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Front cover: A richly embroidered child's *Jhabla* or tunic patterned with an intercrossing *Simurgh* (senmurw) and peacocks from the Indian tradition along with floral designs from Persia (Photographed by Ashdeen Z. Lilaowala for the Parzor Foundation; © Unesco Parzor).

Back cover: European foliage and scallops form the base of this Parsi embroidered sari (Photographed by Ashdeen Z. Lilaowala for the Parzor Foundation; © UNESCO Parzor).

Contents

27 A 'Stinging' Textile: Cultivation of nettle fibre in Denmark and Asia

Ellen Bangsbo

Ellen Bangsbo is an independent researcher in Copenhagen, Denmark. She was educated at the Textile Department of the Art and Crafts School, Copenhagen (1978), and holds a BA in Tibetan (1997) and an MSc in Anthropology from the University of Copenhagen (2001). She has extensive fieldwork experience in Asian civil societies, Tibet, Nepal and India with research in education for Tibetans in Tibet and exile. She is the author of a book and numerous articles related to Tibet. She is an expert in textile design, weaving, spinning, the cultivation of plant fibres, and other textile handicrafts. Fieldwork abroad associated to the textile nettle project was conducted in Nepal 1979–80 and 2010, and an article on this subject was written: Allo-en bæredygtig nælde som tekstil i Nepal *Nepal Vision* vol. 21, no. 2, Winter 2012, pp. 28–30. She was a guest scholar at the Danish National Research Foundation's Centre for Textile Research, University of Copenhagen 2011/12.

Most people regard the nettle as an unpopular perennial weed with an unpleasant sting, while others know the nettle as a useful herbal remedy, but nettle (*Urticanceae*) has yet another quality: as a textile fibre which was cultivated in Denmark back in the Scandinavian Late Bronze Age (900–700 BCE). Prospects of using the nettle as a textile plant might sound familiar from the fairytale 'The Wild Swans' by Hans Christian Andersen, where the brothers of the princess Elisa were bewitched and turned into swans by their stepmother, after which Elisa rescued them by knitting magic shirts made from stinging nettles, thereby turning them back into their human form.

Nettle is a plant that likes abandoned places. There are around 500 different species of the *Urticaceae* family worldwide, and the common name Urtica derives from the Latin word *uro* which means to burn, probably referring to the burning sensation on the skin when touching nettle. Plants of the nettle *Urticaceae* family of bast fibre are *Girardinia, Boehmeria, Laportea* and *Urtica*. The most common wild stinging nettle in Europe is *Urtica dioica*, while the 'Himalayan Nettle' (in the Himalayan regions) is *Girardinia diversifolia* (Fig. 27.1). Better known in China are the stingless nettle species 'Ramie', 'Rhea' or 'China grass', *Boehmeria nivea*. Since the Middle Ages, nettle has been known and valued in multiple ways, and its medical value has been scientifically researched and confirmed: as a tea and tonic, a herbal medicine, a pesticide, paper making and animal fodder to mention a few, as also documented in folklore, literature

and etymology studies. Nettle spring shoots are known to be a nutritious diet; during the 11th century, the Tibetan saint Milarepa is said to have survived for many years on a solitary diet of nettles in the cold and remote Himalayan mountainous regions.

Fig. 27.1: The 'stingy' Himalayan Nettle *Girardinia diversifolia* (Photo: © Ellen Bangsbo).

Nettle Fibres Cultivated Since the Bronze Age

Nettle is the only wild growing plant in Europe which can provide a reasonable fibre crop, although small; barely 5% of dry stalk mass. Historical records mention a long history of the use of nettle fibre. In Denmark, the earliest plant fibre textile is a find of nettle yarn in the Voldtofte grave urn dated to the second period of the Late Bronze Age (800 BCE) (Dreyer and Edom 2005). The Voldtofte nettle cloth was preserved due to it being in contact with a bronze vessel and its bronze oxide. However, laboratory examination of the Voldtofte nettle attests that the plant fibre is not of local origin (Bergfjord *et al.* 2012), suggesting trade in textiles. It seems that linen was introduced in Denmark in the Iron Age (500 BCE–850 CE), which could explain why the use of nettle as a fibre disappears. The earliest find (1929) proving the use of nettle as a culture plant in Scandinavia is a bundle of retted nettle stalks placed in a pre-Viking ship at Kvalsund in Norway, dated to the Late Iron Age (*c.* 850 CE).

