

Ethnobotany of Weeds in Cochabamba

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Submitted to:
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16-March-2001

0 INTRODUCTION

This report is an output of the “The development of integrated weed management strategies for hillsides in the valleys of Cochabamba, Bolivia” (PROMMASEL) (A0814/ZA0276/R7325)¹. Project objectives are (a) to characterise weed problems and assess the extent to which current weeding practices contribute to soil erosion and (b) based on this information, to develop improved weed management strategies to reduce erosion while maintaining crop yield. There is active collaboration with other RNRKS hillsides projects in Cochabamba (LPP, CPP, PSRP) as well as other local research institutes (PROINPA). The project is managed by NRI (Dr M. Smith) and co-ordinated by M. Webb (under contract to NRI) and Ing. J. Villarroel (UMSS).

The project started in February 1999. During the first year, researchers surveyed weed communities, current weed management practices, and farmer decision making in weed control, besides conducting a participatory evaluation of weed control and soil erosion, and began trials to evaluate alternative cropping systems. Results of the first year’s work are discussed in the proceedings of a project workshop (Espinoza *et al*, 2000).

Rationale for this study

Local knowledge is of uneven quality, but for weeds, which are of great importance to campesinos, and which are also easier to observe than, say viruses or nematodes, local knowledge should be detailed and consistent with modern science (Bentley &

¹ Acknowledgement: The authors are grateful to Morag Webb for comments on a previous draft, and for her encouragement of this research.

Disclaimer: The notions in this paper are not necessarily those of DFID or NRI.

Rodríguez 2001). Campesinos have an explicit model for managing each weed species, based on experience with the reproductive cycle and damage of the weed, and taking into account farmers' resources, especially the supply of labour. Agricultural R&D that takes this knowledge into account will help ensure that research topics are appropriate and that the results are adopted.

Method

The authors began each farmer interview by explaining the purpose of the PROMMASEL Project and of this ethnobotanical study. We explained that the research was conducted through the Agricultural Faculty of the Universidad Mayor de San Simón, with British funding. We invited farmers to pick some weeds and explain them to us, in order of their importance. Meanwhile, one member of our team (SP) collected other weeds. After discussing the weeds which the farmers had collected, we asked them to tell us about the ones SP had picked.

One interview was in Spanish and all other interviews were in Quechua. Silvio Nina, who is a native speaker of Quechua, conducted the interviews. The senior author took notes. Afterwards, the 3 authors discussed each interview in detail.

Farmers were paid for their time, which is standard practice in ethnobotanical research (Alexiades 1996). This was important for ensuring the participation of farmers, since most interviews took several hours and most of the campesinos were anxious to get on with their regular farm work.

Dates and places

This report is based on fieldwork from January 15 to January 26, 2001, in 3 Andean provinces of Cochabamba, Bolivia:

- Ayopaya (communities of Piusilla and San Andrés, near the town of Morochata)
- Tiraque (communities of Qulqi Xuya and Payrumani, near the town of Tiraque)
- Esteban Arce (Yunkataki, Uray Huerta, and Mayola, near Sacabamba)

Table 1: Date and Place of Main Interviews

<i>Date</i>	<i>Place</i>	<i>Who was interviewed</i>
17-Jan	Piusilla	Severino García, Angel Begamonte + others
18-Jan	San Andrés	Angel Begamonte, Germán Alegre
19-Jan	San Andrés	Cecilia Ruíz, Casiano Ruíz
22-Jan	Qulqi Xuya	Francisco Molina, Juan Galindo
23-Jan	Payrumani	Federico Zelada, Ramiro Colque
24-Jan	Yunkataki	Vicenta Blanco
25-Jan	Uray Huerta	José Ugarte, Francisco Veizaga, + 2 others
26-Jan	Mayola	Mario López, Guillermo Osorio

Use of Quechua and Spanish terms

Quechua terms are indicated in bold (e.g. **qhura**). Spanish terms are in italics (e.g. *maleza*). Mixed terms are in bold and italics: they may be Spanish roots with Quechua inflections (e.g. ***molestanku***—they bother) or mixed phrases (e.g. ***rumi corral***—stone corral) or Spanish words in Quechua syntax (e.g. ***Castilla nabo***—“Castillian turnip”)

1 NAMES FOR WEEDS

1.1 Taxonomy

Formal taxonomists classify living things in nested, taxonomic hierarchies with named levels (e.g. kingdom, phylum, class, order, family, genus, species). Likewise, anthropologists generally present folk biological classification systems as hierarchical taxonomies. The model devised by Brent Berlin (1992) uses 6 taxonomic levels:

1. Kingdom
2. Unique beginner
3. Intermediate
4. Generic
5. Specific
6. Varietal

In Quechua, the folk kingdom of “plants” (level 1) is labelled with the word *plantas* (a loan word from Spanish). We propose that Bolivian Quechua has the following categories of unique beginners (level 2):

- **Sach’a** (trees and bushes)
- **Qhura** (herbaceous plants)
- **Chajra** (cultivated plants)
- **Khishka** (thorny plants. Not clear if it includes cactus).

Cactus and vines may not fall into any of the above categories. It is not unusual in folk biological systems for some categories to fall outside of the higher levels. (This is one of the major differences between folk and Linnaean classificatory systems.)

Bolivian Quechua does not have an unambiguous word for “weed.” All weeds are called **qhuras** in Quechua (or *hierbas* when campesinos speak Spanish.) But **qhura** includes all herbaceous plants and grasses, not just weeds.

As is common in folk classifications, we did not document any intermediate level (level 3) categories. Almost all of the plant names in Annex A (Catalogue of Weeds) are generic (level 4) terms, which is typical of folk classification systems². There are a few cases of folk genera with more than one folk species (level 5): e.g. there are 2 folk species of *nabo*, 2 folk species of **muni** (see Annex A for a description of these and other folk names for weeds).

The Catalogue of Weeds (Annex A) lists the weeds approximately in order of importance to the campesinos. The main exception to this principle is that weeds that campesinos perceive as being related to each other are kept together in the catalogue (e.g. all the *Oxalis* spp. are grouped together, because farmers recognise their similarities.)

Criteria of importance

Campesinos judge plants to be important if they are crop pests. Farmers describe weeds with the verb *molestay* (from the Spanish *molestar*, “to bother.”)

Molestan—it bothers (i.e. a serious weed).

Mana molestanchu—it does not bother (not a very worrisome weed).

² This is slightly counterintuitive, so it may be a bit confusing. One of the key differences between folk and Linnaean taxonomies, is that folk genera are usually monotypic. They have only one folk species, and it is labelled only with the folk genus name, not with a binomial.

Farmers said that of the perhaps 30-40 plants in their fields, only 3-4 really bothered the crop. *Brassica campestris*, *Bidens trinervia*, *Pennisetum clandestinum*, *Viguiera lanceolata*, *Rumex acetosella* and *Spergula arvensis* were the major, serious weeds (See Annex A).

Criteria of use

The next criteria was use, of which fodder was by far the most important. Farmers showed a deep knowledge of weeds as forage. They knew which livestock species ate which plant, at which stage in its life cycle and whether the animal could eat the plant in the field or whether it could only eat the plant if the farmers harvested it and fed it to the animal. Farmers were also aware of whether or not livestock found the plants palatable, or merely ate them out of hunger, when there was nothing else.

Other uses, such as medicine or toys were a distant third criteria for importance of a plant.

1.2 Semantics

Naming and utility

Farmers explicitly linked naming to utility. Campesinos knew the names of most wild plants in their fields. For the few plants which local people did not name, instead of saying “I don’t know its name”, they said “*mana servinchu*” (it is not good for anything) (see Hunn 1982).

However, names are also linked to pest status, not just utility (Bentley & Rodríguez 2001). Some informants explained that they did not know the name for some plants by saying “*mana perjudichanchu*” (it is harmless). Francisco Molina, explained that if a plant was not harmful, or did not have any uses, there was little to say about it.

Semantic extension

Some folk names apply to 2 completely separate species, sometimes within the same village. Farmers do not confuse these weeds, but realise that the same name applies to 2 different plants. This probably reflects the common human tendency to name new items by extending the meaning of an existing term. For example, the first British settlers of North America named the American birds by giving each one the name of the English bird which most resembled it. Occasionally the American birds were con-generics of the European ones, but often they were not closely related (Brown 1992). We hypothesise that in Bolivia, Quechua-speakers may have first farmed the warm valley bottoms, gradually expanding into nearby higher country. Farmers breaking new land on Andean slopes would have found new weeds and could have given them the names of weeds from the valleys. (See Webb et al. 2000 for a list of the separate weed flora for mountain slopes and valley bottoms of Cochabamba).

Semantic opacity

Many of the folk names for weeds cannot be broken down (parsed) into constituent meanings: they are semantically opaque. In this sense they resemble common English folk names for plants (like clover, shamrock, sage) and may be part of the basic, native vocabulary of Quechua. Some of these unanalyzable terms may be loan words from other native American languages. For example, the Quechua word **muni** labels the weed *Bidens trinervia*, and has no other meanings. **Muni** is just the name of that plant.

Analysable weed names

A few weed names are brief Quechua descriptors of the plant. For example one of the terms for *Spergula arvensis* is **yuraj t'ika** (white flower) and one of the words for *Rumex acetosella* is **puka qhura** (red herb). Both of these species are recent introductions, but some native plants are also named this way, e.g. **k'ita papa** (runaway potato) is one of the names for the wild potato *Solanum toralapanum*.)

Spanish loan words

The senior author was surprised to find so many Spanish names in the Cochabamba weed lexicon³. Perhaps Spanish names are used more frequently for weeds introduced from the Old World. For example, the Spanish word for “turnip,” *nabo*, is used to label the weed *Brassica campestris*. In loose, fertile soils, *B. campestris* does grow a large, white root, a bit like a turnip, and which may have been used as a survival food, during famines (Annex A).

³ All of the farmers we interviewed speak Quechua and most also speak at least some Spanish. Yet they do not have separate Spanish and Quechua names for weeds. They have a mixed Spanish-Quechua set of weed names, which they use regardless of which language they are speaking.

2 DAMAGE AND CONTROL

As mentioned in the previous section, campesinos name and otherwise pay attention to those weeds which are the most important pests. That is, a weed's status as a weed is more important to people than its use in a home remedy, for example.

2.1 Damage

Infuriating weeds

Campesinos describe the most serious weeds by saying that they make one furious (*rabiachin*). Characteristics of an infuriating weed, in order of importance are:

1. Abundant
2. Difficult to control

As will be described below, most of the infuriating weeds have some uses, but farmers still regard them on the whole as negative. **Ch'iki** (*Pennisetum clandestinum*) is such extremely good fodder that farmers give it a kind of begrudged appreciation, yet it is still infuriating in a field. The infuriating weeds are named and well-known.

The non-infuriating weeds are not abundant, easy to control, and may be useful. Most of them are still named, even though farmers do not know them as well as the infuriating weeds.

Plant pests of the human body

Some weeds, like **ch'uqi ch'api** (*Xantium spinosum*), are not very abundant, but campesinos consider them infuriating because they are thorny. Farmers complain about them because livestock will not eat them, and because they are uncomfortable to weed. If people get pricked by **ch'uqi ch'api**, they have to keep working with an irritating hand injury.

