheese; tisanes; used to mask the taste of marmot meat	CN =	UNISG-DIS024
Malvaceae	*Malva sylvestris* L.	malva (GE, CH, CN)	Leaves, flowers	Preboggion; soups; emollient tisane	GE, CH, CN =	UNISG-CHI-RIU
Moraceae	*Morus nigra* L.	moro, gelso (CH, MO)	Fruits	Eaten raw; preserves	CH, MO −	—
Papaveraceae	*Papaver rhoeas* L.	papavau (GE); rosolacci (CH)	Leaf rosettes	Preboggion; boiled greens; explicitly recalled as a hunger filler	GE, CH −	—
Pinaceae	*Pinus cembra* L.	pinoli, pino cembro (CN)	Seeds	Pressed for oil; source of unsaturated fats at high altitude	CN −	UNISG-CHI-ELV

Family	Recorded taxon	Local folk name(s)	Part(s) used	Recorded traditional and current uses	Areas; trend	Voucher
Plantaginaceae	*Plantago lanceolata* L.	piantaggine (GE, CH)	Leaves	Preboggion; minor medicinal uses	GE, CH −	UNISG-CHI-PIA1
Plantaginaceae	*Plantago major* L.	piantaggine rotonda (GE)	Leaves	Preboggion	GE −	UNISG-CHI-PIA2
Plantaginaceae	*Veronica* cf. *allionii* Vill.	thè di montagna (CN)	Aerial parts	High-altitude substitute for tea	CN −	UNISG-CHI-JAS
Polygonaceae	*Rumex acetosa* L.	acetosa (CH)	Leaves	Eaten raw as a sour snack; flavouring	CH −	UNISG-CHI-SET1
Polygonaceae	*Rumex alpinus* L.	rabarbaro selvatico (CN)	Leaves, petioles	Leaf wrappers for capunet when cabbage was unavailable	CN −	UNISG-CHI-GRA
Portulacaceae	*Portulaca oleracea* L.	erba porcellana (CH)	Shoots, leaves	Salads; currently sold at farmers' markets	CH +	—
Primulaceae	*Primula veris* L. (and *P. vulgaris* Huds.)	blins, primule (CN, MO)	Leaves, flowers	Omelettes on feast days; minestra di fiori	CN, MO −	UNISG-DIS032
Rosaceae	*Aria edulis* (Willd.) M.Roem.	sorbo montano (CN)	Fruits	Bletted under straw and then eaten	CN −	—
Rosaceae	*Fragaria vesca* L.	fragoline di bosco (CH, CN, MO)	Fruits, leaves	Eaten raw; jams; leaves in minestra di fiori; plants transplanted into kitchen gardens	CH, CN, MO =	UNISG-CHI-MOU
Rosaceae	*Prunus avium* (L.) L.	ciliegie selvatiche (MO)	Fruits	Eaten raw; preserves	MO =	UNISG-DIS034
Rosaceae	*Rosa canina* L.	gratacul (CN)	Hips	Jams, after removal of seeds and hairs	CN −	UNISG-CHI-BUC

Family	Recorded taxon	Local folk name(s)	Part(s) used	Recorded traditional and current uses	Areas; trend	Voucher
Rosaceae	*Rubus ulmifolius* Schott	more, rovo (CN, MO)	Fruits, young shoots	Jams; a wine-based beverage (vinus moretus); shoots in minestra di fiori	CN, MO =	—
Rosaceae	*Sanguisorba minor* Scop.	pimpinella (GE)	Leaves	Preboggion; raw in salads	GE =	—
Urticaceae	*Parietaria officinalis* L.	erba vetriola (CH)	Leaves	Occasional food; minor medicinal use	CH −	—
Urticaceae	*Urtica dioica* L.	ortica (GE, CH, CN, MO)	Young shoots	Omelettes, soups, fillings; preboggion; gathered by children in spring	GE, CH, CN, MO =	UNISG-CHI-URT
Viburnaceae	*Sambucus nigra* L.	sambuco (CH, CN)	Flowers, fruits	Fritters, liqueurs, tisanes; berry juice for syrup, jam and elder “wine”	CH, CN =	UNISG-DIS012
Violaceae	*Viola odorata* L. (and *V. calcarata* L. in the upper valleys)	violette (CN, MO)	Flowers	Decoctions; violet cream and syrup; formerly gathered by girls and sold to confectioners and herbalists	CN, MO −	UNISG-CHI-VIO

3.2 Crop wild relatives and wild harvested plants in the inventory

Applying the taxon group concept to the inventory (Table 2) shows that the foraged repertoire and the national register of plant genetic resources overlap to a degree that is not obvious from either literature alone. Forty-four of the 63 taxa (70%) are crop wild relatives in the broad, taxon group sense. Twenty-nine (46% of the inventory) are conspecific with a cultivated plant and therefore belong to taxon group 1b: they are wild or feral populations of a species that is itself a crop. A further 15 (24%) are congeneric with a crop

without being conspecific with it. The remaining 19 taxa (30%) are wild-harvested plants with no cultivated congener.

The taxon group 1b set is not a marginal fraction of the inventory but includes several of its most culturally salient members. *Beta vulgaris* subsp. *maritima* (L.) Arcang., the wild progenitor of all cultivated beets, is one of the six species cited by every informant in the Genoese sample and is a defining component of *Preboggion*. *Humulus lupulus*, the *Luvertin* of the Piedmontese material and the only taxon reported as gathered in undiminished quantity, is the crop species itself. *Corylus avellana* L. is the species on which the Piedmontese hazelnut sector rests, and *Prunus avium* (L.) L. that on which the cherry orchards of the Chierese rest, in both cases with wild and feral populations persisting alongside the orchards. *Asparagus officinalis* L., *Portulaca oleracea* L., *Valerianella locusta* (L.) Laterr., *Rumex acetosa* L., *Nasturtium officinale* W.T.Aiton, *Foeniculum vulgare* Mill., *Sanguisorba minor* Scop., *Ribes rubrum* L., *Juglans regia* L. and *Cornus mas* L. are all wild populations of European crops, several of them of considerable local importance.

The distribution of reported trends across the three classes is informative (Table 3). All six taxa reported as increasing or newly commercialised — *Allium ursinum* L., *Asparagus officinalis*, *Coriandrum sativum* L., *H. lupulus*, *Matricaria chamomilla* L. and *P. oleracea* — are crop wild relatives, and five of the six belong to taxon group 1b. Not one wild harvested plant was reported as increasing. Conversely, 12 of 29 taxon group 1b taxa (41%) were reported as declining, against 10 of 15 congeneric taxa (67%) and 11 of 19 wild harvested plants (58%). Neither contrast reaches conventional significance with these numbers (Fisher's exact test, $p = 0.13$ for decline and $p = 0.09$ for increase, taxon group 1b against all others), and we present them as patterns to be explained rather than as demonstrated effects. The direction, however, is consistent: the part of the repertoire that is holding or expanding is composed almost entirely of the wild relatives of cultivated plants, and the part that is disappearing fastest is the part with no cultivated counterpart.