Nettle cloth was produced in Denmark especially during the 18th and 19th centuries. During this time its craftsmanship reached such high levels that cloth produced in nettle fibre was compared to silk, and in 1917, the Danish government established a Nettle Commission to promote its production. During World War II, nettle fibre was used and cultivated in Denmark, but due to poor crops, technical difficulties, labour cost and low cost-effectiveness, the cultivation of nettle was abandoned at the end of the war.

Nettle Fibre Cultivation in Asia

The stinging wild nettle *Urtica dioica* is also common in Asia, but here the Himalayan Nettle *Girardinia diversifolia* flourishes at the moist sub-tropical and temperate Himalayas from Kashmir to Sikkim, in Bhutan, Assam and the Khasi Hills, Myanmar, Java and China, and from Marwar and central India down to Travancore and Sri Lanka (Singh and Shrestha 1988, 445). The Himalayan Nettle grows to a gigantic height of up to 3.5 metre being a component of the natural forest ecosystem. It produces a lustrous, smooth and very strong fibre 9–54 cm long, which is amongst the longest found in any plant.

The tradition of extracting fibre from nettle has been practised for generations in Asian regions and is even said to be praised for its beauty and firmness in the Hindu epic *Ramayana* (Dunsmore 1993, 59). Native peoples of early India were acquainted with the arts of spinning and weaving, as proved by references in the Vedas, the ancient Indian scriptures (1500–500 BCE), and urticaceous fibres are known to have been used in Atranjikhera, the early civilization of the Upper Ganga Basin (*c.* 1200–600 BCE) according to G. M. Buth and K. A. Chowdhury (Vishnu-Mittre 1974, 26). In Bhutan, old-time tunics predating the female dress *kira* dating to the 19th century were sometimes made from nettle (Myers *et al.* 1995,106).

A well-known nettle of the *Urticanceae* family known for its fibre in Asia is often referred to as "China Grass", Ramie or Rhea (*Boehmeria nivea*), here devoid of stinging hairs. Ramie is known to have been cultivated in India at least since the beginning of 1800s, where it was processed by hand, after which the government of India in 1869 had its first try at mechanical processing (Kozlowski *et al.* 2005, 208). Ramie has been cultivated in China for centuries. Today, the mechanical facilities available in China for processing nettle plant fibres from the stalk, provide the opportunity for some Nepalese business companies (dealing with nettle fibre) to regularly ship their own raw nettle bark ribbon to China for mechanical treatment.

Allo, Nettle Fibre Cultivation in Nepal

The Himalayan Nettle *Girardinia diversifolia* (Urticaceae) with the local Nepalese name *Allo* grows abundantly in the highland forests of the mid hills at 1400 m and high hills up to 2500–3000 m in western and eastern Nepal. The harvest takes place from August through December and is a tedious and unpleasant task trying to avoid leeches in the damp forest area and eventual allergic reactions caused by the stings (Fig. 27.2). Thick protective gloves are usually required for peeling the bark, but in one village I visited in the Midwestern region of Nepal, local women collected the bark ribbon without using gloves, indicating that a toxic resistance to allergic reactions from yearlong harvesting has developed, as cultivation of nettle fibre had taken place for generations in this area.