2.2 Control

It comes out in the weeding

The rhetoric of control: farmers speak of weeds that are easy to control as “**qhurana lluqsin**” (*sale en la carpida*—it comes out in the weeding). That is, farmers remove the weed during the regular operations of hoeing and cultivating and the species does not require it any special attention⁴. This contrasts with other weeds that for some reason, usually architecture, demand a special treatment: e.g. *nabo* grows low to the ground when it is young, which makes it hard to remove from a field of cereals. *Nabo* is easy to hand pull when it grows its flower stalk, but before the seeds set.

Ease of control

Weediness, or the extent to which campesinos regard a species as noxious, is also related to its ease of control. Farmers regard the easy-to-kill species as less of a problem than others. Campesinos' ideal of an easy weed is an erect plant without thorns, with a single root, with few seeds.

⁴ There is much variation, but typically, farmers weed twice in the season with hand tools, followed each time a day or 2 later by cultivation with an ox-drawn plough. See Bentley (2000) for a longer description.

3 USE

There are many uses for weeds, but few demands for large volumes of weeds, of which fodder is the most important. Another bulk use would be the occasional, but dramatic use as a famine food. Large amounts of weeds may help conserve soil, but it is not clear if campesinos value weeds for that reason. Most of the other uses of weeds are as specialty items: medicine, playthings etc. that use only small amounts of the plants.

3.1 Fodder

Incidence

As stated above, only plants with a high incidence can become important weeds. Paradoxically, only common plants are abundant enough to be important fodder species. Thus, many of the most vexing weeds are the most useful for fodder.

Hypothesis about land supply

As land supply decreases, the weeds become more important as fodder.

In the Project area, land supply seems to be as follows:

- Morochata: abundant (much fallow land, some pastures and much irrigation)
- Tiraque: less abundant (less fallow land, some pastures, some irrigation)
- Sacabamba: scarce land (little fallow land, degraded pastures, irrigation unavailable in some places.)

In Morochata, farmers pasture livestock on weeds in fallow land. When campesinos are cultivating with oxen, far from the village, they may use a few armloads of recently cut weeds as fodder for the ox team, but otherwise make little use of weeds as fodder.

In Tiraque, campesinos harvest weeds, and haul them home in **q'ipis** (cloth bundles) for animals.

In Sacabamba, it is common to see people hauling weeds in **q'ipis** to feed to livestock. Farmers also wash weeds for livestock and haul weeds on donkeys to feed to other animals.

Local knowledge of plants that animals eat

Farmers pay close attention to which plants animals eat. People distinguish between the plants eaten by sheep, cattle, burros etc. They also distinguish between plants that are removed from fields as fodder, and between plants that are only eaten when they grow in pasture or fallow land. They also make the following distinctions of palatability.

Table 2: Rhetoric of fodder palatability

<i>Quechua</i>	<i>Bolivian Spanish</i>	<i>English translation</i>
Sumaj mikhun	Lo come bien	(the animal) eats it readily
Mikhunpuni	Lo come siempre	eats it alright
Mikhunlla	Lo come no más	kind of eats it
Mikhun, pero pisi	Lo come, pero poco	eats it, but not much
Mana mikhunchu	No lo come	does not eat it

Fodder weeds from fallow lands

Several farmers scoffed at the idea that they left weeds in fields to use as fodder. They emphasised how aggressive weeds were, and that without timely weeding, the whole crop would be lost. If anything, fields in Cochabamba are over-weeded (Bentley 2000). Where land and fodder is scarce, campesinos make more of an effort to salvage weeds during regular weeding and feed them to livestock. However, most weeds that are used as fodder are from fallow lands. Farmers explicitly stated that many species are used as fodder only on fallow lands: in cropland the same weeds are simply hoed up and left to rot (**ismupun**). Brassica that is hand pulled from cereals is fed to livestock, and *garrotilla* is tolerated in some fields and harvested and even stored as fodder, but most weeds in farmers' fields are weeded out and not used as fodder (see Annex A for a description by each species of weed). This is a topic worthy of future study, but our impression is that any crop is much more valuable than the weeds in it, and that few farmers allow a field to get very weedy on purpose. On the other hand, some weed species are tolerated for fodder, *garrotilla*, *nabo* and others (Annex A).

3.2 Soil Conservation

At least 2 farmers discussed the benefits of weeds for soil conservation and fertility improvement. They described how weeds help keep soil from washing away during rainstorms. It is not clear if this is local knowledge, or if the farmers picked it up from agricultural development projects. One farmer said that the *ingenieros*⁵ had told her that weeds should be incorporated into the soil, because they are like manure, but she said that she already knew that, because her mother had taught her.

Even if farmers did not formerly know that weeds can play a role in soil conservation, many of them know it now, and seem to be sincerely convinced of their importance.

3.3 Food

Amaranth and *Chenopodium album* may be eaten as greens a few times a year. Some people use a few other plants as spices or in sauces, but weeds are not a major, staple part of the diet in Cochabamba.

3.4 Construction material

Farmers use **sunch'u** (*Viguiera lanceolata*) for building **pirwas**⁶. *Viguiera* grows tall and woody, especially on field edges. Farmers harvest some of the dried, hollow stalks and tie them together to make the **pirwas**.

3.5 Toys

Several times, the farmers smiled as they talked about their childhood, when they made flutes from **kina kina**, or celebrated pretend carnivals with streamers of *pajarillo*. Campesino children often go to the fields with their parents, and play there while the adults work. Making toys from weeds is one way people start to learn about them. It is an example of the creativity of children who have few store-bought toys. People who

⁵ "Ingeniero" is a formal title in Latin America, for a person with a university degree, especially in a technical area like agronomy. However, Quechua-speaking farmers use the term almost like a class or ethnic label. Any Spanish-speaking (or English-speaking) person who arrives by automobile, and is associated with a development project is called "ingeniero."

⁶ Basket-like granaries, about a meter tall and about a meter across. Used mainly for maize.

play with weeds as children grow up to know them in a more intimate, immediate way than people exposed to plants through formal education.

3.6 Medicine

Medical disclaimer

We include this discussion of ethno-pharmacy only for research purposes. The reader should not interpret the following text, nor the uses listed in the Weed Catalogue (Annex A) as an endorsement to try them. Some wild plants can be quite toxic, and toxicity varies by dosage, place of origin of the plant etc. Many of the diseases that campesinos treat with weeds are folk diseases, without exact counterparts in modern medicine. The authors strongly caution the readers against casually trying weeds as pharmaceuticals.

Cochabamba's folk medicine may have once been fairly extensive, but it is being eroded. For some species, farmers recall that it once had a medical use, but they no longer know what it was. Although our sample of informants was not large enough to allow a formal comparison of knowledge and gender, there is some suggestion that women are more familiar with folk medicine than men. Interviewees who half-remembered a medicinal use would shrug and say "the grannies know" (*las abuelitas saben*). They never said their grandfathers knew.

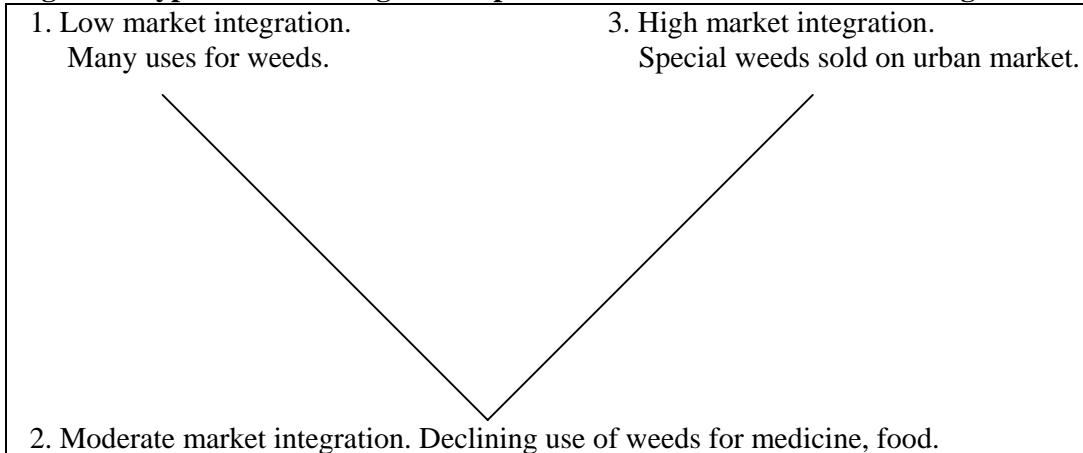
Uncertain knowledge about medicinal plants

When campesinos discuss forage, they are unequivocal. They speak with clear intellectual authority about which species are palatable, which species eat it and which part of the plant they will eat and when. It is often the first thing farmers mention about a plant. This is not the case with knowledge about medicinal plants. People hesitate to respond. They hedge their statements by admitting that the knowledge is hearsay and that they have not really tried the remedy themselves. In a few cases, people described a first-hand account with a medicinal plant.

3.7 Market integration

We hypothesise that as market integration increases, specialty use of weeds first decreases, and then increases as there are more opportunities to sell. This idea was adapted from the work of Ricardo Godoy and his colleagues, which suggests a similar pattern for the harvest of non-timber forest products by Indians in the Central American rainforest (Godoy *et al* 1995).

Figure1: Hypothetical Changes in Importance of Weeds with Market Integration



Low market integration is related to poor roads and geographical isolation. Communities have few opportunities for modern medical attention, little formal education and low use of the Spanish language. There are many uses of weeds for medicines, food, etc., but no weeds are sold. This may have been the case of many communities in rural Cochabamba in the 1940s.

As market integration increases, with daily truck traffic to the city, health centres in the provinces. Sale of agricultural commodities (e.g. potatoes) provides cash for pharmacies and medical attention. Many people, especially young men and children are bilingual in Quechua and Spanish. There are schools in the villages. The use of weeds and other wild plants declines. This is the case in much of Cochabamba in 2001.

With high market integration, e.g. in the Cochabamba Valley, people can visit the city for trivial reasons. Children can attend university. Almost everyone is bilingual. Urban manufactures and imports are readily available. Fresh, perishable produce (e.g. milk) can be sold. People can also sell weeds on the urban market, both as medicines and as green vegetables (e.g. *cojo pollo*). We learned of one woman in Sacabamba who harvests weeds as medicines and sends them to her daughter in Santa Cruz, who packages and sells the herbs there. Some farmers in Cochabamba are starting to sell the brassica seed as birdseed. The commercial use of weeds is a topic that could be easily studied by students, since much of the fieldwork could be done in the markets in the city of Cochabamba.

4 LOCAL KNOWLEDGE

In Section 3, we described how rural people know about the pest status of weeds and their uses, especially fodder. Campesinos also have a keen awareness of how weeds reproduce. They confidently described the flowers, seeds and their dispersal (see Annex A). In one interview, our informants casually observed the leaf spots on a viguiera plant, and remarked that the weed had a disease (**unquy**).