Three cases in the inventory document an ongoing transition from gathering towards cultivation. In the Racconigi plain, *M. chamomilla* has shifted within living memory from a field weed collected opportunistically to a plant transplanted and grown deliberately. *Gentiana lutea* L. and *Artemisia umbelliformis* Lam., the two Alpine taxa whose harvest supports the gentian and *Genepì* liqueur trades, have both moved partly into cultivation drawn from wild germplasm. Alongside these, informants in three areas reported transplanting *F. vesca* and *R. rubrum* seedlings from woodland and hedgerow into kitchen gardens, a management practice short of cultivation but well beyond simple harvesting.

Table 2 Crop wild relative (CWR) and wild harvested plant status of the 63 taxa recorded, assigned following the taxon group concept of Maxted et al. (2006) as described in Sect. 2.4. TG1b = conspecific with a cultivated plant, i.e. wild or feral populations of a crop species; TG2–4 = congeneric with a crop but not conspecific with it; WHP = wild harvested plant with no cultivated congener. Area codes and trend symbols as in Table 1.

Taxon	Family	Class	Related crop(s)	Areas; trend	Notes
Beta vulgaris subsp. maritima (L.) Arcang.	Amaranthaceae	TG1b	Beetroot, chard, sugar beet, fodder beet	GE =	Wild progenitor of all cultivated beets; identity core of Preboggion
Allium schoenoprasum L.	Amaryllidaceae	TG1b	Chive	CN −	Wild populations of a species grown commercially as a herb
Coriandrum sativum L.	Apiaceae	TG1b	Coriander	MO +	Gathered populations are feral escapes from cultivation
Foeniculum vulgare Mill.	Apiaceae	TG1b	Florence fennel, fennel seed	GE =	Wild populations of the progenitor of cultivated fennel
Asparagus officinalis L.	Asparagaceae	TG1b	Asparagus	CH +	Wild populations of the crop species; now sold at farmers' markets
Achillea erba-rotta All. subsp. *moschata* (Wulfen) I.Richardson	Asteraceae	TG1b	Alpine liqueur herb (cultivated)	CN =	Brought into cultivation in Alpine areas for liqueur production
Artemisia absinthium L.	Asteraceae	TG1b	Wormwood (absinthe, vermouth)	CN −	Cultivated commercially for the beverage industry
Artemisia umbelliformis Lam.	Asteraceae	TG1b	Genepi liqueur herb	CN =	Cultivation established in Alpine areas from wild germplasm
Matricaria chamomilla L.	Asteraceae	TG1b	Chamomile	CH, CN +	Documented shift from field weed to transplanted crop in the Racconigi plain
Taraxacum officinale F.H.Wigg.	Asteraceae	TG1b	Dandelion (leaf and root cultivars)	GE, CH, CN, MO =	Cultivated selections exist; the only taxon recorded in all four areas with T. officinale
Corylus avellana L.	Betulaceae	TG1b	Hazelnut	CN −	Wild populations of the crop underpinning the Piedmontese hazelnut sector

Taxon	Family	Class	Related crop(s)	Areas; trend	Notes
Borago officinalis L.	Boraginaceae	TG1b	Borage	GE, CN, MO =	Cultivated in Liguria for pasta fillings; local landraces
Nasturtium officinale W.T.Aiton	Brassicaceae	TG1b	Watercress	CN −	Wild populations of the crop species
Humulus lupulus L.	Cannabaceae	TG1b	Hop	CH, CN, MO +	Wild populations of the crop species; the Luvertin of the inventory
Valerianella locusta (L.) Laterr.	Caprifoliaceae	TG1b	Corn salad, lamb's lettuce	CN −	Wild populations of a European leaf crop
Cornus mas L.	Cornaceae	TG1b	Cornelian cherry	CH −	Fruit cultivars selected in central and eastern Europe
Vaccinium vitis-idaea L.	Ericaceae	TG1b	Lingonberry	CN −	Cultivated in northern Europe
Trifolium pratense L.	Fabaceae	TG1b	Red clover (forage crop)	CH −	Wild populations of a major forage crop
Gentiana lutea L.	Gentianaceae	TG1b	Yellow gentian (bitter liqueurs, amari)	CN =	Now cultivated; wild populations are the germplasm base
Ribes rubrum L.	Grossulariaceae	TG1b	Redcurrant	CN −	Seedlings transplanted into kitchen gardens by informants
Juglans regia L.	Juglandaceae	TG1b	Walnut	CN −	Feral and planted populations; oil pressed for dressing wild greens
Melissa officinalis L.	Lamiaceae	TG1b	Lemon balm	CH, CN =	Wild populations of a cultivated aromatic
Mentha spicata L.	Lamiaceae	TG1b	Spearmint, peppermint	CN =	Later brought into cultivation at Pancalieri, a designated Italian mint district
Morus nigra L.	Moraceae	TG1b	Black mulberry	CH, MO −	Feral and relict planted trees

Taxon	Family	Class	Related crop(s)	Areas; trend	Notes
Rumex acetosa L.	Polygonaceae	TG1b	Garden sorrel	CH −	Wild populations of a cultivated leaf vegetable
Portulaca oleracea L.	Portulacaceae	TG1b	Purslane	CH +	Wild populations of the crop; currently sold at farmers' markets
Prunus avium (L.) L.	Rosaceae	TG1b	Sweet cherry	MO =	Wild populations of the crop; the Chierese is a cherry-orchard district
Sanguisorba minor Scop.	Rosaceae	TG1b	Salad burnet	GE =	Cultivated forms exist; Preboggion component
Sambucus nigra L.	Viburnaceae	TG1b	Elder (fruit and flower cultivars)	CH, CN =	Cultivars selected in central Europe
Blitum bonus-henricus (L.) Rchb.	Amaranthaceae	TG2--4	Quinoa and allied Chenopodioideae grain crops	CN −	Remote relationship; nitrophilous stands tied to summer pastoral settlement
Allium ursinum L.	Amaryllidaceae	TG2--4	Onion, garlic, leek, chive	CN, MO +	Increasingly cultivated in Europe as a leaf crop
Allium vineale L.	Amaryllidaceae	TG2--4	Onion, garlic, leek	CH −	Also a weed of arable land
Artemisia vulgaris L.	Asteraceae	TG2--4	Wormwood, tarragon	CN −	Historical bulk herb trade
Tragopogon pratensis L.	Asteraceae	TG2--4	Salsify (Tragopogon porrifolius)	CH, MO −	Congeneric with a root vegetable
Sinapis arvensis L.	Brassicaceae	TG2--4	Brassica oilseeds and vegetables, mustard	GE, MO −	Arable margin guild; tertiary gene pool relationship
Vaccinium myrtillus L.	Ericaceae	TG2--4	Highbush and lowbush blueberry	CN =	Persisting; supported by the berry trade
Gentiana acaulis L.	Gentianaceae	TG2--4	Yellow gentian (bitter liqueurs)	CN −	Congeneric with a cultivated bitter crop
Salvia pratensis L.	Lamiaceae	TG2--4	Sage (Salvia officinalis)	CH −	Meadow guild; congeneric with a cultivated aromatic

