The use of local plants to control parasites

Ida Mendoza Alvarez and Vicente Nalvarte

The sheep-raising family farms of the Andes rely on natural pastures growing at altitudes that exceed 4000m. The extent of grazing land available varies, depending on the access peasant communities have to these areas and the climate. Pastures that flourish during the rainy season are depleted in the dry season. The lack of fodder and difficulties in managing flocks at these altitudes affect animal health and, consequently, the economy of peasant families. Such is the case in the communities of the San Juan de Jarpa and Yanacancha districts in the upper reaches of the Cunas river in Peru's central highlands. Here livestock breeding is the main activity among small-scale farmers. Family-owned flocks consist of sheep, alpacas and some bovine cattle. Although pastures are plentiful during the rainy season, over-grazing destroys them.

In the middle and lower parts of this river basin, peasant families grow potatoes, barley, broad beans and native varieties of tubers and edible roots to feed themselves and to sell any surplus. They also plant exotic fodder to complement their animal feed balance, mainly oats. The farmers have links with urban markets like Huancayo and Chupaca where they take their produce each week.

Diagnosis of farming constraints

Peasant communities in San Juan de Jarpa conducted community diagnosis and a diagnosis of their farms, with a great deal of knowledge and skill, particularly in identifying their main problems. They pointed out the following constraints:

- 'Andean weevil' (*Coleoptera Curlionidae Premnotrypes*) infestation of potato crops, which damaged between 45 and 50% of the production during 1997-98 season.
- Fodder shortage during the early months of the rainy season (November to February) when pastures have still not recovered from the dry season,
- Parasitism affecting sheep and cattle during the rainy season caused by *hepatic fasciola* or *distomatosis*, locally known as *'alicuya'*. Hence the low productivity of the livestock and the consequent negative impact on the family's economy.
- The low prices of meat in urban markets. These low prices fail to compensate production costs, particularly when the animals are sold at a time when pastures are scarce.

The family livestock-breeding system

Sheep breeding systems are based on the availability and extent of the natural pastures owned by each community. These include:

- *Permanent grassland:* Animals graze in a natural pasture assigned to each peasant family. This is capable of sustaining between 50 and 450 sheep and is run by a family member or a hired shepherd. The process is currently improving as management schedules have been established, sanitary conditions are more stable and fields are rotated. This is a mixed breeding, multi-family system (for examples sheep, beef cattle and alpacas) practised in large communities in which each community member is entitled to an average of 15 to 25ha of natural pastures.
- *Rotational grazing:* Sheep graze alongside beef cattle and rotate between two areas, depending on the season. In the higher parts (community pastureland), they graze during the rainy season (September and May), taking advantage of the re-growth of forage and water sources. During the dry season (June-August), they graze in the lower parts, taking advantage of stubble fields, damp meadows and small areas of permanent grassland. This is a multi-family system with flocks of between 20 and 150 sheep, practised in medium-sized communities with an average of 5 to 10ha natural grassland per community member.
- *Grazing on the borders of farm plots:* Under this system, sheep graze outside the farms, alongside roads and in small natural pastures under the control of a shepherd. Flocks range from 5 to 20 sheep per family and family members take turns in taking them out to graze. This system is practised among small communities and families with only a few animals.

Rate of occurrence of distomatosis

In the higher parts of the Cunas river basin, distomatosis is one of the parasitic diseases which has the greatest economic impact on sheep breeders because it results in a high mortality rate, low meat production and a poorer quality of wool.

The following are the main causes of the increasing frequency of this parasitic disease:

- Grazing in infested pastures, whether natural or cultivated. This problem is aggravated by the lack of grassland rotation.
- A lack of preventive treatment of the sheep because farmers cannot afford veterinary products.

- Lack of awareness of the biological cycle and rate of occurrence of this parasite.
- Lack of preventive practices to control the vector (*Lymnea ssp.* snail) which thrives in moist or humid soil during hot periods.

The sanitary aspect is precisely one of the factors that restricts livestock-breeding, particularly if the intention is to improve animal productivity.