Habitat

Most communities distinguish 2 kinds of land “up and down” (*arriba y abajo*; **patapi urapi**). Farmers frequently describe where a plant grows in these terms. Farmers also know if a plant is more common in fields or field edges or pastures, and can describe for example, that an **uqa uqa** plant grows better in a ploughed field than in fallow. In other words, local people are quite aware of the habitat of each species.

Deep knowledge

The farmers know much about certain topics, like architecture of the plant, habitat, life cycle, which we did not focus on or anticipate. E.g. farmers in Morochata gave us a detailed description of how there is more *Paspalum repens* in oca than in potatoes because birds eat the seeds of the weed when it grows in potatoes, then defecate the seed in the same fields, which are planted in oca the following year. Farmers are a bit less familiar with the species growing in the hard soil on the field edges. Still, farmers have a name and know uses for most of these species. This study only (or mostly) discusses weeds: annual plants that grow in cultivated fields. Besides the weeds, there are species in field edges, in pastures, along roadsides, along rivers, in fallow land and wild lands. These make up a huge ethno-flora, which is beyond the scope of this report.

Birdseeds

As we said above, campesinos are well aware of the seeds of weeds. Campesinos know which seeds stick to sheep’s wool, which ones pass through their guts, which ones are destroyed by the rumen of a cow. We expected such knowledge, but one of the things that most surprised the authors is that campesinos pay a fair amount of attention to which species of weeds produce seeds which are eaten by small birds (**p’isqus**). For many species of weeds, campesinos would explain how much the little birds liked their seeds. This indicates how people monitor their environment, even details which may not be of strict economic importance.

Manure

Many species arrived in Piusilla with manure from Cochabamba, but farmers are not very concerned about them.

Guano links animal traction with soil fertility with weeds. The animals eat weeds, defecate their seeds, pull the ploughs that control the weeds. The guano takes the weed seeds back to the field. The people are fully aware that they are planting weeds with manure. Yet guano management seems rather rudimentary. Farmers buy manure. They also muck it out of the corral at planting time and apply it to the soil.

5 SUMMARY AND CONCLUSIONS

Weed management in Cochabamba is resilient

Cochabamba's farming systems have withstood many shocks. Some old weeds seem to have disappeared, or lost population, perhaps out of competition with other, new weeds. Many of the major plants in the system have only been there for a few years. *Rumex acetosella*, *Pennisetum clandestinum* and *Spergula arvensis* are not only some of the most damaging weeds, but some of the newest (and *Cynodon dactylon* is now arriving). Yet people are coping with these aggressive new weeds.

Weed control is thorough

The Cochabamba weed system is dynamic, but control is fairly thorough, because farmers invest much hand labour in it, but especially because of the deep knowledge campesinos have of weeds, which allows them to adjust rapidly to change.

Campesinos have models by species

Campesinos have an explicit model for managing each weed species, based on experience with the reproductive cycle and damage of the weed, and taking into account farmers' resources, especially the supply of labour. Agricultural R&D that takes this knowledge into account will help ensure that research topics are appropriate and that the results are adopted.

Weeds are more important as weeds than as fodder

Campesinos name and otherwise pay attention to weeds which are the most important pests. That is, a weed's status as a weed is more important to people than its use in a home remedy, for example. Farmers scoffed at the idea that they left weeds in fields to use as fodder. They emphasised how aggressive weeds were, and that without timely weeding, the whole crop would be lost. Any crop is much more valuable than the weeds in it, and that few farmers allow a field to get very weedy on purpose.

Bulk uses of weed are more important than special uses

There are many uses for weeds, but few demands for large volumes of weeds, of which fodder is the most important. Another bulk use would be the occasional, but dramatic use as a famine food. Large amounts of weeds may help conserve soil, but it is not clear if campesinos value weeds for that reason. Most of the other uses of weeds are as specialty items: medicine, playthings etc. that use only small amounts of the plants.

As land supply decreases, the weeds become more important as fodder

Where land and fodder is scarce, campesinos make more of an effort to salvage weeds during regular weeding and feed them to livestock.

Farmers know about weeds and soil conservation (at least now)

Even if farmers did not formerly know that weeds can play a role in soil conservation, many of them know it now, and seem to be sincerely convinced of their importance.

Local knowledge is deep

Rural people not only know about the pest status of weeds and their uses, but also have a keen awareness of how weeds reproduce.

An idea for a weed control technology

Since people know which guano has seed, base a weed control technique on the control of seed in manure. For example, the guano of November-January could be placed on the bottom of the pile, with later manure on top of it to compost it. Clean the corral just before the weeds produce seeds.

Some feasible thesis topics

- Take an inventory of seeds in guano
- Develop techniques to eliminate those seeds
- Take an inventory of weedy species sold in the *cancha* in Cochabamba (name, place of origin, uses, price)

Crop rotation ends with oats, because they tolerate weeds

Oats and other small grains that close a 4 year crop rotation do not eliminate weeds; weeds prosper in the following fallow. Farmers end the crop rotation cycle with cereals, not to eliminate weeds, as the senior author hypothesised in 2000, but because cereals tolerate weeds.

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Annex A
Catalog of Weeds
Cochabamba, Bolivia

Nabo (*Brassica campestris*)

MEANING OF FOLK NAME: Turnip (in loose, fertile soil, the root grows to about the size and shape of a carrot, but is white, like a turnip, which is also a crucifer).

ENGLISH COMMON NAME: Rape??

PEST STATUS

One of the most serious and abundant weeds, occurring in dense stands in virtually all crops at high and low elevations. It grows best in the most fertile soil. If left untended, *nabo* will destroy a crop.

MANAGEMENT

When *nabo* is young, it grows flat to the ground, and can be weeded with hoes or animal-drawn ploughs if it is in a widely spaced crop, e.g. potatoes. It can be a tedious weed to hoe. In densely sown crops, especially the European cereals, *nabo* cannot be hoed without disturbing the crop, so farmers wait until the *nabo* flowers, when it produces stalks that grow higher than the cereals, and can be removed by hand. The *nabo* is easy to kill: the sun kills it as soon as it is removed from the earth. It is important to eliminate *nabo* from a field before it goes to seed, because it produces so many seeds.

USES

Fodder. Farmers often feed *nabo* to livestock after plucking it from fields. Most animals eat it, but the burro will not. Animals will eat it in vegetative or flowering stages, but not after it has gone to seed. Animals also feed on *nabo* in fallow fields. Some farmers wash *nabo* in the river before feeding it, to make it more attractive to livestock. The animals generally eat the leaves but not the stalk.

Medicine. The leaves are used to treat the folk diseases *arrebato* and *colerina*, which are caused by excessive anger. After an attack of rage, the forehead and the soles of the patient's feet are rubbed with *nabo* leaves, to prevent internal organs from bursting and to avoid the yellow vomit.

Birdseed. Several farmers reported that merchants come from Punata to buy *mostaza* (lit. "mustard," i.e. the seed of *nabo*) which is sold in the city of Cochabamba as birdseed. The merchants exchange a kg. of sugar for a kg of *nabo* seed.

Soil conservation. The stalks that livestock do not eat are thrown into the corral, where they mix in with the manure and are later applied to fields.

Famine food. There are reports that in the time of the grandparents of today's senior generation (early twentieth century) that people ate the root of *nabo* during famines.

INDIGENOUS KNOWLEDGE

Farmers are keenly aware of the relationship between flowers-seeds-reproduction. They are careful to harvest *nabo* before it goes to seed. The seed pods shatter and scatter many seeds. Various kinds of small birds are attracted to, and eat seeds from the ripening seed pods.

Source: interviews in Piusilla, San Andrés, Qulqi Qhuya, Payrumani, Yunkataki, Mayola.

Castilla Nabo (*Raphanus raphanistrum*)

MEANING OF FOLK NAME: Castilian turnip.

ENGLISH COMMON NAME: ??

PEST STATUS

Reported as a serious weed of rye and wheat in Piusilla. Indirect losses are caused by mice which climb it to eat ripening grain.

MANAGEMENT

Must be removed with hand tools. It has a single, tough root that ploughs will not remove.

USES

Medicine. Its roots are boiled and people bathe in the water to cure the folk diseases *arrebato* and *colerina*⁷.

INDIGENOUS KNOWLEDGE

Produces many seeds which stay for years in the soil.

Source: interviews in Piusilla.

⁷ Both diseases seem to be associated with the sorrow and discomfort that follow anger.

Muni (*Bidens trinervia*)

MEANING OF FOLK NAME: Unanalyzable.

ENGLISH COMMON NAME: ??

PEST STATUS

Muni is a serious weed in many crops, especially wheat. The ripe seeds are a nuisance because they are thorn-like and stick to people's clothing, "we leave the field (furry) like bears." During the wheat harvest the sharp seeds can fly off the plant and poke people in the eye.

MANAGEMENT

Muni is controlled in the regular weeding, but it is best to weed it when it is young, before it grows seeds. It must be cut with a hoe or a sickle, because when **muni** is pulled either the stems snap or the roots come out with a dirt ball. It is almost impossible to remove from wheat, because cutting or pulling **muni** damages the small wheat plants.

USES

Fodder. Livestock eat some **muni**, especially if it is young, but they seldom eat the whole plant. Farmers rarely carry **muni** home for their animals.

Medicine. The seeds can be toasted, powdered and drunk in water as a cough remedy.

INDIGENOUS KNOWLEDGE

In spite of its uses, Cochabambinos regard this weed as overall negative, and would like better control of it. It produces many seeds and they stay viable in the soil for 3-5 years. Fallow soil may appear not to have it, but after plowing, *Spergula* appears again. Farmers in Payrumani observed that **muni** populations were declining, because of competition from *Spergula arvensis*.

Source: interviews in Piusilla, San Andrés, Qulqi Qhuya, Payrumani, Yunkataki, Uray Huerta, Mayola.

Chhina Muni (*Bidens pilosa*)

MEANING OF FOLK NAME: Female **muni**.

ENGLISH COMMON NAME: ??

PEST STATUS

A serious weed, especially in wheat in Sacabamba.

MANAGEMENT

Hand pulled.

USES

Fodder. Sheep eat it.

INDIGENOUS KNOWLEDGE

It is transported in manure.

Source: interviews in Uray Huerta.

**Mach'a Qhura, Comino Qhura, Yuraj T'ika, Asnan Qhura,
Wila Qhura** (*Spergula arvensis*)

MEANINGS OF FOLK NAMES: Sticky herb, cumin herb, white flower, stink herb, **wila** (unanalyzable) herb. (There are many names because spergula is new in Bolivia).

ENGLISH COMMON NAME: ??

PEST STATUS

A very serious weed, even though it has only been in Cochabamba for a few years. Some farmers said they had known spergula since 1985-1990, though in Yunkataki and Uray Huerta farmers said it had come from the nearby higher country (Alalay) about 1965. Spergula infests all crops and "sucks" the soil (decreases the fertility.) If left untended it soon blankets the ground.

MANAGEMENT

Must be hand weeded, but even so it reappears rapidly from the pieces left in the soil. Farmers regard spergula as less of a problem if they cut it with sickles in their fields and remove it in bundles for fodder, but such behavior is a sign of land or fodder shortage. Farmers in Uray Huerta and Yunkataki reported using herbicides against spergula in wheat.