Taxon	Family	Class	Related crop(s)	Areas; trend	Notes
Thymus serpyllum L. s.l.	Lamiaceae	TG2--4	Thyme (Thymus vulgaris)	CN =	Congeneric with a cultivated aromatic
Papaver rhoeas L.	Papaveraceae	TG2--4	Opium poppy (Papaver somniferum)	GE, CH –	Arable guild; explicitly recalled as a hunger filler
Rumex alpinus L.	Polygonaceae	TG2--4	Garden sorrel, rhubarb	CN –	Nitrophilous stands dependent on transhumant husbandry
Fragaria vesca L.	Rosaceae	TG2--4	Garden strawberry (Fragaria x ananassa)	CH, CN, MO =	Also cultivated in its own right; plants transplanted into kitchen gardens
Rosa canina L.	Rosaceae	TG2--4	Cultivated roses (rootstock), rosehip	CN –	Standard rootstock for cultivated roses
Rubus ulmifolius Schott	Rosaceae	TG2--4	Cultivated blackberry	CN, MO =	Congeneric with, and interfertile within, the cultivated blackberry complex
Bellis perennis L.	Asteraceae	WHP	---	MO –	Meadow guild
Hyoseris radiata L.	Asteraceae	WHP	---	GE =	Preboggion component; two folk names in the Genoese sample
Leontodon hispidus L.	Asteraceae	WHP	---	GE –	Meadow guild
Leontopodium nivale (Ten.) Huet ex Hand.-Mazz.	Asteraceae	WHP	---	CN –	Legally protected; historical use only
Reichardia picroides (L.) Roth	Asteraceae	WHP	---	GE =	Candidate for neo-domestication as a leafy vegetable
Sonchus oleraceus L.	Asteraceae	WHP	---	GE =	Preboggion component; two folk names
Urospermum dalechampii (L.) Scop. ex F.W.Schmidt	Asteraceae	WHP	---	GE =	Preboggion component, cited by 82% of the Genoese sample
Silene vulgaris (Moench) Garcke	Caryophyllaceae	WHP	---	GE, CH, CN =	Semi-cultivated elsewhere in southern Europe; neo-domestication candidate

Taxon	Family	Class	Related crop(s)	Areas; trend	Notes
Robinia pseudoacacia L.	Fabaceae	WHP	---	CN =	Naturalised alien; flowers used for fritters
Malva sylvestris L.	Malvaceae	WHP	---	GE, CH, CN =	Preboggion component
Pinus cembra L.	Pinaceae	WHP	---	CN −	Seed pressing for oil ceased with the trade
Plantago lanceolata L.	Plantaginaceae	WHP	---	GE, CH −	Meadow guild
Plantago major L.	Plantaginaceae	WHP	---	GE −	Preboggion component
Veronica cf. allionii Vill.	Plantaginaceae	WHP	---	CN −	High-altitude tea substitute
Primula veris L. (and *P. vulgaris* Huds.)	Primulaceae	WHP	---	CN, MO −	Montane meadow margin guild
Aria edulis (Willd.) M.Roem.	Rosaceae	WHP	---	CN −	Fruits bletted under straw
Parietaria officinalis L.	Urticaceae	WHP	---	CH −	Occasional food
Urtica dioica L.	Urticaceae	WHP	---	GE, CH, CN, MO =	Recorded in all four areas; fibre and leaf-crop candidate
Viola odorata L. (and *V. calcarata* L.)	Violaceae	WHP	---	CN, MO −	Formerly sold to confectioners and herbalists

Table 3 Reported trend in use by crop wild relative class. Classes as in Table 2

Class	n	Increasing (+)	Persisting (=)	Declining (−)
TG1b: conspecific with a crop	29	5	12	12
TG2–4: congeneric with a crop	15	1	4	10
WHP: no cultivated congener	19	0	8	11
Total	63	6	24	33

3.3 *Preboggion*: a mixture that outlives its species

In the Genoese sample, all eleven informants knew and practised *Preboggion* gathering, with an average of some sixty years of experience. Every informant cited six species — *B. officinalis*, *B. vulgaris* subsp. *maritima*, *T. officinale*, *S. vulgaris*, *S. minor* and *U. dioica* — and constitute the identity core of the mixture; *M. sylvestris* (91%) and *U. dalechampii* (82%) follow closely. Informants consistently described the mixture as variable by season, slope and gatherer, and treated that variability as constitutive rather than accidental.

The comparison of past and present practice reported by the same informants is unambiguous. Frequent use of *Preboggion* fell from 93% to 34%; use in soups fell from 87% to 28%; use in savoury pies held up better, falling from 80% to 41%; and family transmission of the knowledge fell from 100% to 38%. Averaged across indicators, the decline is of the order of half. The most consequential figure, however, is the last one: the species themselves are common, resilient and in no sense threatened, but the capacity to read them as food is not being handed on. As one informant put it, people are now afraid of getting the identification wrong.

What keeps *Preboggion* alive is precisely that it is a named artefact with a market. At the Mercato Orientale it is sold ready-mixed and correctly composed; the buyer purchases not only the greens, but the identification skill embedded in them. This is the clearest instance in our material of a wider pattern: where gathering knowledge has been externalised into a commodity, consumption survives the collapse of household transmission.

3.4 *Luvertin*: the resilient shoot

Humulus lupulus is the only taxon in our material that all Piedmontese informants described as still being gathered in essentially unchanged quantities, and the reasons given are consistent across the three areas: the shoots are easy to recognise, they appear in a narrow and well-known season, and they are unambiguously good to eat. The plant carries at least three folk names in the Monferrato alone (*Luvertin*, *Uvertin*, *Invertin*), it supports a local fair at Sant'Albano Stura, and it has moved into professional kitchens — as a filling for fresh pasta in the everyday restaurant sector, and as a seasonal signature in the fine-dining sector, where the chef interviewed in the Monferrato described sourcing and handling as the decisive steps.

