

# ***Ficus*(Fig) species in Nepal: a review of diversity and indigenous uses**

## **Abstract**

*Ficus* (fig) species have a wide range of distribution and uses in Nepal. Of the 36 *Ficus* species native to Nepal, 21 are indigenously used as food, fodder, fuel wood, vegetable, medicine, etc. and some are used religiously in Nepal, and 10 in the closer study area. *Ficus religiosa* (Pipal), *F. benghalensis* (Bar), *F. benjamina* (Sami), *F. racemosa* (Dumri), especially have a high religious value for both Hindus and Buddhists and are deemed sacred. The indigenous use as medicine is very important. *F. benghalensis* (Bar) was found as the medicinally most important species, used to treat 22 ailments.

Key words: *Ficus*, Nepal, traditional use, biodiversity

Ethnobotany of *Ficus* (Fig) species in Nepal

*Ficus* (Fig) species in Nepal: a review of diversity and indigenous uses

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## **Introduction**

Plants are of utmost interest to the human race and our ancestor also lived on nuts, roots, succulent stems, fruits, and other parts of plants. Today, our existence can still not be imagined without plants. The use and conservation of plants and plant products is rooted in Nepalese culture since time immemorial (Kunwar and Adhikari 2005a). There is a general tendency among villagers in Nepal to preserve useful plants on their own farms (Pokharel 1998).

Fodder plants, long an integral part of farming systems, provide a source of green fodder during the dry season when the decreased forage far exceeds the sustainable supply for livestock (Amatya 1990, Lekhak 1998). Over 300 species of fodder trees are found in Nepal and a number of these are *Ficus* species, which are being cultivated in and around farmlands. Their role in Nepal's agriculture is high, as they provide 40-50% of the animal feed (Pandey 1982, Kunwar 2002). More than 50% of the fodder trees in and around the agricultural lands and homestead of rural areas are *Ficus* species. The common *Ficus* species used for fodder are *Ficus hispida* (Kharsu), *F. semicordata* (Khaniyu), *F. neriifolia* (Dudhilo), *F. lacor* (Kavro). 36 species of *Ficus* are reported so far from Nepal but a detail investigation of their indigenous uses was never undertaken. The present study, therefore explored and collated the indigenous uses of *Ficus* species in Nepal.

## **Methods**

Both primary and secondary data were collected. Notes on indigenous uses of plants by the local population were collected from Bardia, Dolpa, Kaski and Kathmandu districts in the central and western part of Nepal. The surveyed study sites range from the tropical zone (250m) to as high as the temperate zone (2950m). Secondary data came from a large range of published and unpublished literature. Plants collected were identified at Tribhuvan University Central Herbarium (TUCH) and specimens are deposited there.

[[Results and Discussion]]

Diversity

*Ficus* species are the most interesting group of trees in Nepal, not only of their useful value but also of their growth habits and religious significance. The genus *Ficus* is an exceptionally large pantropical genus with over 700 species (Berg 1989) and belongs to the family Moraceae. It is retained as a single, large genus because it is well defined by its unique reproductive system, involving *Syconia* fig- and specialized pollinator wasps (Novotny et al 2002).

Out of 36 species of *Ficus* found in Nepal, 16 species are reported from the study area in western and central Nepal (Table 1). Their distribution is either restricted to one region or they are common throughout Nepal. 11 species were found only in the Makalu Barun region, Eastern Nepal (Chaudhary et al 2001), with their altitudinal range higher in subtropical region. *Ficus palmata* was observed to be restricted in Western Nepal. These species provide good fodder and various ecological services. They also provide nectar, refuge habitat for several bird species and a wide variety of insects, and many ecological services. *Ficus benghalensis*, *F. benjamina*, *F. religiosa*, *F. lacor*, *F. nerifolius*, *F. glaberrima* are common host plants for orchids (Subedi and Paudyal 2001). Some orchid species are restricted to the tree trunks and branches of *Ficus glaberrima*.

*Ficus religiosa* (Peepal), *F. benghalensis* (Bar), *F. benjamina* (Sami), *F. racemosa* (Dumri) etc. possess high religious value for both Hindus and Buddhists (Subedi et al 1998, Shrestha 1999) and are deemed sacred. *Ficus religiosa* is not uprooted, it grows on shrines and buildings, because it represents the Hindu god lord Vishnu, the god of sustenance. It is widely worshipped as Bodhi tree under which lord Buddha attained enlightenment (Majupuria and Joshi 1989). For antiquity and veneration the Peepal is unrivalled throughout the world. No other tree is claimed to have such long life's part of one in Ceylon, said to have been planted in the year 288 B.C., still lives and flourishes (Cowen 1970).

