

Big Bone Disease

A multidisciplinary approach
of Kashin-Beck disease
in Tibet Autonomous Region (P.R. China)



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Chapter 5

Studies and actions concerning several hypotheses

- 5.1. The fungal hypotheses
- 5.2. The mineral deficiency hypothesis
- 5.3. The alternative food path or the very little diversified diet hypothesis
- 5.4. Protinet



Plate 5.1. Surveys and samplings in the villages. A. Cereal grain are sampled in sacks or containers in the family store-room with a grain trier – B. This trier is conceived for sampling grain at different levels in bags or containers. It is important because fungal contamination may be different according the depth – C. Humidity of grain is also measured with a Samap device.

5.4

Protinet

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Introduction

Previous studies have established the poor and very little diversified diet of most of Tibetan peasants in several rural areas. Also from latter matters developed in the present book (Chap. 5.3.), it appears easily that nettles are a valuable potherb, and even a fine alternative food. Therefore, to encourage eating nettles in a more routine way could easily contribute to improve the nutritional status of people and more specifically children. As a consequence, it could have an implication on Kashin-Beck disease prevention!

A new programme called PROTINET (Programme on Tibetan nettles) is born. Its objectives are to increase interest of local populations regarding their ancient knowledge and tradition of nettle consumption, as well as an establishment of nettle fields in villages.

Programmes and actions that have to be undertaken in South Central Tibet are listed and commented in this chapter. It includes both a better knowledge regarding diversity of nettles in T.A.R. as well as regarding the methods of cultivation. These aspects will be shortly discussed. A better knowledge of the various aspects of local sensibility for this diet is also of interest.

5.4.1. Nettle as diet in T.A.R.

Nettle has been considered since a long time as a food, a fodder, and a medicinal plant. The consumption of stinging nettle as a vegetable dates back to antique times. In Ancient Greece, it was known and mentioned by Hippocrates (460-377 B.C.) and Theophrastus (372-285 B.C.). Its use as food is praised and advised in *Materia Medica* by Dioscorides and *Naturalis Historia* by Plinius, both works dating back to the first century (Randall, 2003). The remedial properties of the plant