The same species also illustrates how a single plant can span registers. Its female cones are used domestically as a bitter tonic and sleep aid, in doses reported to us in the same terms as those given in mid-twentieth-century herbal manuals, and industrially in brewing. Very few of the taxa in Table 1 travel this comfortably between the kitchen garden, the pharmacy shelf and the restaurant. It is worth noting that the wild populations gathered for *Luvertin* and the plants grown in the region's small but expanding hop yards are the same species, so that the shoot harvest and the cone crop draw on a single gene pool.

3.5 Erosion of the transmission chain

In all four areas informants located the break in transmission in the same period: the post-war decades and above all the economic boom of the 1960s, with rural depopulation, the arrival of industrial foodstuffs perceived as more prestigious, and the association of wild greens with poverty. The Occitan formulation recorded in Cuneo is the sharpest statement of this reversal: "Nous sen pas ciabre" — we are not goats.

Eating what the mountain offered became embarrassing at precisely the moment when it stopped being necessary.

Older informants described learning in the field, from mothers and grandmothers, as small children carrying a basket. That channel is now largely closed. In the Chierese, a nursery grower observed that the habit has gone and the memory with it, while his wife added that people no longer know how to look because the word is no longer passed from one generation to the next. A young farmer in the same area asked whether he could recognize *Coujet* S. *vulgaris* in a meadow, admitted that he would struggle. The Genoese figures quantify the same phenomenon: perceived knowledge of wild greens among younger generations stands at 45% against 100% for the previous ones.

Alongside the social causes, informants named ecological ones: agricultural intensification and specialisation, heavy machinery and soil compaction, herbicides, the loss of field hedges, the disappearance of permanent meadows to building and to arable conversion, and, at altitude, grazing pressure on *Vaccinium* stands and the effect of harvesting combs that strip leaves along with berries. Climate was raised repeatedly and specifically: in the Varaita valley, *Genepì* is now in flower by mid-July and already over by August, when gathering traditionally took place.

3.6 Re-emergence and new actors

The same interviews record a countermovement. Wild hop shoots, wild asparagus, purslane, dandelion and poppy rosettes now appear on farmers' market stalls in the Chierese, bought by consumers who do not gather. Agriturismi and mountain refuges in Cuneo have built menus around wild plants; several were founded by returnees who left for the city and came back. Courses on identification and processing have been organised in Piedmont, and university-linked projects have re-engaged younger participants with the older documentary record. Informants themselves repeatedly proposed ecomuseums and slow-tourism itineraries as a way forward, and in Liguria the candidacy of *Preboggion* as a Slow Food Presidium is being actively pursued by the community around the Mercato Orientale. A Praesidium is a scheme run by the Slow Food Foundation for Biodiversity that supports a food product judged to be at risk of disappearing by constituting its producers as a group, agreeing a production protocol, providing technical assistance, and opening commercial outlets.

These initiatives were not described uncritically. Informants in the Cuneo valleys reported persistent consumer distrust of wild ingredients in restaurants, and fear of poisoning; the agronomist interviewed in the Chierese warned explicitly against the local proverb holding that any herb that raises its head makes good soup, insisting that renewed interest is welcome only if it is matched by competence.

4 Discussion

4.1 Contraction of breadth, expansion of meaning

Read together, the four datasets do not support either of the two standard narratives. Traditional foraging in NW Italy is not simply disappearing: several taxa are gathered as much as ever, two preparations have

acquired a market, and interest among younger and urban consumers is real. Nor is it thriving: the number of taxa that any given person can name and use has fallen sharply, entire use categories — famine foods, coffee surrogates, veterinary and household use — have gone, and the channel through which the knowledge moved has been cut. What we observe is a decoupling. The breadth of the repertoire contracts while the cultural and commercial value of what remains expands. The same decoupling has been described for the Southern Occitan Alps and the upper Susa Valley (Alrhmoun et al. 2025b; Sulaiman et al. 2024b) and, in more advanced form, in coastal Mediterranean settings where the tradition survives mainly as memory (Sulaiman et al. 2026).

Our material suggests what determines which taxa survive the contraction. Three anchors recur. The first is incorporation into a named dish or product: *Preboggion* in Liguria, *Luvertin* in Piedmont, *Genepì* and *Genziana* liqueurs in the Alpine valleys. A plant that is an ingredient of something with a name is remembered, sought and bought; a plant that is merely edible is forgotten. The second is ease and safety of recognition, which informants stated explicitly for hop shoots and elder flowers. The third is the existence of a commercial channel, whether a market stall, a fair, a distillery or a restaurant. Taxa lacking all three — *Papaver rhoeas* L., *Tragopogon pratensis* L., *Rumex alpinus* L., *Blitum bonus-henricus* (L.) Rchb. — are precisely those our informants named as no longer gathered, and they are disproportionately the plants that were most closely bound to scarcity.

4.2 What foraging knowledge contributes to work on crop wild relatives

The central result of this study is the extent of the overlap reported in Section 3.2: 70% of a repertoire assembled purely on ethnobotanical criteria turns out to consist of crop wild relatives in the taxon group sense, and 46% of wild populations of crop species themselves. The overlap is not a coincidence of classification. People gather, preferentially, the wild counterparts of the plants they already grow and eat, because those are the plants whose edibility, seasonality and processing they already understand. Wild food plant inventories and CWR checklists are, to a substantial degree, two descriptions of the same set of populations arrived at from opposite directions: one from use, the other from taxonomy. That largely separate research communities compile them is a historical accident with practical costs.

Those costs are worth stating concretely, because the ethnobotanical record supplies three things that a taxonomic and spatial inventory cannot.

The first is the location and condition of populations that are actually being used. A CWR checklist establishes that *B. vulgaris* subsp. *maritima* occurs on the Ligurian coast; Landucci et al. (2014) place the genus *Beta* among the priority Italian CWR, and it is among the highest-priority genera globally (Vincent et al. 2013; Castañeda-Álvarez et al. 2016). What our informants add is that specific stands on the terraced slopes above Bavari are harvested repeatedly through the season by named gatherers, that the harvest supplies a specific urban market, and that the people concerned can walk to the stands. That matters, because sea beet is not an abstract genetic resource: it is the population from which the rhizomania resistance locus *Rz2* was mapped directly, by sequencing wild beets sampled in their natural habitat. The authors of that work drew the explicit conclusion that in situ preservation of such populations is what makes the approach

possible (Capistrano-Gossmann et al. 2017). A community that harvests a sea beet population weekly is, whether or not it is described in these terms, maintaining an in situ genetic resource and monitoring it continuously. When the harvesting stops, the monitoring stops with it, and the population becomes a dot on a distribution map again.