USES

Fodder. All farmers agree that livestock eat spergula, although some claimed that animals eat it more readily when it is young, or when it is mixed with straw or other forage. One farmer said animals would even eat it dried. Farmers in Piusilla and Payrumani said it helped cattle to give more milk, or to gain weight.

INDIGENOUS KNOWLEDGE

Spergula sheds so many seeds that the earth becomes black with them, and not even the doves can eat them all. The tiny, black seeds are transported by rain runoff or in animal manure, especially of sheep. When the plant is mature and when the weather is warm, the plant becomes sticky and pieces of it get caught in sheep's wool. Many farmers want to lose this serious weed, in spite of its value as fodder.

Source: interviews in Piusilla, Qulqi Qhuya, Payrumani, Yunkataki, Uray Huerta, Mayola.

Ch'iki, *Grama*, *Grama Dulce*, *Dulce Grama* (*Pennisetum clandestinum*)

MEANINGS OF FOLK NAMES: Unanalyzable, grass, sweet grass, sweet grass.

ENGLISH COMMON NAME: Kikuyu grass.

PEST STATUS

A serious, aggressive, relatively new weed, which appeared about 1970 (in Piusilla), about 1980 or 1990 in Mayola and about 1998 in Qulqi Qhuya. Kikuyu grass grows fast and multiplies readily in Cochabamba. It affects all crops, especially maize. It “sucks” the earth (of fertility).

MANAGEMENT

Must be dug out during the major weeding with a hoe or a **chujchuka**. The underground portions grow like cables (“they grow underground like snakes, poking their heads out of holes here and there.”) These are so abundant and strong that when the plough hooks into them, the ox team may be stopped in its tracks. Sometimes it breaks ploughs. Herbicides are ineffective. In the case of severe infestations, the grass has to be dug, piled and burned.

USES

Fodder. An excellent, “sweet” fodder which all livestock eat as readily “as toasted grain”. Some farmers remove Kikuyu grass from fields for livestock; others pasture animals in fallow fields where the grass grows. Cattle will eat the grass, roots and all. When Kikuyu grass is hand pulled it breaks off in large pieces, which are easy for cattle to eat.

Soil conservation. Farmers in San Andrés, Qulqi Qhuya and Yunkataki said that Kikuyu grass helps prevent soil erosion (keeps soil from washing away in the rain) and maintains soil fertility (this information may have been influenced by extensionists.) Where it has grown, the soil is fertile. Sheep stop at Kikuyu grass in fallow fields; they eat, defecate and the grass holds their droppings so they do not wash away. When burned, the grass’s ashes are good fertilizer.

INDIGENOUS KNOWLEDGE

It has a single main root and many smaller ones. It can reproduce by seed or vegetatively, from pieces cut while weeding, and left in the soil. Each joint of the stem is capable of producing more shoots. Kikuyu grass thrives in Cochabamba. It has a spreading architecture, like a squash plant. The grass produces flowers and seeds. Its tiny, black seeds can spread by the wind.

Source: interviews in Piusilla, San Andrés, Qulqi Qhuya, Yunkataki, Uray Huerta, Mayola.

Puka Qhura (*Rumex acetosella*)

MEANING OF FOLK NAME: Red herb.

ENGLISH COMMON NAME: Dock.

PEST STATUS

Although it is a new weed (since about 1996 in Piusilla), it is spreading rapidly and is now a major pest in many areas. (Although farmers in Qulqi Qhuya said it was an old, long-established plant and in Payrumani they said it had been in the area at least since 1980, but it was relatively new.) Dock out-competes other plants. It damages the soil. Some plots are red with this weed.

MANAGEMENT

Dock is weeded with hand hoes and **chujchukas** and with animal-drawn ploughs. Sometimes dock has to be ploughed 3 times to remove it, because it does not come out unless the plough hits it directly: plowing it “is like passing through straw.” To remove it from fallow lands, it is helpful to plough the soil when it is dry, but even this does not give a total control. Weeding with hand tools is time-consuming, but is the most sure control. Herbicide does not affect it. Dock is very difficult to get rid of.

USES

Fodder. Farmers in Piusilla and San Andrés said that livestock eat it readily, although cattle and horses will not eat it if it is mature. Farmers in Qulqi Qhuya said it had a sour (**q'allku**) taste, and cattle and guinea pigs will not eat it. In Payrumani, campesinos said livestock will eat a little of the red herb, if it is young.

INDIGENOUS KNOWLEDGE

Its thin root can reach 80 cm into the soil. The plant can survive being cut off at the base of its stem. Farmers hate it and want to get rid of it, because it is difficult to control and advances rapidly into new areas. It is so new in some areas that many campesinos do not have a name for dock. Its seeds are transported in manure. It thrives best in humid lands, or places with frequent fog. Once it flowers, its root grows even faster.

Source: interviews in Piusilla, San Andrés, Qulqi Qhuya, Payrumani.

Sunch'u (*Viguiera lanceolata*)

MEANING OF FOLK NAME: Unanalyzable.

ENGLISH COMMON NAME: ??

PEST STATUS

Reported as a serious weed in Yunkataki and Mayola. It “sucks” the earth and infests all crops.

MANAGEMENT

Controlled with hand tools and animal cultivation. Farmers in Mayola follow animal cultivation with a second weeding with hand tools, to remove fragments from the soil, before they take root. Some farmers cut **sunch'u** and pile it to dry it in the sun, to kill it, yet it is so resilient that if it gets wet, some of the plants take root. Farmers in Mayola said that **sunch'u** roots were so dense that sometimes they broke ploughs.

USES

Fodder. Livestock eat it when it is young. Farmers in Mayola use it as stall feed.

Construction material. The dried, mature stalks are a meter or more tall, and woody but hollow. Campesinos tie them into a circle, upright, to fashion a basket-like granary called a **pirwa**, used for storing grains, especially maize.

INDIGENOUS KNOWLEDGE

It has many roots and when the plant is cut at the base, its foliage grows back. **Sunch'u** grows especially well (and tall) on field edges, but also grows in the field. It can reproduce by growing back from the root. **Sunch'u** is more common in low country.

Source: interviews in Piusilla, Yunkataki, Mayola.

Sunch'u², Lap'iya (q'illu t'ika) (*Viguiera* sp.)

MEANINGS OF FOLK NAMES: Unanalyzable (farmers are aware that this is “another **sunch'u**” i.e. not the same one described on the previous page.) **Lap'iya** (unanalyzable): the one with yellow flowers.

ENGLISH COMMON NAME: ??

PEST STATUS

There is little of it, but it appears in potatoes, oca and many other crops.

MANAGEMENT

Weeded with **chujchuka** and plough.

USES

Fodder. Animals eat it when they find it in the pasture. If farmers weed it and feed it to livestock, they eat it.

INDIGENOUS KNOWLEDGE

This **sunch'u** is mat-forming, not an erect plant like the other **sunch'u**. It has dense roots and is found in fallow land. Grows in high country.

Source: interviews in San Andrés, Qulqi Qhuya, Payrumani, Yunkataki.

Chhujlla, Cucharilla², Sara Sara, Piki Piki (*Paspalum repens*)

MEANINGS OF FOLK NAMES: Unanalyzable, teaspoon, maize-maize (refers to the resemblance of the blades of this grass to maize leaves), small insect.

ENGLISH COMMON NAME: ?? a kind of grass.

PEST STATUS

It is a weed of oca, but also of potatoes, papalisa and maize. If it is abundant it can be a serious weed. It is difficult to get rid of if populations are high. In Mayola (which is warm and well-watered) farmers complained that when this weed gets out of control, it can destroy a potato crop.

MANAGEMENT

Weeded with hand tools. The only way to really kill it is to uproot it and place it upside down, so the roots are in full sun. It is frequently weeded out and fed to animals.

USES

Fodder. Excellent for cattle, sheep and llamas. Animals will not eat this grass if it has been uprooted, because the roots have a good deal of earth on them. Farmers who rely more on this grass for fodder (as in Payrumani and Yunkataki) do not regard it as a serious pest.

Soil conservation. One farmer mentioned that it improved and protected the soil.

INDIGENOUS KNOWLEDGE

Farmers in San Andrés said it does not thrive in fallow lands, although it would be good to have more of it there, since it is such good fodder. Farmers in Payrumani (which is warmer than San Andrés, said this grass does grow in fallow lands. There is so much of this grass in oca because it starts growing in potatoes. Although few plants survive the weeding, birds come and eat their many seeds. The birds defecate in the potato field, and the following year, when oca is planted there, the grass is much more abundant. It is a small plant with many, densely packed roots and leaves; it multiplies rapidly.

Source: interviews in Piusilla, San Andrés, Qulqi Qhuya, Payrumani, Yunkataki, Mayola.

Qallu Qallu, *Lanten Lanten, Llantín* (*Plantago lanceolata*)

MEANINGS OF FOLK NAMES: Tongue-tongue. The second and third names are derivations of the Spanish common name: *llantén llantén*.

ENGLISH COMMON NAME: Plantain (of the family Plantaginaceae, not to be confused with banana-type of plantain, which is a Musaceae.)

PEST STATUS

Is a weed in maize, potatoes, alfalfa etc. It can be difficult to eliminate, but in most areas it is not regarded as a serious weed.

MANAGEMENT

Hand weeding. It comes out in the regular weeding.

USES

Fodder. All livestock eat it, when it is young. It grows in fallow lands, where animals eat it.

Medicine. Some people say that a remedy for canker sores of the mouth can be made from its roots.

INDIGENOUS KNOWLEDGE

It is more common in lower, warmer country. Although it occurs in field edges, fallow and cultivated land, the plants grow much larger in cropland. It produces seed and reproduces well. Not all farmers know a name for this plant, and folk knowledge of it is somewhat thin, because it is not a major weed in most places.

Source: interviews in Piusilla, San Andrés, Payrumani, Yunkataki, Mayola.

Cebadilla (*Bromus lanatus*)

MEANING OF FOLK NAME: Little rye.

ENGLISH COMMON NAME: ?? a kind of grass.

PEST STATUS

Is an aggressive weed in some places. Occurs in many crops. It “sucks” the soil. Its seeds are like thorns and it hurts peoples’ hands to pull it up. In Mayola they reported that it grew only on the field edges and was not a serious pest.

MANAGEMENT

“We can’t get rid of it.” Hand pulled and weeded with hand tools. It is very difficult to pull up.

USES

Fodder. “It’s a bastard weed, but the cows really eat it.” People carry it home in bundles (**q’ipis**) to stall feed it to animals.

INDIGENOUS KNOWLEDGE

It produces many seeds. Has thick roots.

Source: interviews in Payrumani, Yunkataki, Mayola.

Janu K'ara, K'impi (*Lepidium ruderale*)

MEANINGS OF FOLK NAMES: Unanalyzable, although the second name is a play on the word **impi**, a type of skin irritation common in the Andes.

ENGLISH COMMON NAME: ??

PEST STATUS

Not a serious weed, although it occurs in many fields, especially in potato.

MANAGEMENT

Controlled with routine weeding, along with other crops. "It dies easily."

USES

Fodder. Animals eat it well, especially when they graze upon it in fallow lands.