Table 1. Diversity of *Ficus* species in Nepal

S.No	Species	Altitude	Habit	Distribution
	<i>Ficus altissima</i> Blume		Tree	Himalaya
	<i>F. abelii</i> Miq.		Tree	C
	<i>F. arnottiana</i> (Miq.) Miq.	850-1500	Small tree	WE
	<i>F. auriculata</i> Lour.*	250-1700	Tree	WC
	<i>F. benghalensis</i> L.*	500-1200	Tree	WCE
	<i>F. benjamina</i> L.*	150-1000	Tree	WC
	<i>F. curtipes</i> Corner	450-600	Small tree	E
	<i>F. drupacea</i> Thunb.	1100	Tree	E
	<i>F. elastica</i> Roxb. ex. Hornem*		Tree	C
	<i>F. geniculata</i> Kurz	650	Tree	E
	<i>F. glaberrima</i> Blume*	600-1500	Tree	WC
	<i>F. hederacea</i> Roxb.*	500-1500	Climber	WC
	<i>F. heterophylla</i> L.f.	300	Shrub	W
	<i>F. hirta</i> Vahl	900	Small tree	C
	<i>F. hispida</i> L.*	450-1100	Small tree	WCE
	<i>F. hookeriana</i> Corner	1800	Small tree	E
	<i>F. lacor</i> Buch.-Ham.*	500	Tree	WC

	<i>F. laevis</i> Blume	300	Tree epiphyte	CE
	<i>F. microcarpa</i> L.f.	300-1100	Tree epiphyte	WC
	<i>F. nepalensis</i> Spreng.		Small tree	C
	<i>F. neriifolia</i> Sm.*	1400-2200	Tree	WC
	<i>F. nervosa</i> Heyne ex Roth	450-600	Tree	E
	<i>F. oligodon</i> Miq.*	1000-1800	Tree	WCE
	<i>F. palmata</i> Forssk*	600-2300	Small tree	W
	<i>F. pubigera</i> (Wall ex Miq.) Brandis		Small tree	C
	<i>F. pumila</i> L.*	1400	Tree	C
	<i>F. racemosa</i> L.*	300	Tree	WC
	<i>F. religiosa</i> L.*	150-1500	Tree	WCE
	<i>F. rumphii</i> Blume	200	Tree	W
	<i>F. sarmentosa</i> Buch.-Ham. ex Sm.*	1400-2500	Shrub	WCE
	<i>F. semicordata</i> Buch.-Ham. ex Sm.*	200-1700	Tree	CE
	<i>F. squamosa</i> Roxb.	500-600	Shrub	CE
	<i>F. subincisa</i> Buch.-Ham. ex Sm.	300-1800	Tree	WCE
	<i>F. subulata</i> Blume	300	Shrub	E
	<i>F. tinctoria</i> G. Forst.		Shrub	W
	<i>F. virens</i> Aiton	80-200	Tree	E

\* Species observed in study area C= Central Nepal, E = East Nepal, W = West Nepal

#### Indigenous use

21 *Ficus* species are indigenously used in Nepal for various purposes. For enumeration, taxa are arranged alphabetically. Vernacular names are given in *italics*, followed by synonyms and ethnobotanical uses.

Only 10 species (*Ficus auriculata*, *F. benghalensis*, *F. benjamina*, *F. hederacea*, *F. hispida*, *F. palmata*, *F. racemosa*, *F. religiosa*, *F. sermentosa*, and *F. semicordata*) were used in study area for various purposes. The Ethnomedicinal use of *Ficus* species in Nepal is quite noteworthy (Kunwar and Adhikari 2005b). *F. benghalensis* (Bar) was most important, used to heal 22 ailments.

#### 1. *Ficus auriculata* Lour.

Vernacular names: *Kaitak* – Chepang; *Eve's apron*, *Roxburgh fig* – English; *Paingi* – Gurung; *Tirmal*, *Timla* - Hindi; *Poyepa* – Limbu; *Anjir*, *Nimaro*, *Gopa*, *Timila*, *Bhutuk* –Nepali; *Mago* – Tamang.