The second is phenotypic resolution. Folk taxonomies are frequently finer than the botanical species where the distinctions matter to the user, and coarser where they do not. Our Genoese material shows both: 14 species carry 17 names, while elsewhere a single name covers two species. The names that multiply are those of the edible-leaved Asteraceae that must be discriminated in the field at rosette stage, and the criteria informants gave for the distinctions bitterness, leaf texture, and the moment at which the rosette becomes unusable are recognisably the same descriptors that appear in germplasm characterisation. Something similar has been argued for the Basque Country, where the fine-grained naming of gathered wild vegetables was documented precisely in this journal (Menendez-Baceta et al. 2012). A folk taxonomy of this kind is the sedimented outcome of many generations of phenotypic screening across a wild population, and it is the sort of information that is expensive to reconstruct once lost and cheap to record while it survives.

The third is a defensible shortlist for neo-domestication. The standard triage for identifying wild food plants that might become novel crops combines cultural salience, existing economic value in local markets, and agronomic feasibility (Sulaiman et al. 2023). Ethnobotanical fieldwork supplies the first two directly and cheaply. In our inventory, *R. picroides*, *S. vulgaris*, *S. minor*, *U. dalechampii*, *A. ursinum* and *P. oleracea* satisfy both criteria: high salience, an existing point of sale or restaurant demand, and several of them have already attracted attention as candidate leafy vegetables elsewhere in southern Europe. *Humulus lupulus* unusually satisfies them, since the crop already exists and it is the wild shoot harvest, rather than the plant, that would need to be brought into production.

Beyond candidate identification, our material contains four documented cases of a transition already under way (Section 3.2). Domestication is best understood as a process rather than an event, and the early stages deliberate transplanting, protection in place, movement from field margin to seedbed are ordinary and unspectacular (von Wettberg et al. 2020). The Racconigi chamomile and the Pancalieri mint are exactly this: plants that entered the regional agricultural economy from the wild flora within living memory, through the intermediate step of being tended where they stood. The transplanting of *F. vesca* and *R. rubrum* into kitchen gardens is the same process caught earlier. None of these transitions is recoverable from a herbarium or a distribution model. They are visible only because someone asked the people doing them, and in three of the four cases the people who could describe the transition were over seventy-five.

4.3 The erosion has a genetic resources cost, not only a cultural one

If the argument above holds, then the decline documented in Sections 3.3 and 3.5 is not only a loss of intangible heritage. Three distinct mechanisms connect it to the state of the genetic resources themselves.

The first operates through habitat. Several of the declining taxa are not merely gathered in a habitat but dependent on a management regime that gathering was part of. *Rumex alpinus* and *B. bonus-henricus* are nitrophilous species of livestock resting places, of the surroundings of alpine cowsheds and of seasonally

inhabited high settlements; their habitat is a by-product of transhumant husbandry, and the same is largely true of the moist mown meadows in which *Allium schoenoprasum* L. was gathered. When the summer pastoral economy contracts, the stands contract with it, so that the plant and the gatherer disappear in the same movement and for the same reason. This is the mechanism repeatedly documented for Alpine grassland flora following the withdrawal of traditional management (Tasser et al. 2007; Niedrist et al. 2009). Here the loss of practice and the loss of population are not two events but one.

The second operates through land use, and affects a well-defined guild: the plants of hay meadows and of low-input arable fields and their margins. *P. rhoeas*, *Sinapis arvensis* L., *V. locusta*, *T. pratensis*, *Salvia pratensis* L., *Trifolium pratense* L., *Bellis perennis* L., *R. acetosa*, *Plantago lanceolata* L., *Leontodon hispidus* L. and, at the montane meadow margin, *Primula veris* L. are precisely the guilds whose measured decline across Europe has been attributed to fertiliser and herbicide use and to the conversion of permanent grassland (Storkey et al. 2012), and in the Alpine context to the parallel intensification of accessible land and abandonment of the rest (Tasser et al. 2007; Niedrist et al. 2009). Our informants named the same drivers independently and without prompting. It is worth noting how many members of this guild are crop wild relatives: *V. locusta* is the crop species itself, *T. pratense* is a major forage crop, *R. acetosa* is cultivated sorrel, and *T. pratensis* and *S. arvensis* are congeners of salsify and of the *Brassica* crops respectively. The arable and meadow margin is not an ethnobotanical curiosity but one of the principal reservoirs of European CWR diversity, and it is being lost for reasons that have nothing to do with whether anyone still gathers from it.

The third operates through knowledge, and is the one specific to this study. Where a population persists and its habitat persists, what can still be lost is the ability to find it, to recognise it, and to distinguish what is worth taking within it. This is the loss our Genoese figures measure most directly: the species are common and unthreatened, family transmission has fallen from 100% to 38%, and the reason informants gave was fear of misidentification. Nothing about the beet populations above Genoa has changed; what has changed is the number of people who can read them. Recent ethnobiological work has argued that local ecological knowledge cannot be maintained in the absence of continuous, embodied interaction with the landscape (Pieroni et al. 2025; Sulaiman et al. 2026), and our material is consistent with that: the taxa that hold or expand are, almost without exception, those of habitats crossed daily anyway hedgerows and riparian scrub for *H. lupulus*, vineyard and field margins for *A. officinalis*, gardens and yards for *P. oleracea*, *Melissa officinalis* L. and *M. chamomilla*, roadsides and orchard floors for *T. officinale*, and the terraced slopes immediately above Genoa for the whole *Preboggion* assemblage. Gathering survives where it costs no additional journey. What has contracted at altitude is not the flora but routine bodily presence in the habitat, the food- and landscape-specific form of what has been described more generally as the extinction of experience (Soga and Gaston 2016).

4.4 Elevation, frequentation and an attribution problem

The ecological patterning of the decline deserves a closer look, because it bears on where in situ measures would be effective. We assigned each of the 63 taxa to the vegetation belt and habitat in which our informants actually gathered it, following the habitat indications given during the interviews and field walks and checking them against Flora d'Italia (Pignatti et al. 2017–2019). The assignment is coarse, and several taxa span belts, but it is sufficient for the comparison that matters here.

Twelve taxa belong to the montane–subalpine and alpine group, all of them recorded in the province of Cuneo. Eight of these (67%) were reported as declining or no longer gathered, four as persisting, and none as increasing. Of the 51 taxa of the hill and lowland belts, 25 (49%) were reported as declining, 20 as persisting, and six (12%) as increasing or newly commercialised. Restricting the comparison to Cuneo, the only area that spans both groups and therefore the only internally controlled comparison available to us, the contrast is of the same sign: eight of 12 high-belt taxa declining against 11 of 26 lower-belt taxa, with three of the latter increasing. The direction is consistent, but with these numbers the association is not statistically significant (Fisher's exact test, $p = 0.34$ for the full inventory and $p = 0.30$ within Cuneo), and we present it as a pattern to be explained rather than as a demonstrated effect.