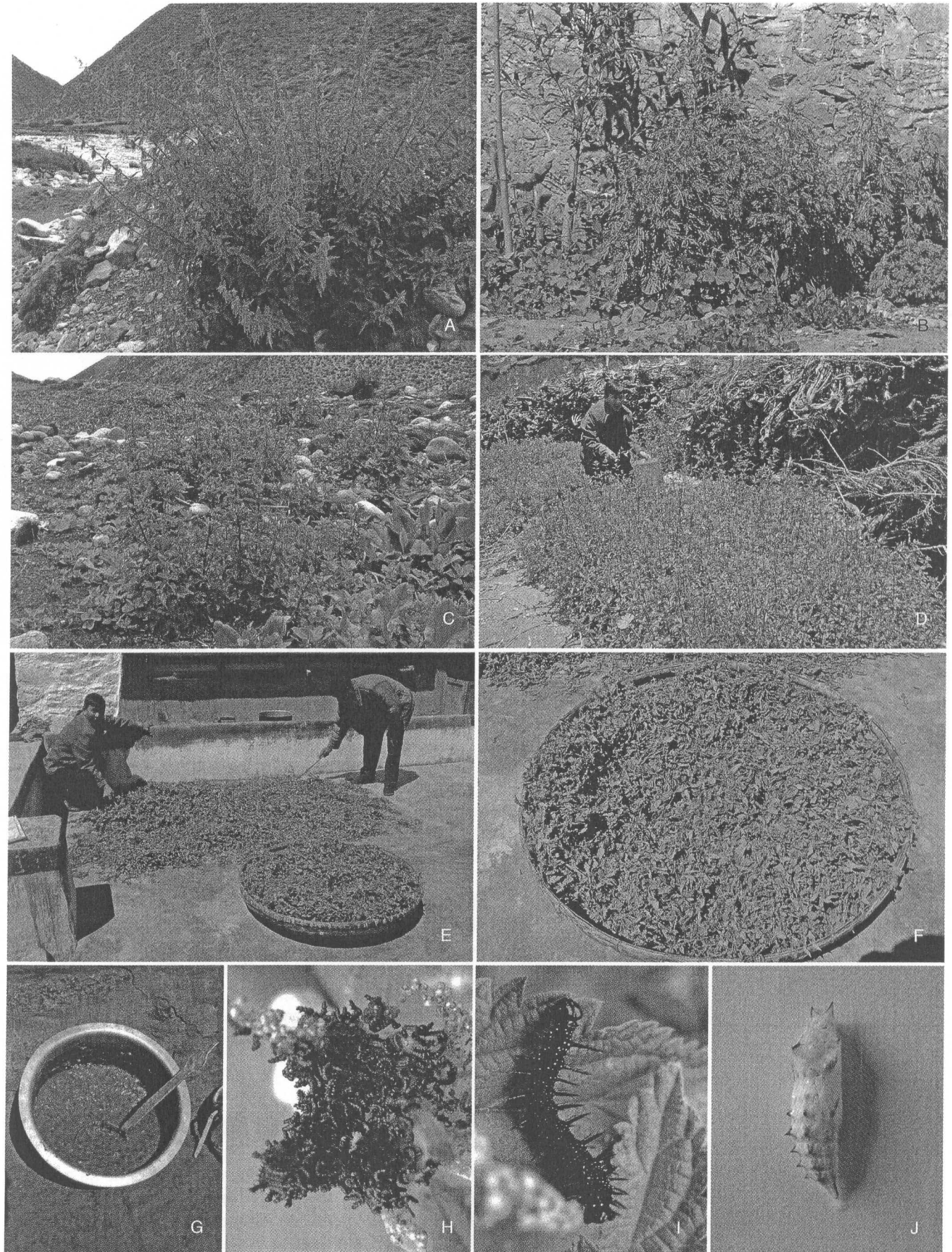


Plate 5.23. Nettle as food in South Central Tibet. A. *Urtica dioica* subsp. *dioica* in the wild – B. *Urtica cannabina* – C. *Urtica triangularis* in the wild – D. A plot of *Urtica* sp. – E. Drying nettles or *sapo* at home – F. Basket of nettle leaves – G. Nettle soup or *suptuk* – H. *Inachis io*: third instar caterpillar – I. *Inachis io*: fourth instar caterpillar – J. *Inachis io*: chrysalis.

are also listed (Wetherilt, 2003). In T.A.R. also the plant is listed in diverse books of medicinal plants (Tsarong, 1994; Dga' ba'i rdo rje, 1995).

The leaves of *Urtica* species have been reported to be excellent sources of some important minerals and vitamins (Booth et al., 1963; Trofimova, 1977; Adamski et al., 1980) and to have a higher level and a better quality of protein when compared with many other green leafy vegetables (Adamski et al., 1984; Ullrich et al., 1984; Wetherilt, 2003; Bertrand 2005).

Most of our programme's villages have access to nettles. Even better, numerous peasants know nettle clumps in a distance of less than 300 m from their houses. Nettles are found in several sites, notably in rocky places, along water channels and around cesspools.

All the villagers in our programme's areas eat nettles, but there are big differences on the quantity of consumption between villages to villages and families to families (Plate 5.23). It seemed that the poorer families eat larger quantity and more frequently nettles than the rich ones. Also family traditions of eating nettles are different from one family to another. There are families eating fresh and dried nettles all year long, but some other families eat only few times (1-4) a year. Many families have also dried nettles to use for their domestic animals.