Traditional treatiment: shipita

According to research studies carried out in the region, producers have traditional ways of controlling distomatosis or *'alicuya'*. These include adding copper sulphate and salt to the animal feed as well as a dose of wild artichoke leaf extract or a combination of bell pepper, red nettle and sharp lemon. Amazing results are obtained from a dose of a preparation made from a native shrub known as *'shipita'* (*Columnella abovata*).

The *shipita* is a perennial shrub that grows all over the southern part of Huancayo province. It has long thin stems which are flexible enough to be used for weaving baskets. It has plenty of small leaves of a dark green colour and has yellow flowers. It can reach a height between 1.5 and 2m and can be multiplied through seeds, by layering and through cuttings.

According to some local community members, treating alicuya with *'jaya shipita'* involves soaking dry leaves from the shrub overnight and, after straining the liquid, mixing it with oil. Half a bottle of this medication is fed to each adult sheep.

Table 1. Design of the experiment and treatment per family

Treatment A :

5 adult sheep that will be given the dosage and remain under observation for 14 days.

Treatment B:

5 adult sheep that will not be given the dosage (control)

Recipe used for the shipita preparation:

- Boil 250g of shipita stems and flowers in five litres of water for one hour at a high temperature.
- Remove the stems and flowers and grind them.
- Place the mixture back in the liquid and continue boiling for another hour until only about one litre remains.
- Let the mixture marinate in a covered container for 10 to 12 days
- Strain and use the extract

Dosage applied:

1cc of extract for every 3kg live weight.

One researcher (Cordova, 1981) recommended the use of one kilo of leaves of this plant per gallon of water (nearly 5 litres), soaked and strained as explained by community members, then mixing three parts of the extract with two parts of oil. The project's veterinarians changed this recipe to adapt the dosage to the limited number of sheep in family flocks and obtained a dosage of 1cc of extract per kilo of live weight.

As this plant is used frequently, communities obtain their supply from cattle merchants, basket vendors or from families who exchange products from the lower part of the valley for produce from the upper reaches.

Designing the experiment with shipita

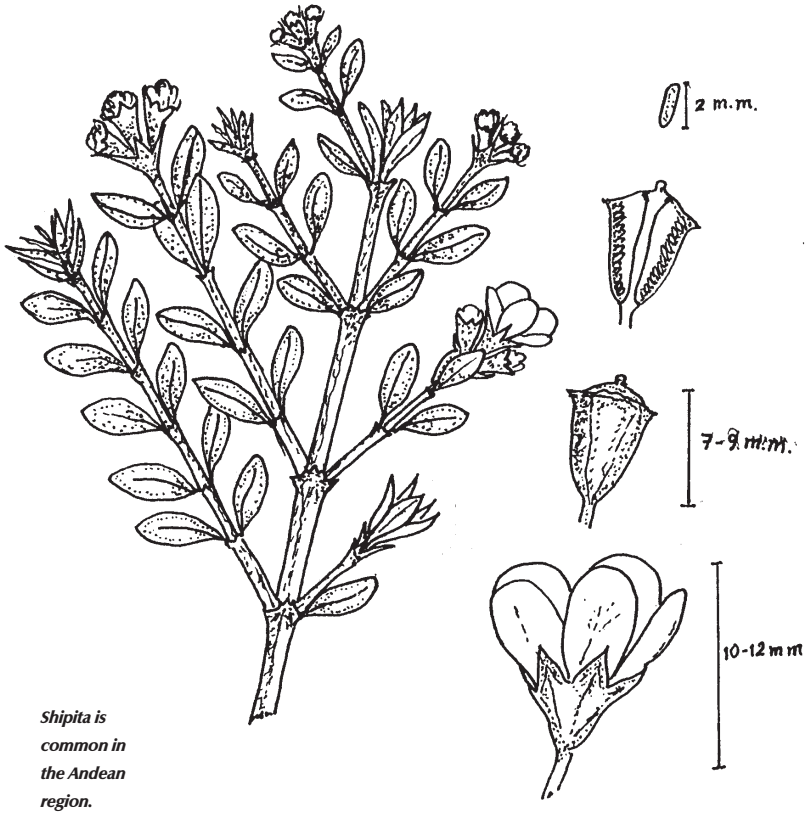
With a view to improving production and reducing the costs of family sheep-raising farms, the NGO staff involved in the ILEIA research programme decided to experiment with the use of shipita in controlling alicuya. To this end, arrangements were made with the Development Committee of the Peasant Communities of Alto Cunas, after the PTD approach had been presented. The Committee decided that the work would take place in six communities with an average of 4 to 6 research farmers - including women - per community. The research farmers were selected at a general assembly in each community, thus ensuring their participation and the replica of the results in each community. The participants formed working groups that were responsible to a coordinator.