Syn. *Ficus roxburghii*, *F. macrophylla*

Uses: Fodder and edible (Bajracharya et al 1978; Pandey 1982; Gajurel et al 1987; Shrestha 1988a, 1988b; Shakya 1992; Muller-Boker 1993; Chapa 1994; Rijal 1994; Chhetry 1996; Khan 1997; Thapa et al 1997; Kaundinya 1998; Lekhak 1998; Pokhrel 1998; Chaudhary et al 1999; Bhatta 1999; Parajuli 2000; Pandey 2000; Oli 2001; Panthi and Chaudhary 2002; Manandhar 2002; Manandhar and Acharya 2003; Gurung 2003; Rajbhandary and Dhakal 2003; Uprety 2005; Nepal and Sapkota 2005).

Leaves are crushed and the paste is applied on the wounds (Shrestha and Dhillion 2003). They are also used in diarrhea and dysentery (Manandhar 1991b). Leaves are used for making plates for festive banquets (Chhetry 1996).

Stem bark juice is effective for diarrhea (Bhattarai 1992a, 1993b), cuts and wounds (Manandhar 2002).

Roasted figs are taken for diarrhea and dysentery (Manandhar 2002, CECI 2004).

Root latex is used in mumps (Oli 2001), cholera, diarrhea and vomiting (Devkota and Karmacharya 2003; Pant and Panta 2004), root powder of *F. auriculata* and bark of *Oroxylum indicum* is taken in jaundice.

## 2. *Ficus benghalensis* L.

Vernacular names: *Bar* – Bhojpuri; *Bar* – Chepang; *Bar* – Danuwar; *Banyan tree* – English; *Bar* – Gurung; *Bargad*, *Watam* - Hindi; *Kungiyi* – Lepcha; *Lara* -Limbu; *Paramsing* – Magar; *Bar* – Mooshar; *Bar* – Nepali; *Bara*, *Dariyongma* – Rai; *Avaroha*, *Bahupada*, *Bhringi*, *Jatalo*, *Vat* – Sanskrit; *Banidare* –Satar; *Bargadh* – Tharu; *Ni-gro-dha* – Tibetan.

Syn. *Ficus indica*, *Urostigma benghalensis*

Uses: Fodder and edible (Manandhar 1972; HMG 1982; Tiwari 1983; Shrestha 1990; Dhakal and Aizz 1996; Chhetry 1996; Siwakoti et al 1997; Thapa et al 1997; Nepal 1999; Shakya et al 1999; Ghimire et al 2000; Parajuli 2000; Paudyal 2000; Priya 2000; Karki 2001; Bhattarai 2002; Dangol 2002; Manandhar 2002; Sah et al 2002; Shrestha and Kunwar 2003; Rajbhandary and Dhakal 2003). Fuelwood and ceremonial (Kaundinya 1998; Bhatta 1999; Shakya et al 1999; Pandey 2000; Karki 2001; Panthi and Chaudhary 2002; Sah et al 2002; Nepal and Sapkota 2005).

Stem bark is used as antihelminthic, for diarrhea, dysentery, diabetes, cuts and wounds, joint pain, cracked heel and toe (Mandar and Chaudhary 1993; Sarkar 1994; Vihari 1995; Siwakoti and Varma 1996; Karna 1997; Mishara 1998; Shakya et al 1999; Yadav 1999; Joshi and Joshi 2001; Tiwari 2001; Manandhar 2002; Panthi and Chaudhary 2003).

Stem bark of *F. benghalensis*, root of *Asparagus racemosus*, fruits of *Annona squamata*, and shoot of *Colebrookea oppositifolia* are crushed and eaten on empty stomach to cure urinary problems (Paudyal 2000).

Bark decoction is taken as antidote (Thapa 2001), and used in epistaxis (Bhattarai 1993c), and stomachache (Acharya 1996). Boiled bark is employed in cold, cough and asthma (Bhattarai 2002). Milky sap from bark is used for diarrhea, dysentery, indigestion, joint pain (Manandhar 2001; Shakya 2000), dermatitis, gum swelling, gonorrhoea (Basnet 1998) and snake bite. It is valued to take out pus of wounds (Manandhar 1986) and it is mixed with sugar to give to children suffering dysentery (Yadav 1999). The latex is also used for polishing copper, brass and bronze (Vihari 1995). Leaves latex causes allergies in children (Dangol 2002).