Soil conservation. Farmers in Piusilla report covering it with earth while weeding, and that it improves the soil.

Medicine. It is used as a cure for **impi**, a crusty patch of skin on children's cheeks. The plant is ground, mixed with urine and applied to the skin irritation. The remedy burns and "ploughs" the children's skin, until the **impi** comes off.

Toy. Some children play with this doily-shaped plant, uprooting it and wearing it on their heads, like a hat.

INDIGENOUS KNOWLEDGE

It produces a lot of seed which livestock and the little birds eat. It is a common plant because it produces so much seed. It is a mat-forming plant (*rastrera*, **last'a**).

Source: interviews in Piusilla, Yunkataki.

Garrotillo, Garrotilla (Medicago hispida)

MEANING OF FOLK NAMES: Little stick.

ENGLISH COMMON NAME: Medick.

PEST STATUS

Medick is abundant, fast-growing and thrives in many fields, but it is not a pest. Many farmers tolerate it in fields.

MANAGEMENT

It is easy to weed. It has only one root and comes out of the soil easily. It dies quickly if uprooted and left in the sun. Often harvested as fodder.

USES

Fodder. If the medick is abundant and fodder is scarce, campesinos harvest it, roll it into balls, dry it and store it, like hay. Some farmers store medick mixed with straw (either chopped, or in layers of straw and medick). All livestock accept it readily. For horses, farmers harvest the medick with sickles, and take it to them, since horse find it difficult to eat off the ground.

INDIGENOUS KNOWLEDGE

Farmers are keenly aware of its mat-forming habit (“it covers the soil like wool”); the mats are about 40 cm high. It grows from seeds which come from flowers. The seeds have small hooks, which attach themselves to wool. The sheep carry it home to the corral in their wool. The medick seeds find their way into the manure, and into next years crop. “We love it,” farmers in Mayola said. Medick grows so quickly, and forms such a dense mat that it “eats” (out-competes) many weeds. Many species cannot live around medick, because it covers up their seeds, and they rot. If sheep eat wet medick on an empty stomach, it can give them pains.

Source: interviews in Piusilla, Payrumani, Yunkataki, Mayola.

Uqa Uqa, Ch'ullku Ch'ulku, Ch'ullku (*Oxalis latifolia*)

MEANINGS OF FOLK NAMES: The first name reduplicates the name of the native Andean tuber crop, **uqa**, in Quechua or *oca* in Spanish (*Oxalis tuberosum*.) The second and third names may mean “something with one stem and various leaves.”

ENGLISH COMMON NAME: Shamrock.

PEST STATUS

Occurs in fields, but is not a serious pest.

MANAGEMENT

They come out in the regular weeding, if necessary.

USES

Fodder. Animals eat some of it, when they come across it.

Food. While adults work in fields, children harvest the small tubers and eat them, half in play, half out of hunger. The tubers are sour, but become sweeter if dried in the sun for a few days. Children also eat the flowers, which are sweet. One farmer in Uray Huerta said that as children, they used find areas where the flowers were quite abundant, grind them and make a kind of wine out of them.

Medicine. The plant's small tuber is ground and placed on a sore tooth to relieve the pain.

INDIGENOUS KNOWLEDGE

Grows with **ichhu** in deep, loose soil. Pheasants eat the tuber of this shamrock. It grows on both fallow and cropped land, but thrives best on cropland. Grows best during the rainy season, in high mountains. It grows 10-15 cm high. The plant is reproduced from its tuber.

Source: interviews in Piusilla, San Andrés, Qulqi Qhuya, Uray Huerta, Mayola.

Ch'ullku (*Oxalis corniculata*)

MEANING OF FOLK NAME: Something with one stem and various leaves (?) (Local people distinguish this species from *O. latifolia*, although they resemble each other. E.g. in Piusilla, *O. coniculata* is called **ch'ullku** and *O. latifolia* is called **uqa uqa**.)

ENGLISH COMMON NAME: Shamrock.

PEST STATUS

Not an important weed.

MANAGEMENT

Comes out in the regular weeding. It dies easily.

USES

None. It is too sour to eat or to be fodder.

INDIGENOUS KNOWLEDGE

It is not common and some campesinos do not have a name for it. Grows in high mountains, in the small sheltered places against rocks, in potato fields.

Source: interviews in San Andrés, Qulqi Qhuya.

Qalti, Kina Kina, Tuka Tukana (*Siegesbeckia orientalis*)

MEANINGS OF FOLK NAMES: The first name is unanalyzable. The second name may be derived from the word **qina**, “flute” or “panpipes,” or it may reduplicate the word **kina** (*Cinchona calisaya*) the tree harvested for its bark, used in making quinine (Lara 1991). The third name means “something on which to play (music)” and is derived from the Spanish *tocar* (to play).

ENGLISH COMMON NAME: ??

PEST STATUS

Not a major weed in Piusilla. In Payrumani it is more common in maize, which is planted in May, rather than in the crops planted during the rainy season. In Yunkataki (which has many irrigated crops), it is a weed in all crops.

MANAGEMENT

It comes out in the regular weeding. It dies easily. It is often cut with a sickle for stall feeding to livestock.

USES

Fodder. It often must be mixed with more palatable plants so animals will eat it.

Toy. Children make toy flutes from the dry, hollow plant stems.

INDIGENOUS KNOWLEDGE

It is a tall plant which thrives best in the more fertile soils. It has a disease (yellow spots) that affects its leaves. The birds eat and transport its seeds which can remain viable in the soil for several years. It produces many seeds, which stick to people’s clothing in small chains “like worms.”

Source: interviews in Piusilla, Payrumani, Yunkataki.

**Ch'uqi Ch'api, Ch'uqu Ch'api, Ch'uqa Ch'api, *Amor Seco*,
Ch'uqila (*Xantium spinosum*)**

MEANINGS OF FOLK NAMES: The first 3 and the last are related to each other, but unanalyzable. They are a set obviously derived from a common source⁸. *Amor seco* means “dry love,” perhaps in reference to the delicate yellow flower, and the thorns.

ENGLISH COMMON NAME: ??

PEST STATUS

Although this plant is not abundant enough to be an important weed in the strict agronomic sense, campesinos consider it to be a serious nuisance because its thorns make it difficult to weed. The prick of its thorn is painful and may fester.

MANAGEMENT

May be weeded when young, before the thorns grow. If left to mature, isolated plants are gingerly grasped at the base of the stem, and the weed is removed by hand plucking, or with a sickle or hoe. Cut plants are discarded separately from other weeds, to prevent damage to livestock.

USES

Medicine. The leaves are brewed as a tea for “kidney disease” and the boiled leaves placed in a person’s mouth help to relieve toothache.

INDIGENOUS KNOWLEDGE

It reproduces by seeds.

Source: interviews in Piusilla, Payrumani, Yunkataki.

⁸ like the English words “crawfish, crayfish, crawdad” all derived from Middle English *crevise* (Morris 1970.)

Ajara (*Chenopodium album*)

MEANING OF FOLK NAME: Unanalyzable. A loanword from Aymara?

ENGLISH COMMON NAME: Wild quinoa?

PEST STATUS

Can be a serious weed in broad beans, potatoes. The roots can wrap around potato tubers and stunt them. Is a serious weed in the European cereals, where it cannot be hand pulled because that would uproot the cereals. So it is left in cereals, and when they are harvested, the seeds of the weed shatter and fall onto the ground. It “sucks” (**ch’unqan**) the soil (of nutrients).

MANAGEMENT

Weeded with hand tools, or hand pulled. It is hard to get rid of.

USES

Fodder. Animals eat a little of it. Burros are more likely to eat it.

Food. Some people eat a few of its leaves, when it is young. The leaves are boiled and eaten as greens.

Firewood. If the plant is allowed to mature it may grow to be over a meter tall. The leaves and the seeds fall off and some people burn the erect, woody stalk as fuel.

INDIGENOUS KNOWLEDGE

It looks like quinoa (*Chenopodium quinoa*), but it is not. **Ajara** reproduces by seed, which are black and transported in manure. Grows in “low” country (i.e. below about 3,000 meters.)

Source: interviews in Qulqi Qhuya, Payrumani, Yunkataki, Mayola.

Payqu (*Chenopodium ambrosioides*)

MEANING OF FOLK NAME: Unanalyzable.

ENGLISH COMMON NAME: Wild quinoa?

PEST STATUS

Is considered a weed in some places, e.g. Piusilla.

MANAGEMENT

In Piusilla is cut and taken off to the field edge and dumped there (to discourage it from growing back in the field). In Yunkataki it is actually tolerated or tended in fields, because of its alleged medical value.

USES

Food. Some people eat a few of its leaves as a garnish “like parsley.”

Medicine. Its dried leaves are used as a remedy for certain folk diseases like *arrebato* and *colerina* and for stomach ache.

Fodder. Animals eat it.

INDIGENOUS KNOWLEDGE

A farmer in Yunkataki claimed that this plant is so highly esteemed as medicine that handfuls of it are sold for 50 centavos (\$0.08).

Source: interviews in Piusilla, Yunkataki, Mayola.

Cojo Pollo, Ataqu (*Amaranthus hybridus*)

MEANINGS OF FOLK NAMES: Limping chicken; unanalyzable.

ENGLISH COMMON NAME: Amaranth, pig weed.

PEST STATUS

Not a common weed.

MANAGEMENT

Collected as food and fodder.

USES

Food. The leaves are eaten as a green, boiled, with spices added.

Fodder. All livestock species eat it.

INDIGENOUS KNOWLEDGE

Source: interviews in Uray Huerta, Mayola.

***Millma Malva, Pampa Malva, Mast'a Malva, K'ita Malva,
Qhari Malva, Malva No Más or Malvalla*** (*Malva campestris*)

MEANINGS OF FOLK NAMES: Wool mallow, pampa mallow, mat-forming mallow, runaway mallow, male mallow. *Malva no más* and *malvalla* both mean “just mallow” (i.e. farmers regard this as the “unmarked” or more basic of the 2 mallows in Cochabamba).

Malva is the Spanish common name for mallow. The fact that *malva* has been loaned into Quechua without phonetic deformation suggests that it is a relatively recent borrowing. Mallow is an Old World plant and may be new to Bolivia. However, *malva* is now a folk genus in Cochabamba Quechua, with 2 folk species (see following page) which suggests that *Malva* spp. have been important enough for local farmers to observe, name and elaborate on.

ENGLISH COMMON NAME: Mallow.

PEST STATUS

Mallow grows thick in some places. It is considered a serious weed in Qulqi Qhuya and Yunkataki but not in Piusilla or Mayola. It can be poisonous to sheep and cattle if it is either wet with dew, rain, or heated by the sun.

MANAGEMENT

It is easily controlled with hand tools. It dies when taken from the ground. Sometimes harvested as fodder, with care taken not to transport seeds.