After harvesting, the bark ribbon is stored to dry. It is then boiled in a solution of wood ash. The fibre is then beaten with a wooden mallet, rinsed in water and left to dry in the sun. Caustic soda may be used instead of wood ash, which conveniently reduces the period of boiling to a mere half hour. This is of course attractive in a place where wood is increasingly scarce, but caustic soda is environmentally polluting and also affects the fibre in an unattractive way causing dryness and less shine in the fibre, and if used, the yarn cannot be classified as a sustainable product. A somewhat similar processing of the nettle stalk and fibre is done by the Bhutanese and the Mishmi or Deng ethnic group of Tibet and in India at Sikkim, Arunachal Pradesh, and the Indian Himalayas. The nettle fibre also carries a specific cultural value for the Nepalese Rai people, as they use it in their religious ceremonies. Finally, being a strong fibre, it is also used for fishing nets.

Fig. 27.2: The handling of the nettle plant starts with harvesting by peeling the fresh green nettle bark ribbon by hand, sometimes even teeth are used instead of a sickle or a knife to separate the fibrous material from the stalk. Nepal 2010 (Photo: © Ellen Bangsbo).

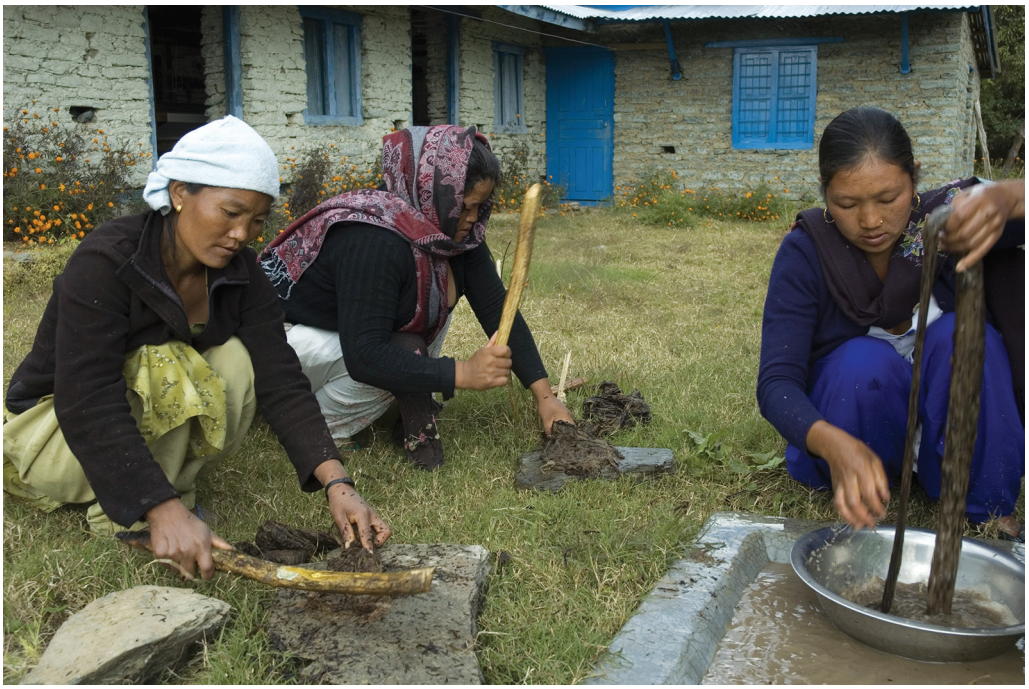

Fig. 27.3: The nettle bark ribbon is rarely boiled immediately, but preferably 2–3 days after harvesting or later with a wood ash solution for approximately three hours sometimes left for simmering overnight. The fibre is then beaten with a wooden mallet and extensively rinsed in water to remove the extraneous plant material, finally it is rubbed with micaceous clay/clay soil and left to dry in the sun. The adding of clay soil serves the purpose of softening and bleaching the fibre. The fibre now becomes very dusty, with clay comprising more than 40% of its weight (Photo: © Ellen Bangsbo).