Aerial root juice is used for stopping menstruation and applied externally for body pain, toothache, diabetes, joint pain (Mishara 1998), body pain, rheumatism (Kharel and Siwakoti 2002). Root bark powder is mixed with *Desmostachys bipinnata* (Kush) and sugar and considered to control leucorrhoea (Paudyal 2000). Root latex treats boils and wounds (Parajuli 2001) and obstinate vomiting (Chopra et al 1956).

The decoction from aerial roots and water obtained from rice wash is used in diarrhoea (Bhattarai 1993b).

## 3. *Ficus benjamina* L.

Vernacular names: *Golden fig*, *Java fig* – English; *Pukar* – Hindi; *Sami*, *Sarane*, *Swami* – Nepali; *Banij* – Sanskrit; *Jhinpatiya* – Tharu.

Syn. *Ficus comosa*, *F. nuda*

Uses: Ceremonial and fodder (Singh 1968; Rijal 1994; Thapa et al 1997; Parajuli 2000; Pandey 2000; Bhattarai 2002; Panthi and Chaudhary 2002).

Twigs are used as insect repellent by keeping them under the beds (Bhandary and Shrestha 1986), leaf juice is used as flea and bug repellent (Shrestha 1985).

Latex is applied on boils (Manandhar 2002).

## 4. *Ficus glaberrima* Blume

Vernacular names: *Pakhuri* – Nepali.

Syn. *Ficus angustifolia*

Uses: Fodder, edible and fuelwood (Upadhyay 1992; Tiwari 1994; Kaundinya 1998; Manandhar 2002). Ceremonial (Rijal 1994; Pokhrel 1998; Pandey 2000; Panthi and Chaudhary 2002).

## 5. *Ficus hederacea* Roxb.

Vernacular names: *Dudhe lahara* – Nepali.

Syn. *Ficus fruticosa*, *F. scandens*

Uses: Fodder (Dangol and Gurung 1995; Manandhar 2002).

Inner bark is used for temporary binding (Manandhar 2002).

6. *Ficus hirta* Vahl

Vernacular names: *Khoksa* – Danuwar; *Khasreto* – Nepali; *Khahatya* – Raute.

Syn. *Ficus hirsuta*, *F. triloba*

Uses: Edible (Manandhar 2002).

Stem latex is used for wounds (Manandhar 1990a; Manandhar 2002).

Stem bark is boiled and its gel is used in fever (Manandhar 1998b).

7. *Ficus hispida* L.f.

Vernacular names: *Kautaik* – Chepang; *Kothayo* – Darai; *Hairy fig* – English; *Khasre*, *Thotne* – Gurung; *Kathumber*, *Daduri* – Hindi; *Bhutu* – Magar; *Kharsu*, *Khasreto*, *Tote*, *Koksa*, *Kothedumar* – Nepali; *Seta podo* – Satar; *Mogu* – Tamang; *Khur hur*, *Kharaha*, *Kothaiya* – Tharu.

Syn. *Ficus caudiculata*, *F. daemanum*, *F. daemonum*, *F. prominens*

Uses: Fodder and edible (Bajracharya et al 1978; HMG 1982; Shrestha 1990; Amatya 1991; Shakya 1992; Rijal 1994; Dangol and Gurung 1995; Dhakal and Aizz 1996; Siwakoti et al 1997; Amatya 1999; Nepal 1999; Karki 2001; Thapa 2001; Bhattarai 2002; Manandhar 2002; Kunwar 2002; Manandhar and Acharya 2003; Nepal and Sapkota 2005; Uprety 2005, Khatri 2005).

Leaf juice is taken for earache (Basnet 1998).

Fumes from twigs are used against earache (Dangol and Gurung 1995; Ghimire et al 2000) and liver troubles (Manandhar 2002).

Fruit, seed and bark are emetic, purgative (Kharel and Siwakoti 2002).

Root juice is used for fever (Manandhar 1993).

8. *Ficus hookeriana* Corner

Syn. *Ficus hookeri*

Uses: Fodder (Manandhar 1972b, Lekhak 1998).

9. *Ficus lacor* Buch.-Ham.

Vernacular names: *Kushi* – Danuwar; *Kabro* – Darai; *Elephant fig*, *Java fig* – English; *Khatarumba* – Limbu; *Kapara* – Magar; *Kavro*, *Gular*, *Pakadi* – Nepali; *Chaspou*, *Chokchi* – Rai; *Katho*, *Nakkali* – Tamang; *Rikhi* – Thami; *Kapro* – Tharu.