USES

Fodder. Cows, sheep, horses eat it when it is young. Because it grows so close to the ground, some animals, e.g. cows, have a hard time eating it, but accept some of it if people cut the plant with a sickle and stall feed it to the livestock. Sheep and pigs eat the leaves, but not the stems. To avoid killing the animals, mallow must be fed that is “neither heated by the sun nor dewy” (**Nitaj qawisqachu, nitaj chhullasqachu.**)

INDIGENOUS KNOWLEDGE

Farmers recognize mallows life cycle: it appears first in potato fields, but in small numbers. The plant sheds its seeds there, and so there is much more mallow the following year, when oca follows the potato in the crop rotation cycle. Grows as a mat (*rastrera*) but can grow as high as 80 cm. This mallow has little root but many branches and blue flowers. It grows best in more fertile soil, in fields and around homes. It is transported in manure. It disappears in the dry season, but it grows back from seed in the rainy season. The seeds stick to the skin of livestock and are transported to the corrals.

Many people consider the 2 *Malva* spp. to be male and female of each other. This one is the male. This idea is probably more allegorical than literal.

Source: interviews in Piusilla, Qulqi Qhuya, Payrumani, Yunkataki, Mayola.

Q'ara Malva, Warmi Malva (*Malva rotundifolia*)

MEANINGS OF FOLK NAMES: Smooth mallow, female mallow.

ENGLISH COMMON NAME: Mallow.

PEST STATUS

Occurs in potato, maize and other fields.

MANAGEMENT

Comes out in the regular weeding.

USES

Fodder. ??

Medicine. In Payrumani, they thought this could be brewed as a tea and made into a bath for curing fever.

INDIGENOUS KNOWLEDGE

People clearly recognize that the 2 mallows (see previous page) are related to each other. "Pariante es el otro." (The other is its relative.)

Source: interviews in Qulqi Qhuya, Payrumani, Yunkataki.

Leche Leche, Khishka Khishka (*Sonchus asper*)

MEANING OF FOLK NAME: Milk-milk, thorn-thorn.

ENGLISH COMMON NAME: ??

PEST STATUS

Incidence is low. Not considered a pest.

MANAGEMENT

It comes out in the regular weeding

USES

Fodder. Cattle eat it. In Yunkataki, one farmers said that cattle do not eat it, but that sheep and burros do.

INDIGENOUS KNOWLEDGE

It produces a flower like that of the onion plant. The seeds are carried by the wind. The sap is white, like milk. It has small thorns.

Source: interviews in Piusilla, Payrumani, Yunkataki.

Leche Leche, Salsa Salsa (*Sonchus oleraceus*)

MEANING OF FOLK NAME: Milk-milk, sauce-sauce. Farmers do not seem to confuse the 2 *Sonchus* spp. They occur together in Yunkataki, where informants called *S. asper* **khishka khishka**, to distinguish it from *S. oleraceus*.

ENGLISH COMMON NAME: ??

PEST STATUS

There is little of it.

MANAGEMENT

Comes out in the regular weeding.

USES

Fodder. Animals eat it.

INDIGENOUS KNOWLEDGE

This species does not have thorns, but *S. asper* does. Otherwise they are similar.

Source: interviews in Yunkataki, Mayola.

Leche Leche (*Taraxacum officinale* and *Taraxacum* sp.)

MEANING OF FOLK NAME: Milk-milk. Although farmers distinguish both species of *Sonchus* spp. some campesinos lump *Taraxacum* spp. with each other and with *S. asper*.

ENGLISH COMMON NAME: Dandelion.

PEST STATUS

Not a pest. "It is just there in the field, alone, like and orphan."

MANAGEMENT

Harvested.

USES

Food. When young and tender, eaten "like lettuce" with oil and cheese. Some is reportedly sold in the market in Cochabamba.

Medicine. The leaves are brewed until the milky sap comes out. Taken as a tea with breakfast for kidney and liver disease.

INDIGENOUS KNOWLEDGE

It has a yellow flower.

In Payrumani, informants explicitly said that this was the same species as *S. asper*, saying that *T. officinale* is the broader leaved version, that grows in the shade, and *S. asper* is the same plant, but that it has narrower leaves when it grows in full sun.

Source: interviews in Qulqi Qhuya, Payrumani, Uray Huerta.

Leche Leche (*Ipoecharis* sp.)

MEANING OF FOLK NAME: Milk-milk.

ENGLISH COMMON NAME: ??

PEST STATUS

Not a pest. There is little of it.

MANAGEMENT

Comes out in the regular weeding.

USES

Fodder. Animals eat it.

INDIGENOUS KNOWLEDGE

Farmers in Mayola were unsure if this was the same plant as *Sonchus oleracea* or not.

Source: interview in Mayola.

Ñajch'a Ñajch'a, Awja Awja, Reloj Reloj, Qulmalachin,

P'isqu Simin (*Erodium cicutarium*)

MEANINGS OF FOLK NAMES: Ñajch'a means "new born baby." Awja is "needle," an old loanword from the Spanish *aguja*. Reloj means "clock or watch." Qulmalachin is unanalyzable. P'isqu simin means "bird's mouth."

ENGLISH COMMON NAME: Heron's bill; stork's bill.

PEST STATUS

Not a serious pest. There is not much of it.

MANAGEMENT

Easy to hoe out. Once cut, it does not recuperate. Often harvested with a sickle, and fed to livestock.

USES

Fodder. Pigs are quite fond of them. When harvesting oca in the high mountains, if people are staying for several days in their stone cabins (*obejeras*) they may take their pigs, which root into the soil of the harvested oca fields, eating the heron's bill. Cattle and sheep also eat it. "It is liked well enough" (**munisqalla.**)

INDIGENOUS KNOWLEDGE

They thrive in more fertile soil, especially in oca fields. It appears here and there, as a mat-forming (*rastrera*) plant. Its seeds look like needles and they stick to sheep's wool.

Source: interviews in Piusilla, Qulqi Qhuya, Payrumani, Mayola.

Rumasa, Luq'u Luq'u (*Rumex obtusifolius*)

MEANING OF FOLK NAMES: Unanalyzable.

ENGLISH COMMON NAME: Dock.

PEST STATUS

Not a serious pest.

MANAGEMENT

When weeding, if the tool or plough hits the root, the plant dies. It is easy to control.

USES

Fodder. Sheep eat it. Cattle eat a few of the leaves if the plant is young.

Medicine. The plant is dipped in boiling water and applied as a compress to a person's skin, for relief of fever and pain. May be brewed as tea, for pain.

INDIGENOUS KNOWLEDGE

It produces a tuber, like a carrot. It has many leaves. It is common in humid places.

Source: interviews in Piusilla, San Andrés, Yunkataki.

Suyku, *Burro Suyku* (*Tagetes minuta*)

MEANING OF FOLK NAME: **Suyku** is unanalyzable. Burro, of course, is a donkey.

ENGLISH COMMON NAME: Marigold.

PEST STATUS

Not a serious pest. Occurs in fields, but mostly on field edges. In Uray Huerta (on the large, dry plain of Sacabamba), it is reported to be an important weed, occurring in all crops and “sucking” the earth.

MANAGEMENT

Comes out in the regular weeding, or is hand plucked and fed to livestock.

USES

Fodder. Livestock eat a little, if it is young. Burros, sheep and goats eat it, but not cattle.

INDIGENOUS KNOWLEDGE

Grows to be a meter tall or more. Produces flowers and many seeds.

Source: interviews in Piusilla, Yunkataki, Uray Huerta, Mayola.

Suyku (*Tagetes mandoni*)

MEANING OF FOLK NAME: Unanalyzable (It is not clear if campesinos lump this with the marigold described on the previous page, since we did not find the 2 species in any of the same places.)

ENGLISH COMMON NAME: Marigold.

PEST STATUS

Is a pest in potatoes, oca, papalisa and other crops, at high and low altitudes.

MANAGEMENT

Hand pulled.

USES

Fodder. Sheep eat a little of it. Cattle will not eat it.

Food. Its leaves are mixed into hot sauce (**llajwa**.)

INDIGENOUS KNOWLEDGE

It is a tall plant with many seeds, like **nabo**.

Source: interview in Payrumani.

Anis, Anis Anis (*Tagetes pusilla*)

MEANING OF FOLK NAME: Anise. The Spanish word is *anís*. We have spelled it without the accent (above) because farmers consistently pronounced it with the accent on the first syllable, as is the Quechua pattern (stress almost always on the penultimate syllable).

ENGLISH COMMON NAME: Marigold.

PEST STATUS

There is little of it in fields.

MANAGEMENT

Not weeded. Fed to sheep.

USES

Fodder. Sheep eat it.

Food. Used as a spice in *humintas* (tamales.) Brewed as tea and mixed with distilled alcohol to make a mixed drink.

Medicine. Boiled as a remedy for stomach ache.

INDIGENOUS KNOWLEDGE

It thrives in fallow land and on field edges during the rainy season. Forms a mat about 10 cm high. Farmers identify this plant almost exclusively by its smell. They seem to recognize it as a kind of **suyku**, or like a **suyku**, on sight, then crush a few leaves between their fingers, and sniff them, to distinguish *anis* from **suyku**.

Source: interviews in Piusilla, Payrumani, Uray Huerta, Mayola.

Wakateya Suyku (*Tagetes graveolens*)

MEANING OF FOLK NAME: **Suyku** is associated with various plants of the genus *Tagetes*, however “**wakateya**” is unanalyzable and has a slightly non-Quechua sound. It is rather long to be a root noun, plus it has an anomalous “e.”

ENGLISH COMMON NAME: Marigold.

PEST STATUS

Not a serious weed.

MANAGEMENT

Harvested.

USES

Food. Crushed and used as an ingredient in sauce (**llajwa**.)

Fodder. Sheep and goats eat some. Cattle do not eat it.

INDIGENOUS KNOWLEDGE

It produces much seed.

Source: interview in Yunkataki.

Wira Wira, Yuraj Wasa (*Gnaphalium* spp.)

MEANING OF FOLK NAME: Tallow-tallow, white back. Both names probably refer to the white color of the underside of the leaves.

ENGLISH COMMON NAME: ??

PEST STATUS

Not abundant.

MANAGEMENT

Easy to control. Comes out with the regular weeding.

USES

Medicine. Some people brew a tea from its leaves, as a cough remedy. Francisco Medina reported firsthand experience, using gnaphalium to cure an injury. He cut himself harvesting rye, wrapped the wound in leaves and bound it with a rag and the cut healed well. Gnaphalium leaves help to draw the puss from a wound.

Fodder. Livestock eat it.

INDIGENOUS KNOWLEDGE

It is more common in fallow lands and on field edges and growing next to rocks than in crops. It disappears in the dry season.

Source: interviews in Piusilla, San Andrés, Qulqi Qhuya.

Pajarillo, Pajarilla (Tropaeolum cochabambense)

MEANING OF FOLK NAMES: Little bird.

ENGLISH COMMON NAME: This genus is native to South America, and includes the crop plant *T. tuberosum*, the *isaño*.

PEST STATUS

Although not especially abundant, is a serious problem in some fields, especially maize and wheat. This weed is a very long, fast-growing vine, and it climbs maize plants, and pulls them over.

MANAGEMENT

Disentangled from the crop, by hand, one plant at a time.

USES

Fodder. Sheep, goats and burros eat a little of it, but cattle will not, because it stinks.

Toys. Children like to collect pieces of the vine with bright yellow flowers, and pretend that they are paper streamers from Carnival.