Textile project programs supporting the development of *Allo* production have been initiated by local and foreign NGOs, and the United Nations Development Programme in several Midwestern districts and especially in the Sankhuwasabha district in eastern Nepal. In some villages, *Allo* has become a major raw material for cottage industry. Here the traditional backstrap loom (Fig. 27.4) is replaced by the larger four-shaft treadle counterbalanced loom, which sometimes has been transported in bits and parts across hills on narrow paths (Fig. 27.5). The extraction of nettle bark ribbon and its processing methods for quality yarn and thread is difficult, tedious, labour intensive and still only provides a low profit for villagers and weavers. In spite of low salaries, *Allo* products are today an increasingly important commodity providing an income for many local ethnic groups living in the rural areas. *Allo* products are easily available in local markets in Kathmandu and Pokhara where consumers are mainly western, in addition to being available on the international market where especially knitted products are shipped to Japan (Fig. 27.6). As seen in European textile history, the use of nettle cloth in Asia is associated with a common humble lifestyle in marginal communities, and most Nepalese prefer to wear more lustrous clothing of soft pashmina wool and glistening velvet fabrics, acknowledging the former low status signal of poor rural descent by wearing *Allo* products.

Fig. 27.4: In Nepal, the hand-spun *Allo* nettle yarn was traditionally woven on backstrap looms, an easily portable loom consisting simply of a warp secured to a beam and kept straight by the strap around the weaver's body. Backstrap looms were used to produce shawls, mats, sacks, headbands, and clothing by local ethnic groups such as Rai, Sherpa, Magar, and Gurung. This photo shows a woman weaving nettle cloth on a backstrap loom in Ghandrung, Nepal 1979 (Photo: © Ellen Bangsbo).

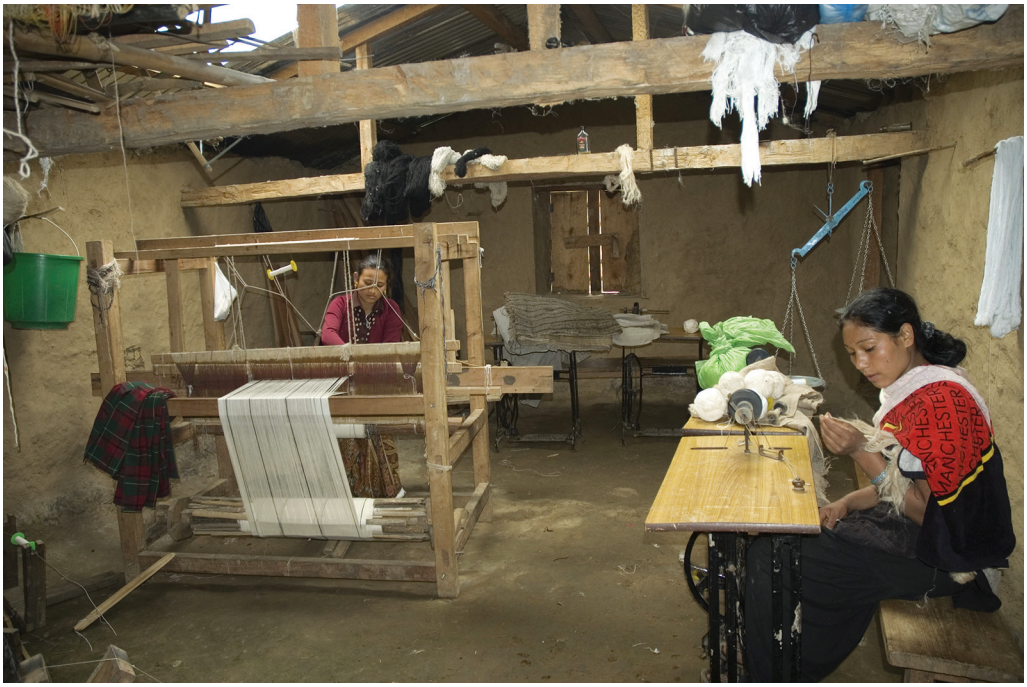

Fig. 27.5: Development projects in Nepal have introduced four shaft-treadle looms and spinning wheel used in more settled environments in the domestic sphere. Here, the fibre is spun by hand into a thread much faster than by the use of the traditional drop spindle. However, the drop spindle/hand spindle enables the person to spin while walking, shepherding or doing other tasks. Before spinning, the fibre bundle is untied by hand and the bundle is kept in order by twisting it around the foot and one toe (Photo: © Ellen Bangsbo).