Syn. *Ficus infectoria*

Uses: Fodder; young buds (Surulo) are used in making pickles (Shrestha 1983; Shrestha 1985; Shrestha 1988b; Shrestha 1990; Amatya and Rajbhandary 1991; Upadhyay 1992; Amatya 1992; Tiwari 1994; Shakya et al 1995; Chhetry 1996; Dhakal and Aizz 1996; Thapa et al 1997; Pokhrel 1998; Nepal 1999; Thapa 2000; Pandey 2000; Paudyal 2000; Parajuli 2000; Karki 2001; Pandey 2001; Oli 2001; Dangol 2002; Manandhar 2002; Kunwar 2002; Shrestha et al 2003; Turin 2003; Khatri 2005).

Edible and ceremonial (Rijal 1994; Kaundinya 1998; Lekhak 1998).

Stem bark is used in gastric and ulcer (Bajracharya et al 1978; Bhattarai et al 2000; Pandey 2001, Rai et al 2004).

Milky latex use in typhoid and heavy fever (Paudyal 2000), dysentery (Oli 2001) and boils (Manandhar 2002).

Decoction of buds is considered for ulcer and leucorrhoea (Chopra et al 1956; HMG 1970), gargle in salivation (Malla 1994), boils (Manandhar 1985), pimples and blisters (Shakya 2000). Dried buds are used to treat harsa (Nakarmi 2001).

Seeds are tonic and used in treatment of stomach disorder (Bhatt 1977).

10. *Ficus neriifolia* Sm.

Vernacular names: *Cheksi* – Chepang; *Ghara*, *Gnta*, *Tauchhi* – Gurung; *Khepsewa* – Limbu; *Dudhilo*, *Dudhe* – Nepali; *Ngerpou*, *Didulang*, *Wakasi* – Rai; *Nunuthi* – Thami; *Mago*, *Grebanam*, *Nedhar*, *Nelam* – Tamang.

Syn. *Ficus nemoralis*, *F. gemella*, *F. trilepis*, *F. fieldingii*, *F. binata*

Uses: Fodder and fuelwood (Singh 1968; Shrestha 1985; Shrestha 1989; Upton 1990; Kapali 1992; Shakya 1992; Chhetry 1996; Nepal 1999; Thapa 2000; Niraula 2001; Manandhar 2002; Panthi and Chaudhary 2002; Gurung 2003; Turin 2003; Manandhar and Acharya 2003; Rajbhandary and Dhakal 2003).

Stem bark juice is given in conjunctivitis and boils (Manandhar 2001, 2002).

11. *Ficus oligodon* Miq.

Vernacular names: *Namsi* – Chepang; *Nimaro* – Nepali, *Waspou* – Rai; *Kholtu*, *Chanadumri* –

Tharu.

Syn. *Ficus hamiltoniana*, *F. pomifera*

Uses: Edible (Muller-Boker 1993; Rijal 1994; Shrestha et al 2003).

Fodder (Nepal 1999; Karki 2001; Chaudhary et al 2001; Shrestha and Kunwar 2003).

12. *Ficus palmata* Forssk.

Vernacular names: *Anjir* – Hindi; *Kappa* – Magar; *Bendu, Anjir, Timilo, Beru, Bedu* – Nepali.

Syn. *Ficus caricoides*, *F. virgata*

Uses: Edible (HMGN 1982; Bhatta 1999; Thapa 2001, Manandhar 2002).

Fodder and fuelwood (Panthi and Chaudhary 2002). Edible, fruit paste is used in ringworm and skin diseases (Thapa 2001).

Ripe fruits are used in dysentery and vomiting (Devkota and Karmacharya 2003; Pant and Panta 2004).

Latex is applied to extract spines deeply lodged in the flesh (Manandhar 1995, 2002).

13. *Ficus microcarpa* Linn.f.

Vernacular names: *Golden fig*-English; *Sami*-Nepali

Syn. *Ficus retusa*

Uses: Leaf extracts is used as insecticide against housefly (Franenkel 1959; Sahu 1997).

14. *Ficus racemosa* L.

Vernacular names: *Dumri* – Bankariya; *Gular* – Danuwar; *Cluster fig* – English; *Dumri, Gular* – Nepali; *Loa* –Satar; *Udumbara* – Sanskrit; *Gullar, Gullri* – Tharu.