The experiment was designed for 10 adult animals from each family flock. Half were treated with shipita and the rest of the animals formed the control group. The experiment was repeated 16 times in six peasant communities (see Table 1).

As experimentation is part of the peasant production system, they had no difficulty starting this 'learning by doing' approach as part of their efforts to improve their production through simple, small-scale comparisons. The close participation of farmers and their families in the implementation of the experiments was important for the assessment of the results.

The identification of evaluation indica-

A PTD experience in sheep-raising family farms in the Peruvian Andes



Shipita is common in the Andean region.

tors for the experiment, such as the weight of the animal, reaction, quality of the wool, feed, quality of the meat and certain symptoms of the disease, were useful for improving accuracy of observation, registration and monitoring activities. The exchanges and evaluation meetings of community working groups also provided an opportunity for discussion. University staff were involved in laboratory testing animal faeces to establish the infection rate.

Results

Results of monitoring and evaluation carried out by experimenting farmers:

- *Weight:* Each animal was weighed at the beginning of the treatment and 30 days later. A 15 to 30% weight increase was recorded in the treated animals.
- *Animal reaction:* After receiving the dosage, many animals felt the impact of the remedy and were motionless. However, two hours later they were back to normal; they started eating and became more active as the days went by.
- *Wool:* some of the sheep had been losing wool. Now they started to recover it and its quality improved.
- *Feed:* After receiving the dosage, the animals acquired a greater appetite as the days went by and started to feed constantly.
- *Quality of the meat:* When the animals were slaughtered a month after the treatment, it was found that the quality of the meat had improved, the carcass weighed more, their livers were better. There was also no evidence of alicuya.

Furthermore, the laboratory tests on the faeces of treated animals proved that the dosage of shipita extract was 87.5% effective in controlling alicuya in adult sheep. Only 12.5% of the animals still had a Grade 2 (low degree) infestation. This shows the effectiveness of shipita in controlling alicuya.

Dissemination of results

Based on the results of the experiment, the NGO staff implemented the following:

- Reproduction and reforestation of shipita: 200 seedlings of that species were brought to the peasant community and planted in hedges and family plots so that shipita would be available to them in the future.
- Sheep handling and sanitation schedules were drawn up based on the results of the experiment and the livestock management system.
- A campaign against alicuya, using shipita was launched: 3248 sheep were treated in 25 farming units run by 60 community families.
- An overall parasite control proposal (MIPAR) based on the control of alicuya in family sheep-raising systems was designed. This included the study by university staff of the transfer of the disease vector. The results were discussed with the farmers.

Conclusions

The experiment confirmed the effectiveness of the natural product *shipita* in controlling *alicuya* as a low cost alternative for family sheep-breeders in Jarpa. The campaign that began with groups of experimental farmers and their families proved that the large-scale use of this method is possible. At the same time, producers were encouraged to continue with their research and experiments - in accordance with their needs - in order to improve their production.

In simpler terms, this process proved that with PTD, actions based on a participatory analysis can begin with a degree of understanding and motivation that reinforces a sense of commitment and guarantees results. At the same time, technologies can be created whilst the promotion is taking place providing they are based on farmers' primary needs.

The integration of local know-how and academic knowledge, cooperation between technicians and peasants and the incorporation of new professionals was another lesson obtained from the PTD exercise. In addition, it strengthened the relationship between research and NGO staff and the population. Finally, it was confirmed that PTD is a process that enhances local skills and resources without restricting external backstopping. ■

photo: Wim Hiemstra

Farmers and technicians discussing integrated approach to liver fluke control.

photo: Bert Lof

photo: CIAREC

Experimenting with Shipta to control parasites in sheep.