There are some typical reasons of eating nettles:

- many people eat nettles as subsidiary food for part time of the year or all year along. It is true mainly for farmers;
- many people also eat nettles during Sagadawa, as respect to be vegetarian for two weeks (Sagadawa is from the first to the 15th of the 4th month of Tibetan lunar calendar; the 15th is the date of the birth and death of Buddha; usually it's the month of June in the universal calendar);
- people eat fresh nettles also as it is the first fresh food of the year, on springtime; therefore eating one or few times nettles for auspicious gesture is fine;
- also some people, especially monks or nuns eat nettles for meditation and honoured to Milarepa (a famous Tibetan poet monk in the 13th century who survived eating only nettles and eventually his body became green).

On the other hand, there are many stories or rumours preventing eating too much nettles. It would provoke high blood pressure, pain to knees, headaches, etc.

There are only two recipes of nettles:

- sauce: to smash fresh or dried nettles and add little water and spices;
- soup: nettles, fat, water, salt and add some *tsampa* (barley powder) to obtain a thicker soup.

Both are eaten with *tsampa* breads as accompany.

There are nettles seen in the Lhasa Barkhor market to sell. The price of 300 g (the measure of an empty can) is around 5-6 yuan during Sagadawa, but after Sagadawa the price comes down to around 2.00 yuan per 300 g. Definitely nettles are one of vegetables people preferred to eat during this period.

The villagers in Lhoca prefecture told us that they do not eat the nettles grown in cesspools but they sell them in the market.

According to the villager's knowledge two or three kinds of nettles are recognized. They are *sanak* near houses, *sakar* on the summit of mountains, and *sakaro* near streams. Some villagers make a distinction between white and dark nettles. They consider that the white nettle grows under shade, in between gaps of rocks, under other big plants such as bushes, meaning that the white nettles are not exposed to sunshine therefore they are less dark. The villagers say that the taste of the white nettles is more delicious than the dark ones. Several locators prefer white nettles that occur in high mountains to black nettles growing near the houses.

Locally, nettle fruits or *sapoi pukku* are eaten in September-October after boiling them in hot water. Old nettles are given to livestock.

5.4.2. Nettles diversity in T.A.R.

Within the Urticaceae of China, nettles are plants armed with stinging hairs and opposite leaves. Moreover they have female flowers without staminodes; the perianth lobes of female flowers are free, the lateral outer pair being much smaller than the dorsiventral pair.

According to Chen et al. (2003; 2004) in the Flora of China, the genus *Urtica* L. amounts about 30 species of which 14 species occur in P.R. China; three of them being endemic (Plate 5.24).

Table 5.12. lists these species, presenting some information on distribution. It indicates that 7 taxa occur in T.A.R. During our surveys we collected *Urtica triangularis*, *Urtica hyperborea* and *Urtica dioica* subsp. *dioica*.

5.4.3. Phytotechny and cultivation of nettles in South Central Tibet

We have no information about cultivation of nettles in South Central Tibet, nor on its local phytotechny. Therefore there is an urgent necessity to carry out