Fig. 27.6: Knitted shawls of hand-spun nettle yarn for sale in Kathmandu 2010. (Photo: © Ellen Bangsbo).

Nettle Fibre Cultivation in India and its Environs

The Himalayan Nettle grows in the sub-tropical and temperate foothills of the Himalayas from Kashmir to Sikkim, in Assam and the Khasi Hills, and in the valleys of the river Sutlej in Kinnaur, Himachal Pradesh state, and from Marwar and central India to Travancore in the south, as well as in the nearby island state of Sri Lanka (Singh and Shrestha 1988, 445).

The Hindi name for the nettle is bichchhoo (बिच्छू), meaning scorpion and it is often used as fencing to keep out cattle. Nilgiri nettle (*Urtica heterophylla*) is found in the Nilgiri Hill area in southern India, and it may be assumed that nettle fibre was cultivated in South India. With the nettle growing in abundance in the foothills of the Indian Himalayas, local Indian women at Almora, Uttaranchal state, have since 1987 produced knitted shawls and purses made from nettle fibre for their livelihood. Now commercialized woven and knitted nettle textiles provide development and financial independence to local inhabitants, so that they are less dependent on the more traditional and laborious work such as agriculture and livestock.

Local practice, ancient ties and tradition often share the same geophysical environment and the contemporary political borders run across areas which centuries ago had a common history, language and religion, with close affinities of lifestyle, weaving and dress, including the cultivation of nettle fibre. The Lepcha people in the Indian state of Sikkim exhibit strong affiliations with the traditions of native people in south-eastern Bhutan; the North-eastern Indian hills are ecologically similar to Bhutan, with the eastern part of Bhutan linking the Mönpa and the Mishmi people of the adjoining Arunachal Pradesh state in eastern India: all these ethnic groups are familiar with the cultivation of nettle cloth. The constant flow over centuries of people, animals and trading of goods in these border regions is visible in their common clothing. Nettle fabric is often used for a wrapped garment sometimes called a 'carrying cloth' in Bhutan, Sikkim and Nepal, and the northern areas of Arunachal Pradesh, India. The nettle cloth is woven into a square and worn over the chest, and tied around the shoulders to form a fold at the back as a kind of knapsack or pouch, and while the garment brings warmth and protection to the body, the folding/pouch is used as a bag or large pocket (Figs 27.7–27.8).

Nettle as a Future Sustainable Crop

Nettle is of interest to the sustainable green textile industry, as it is environmentally friendly with a potential to become a much needed sustainable alternative to cotton, which, with its extensive use of water and pesticides, is a threat to the environment. Nettle, on the other hand, is a perennial plant and requires low resources. It needs phosphates and nitrates, but when grown wild requires neither fertilizer nor pesticides. Furthermore, its presence decreases soil erosion. The fibre possesses strength and durability, it is hollow, thus providing accumulation of air and a natural thermal insulation, and it is resistant to water.

Fig. 27.7: Local village girls in Jumla 1979 dressed in nettle carrying cloth. (Photo: © Ellen Bangsbo).