The obvious reading is that people no longer go up. Against this, however, stands an internal control that we consider decisive. In the same belt, on the same slopes, and in several cases in the same valleys, four taxa are reported as fully persisting: A. umbelliformis, Achillea erba-rotta All. subsp. moschata (Wulfen) I.Richardson, G. lutea and Vaccinium myrtillus L.. Every one of these four has a current commercial outlet — the Genepì and gentian liqueurs, and the berry trade. Every one of the nine that are disappearing lacks one, and the one that once had one, Pinus cembra through seed pressing for oil, lost it when that trade closed. Whatever is removing the nine cannot be a property of the high belt as such, because it leaves the four untouched. Within the alpine belt, availability is not the discriminating variable; the existence of a reason to climb is.

What, then, of climate? Our informants raised it specifically, but in a narrower way than the question is usually posed. In the Varaita valley they reported that *Genepì* is now in flower by mid-July and already over by August, and at altitude they described grazing pressure on *Vaccinium* stands together with the damage done by harvesting combs. Both observations are consistent with the wider evidence. Vascular plants in the Alps have shifted upward measurably over recent decades (Lenoir et al. 2008; Parolo and Rossi 2008), summit floras have been enriched at an accelerating rate that tracks warming (Pauli et al. 2012; Steinbauer et al. 2018), and range dynamics are slower at the highest elevations, so that alpine specialists lag behind the climate they experience (Rumpf et al. 2018). Yet three things argue against reading our declines as a climate signal. None of the nine retreating taxa is rare or threatened in Piedmont; the documented direction of change on Alpine summits is enrichment rather than the loss of common alpine species; and, again, climate cannot explain why four taxa of the same belt are stable. The defensible reading is narrower and, we think, more interesting: climate is acting on our system as a modifier of the gathering calendar rather than as a cause of the loss of the practice. A phenological advance of two to three weeks is a minor inconvenience for someone living on the mountain and a disqualifying obstacle for someone who now drives up on a fixed summer weekend.

This points to an attribution problem that deserves to be stated plainly, because it affects the whole diachronic ethnobotanical literature and, by extension, any use of that literature to infer the status of wild populations. Abandonment and warming produce closely similar landscape signals: the canonical demonstration is that most of the recent advance of the tree line in the Swiss Alps represents infilling of abandoned grassland rather than a true climatically driven upward shift (Gehrig-Fasel et al. 2007). Informants who report that there is less of a plant may be reporting a reduced encounter rate rather than a reduced abundance, and reduced encounter follows from reduced presence as surely as from reduced

population. Our data, like almost all data of this kind, measure use and encounter, not abundance. Testing the alternatives properly would require paired vegetation surveys in the abandoned and still-grazed sectors of the same valleys, which we did not carry out. For CWR assessment this is an important caveat: ethnobotanical data are excellent evidence of use, management and location, and weak evidence of population size.

4.5 Commercialisation as a double-edged conservation instrument

Section 4.4 established that a commercial outlet is what keeps a high-belt taxon in use. Section 3.2 established that every taxon in the inventory with a positive trend is a crop wild relative. Together these results suggest that the market is currently the most effective instrument maintaining wild plant use in the region — and that it is a hazardous one.

Three implications follow. First, commercialisation can conserve practice while hollowing out competence, and the two outcomes should be evaluated separately. The Mercato Orientale keeps *Preboggion* in circulation, and in doing so it allows the buyer to acquire the mixture without acquiring the knowledge that composed it. Persistence of use and persistence of transmission are different outcomes, and our data show the first improving while the second continues to decline. This is consistent with the finding, from a large Iberian dataset, that the wild plant uses which persist are those anchored to high cultural appreciation and to the recreational value of gathering rather than to necessity (Reyes-García et al. 2015).

Second, demand concentrated on a few charismatic taxa creates harvesting pressure that traditional dispersed gathering never generated, and the ecological effects of concentrated wild harvest are well documented and frequently underestimated (Ticktin 2004). The Cuneo material already contains the historical precedent in its own record: the early twentieth-century bulk trade in *Artemisia* for the vermouth industry stripped several species from the valleys. That episode is, in the vocabulary of this journal, a documented case of genetic erosion of a wild harvested resource driven by commercial demand, and it is remembered locally. Access and harvest rules strongly condition what can actually be gathered in European settings (Mina et al. 2023). Current Piedmontese law responds with a general limit of five specimens per person per day for unprotected wild flora. This blunt instrument is difficult to reconcile with commercial supply and was not designed for a revival of this kind. Any policy that deliberately creates a reason to climb — and Section 4.4 implies that this is the only measure likely to recover high-belt use — must be paired with harvest regulation designed for the purpose.

Third, formal recognition schemes face a genuine dilemma that has a direct genetic resources dimension. A Slow Food Presidium would give *Preboggion* visibility, protect its local varieties and support its gatherers. Food festivals and similar arenas have been shown to function effectively as settings in which dormant food knowledge is re-performed and re-legitimated (Fontefrancesco and Zocchi 2020). Still, every recognition scheme tends to fix a composition, and the variability of *Preboggion* — by season, slope and gatherer — is not a defect to be corrected but the very form the knowledge takes, and arguably a proxy for the diversity of the populations being harvested. A protocol that fixed a canonical species list would standardise the harvest onto a subset of the stands. The heritagisation literature warns, more generally, that such arenas select

which elements of a foodscape become recognised heritage and which actors are authorised to speak for it (Zocchi et al. 2021). The most useful design would specify a protected core, a permitted set, and an explicit right to seasonal and local variation.

4.6 Who reinvents foraging, and why it matters for conservation

A design feature of this study turns out to be one of its more informative results. We did not sample the population that the international literature treats as the protagonist of the contemporary foraging revival. Urban and peri-urban recreational foragers have been described in detail in Berlin (Landor-Yamagata et al. 2018), Vienna (Schunko et al. 2021), Baltimore (Synk et al. 2017), and North American cities (Poe et al. 2013; McLain et al. 2014), and the practice is documented across a wide range of urban contexts (Shackleton et al. 2017; Fischer and Kowarik 2020); their motivations, largely recreational, health-related and provenance-driven, are well characterised (Schunko et al. 2015; Reyes-García et al. 2015). None of these people is in our sample. Our informants were rural and peri-urban residents, most over sixty-five, selected for their long-term and inherited experience of gathering. And yet innovation is unmistakably present in what they described.