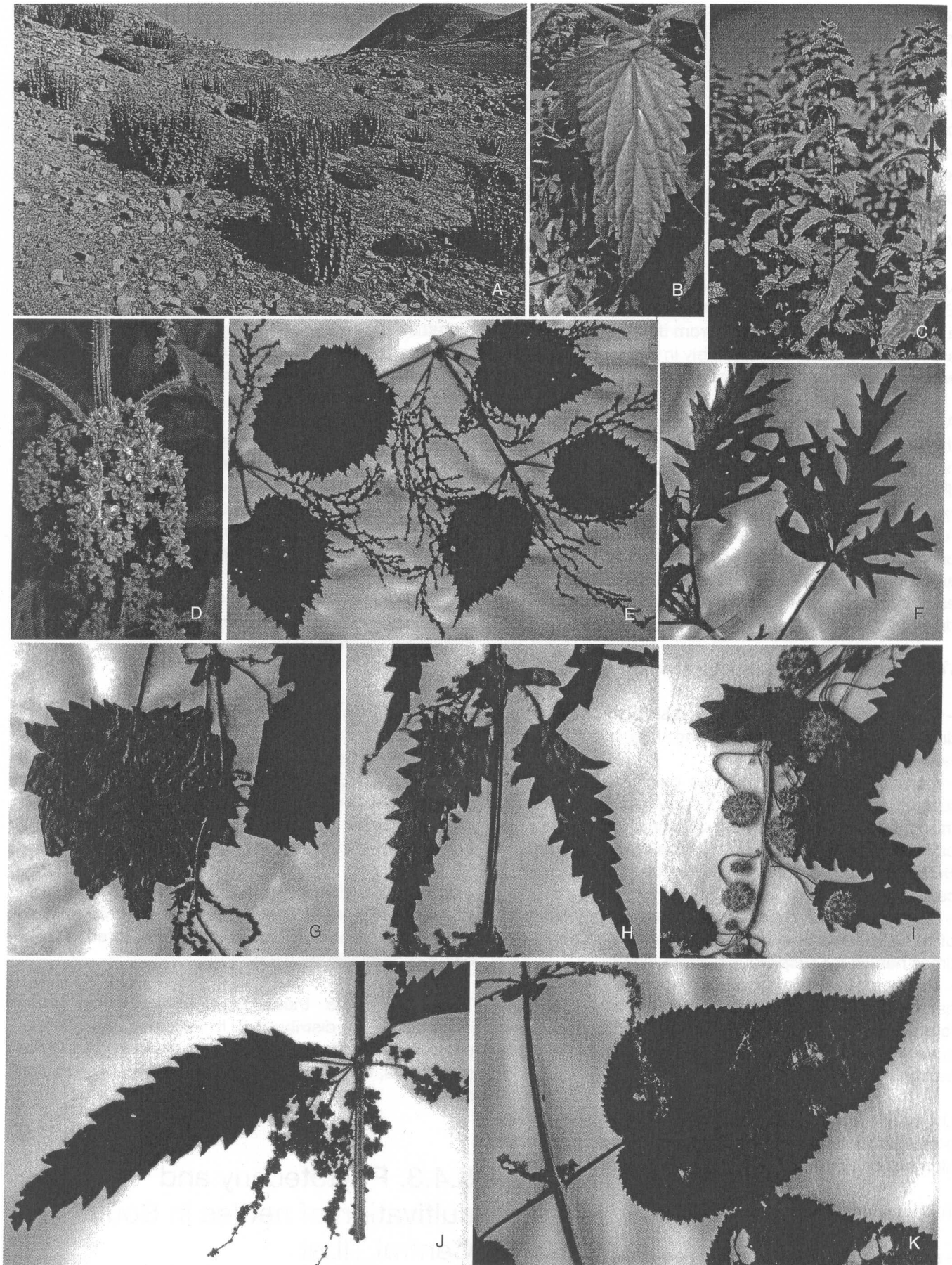


Plate 5.24. Diversity of nettles in China. A. *Urtica hyperborea* at Chak pass – B. *Urtica dioica* var. *dioica*: leaf – C. *Urtica hyperborea*: habit – D. *Urtica dioica* var. *dioica*: infrutescence – E. *Urtica mairei* – F. *Urtica cannabina* – G. *Urtica fissa* – H. *Urtica triangularis* – I. *Urtica urens* – J. *Urtica angustifolia* – K. *Urtica ardens*.

Table 5.12. Diversity and distribution of *Urtica* species in P.R. China (Xizang = T.A.R.).