The most groundbreaking pioneering research on using nettle for textile was conducted in Germany between 1927–1950 by G. Bredemann, who researched on interbreeding selected plants of *Urtica dioica* thereby developing a cloned cultivated high fibre nettle, and consequently increasing the crop from a mere 5% of the wild nettle to a more prosperous 15–17% of the dry stalk crop. This cloned nettle was named 'Fibre Nettle' (*Urtica dioica convar. fibra*) (Dreyer and Edom 2005, 332). This research, however, had to be abandoned in the 1950s due to poor crops, low cost-effectiveness and the competitive appearance on the world market of cotton followed by synthetic fibres. The last decade has seen a renaissance in research of the Fibre Nettle. The EU project, IENICA (Interactive European Network for Industrial Crops and their Applications), was launched in 1999 with the planting of nettle fields in Austria using four nettle clones which originated from the breeding work of G. Bredemann. Another project, named STING (Sustainable Technology in Nettle Growing) was initiated in 2004 in the UK involving local farmers in nettle cultivation. Nettle cloth is now available from a large number of private firms worldwide, where it is often mixed with other fibres, such as cotton, flax, viscose, silk and bamboo. Nettle cloth

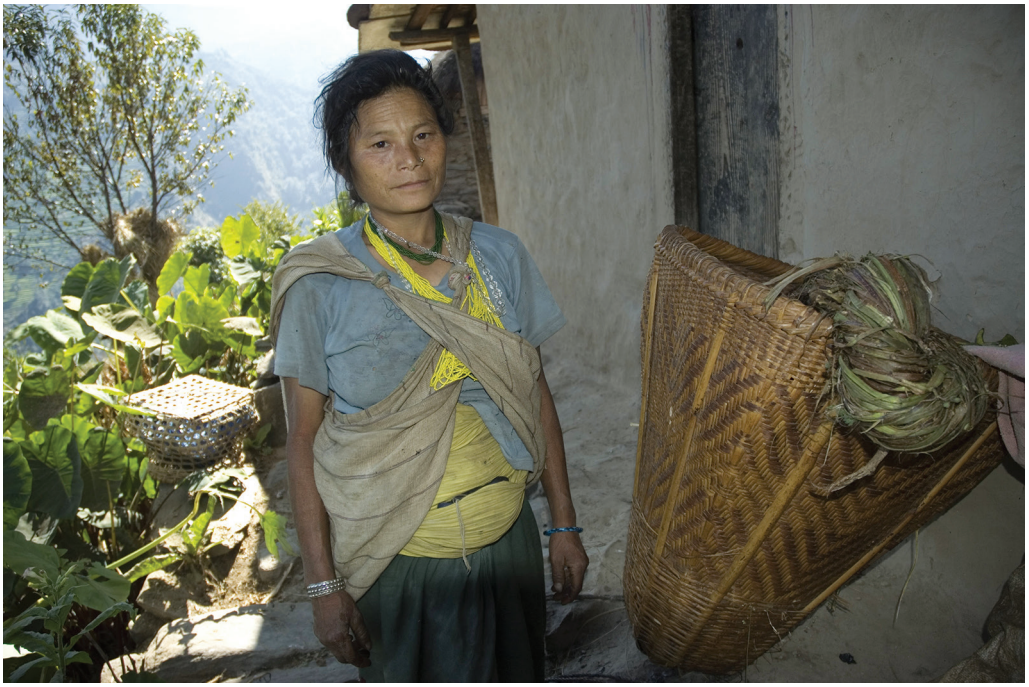

Fig. 27.8: Woman in mid-western Nepal 2010 wearing a nettle carrying cloth. Next to her, a basket with a bundle of freshly harvested raw nettle bark ribbon (Photo: © Ellen Bangsbo).

now appears in Italian fashion houses and denim products made of 10% nettle and 90% organic cotton are available today.

Cost effective processing techniques and improved spinning and weaving methods are still lacking in the smaller countries. In the short run, it might be tempting only to export fibre and raw bark ribbon rather than spun yarn and fabrics that require a more sophisticated technology. However, seen from a local perspective of the smaller Asian countries, this does not seem to be an attractive option for the future prosperity of local nettle industry.

Actual knowledge of the prospects of cultivation of nettle fibre is at present probably only familiar to a narrow circle of textile- and biochemical researchers as well as selected designers, but with an expanding use of nettle fibre in manufacturing denim trousers and various fashion designs, the potential of nettle fibre for textiles is reaching for the future.

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Further Reading

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