Syn. *Ficus glomerata*, *F. goolereea*

Uses: Fodder and edible (Manandhar 1972; HMGN 1982; Dhakal and Aizz 1996; Siwakoti et al 1997; Chaudhary et al 1999; Shakya et al 1999; Pandey 2000; Parajuli 2000; Priya 2000; Pathak 2000; Pandey 2001; Thapa 2001; Dangol 2002; Sah et al 2002; Manandhar and Acharya 2003; Nepal and Sapkota 2005; Uprety 2005).

Milk juice is used to cure stomachache, medicinal, ceremonial (Ghimire et al 2000; Shrestha and Kunwar 2003), cholera, mumps (Basnet 1998; Oli 2001). It is used in boils (Dangol and Gurung 1995), diarrhea, dysentery and piles (Yadav 1999).

Root sap cures heat stroke in cattle, and chronic wounds, malaria (Thapa 2001, Dangol 2002). It is also used as adhesive (Dangol 2002).

Leaf latex and cow milk are mixed and used for measles fever (Paudyal 2000), boils and blisters (Siwakoti and Siwakoti 2000).

Leaf juice is massaged in hair to check splitting, fruit paste is applied in regulating diarrhoea and constipation (Vihari 1995). Infusion of leaves is used in menorrhoea.

Seed paste is taken in measles and smallpox (Acharya 1996; Oli 2001) and diarrhoea (Singh 1994).

Paste of stem bark is taken in burns (Paudyal 2000; Oli 2001), swelling and leucorrhoea (Paudyal 2000), dysentery, diarrhoea and used as astringent (Tiwari 2001).

The powder from stem bark is used in curing boils and secretion of milk for lactating mother (Dangol and Gurung 1995).

15. *Ficus religiosa* L.

Vernacular names: *Pipal* – Bhojpuri; *Pipal* – Chepang; *Pipar* – Danuwar; *Pipal, Bo tree, Peepal tree* – English; *Pipal* – Gurung; *Pipal, Pipali* – Hindi; *Tongiyar* – Lepcha; *Pendi, Pirimsing* – Limbu; *Pipal* –Magar; *Pipar* – Mooshar; *Pipal* – Nepali; *Ashawatha, Bodhidruma, Pippala, Suchudruma, Vrikshraj, Yajnika* –Sanskrit; *Pipal* – Tamang; *Pipra* – Tharu; *Bo-de-tsa* – Tibetan.

Uses: Edible, ceremonial and fodder (Manandhar 1972; Bajracharya et al 1978; Upadhyay 1992; Rijal 1994; Dhakal and Aizz 1996; Chhetry 1996; Thapa et al 1997; Kaundinya 1998; Bhatta 1999; Nepal 1999; Acharya 1999; Thapa 2000; Parajuli 2000; Karki 2001; Dangol 2002; Panthi and Chaudhary 2002; Sah et al 2002; Shrestha and Kunwar 2003; Rajbhandary and Dhakal 2003; Nepal and Sapkota 2005; Khatri 2005).

Fuelwood (Pandey 2000).

Leaf juice and honey is applied on asthma, cough, eye diseases, sexual disorders (Yadav 1999; Gurung 2002), diarrhoea (Bhattarai 1993b), haematuria (Jain et al 1991), earache and toothache (Manandhar 1986; Muller Boker 1999; Kharel and Siwakoti 2002), wounds (Paudyal 2000), migraine (Mandar and Chaudhary 1993), eye troubles (Tiwari 2001), gastric problems (Kattel and Kurmi 2004) and scabies. Leaf decoction is used as analgesic for toothache (Shakya 2000).

Fruits are eaten to facilitate asthma (Bhattarai 1993a) and respiratory system.

Stem bark is used in gonorrhoea (Joshi and Joshi 2000), venereal disease and laxative (Bhattarai

2002), bleeding (Shrestha 1997; Dangol 2002), cuts and wounds (Manandhar 1998a), paralysis (Devkota and Karmacharya 2003), diabetes (Thapa 2001), diarrhea (Bhattarai 1993c), bone fracture (Karki 2001) and used as antiseptic, astringent and antidote (Thapa 2001). Bark infusion is taken in scabies (Manandhar 2002). Bark juice taken with *Dolichus biflorus* (*Ghahata* in Nepali and *Karhi* in Tharu) is used to reduce fever in cattle (Chaudhary 1994). Paste of bark is taken with honey to treat cough and cold as well as accompanying mild fever (Bhattra 1993a).