Taxa	Distribution	Altitudinal distribution (m)
<i>Urtica atrichocaulis</i> (Hand.-Mazz.) C.J.Chen	Guizhou, Sichuan, Yunnan	300-2,600
<i>Urtica taiwaniana</i> S.S.Ying	Taiwan	3,400-3,600
<i>Urtica urens</i> L.	Liaoning, Xinjiang, Xizang	500-2,900
<i>Urtica triangularis</i> Hand.-Mazz. subsp. <i>triangularis</i>		2,500-3,700
<i>Urtica triangularis</i> Hand.-Mazz. subsp. <i>pinnatifida</i> (Hand.-Mazz.) C.J.Chen	Gansu, Qinghai, Sichuan, Yunnan	3,400-4,100
<i>Urtica triangularis</i> Hand.-Mazz. subsp. <i>trichocarpa</i> C.J.Chen	Gansu, Qinghai, Sichuan	2,200-3,000
<i>Urtica cannabina</i> L.	Gansu, Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Ninxia, Qinghai, Shaanxi, Shanxi, Sichuan	800-2,800
<i>Urtica hyperborea</i> Jacq. ex Wedd.	Gansu, Qinghai, Sichuan, Xinjiang, Xizang	3,000-5,200
<i>Urtica laetevirens</i> Maxim.	Anhui, Gansu, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jilin, Liaoning, Nei Mongol, Qinghai, Shaanxi, Shandong, Shanxi, Sichuan, Xizang , Yunnan	100-3,500
<i>Urtica angustifolia</i> Fisch. ex Hornem.	Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Shandong, Shanxi	800-2,200
<i>Urtica dioica</i> L. subsp. <i>dioica</i>	Qinghai, Xinjiang, Xizang	3,200-4,800
<i>Urtica thunbergiana</i> Siebold & Zucc.	Taiwan, Yunnan	1,200-2,500
<i>Urtica fissa</i> E.Pritz.	Anhui, Fujian, Gansu, Guangxi, Guizhou, Henan, Hubei, Hunan, Shaanxi, Yunnan	100-2,000
<i>Urtica mairei</i> H.Lév.	Xinjiang, Xizang , Yunnan	1,500-3,400
<i>Urtica ardens</i> Link	Guangxi, Xizang , Yunnan	2,400-2,700
<i>Urtica parviflora</i> Roxb.	Guangxi, Xizang , Yunnan	1,500-2,400

observations on ecology and phenology, as well as on herbivory of the species present in the area of concern. Herbivory has been observed in several villages. Caterpillars of *Inachis io* or peacock, belonging to the Nymphalidae family, appears to be not rare.

The villager's motivation of planting nettles in the gardens is not very high. They say they have nettles near their houses. Other reasons given to avoid plantation are: «too much eating is bad for health», etc. As a result, most of the experimenting gardens took place in the village leader's houses (Plate 5.25). But the combination of planting other vegetables such as cabbage and radish motivates some families to grow nettles.

Some nettle gardens are already started in Sangri county (Lhoca prefecture), Nanang and Medrokongkar counties (Lhasa prefecture). Cabbage and radish seeds are provided to those families who have planted nettles.

If we could provide new nettle recipes (Figure 5.6), it will motivate farmers to increase their nettle intakes, especially for their children.

All in total, 90 families are scheduled to plant the experimenting nettle gardens in three methods: soil with water, soil with urine, and soil with manure.

Results will be available after the first year trials.

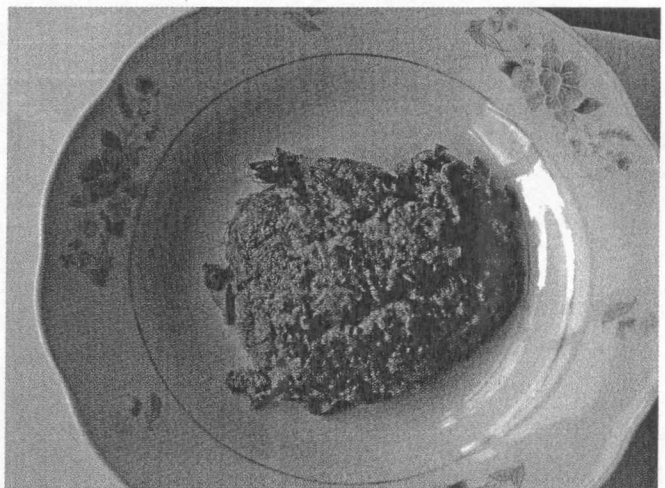


Figure 5.6. Nettle omelette.