INDIGENOUS KNOWLEDGE

The flowers produce seed, which reproduces the plant. Also grows in field edges.

Source: interviews in Yunkataki, Uray Huerta, Mayola.

Layu, Kinsa Laqhi, Chhijmu (*Trifolium amabile*)

MEANING OF FOLK NAME: The first and last are unanalyzable. The second means “three leaves.”

ENGLISH COMMON NAME: Clover.

PEST STATUS

Not important. Grows in fallow lands and in uncultivated land.

MANAGEMENT

Eliminated by plowing fallow lands; not common in fields.

USES

Fodder. Animals eat it, all animals, even ducks, pigs and llamas.

Medicine. Hangover remedy: the roots are brewed as a tea.

Soil conservation. One farmer mentioned that it improved the soil (he has had a lot of contact with projects.) Potatoes grow well in soil that has had clover in it.

INDIGENOUS KNOWLEDGE

Grows about 10 cm tall.

Source: interviews in Piusilla, Qulqi Qhuya, Payrumani.

Janu K'ara, Cucharilla (*Portulaca* sp.)

MEANINGS OF FOLK NAME: The first is unanalyzable. The second means “teaspoon.”
ENGLISH COMMON NAME: Purslane.

PEST STATUS

A serious pest. Occurs in all crops and can destroy a crop if left unattended (Piusilla.)

MANAGEMENT

Must be removed with hand tools (hoes or **chujchukas**.)

USES

Fodder. Animals eat it readily, especially in pastures and fallow lands (Piusilla). Only sheep eat it, and little at that (Qulqi Qhuya.)

INDIGENOUS KNOWLEDGE

The leaves are spoon-shaped and the plant has red flowers. Grows about 15 cm high. Farmers in Qulqi Qhuya call this and *Paspalum repens* by the same name, but realize that they are completely different plants.

Source: interviews in San Andrés, Qulqi Qhuya.

Asnan Qhura (*Senecio vulgaris*)

MEANING OF FOLK NAME: Stink herb.

ENGLISH COMMON NAME: Senecio.

PEST STATUS

Is a weed in broad beans and maize.

MANAGEMENT

Weeded with hoe and **chujchuka**, along with **nabo** and **rumasa**. It is difficult to eliminate, because it has lots of roots. They hoe it up and it keeps growing. (In Payrumani they said it was eliminated with the regular weeding.)

USES

Fodder. Animals do not eat it, not even birds, because it has a bad smell. (Although in Payrumani they said animals will eat a little of it.)

INDIGENOUS KNOWLEDGE

Some farmers recognize the plant, but do not know a name for it. Grows in warm country, in wet areas. Has been in Piusilla for years, and was introduced with manure brought in from the Cochabamba Valley. The seed is carried by wind, like smoke, like tiny pieces of cotton.

Source: interviews in Piusilla, Qulqi Qhuya, Payrumani.

Waych'a (*Senecio liviculus*)

MEANING OF FOLK NAME: Unanalyzable.

ENGLISH COMMON NAME: Senecio.

PEST STATUS

Not common, but can be a weed.

MANAGEMENT

Regular weeding.

USES

Fodder. Sheep eat it. Goats eat it well.

Medicine. The plant is boiled and the patient bathes in the water to cure “allergies” (**mara**.) especially spots on the legs.

Soil conservation. Protects and improves the soil.

INDIGENOUS KNOWLEDGE

Source: interview Yunkataki.

Yuraj Qhura, Khuchi Qhura (*Senecio* sp.)

MEANINGS OF FOLK NAMES: White herb, pig herb.

ENGLISH COMMON NAME: Senecio.

PEST STATUS

A very serious weed on the Sacabamba plains, especially in wheat and potatoes. It “sucks” the soil of fertility and grows rapidly.

MANAGEMENT

Weeding is not effective enough. Some people want an herbicide to get rid of it.

USES

None. Nothing will eat it.

INDIGENOUS KNOWLEDGE

It has a white flower.

Source: interviews in Uray Huerta.

Jatun Ch'iwa (*Veronica persica*)

MEANING OF FOLK NAME: Big **ch'iwa**.

ENGLISH COMMON NAME: Speedwell.

PEST STATUS

Can be a serious weed, especially in high country.

MANAGEMENT

Weeded with hand tools. The plant dies when removed.

USES

Fodder. All livestock eat it.

INDIGENOUS KNOWLEDGE

Appears from October or December through June and July. Sheep eat some of its seeds.

In Payrumani and Yunkataki they did not know a name for this plant.

Source: interviews in San Andrés, Payrumani, Yunkataki.

Ch'iñi Ch'iwa (*Nombre científico*)

MEANING OF FOLK NAME: Small and dense **ch'iwa**.

ENGLISH COMMON NAME: ??

PEST STATUS

A fast-growing weed, found in potatoes and oca in high mountains. Not as common as it once was.

MANAGEMENT

Each individual plant must be turned over with hand tools, or it tends to keep living.

USES

Fodder. Cattle eat it, but only in pasture, not in fields.

INDIGENOUS KNOWLEDGE

It grows much like **ch'iki** (*Pennisetum clandestinum*), with white flowers, many small leaves, many seeds and with branches growing from every node on the stem. In the old days, this was the weed that gave us a lot of work. If you weed it, and it rains, the plant keeps growing. There is much less of it now because of the **jampis** (literally “remedies,” i.e. agrochemicals) that we use, like Tamaron⁹.

Source: interview in San Andrés.

⁹ This statement is probably not strictly accurate. Tamaron is an insecticide and unlikely to have a direct effect on a weed population. Nevertheless, this is an important observation: people feel that this weed was quite common and is now much less so. Perhaps competition from recently introduced weeds has reduced the number of this species.

P'uchunqura (*Solanum radicans*)

MEANING OF FOLK NAME: Unanalyzable.

ENGLISH COMMON NAME: Wild potato.

PEST STATUS

Not a pest.

MANAGEMENT

Tolerated or harvested.

USES

Food. Children eat its small, orange fruits.

Medicine. Its leaves are brewed as tea to make a remedy for children with canker sores (**phasku**).

INDIGENOUS KNOWLEDGE

It is a mat-forming plant (*rastrera*.)

Source: interviews in Yunkataki, Mayola.

Apharuma, Katari Papa, K'ita Papa (*Solanum toralapanum*)

MEANINGS OF FOLK NAMES: The first name is unanalyzable. Snake potato, runaway potato (second and third names).

ENGLISH COMMON NAME: Wild potato.

PEST STATUS

It is a minor weed in a few, high areas.

MANAGEMENT

Tolerated, or it comes out in the regular weeding.

USES

Fodder. Not a good fodder. Livestock eat little of it. It makes cattle drunk (**waka machan**) if they eat it.

Medicine. The tiny white tubers can be used as medicine for **wajchilla**, a certain kind of white marks on a person's face (caused by fungus?). The tubers are split open and placed on the marks.

INDIGENOUS KNOWLEDGE

It flowers just like the potato. Its tubers are also like potatoes, like that of the variety Papa Runa, only much smaller. It may have been a famine food in our grandparents' time. It appears in potato fields, in the most fertile soil, during the rainy season. It is harmless, but useless; nothing eats it, not even the pheasant (**llujt'u**).

Source: interviews in Qulqi Qhuya, Yunkataki, Mayola.

Papa Papa (*Solanum* sp.)

MEANING OF FOLK NAME: Potato-potato.

ENGLISH COMMON NAME: Wild potato.

PEST STATUS

Not a pest.

MANAGEMENT

None.

USES

None.

INDIGENOUS KNOWLEDGE

It is not harmful and not useful. Nothing eats it, not even the burro.

Source: interviews in Uray Huerta.

Lap'iya, Para T'ika (*Cosmos* sp.)¹⁰

MEANINGS OF FOLK NAMES: Unanalyzable, rain flower.

ENGLISH COMMON NAME: Cosmos.

PEST STATUS

It is a pest, not only as a weed, but as a pest of livestock. After the maize harvest, when the soil is ploughed, the small tubers of this plant come to the surface. If sheep eat them, they die. It reproduces quickly and thrives especially in irrigated maize.

MANAGEMENT

Comes out in the regular weeding.

USES

None.

INDIGENOUS KNOWLEDGE

Grows about 15 cm high. Lives for only about 3 months, especially during the rainy season. Only flowers in January.

Source: interviews in Piusilla, Qulqi Qhuya, Payrumani.

¹⁰ In Qulqi Qhuya, farmers also called *Viguiera* sp. **Lap'iya**, although they realised fully that they are completely different plants. When asked to distinguish them, they called the cosmos **Lap'iya**, **ujnin**, **puka t'ika** (the other dahlia, the one with the red flowers), although this is an *ad hoc* description, not a specific folk name.

Wirbina, Verbenita, Verbeñita (Verbena litoralis)

MEANING OF FOLK NAMES: All 3 names are phonetic deformations of the scientific genus name.

ENGLISH COMMON NAME: Verbena.

PEST STATUS

Not a serious weed in most crops, but may be in wheat in Sacabamba. Little grows in fields. Grows mostly along field edges and in fallow fields.

MANAGEMENT

Comes out in the regular weeding. Hand pulled, when necessary, especially in wheat.

USES

Fodder. Sheep eat a little of it.

Medicine. Brewed as a tea and taken for stomach ache. Also taken by some women during menstruation. Can be brewed with or without the root.

INDIGENOUS KNOWLEDGE

Source: interviews in Payrumani, Yunkataki, Uray Huerta.

Wajcha Barbero (*Poligonum hidropiperoides*)

MEANING OF FOLK NAME: Orphan barber.

ENGLISH COMMON NAME: Poligonum.

PEST STATUS

Thrives in maize. Multiplies quickly.

MANAGEMENT

Comes out in the regular weeding.

USES

Fodder. Cattle eat it.

Medicine. The leaves are ground and applied to large goiter sores on the neck, to make them burst.

INDIGENOUS KNOWLEDGE

Source: interviews in Piusilla.

Qhura No Más (*Gallinsoga parviflora*)

MEANING OF FOLK NAME: Just an herb (i.e. it does not have a folk name.)

ENGLISH COMMON NAME: Gallinsoga.

PEST STATUS

It is a weed, but not a very serious one.

MANAGEMENT

Comes out in the regular weeding. It dries up and dies when cut.

USES

Fodder. Animals eat a little of it.

INDIGENOUS KNOWLEDGE

Appears during the rainy season.

Source: interviews in Piusilla, Payrumani, Yunkataki.

Alfalfa (*Polygonum avicularis*)

MEANING OF FOLK NAME: Alfalfa.

ENGLISH COMMON NAME: Polygonum.

PEST STATUS

The plant is not abundant.

MANAGEMENT

Comes out in the regular weeding.

USES

Fodder. All animals eat it, except birds.

INDIGENOUS KNOWLEDGE

Campesinos recognize that this weed is not alfalfa, but the 2 plants resemble each other. Has been in Piusilla since about 1995, and was introduced via manure from the Cochabamba Valley.

Source: interviews in Piusilla, Payrumani.

Qhura (*Capsella bursa-pastoris*)

MEANING OF FOLK NAME: No folk name recorded.

ENGLISH COMMON NAME: Shepherd's purse?