Five figures recur across the four areas: the returnee producer, who converts a domestic seasonal practice into a bookable service and in doing so needs the plants to be reliably available and nameable (Dematteis 2011; Corrado et al. 2014); the market vendor, who standardises the mixture just enough for it to be sold; the chef, for whom wild plants are a seasonal signature and whose knowledge comes from books, suppliers and peers rather than from a family line, exactly as documented for nearby Lombardy (Sulaiman et al. 2024a); the institutional broker behind a Presidium candidacy, a fair or an ecomuseum; and the custodian turned teacher, who learned in the field as a child and now transmits to strangers rather than to kin. None is a hobbyist: each has an economic or institutional stake in the plants, and all five are intermediaries standing between the plant and a public that does not gather.

Two features of this configuration matter for genetic resources. The innovation is organisational rather than botanical: nothing in Table 1 is new, no taxon entered the repertoire through the contemporary revival, and the species whose trend is positive are long-standing local foods moving through new formats. This is a useful point of contrast with urban foraging inventories, which are typically floristically broader and include ornamental, alien and spontaneously urban taxa absent from any inherited local corpus (Landor-Yamagata et al. 2018; Fischer and Kowarik 2020). And the innovators are, in general, not the transmitters: a vendor who sells a correctly composed mixture, a chef who buys shoots from a supplier and a festival that stages a plant once a year all keep the plant in circulation without restoring in-field learning. For anyone hoping to use these actors as custodians of in situ genetic resources — and they are the obvious candidates, since they are the ones with a stake in the populations continuing to exist — this distinction is the crucial one. They can be relied upon to maintain demand. They cannot, as currently organised, be relied upon to maintain the competence that locates and discriminates the populations.

A further observation, which our sampling allows us to state but not to quantify, concerns gender. The transmission that broke was largely female and domestic, and the knowledge holders we interviewed in Cuneo were predominantly women. The reinvention is being carried out to a considerable extent through

commercial and public roles — restaurateurs, distillers, market vendors, fair committees — in which men are, at least in our sample, more visible. If confirmed, this would mean that the shift from household to market has also been a shift in who is credited with the knowledge, a dynamic that the food heritage literature identifies as a recurrent risk of heritagisation (Zocchi et al. 2021).

4.7 Recommendations

Three proposals follow from the material, addressed to different audiences.

To those compiling national inventories of plant genetic resources, we suggest that ethnobotanical surveys be treated as a routine input rather than as parallel literature. Concretely, the Italian CWR and wild-harvested plant checklist (Landucci et al. 2014; Perrino and Perrino 2020) could carry a use-and-management attribute for each taxon, recording whether the taxon is currently gathered, whether it is deliberately managed, and whether a community exists that can locate and discriminate its populations. That attribute is cheap to collect alongside existing ethnobotanical fieldwork, it changes the priority ranking, and it identifies the populations for which in situ measures have a realistic chance of being maintained by the people already present.

To those designing in situ measures in this region specifically, the asymmetry established in Section 4.4 has a clear consequence. Where loss is driven by access rather than by availability — the alpine taxa — measures that restore a reason to be present, such as grazing support, staffed refuges, guided harvest and short product chains, will recover use faster than measures that protect plants which are in no danger. Where loss is driven by habitat conversion — the meadow and arable margin guild, which contains a disproportionate share of the region's CWR — the priority is the reverse, and no amount of cultural interest will bring *V. locusta* or *P. rhoeas* back onto a plate without margins, hedgerows and low-input permanent grassland. The terraced slopes above Genoa are a candidate for the first kind of measure and, given the identity of the species involved, a plausible site for a genetic reserve built around a harvesting community rather than around an exclusion.

To those documenting the knowledge, the practical point is one of sequence. Systematic documentation is most urgent where the last competent gatherers are now in their eighties, which in our material means the Occitan valleys and the Genoese hinterland. Recognition schemes should be designed to protect variability rather than to fix a recipe. And the single most consequential intervention, on our evidence, is also the least technical: arrangements that put learners and knowledge holders in the same field in the same season. No amount of documentation reproduces a practice that has stopped being practised, and no distribution map substitutes for a person who knows which slope.

4.8 Limitations

The four datasets were collected independently, with partly different interview schedules and sampling strategies, and the samples are small and purposive; the frequencies reported for the Genoese area in particular rest on eleven informants and should be read as indicative rather than representative. Fieldwork was concentrated in late winter and spring, which favours leafy species and under-records autumn taxa. Perceived past frequencies of use are retrospective self-reports and are subject to the usual recall effects, including a tendency to contrast a vivid childhood with an undifferentiated present. Our samples are strongly

skewed towards older residents, and the perspective of younger non-gatherers is represented only through the accounts of others; for the same reason, the study contains no urban recreational foragers, and the contemporary urban demand described in Sections 4.5 and 4.6 is documented only from the supply side.

Two limitations bear specifically on the genetic resources argument. We collected no vegetation or abundance data, so the ecological reading proposed in Section 4.4 rests on reported use and on the published literature rather than on measured changes in plant populations; as noted, ethnobotanical data are strong evidence of use and location and weak evidence of population size. And the CWR assignment in Table 2 rests on the taxon group concept rather than on documented crossing behaviour or molecular data (Maxted et al. 2006). For the taxon group 1b taxa this is unproblematic, since conspecificity with the crop is not in doubt; for several of the congeneric assignments the relationship with the crop gene pool is remote, and the corresponding figures should be read as an upper bound on the breeding-relevant fraction of the inventory.

5 Conclusions

Across four areas of Liguria and Piedmont, 63 wild taxa in 30 families were recorded as gathered now or within living memory, and only two of them are shared by all four areas. Seventy per cent of that repertoire consists of crop wild relatives in the taxon group sense, and 46% of wild populations of crop species themselves, including the wild progenitor of all cultivated beets, which is the identity core of a mixture still sold daily in the centre of Genoa. Every taxon in the inventory whose use is expanding is a crop wild relative; not one wild harvested plant without a cultivated counterpart is gaining ground.

Behind the low overlap between areas lies a general pattern: what survives is not the plant but the artefact the mixture, the shoot, the liqueur and the market or the table that keeps it in circulation. Gathering has ceased to be a household competence transmitted in the field and is becoming a specialised, purchasable and increasingly professional one. Almost every taxon in Table 1 is common, and species conservation is not the issue. What is at issue is the maintenance of the practices that keep specific populations under continuous local management and observation, and of the knowledge that locates and discriminates them.