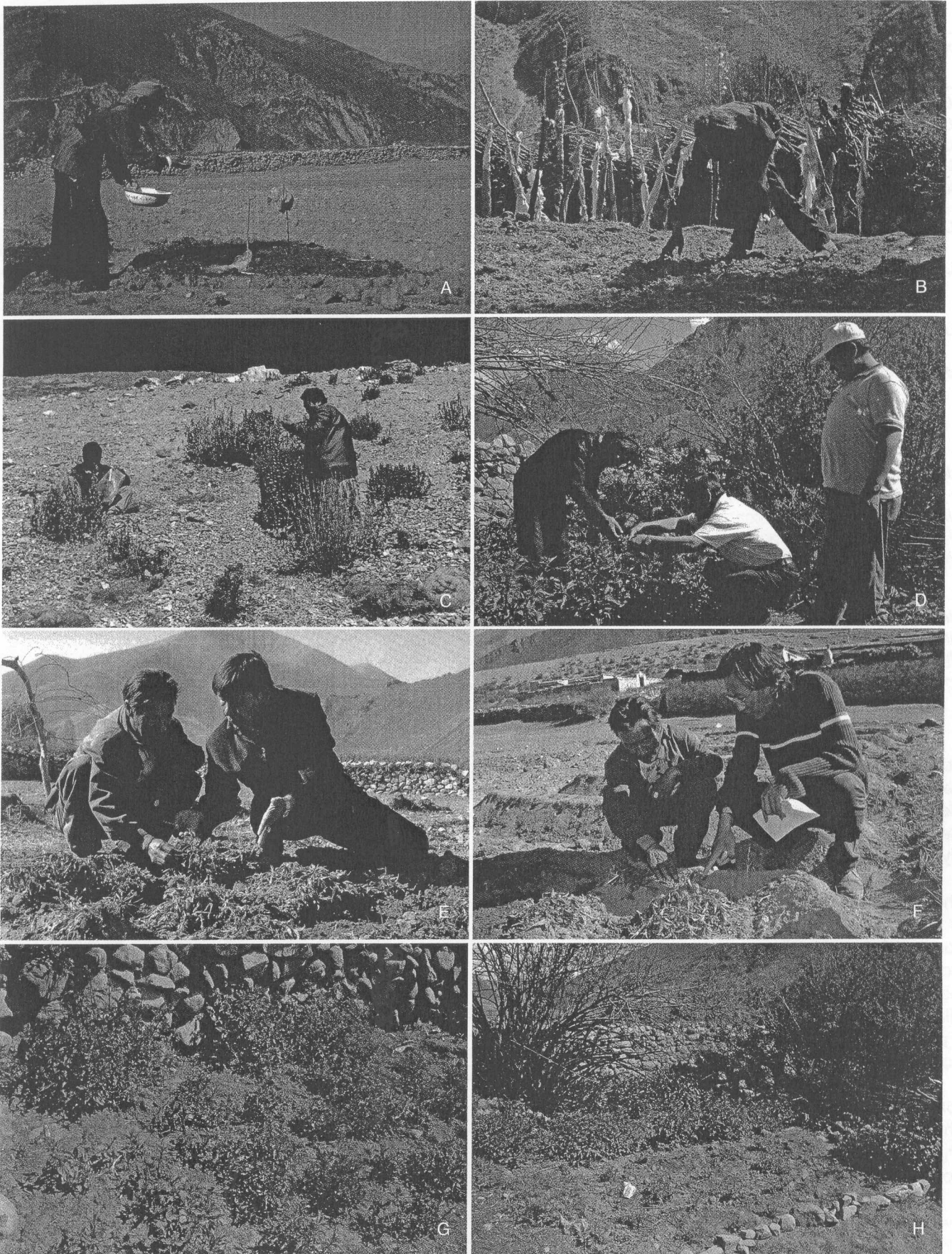


Plate 5.25. Protinet in action. A. Plot preparation – B. Checking nettle garden – C. Collecting seeds of *Urtica hyperborea* – D. Nettle garden – E. & F. Councils of KBD team on peasants about nettle's garden – G. & H. Successful nettle cultivation.