PEST STATUS

Not a serious weed, although it occurs in many crops.

MANAGEMENT

Cut with a sickle and stall fed to animals, along with other herbs. It comes out with the regular weeding, but a few always escape, and these produce seed for next year.

USES

Fodder. Sheep and cattle eat it when it is tender.

Soil conservation. It improves the soil.

INDIGENOUS KNOWLEDGE

Birds eat the seeds. It produces a lot of seeds.

Source: interviews in Payrumani, Yunkataki.

Alqu Perejil (*Apium leptophillum*)

MEANING OF FOLK NAME: Dog parsley.

ENGLISH COMMON NAME: ??

PEST STATUS

Not a very common weed.

MANAGEMENT

Comes out in the regular weeding. "We weed it and it disappears."

USES

Fodder. Animals eat a little of it, but there are only a few plants.

INDIGENOUS KNOWLEDGE

This plant arrived in the time of our grandparents, in manure from Punata.

Source: interviews in Piusilla.

Chujlla (*Bromus* sp.)

MEANING OF FOLK NAME: Unanalyzable.

ENGLISH COMMON NAME: ??

PEST STATUS

Not an important weed.

MANAGEMENT

It is tolerated in the European cereals, and harvested and stored along with the straw. In fallow lands animals are tied near patches of it.

USES

Fodder. A good fodder for livestock.

INDIGENOUS KNOWLEDGE

This plant is neither hated nor highly appreciated.

Source: interviews in Qulqi Qhuya.

Mula Watana (*Juncus* sp.)

MEANING OF FOLK NAME: For tying mules.

ENGLISH COMMON NAME: Rush.

PEST STATUS

Rare in fields. Tends to grow in humid areas and along field edges.

MANAGEMENT

Only occurs in fields when they have not been ploughed properly.

USES

In the times of the haciendas (before 1952) it was used for tying mules.

INDIGENOUS KNOWLEDGE

This plant used to grow taller, during hacienda times.

Source: interviews in Qulqi Qhuya.

Dulce Grama (*Brachipodium?* sp.)

MEANING OF FOLK NAME: Sweet grass.

ENGLISH COMMON NAME: ??

PEST STATUS

Not a serious weed.

MANAGEMENT

Comes out in the regular weeding.

USES

Fodder. Animals eat it.

INDIGENOUS KNOWLEDGE

This herb has always been here (in Yunkataki.) It has a harder stem and smaller leaves than the other *grama* (*Pennisetum clandestinum*), but it holds the soil just the same.

Source: interview in Payrumani.

Cebadilla Pastu (*Poa annua*)

MEANING OF FOLK NAME: Little rye grass.

ENGLISH COMMON NAME: Meadow grass, spear grass.

PEST STATUS

It occurs in fields but is not a pest.

MANAGEMENT

It can be pulled up if the ground is wet, otherwise the grass breaks off in one's hand.

USES

Fodder. Sheep eat it readily.

INDIGENOUS KNOWLEDGE

Source: interview in Yunkataki.

Cebadilla (*Eragrostis* sp.)

MEANING OF FOLK NAME: Little rye.

ENGLISH COMMON NAME: Love grass.

PEST STATUS

A serious weed of wheat in Sacabamba. It reproduces quickly and there is a lot of it.

MANAGEMENT

It is difficult to weed, because weeding often uproots the wheat plants. It dies easily with herbicides, like Grammoxone.

USES

Fodder. Cattle eat it.

INDIGENOUS KNOWLEDGE

It is not carried in cattle manure, because chew and re-chew grass, which destroys the seeds. Farmers hate this weed.

Source: interviews in Uray Huerta.

Sirk'i Qhura (*Alternanthera* sp.)

MEANING OF FOLK NAME: Wart herb.

ENGLISH COMMON NAME: Alternanthera.

PEST STATUS

A serious weed in Sacabamba. It does not let the crops produce.

MANAGEMENT

Farmers want an herbicide for this one.

USES

Fodder. Sheep eat some of it. Cattle eat less.

INDIGENOUS KNOWLEDGE

This was not formerly present in Sacabamba, but came from the higher country. The seed is abundant and is carried by wind and in manure. The weed is abundant, like warts.

Source: interviews in Uray Huerta.

Jayaj Pichana (*Skuria pinnata*)

MEANING OF FOLK NAME: Hot (spicy) broom.

ENGLISH COMMON NAME: ??

PEST STATUS

Is a weed of potatoes and wheat in Sacabamba.

MANAGEMENT

Hand pulled.

USES

Broom. People take them home and use them for sweeping the floors of their houses.

INDIGENOUS KNOWLEDGE

Source: interview in Uray Huerta.

Llaq'u Llaq'u (*Plantago major*)

MEANING OF FOLK NAME: Unanalyzable.

ENGLISH COMMON NAME: Plantain (not the banana kind.)

PEST STATUS

MANAGEMENT

USES

Fodder. Animals eat it.

INDIGENOUS KNOWLEDGE

Source: interviews in Uray Huerta.

Turu Turu Khishkan (*Erigium??* sp.)

MEANING OF FOLK NAME: Thorns like a bull.

ENGLISH COMMON NAME: ??

PEST STATUS

Grows in field edges. When people cut grass, the thorns from this plant prick their hands and for this reason they dislike it.

MANAGEMENT

Hand removed.

USES

None. The animals will not eat it.

INDIGENOUS KNOWLEDGE

Source: interviews in Mayola.

Llama Thasa (*Nombre científico*)

MEANING OF FOLK NAME: Llama fart.

ENGLISH COMMON NAME: ??

PEST STATUS

A weed in places with loose, deep soil, in the warm areas of Piusilla. It grows in dense stands.

MANAGEMENT

Must be weeded out with a **chujchuka** when it is young.

USES

None. Animals will not eat it.

INDIGENOUS KNOWLEDGE

It produces much seed. Came to Piusilla about 1995. It out-competes other weeds and has roots about 50 cm deep. The plant smells like the belch of a llama.

Source: interviews in Piusilla.

Qhura (*Cotula australis*)

MEANING OF FOLK NAME: No name recorded.

ENGLISH COMMON NAME: Cotula.

PEST STATUS

A small plant, not extremely common. People are still not very familiar with it.

MANAGEMENT

Not explicitly managed.

USES

Fodder. Animals may eat it.

INDIGENOUS KNOWLEDGE

It may have come to Piusilla and San Andrés in oat seed, about 1995. It grows best in the high country.

Source: interviews in San Andrés.

Kanlla Khishka (*Nombre científico*)

MEANING OF FOLK NAME: **Kanlla** thorn.

ENGLISH COMMON NAME: ??

PEST STATUS

Occurs in fallow land and in wild land, not in fields.

MANAGEMENT

Disappears when the soil is ploughed.

USES

Medicine. Half of the plant is toasted and ground and the other half is left raw. These are then brewed into a tea and taken for measles, cough and for the folk disease *alfombrillo*.

INDIGENOUS KNOWLEDGE

Parrots are attracted in great numbers to eat its seeds.

Source: interviews in Qulqi Qhuya.

Qhura (*Cerastium glomeratum*)

MEANING OF FOLK NAME: No folk name recorded.

ENGLISH COMMON NAME: Cerastium.

PEST STATUS

Is a pest in some fields. Will not let crops grow.

MANAGEMENT

Hand pulled, piled in the field to rot, and ploughed into the soil the next year.

USES

Fodder. All animals eat it, including sheep.

INDIGENOUS KNOWLEDGE

Source: interview in Yunkataki.

Qhura (*Stellaria media*)

MEANING OF FOLK NAME: No folk name recorded.

ENGLISH COMMON NAME: ??

PEST STATUS

Many fields in Yunkataki have it, but it is not a serious pest.

MANAGEMENT

Hand pulled, but as it is pulled it snaps off.

USES

Fodder. Animals eat it.

INDIGENOUS KNOWLEDGE

Grows mostly on the pampas.

Source: interview in Yunkataki.

Qhura (*Dichondra* sp.)

MEANING OF FOLK NAME: No folk name recorded.

ENGLISH COMMON NAME: ??

PEST STATUS

A serious pest in Sacabamba. It prevents potatoes from growing small (immature) tubers (**llulus**.)

MANAGEMENT

USES

Fodder. Sheep eat a little of it. Cattle will not eat it.

INDIGENOUS KNOWLEDGE

The seed is probably in sheep manure. The plant is sticky.

Source: interviews in Uray Huerta.

Qhura (*Helianthus* sp.)

MEANING OF FOLK NAME: No folk name recorded.

ENGLISH COMMON NAME: Sunflower.

PEST STATUS

Reproduces rapidly and is a weed in Sacabamba.

MANAGEMENT

In Mayola, which is near Sacabamba but more humid, the sunflower is a minor pest. There is little of it and it comes out in the regular weeding.

USES

Fodder. Animals eat it.

INDIGENOUS KNOWLEDGE

The roots spread quickly.

Source: interviews in Uray Huerta, Mayola.

Qhura (*Richardia brasiliensis?*)

MEANING OF FOLK NAME: No folk name recorded.

ENGLISH COMMON NAME: ??

PEST STATUS

Its seeds stick to the clothing of people as they cut wheat.

MANAGEMENT

USES

Fodder. Animals eat it.

INDIGENOUS KNOWLEDGE

Its seeds are carried by animals.

Source: interviews in Uray Huerta.

Qhura (*Partenium* sp.)

MEANING OF FOLK NAME: No folk name recorded.

ENGLISH COMMON NAME: ??

PEST STATUS

It is a pest in Sacabamba. It “sucks” the earth and will not allow the crops to produce.

MANAGEMENT

USES

Fodder. The animals will barely eat it. Only when there is no grass left, then they will eat some.

INDIGENOUS KNOWLEDGE

It is a erect plant, about 30 cm high, with a white flower.

Source: interviews in Uray Huerta.

Ch'awqa Rumi (*Argemone mexicana*)

MEANING OF FOLK NAME: Ch'awqa rock.

ENGLISH COMMON NAME: Prickly poppy.

PEST STATUS

Grows along stream banks, not in fields.

MANAGEMENT

USES

Medicine. People brew its flowers as a tea, for cough.

INDIGENOUS KNOWLEDGE

It has serious thorns, and produces many seeds, which doves like to eat.

Source: interview in Uray Huerta.

Qhura (*Cynodon dactylon*)

MEANING OF FOLK NAME: No folk name recorded.

ENGLISH COMMON NAME: Bermuda grass.

PEST STATUS

It is becoming a serious pest in Sacabamba.

MANAGEMENT

Very difficult to weed. People can hand dig it out of potatoes, with picks and hoes, but it cannot be removed from other crops.

USES

Fodder. Sheep eat it, but it grows too close to the ground for cattle to eat.

INDIGENOUS KNOWLEDGE

It spreads across the ground, like *dulce grama* (*Pennisetum clandestinum*.) This weed only appeared in Sacabamba in the 1990s. It is spreading fast¹¹.

Source: interviews in Uray Huerta.

¹¹ This is a serious weed in Central America and elsewhere (Muñoz & Pitty 1994). Thus, a system which has absorbed several major new weeds in the past 3 decades is starting to take one more on board.