We therefore suggest that the ethnobotany of wild food plants be treated not as a parallel literature to the conservation of plant genetic resources but as one of its instruments. It identifies which wild relatives are embedded in living agroecosystems rather than merely present in them; it supplies phenotypic and locational detail that taxonomic inventories cannot; it catches incipient domestication in progress; and it names the communities on whose continued presence in situ measures would depend. It also has a short window. In our material, three of the four documented transitions from gathering towards cultivation were described by people over seventy-five.

Declarations

Competing interests

The authors have no relevant financial or non-financial interests to disclose.

Ethics approval

The research was conducted in accordance with the Code of Ethics of the International Society of Ethnobiology (ISE 2006). Ethical approval was granted by the Ethics Committee of the University of Gastronomic Sciences, Pollenzo, Italy (protocol UNISG 24092024).

Consent to participate

Prior free and informed consent was obtained verbally from every participant before each interview, after the aims of the research, the intended use of the data and the possibility of withdrawing at any moment had been explained in the participant's own language. Permission to record was requested separately.

Consent for publication

All participants consented to the publication of the anonymised data and of the quotations reproduced here. No personal data beyond age, occupation and locality are reported: informants interviewed in a private capacity are identified by initials or by first name only, whereas the professional figures who explicitly agreed to be named are cited in full.

Plant material

No plant material was collected, exported or otherwise utilised during this study; no access and benefit sharing procedure under the Nagoya Protocol was therefore applicable. Voucher specimens consulted for verification were collected during previous expeditions by the same research group and are deposited as stated in Sect. 2.3.

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Author Contribution

Conceptualization: AP; Methodology: AP; Investigation: AP; Formal analysis: AP, AKM; Writing - original draft preparation: AP; Writing - review and editing: AP, AKM. All authors read and approved the final manuscript.

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Data availability

The inventory supporting the conclusions of this article is included within the article as Tables 1 and 2. The interview transcripts and field notes are not publicly available because they contain information that could compromise the privacy of participants.

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Figures

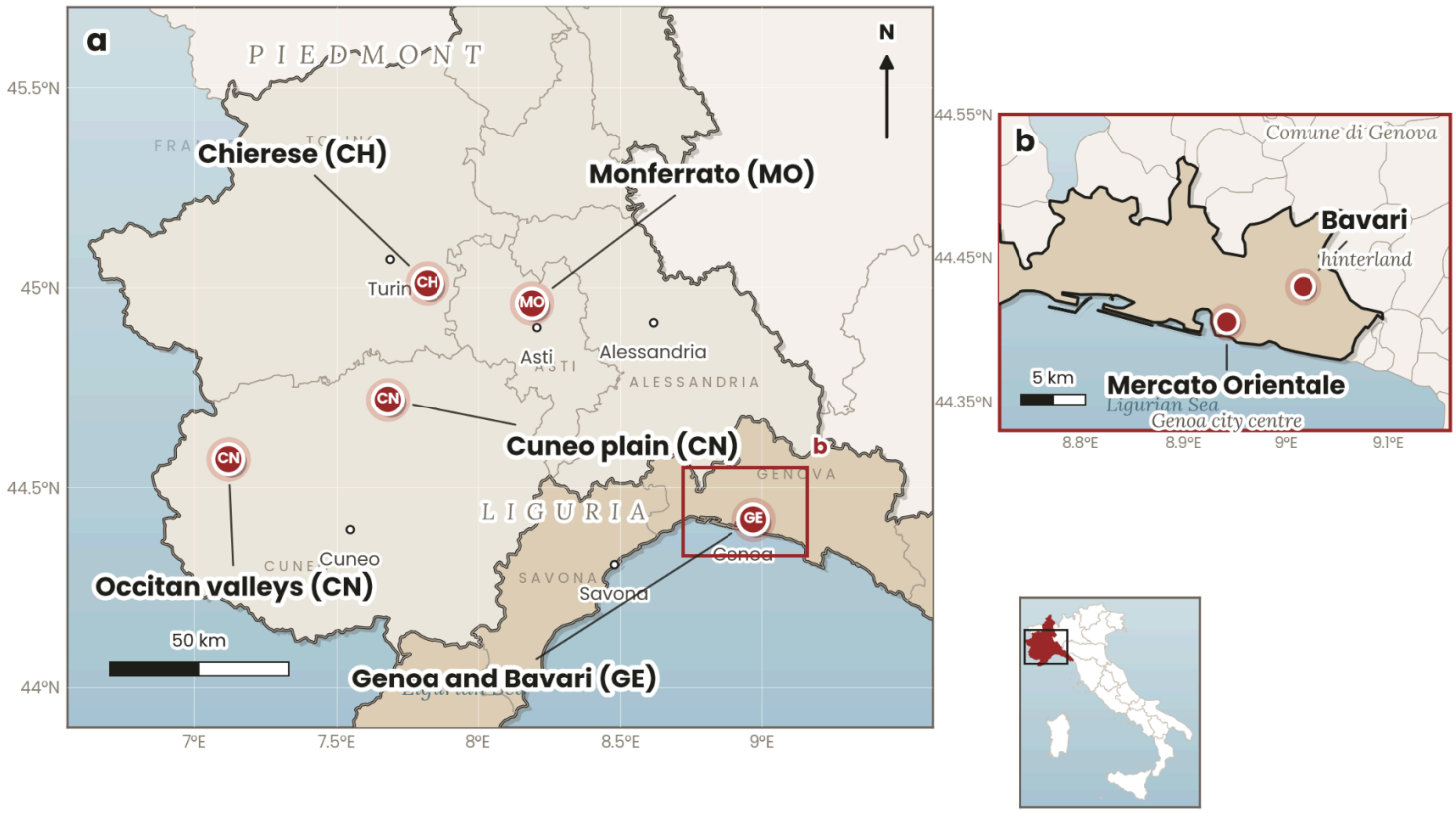

Figure 1

Study areas. **a** The four areas investigated in Piedmont and Liguria, NW Italy. CH = Chierese (Metropolitan City of Turin); CN = province of Cuneo, investigated at two contrasting altitudes (the Occitan-speaking valleys of Varaita, Maira and Po, and the plain around Racconigi, Caramagna, Savigliano and Cavallermaggiore); MO = Monferrato (province of Asti, around Cioccaro and Penango); GE = Genoa and its hinterland (Liguria). Province boundaries are shown in grey and provincial names in italics; the red rectangle marks the extent of panel **b**. **b** The Ligurian study area, within the municipality of Genoa: the Mercato Orientale in the city centre, where *Preboggion* is sold ready-mixed by specialised vendors, and the rural quarter of Bavari in the hinterland above the city, where it is gathered. Inset: position of Piedmont and Liguria within Italy.