Aerial root juice is used for menstrual problems (Manandhar 1998).

16. *Ficus rumphii* Blume

Vernacular names: *Wagrans* – Chepang; *Kathepipal, Paharepipal* – Nepali; *Pekle, Dango* – Tamang.

Syn. *Ficus cordifolia*,

Uses: Fodder (Manandhar 2002). Foot and mouth disease of cattle is treated by feeding *F. rumphii* (Manandhar 1992, 2002).

17. *Ficus sarmentosa* Buch.-Ham. ex Sm.

Vernacular names: *Dumri* – Darai; *Aagjara* – Magar; *Berulo, Gai berulo, Bantimila* – Nepali; *Mogu* – Tamang.

Syn. *Ficus foveolata, F. luducca*

Uses: Edible (Manandhar 1980, 1991a, 2002; Shrestha 1988a, b; Dangol and Gurung 2000).

Bark powder is taken to cure boils and secrete more milk during delivery.

Root extract is used in malaria (Dangol and Gurung 2000).

18. *Ficus semicordata* Buch.-Ham. ex Sm.

Vernacular names: *Kokshi* – Chepang; *Khurhur* – Danuwar; *Nepal fodder fig, Red earth fig, Wedgeleaf fig* – English; *Khajare* – Gurung; *Kokse, Yangkhoppa* – Limbu; *Aarkhot* – Magar; *Khaniyu* – Nepali; *Khuksi, Khokpou* – Rai; *Kho* – Raute; *Hor podo* – Satar; *Koshing* – Tamang; *Khurburia, Khurkhuri* – Tharu.

Syn. *Ficus cunia, F. conglomerata*

Uses: Fodder and edible (Singh 1968; Bajracharya et al 1978; Maskey and Shah 1982; Shrestha 1985; Shrestha 1990; Karki 1994; Khan 1997; Siwakoti et al 1997; Thapa et al 1997; Bhatta 1999; Nepal 1999; Pandey 2001; Karki 2001; Oli 2001; Kunwar 2002; Bhattarai 2002; Rajbhandary and Dhakal 2003; Shrestha and Kunwar 2003; Manandhar and Acharya 2003; Nepal and Sapkota 2005; Upreti 2005).

The use of latex to cure boils is so ancient that it is also reported from the Holy Bible. A bath made from the fruit and bark is a cure for leprosy. Latex is drunk to cure fever (Rijal 1994; Karki 2001; Panthi and Chaudhary 2002).

Raw fruits are eaten in diarrhea (Bhattarai 2002). Young fruit juice is applied in forehead to relieve headache (Manandhar 1998b).

Young twigs are fed to cattle for facilitating the discharge of placenta (Dangol and Gurung 1995).

Fume of twigs is used in earache (Muller-Boker 1993).

Bark of *Ficus semicordata, Schima wallichii, Syzygium cimuni, Phyllanthus emblica* and *Mangifera indica* are pounded and given in ulcer and gastric problems (Manandhar 1993). Root is taken to cure headache (Manandhar 2002).

19. *Ficus subincisa* Buch.-Ham. ex Sm.

Vernacular names: *Cheksi* – Chepang; *Kane chhi* – Gurung; *Belda* – Lohar; *Birula, Lekho* – Magar; *Bedulo, Bello, Aankhpakuwa* – Nepali; *Lomago, Soror* – Tamang.

Syn. *Ficus chincha, Ficus clavata, F. caudata, F. trachycarpa*

Uses: Long term feeding results eye infection. Seed is antihelminthic (Devkota and Karmacharya 2003; Pant and Panta 2004).

Leafy biomass 60-80 Kg/Yr, Crude protein 18 % (Amatya et al 1994), 15.2% (Malla 2004).

*Fodder, Fuelwood* (Pandey 1982, Shrestha 1985, Shrestha 1988a, Shrestha 1988b, Rijal 1994, Amatya et al 1994, Pokhrel 1998, Pandey 2000, Manandhar 2002; Panthi and Chaudhary 2002, Manandhar and Acharya 2003).

20. *Ficus virens* Aiton

Vernacular names: *White fig, sour fig, grey fig* – English; *Pilkhan* – Hindi; *Pakar* – Nepali; *Pakhar* – Satar.

Syn. *Ficus infectoria*

Uses: Foliage buds are eaten as vegetable and pickle (Siwakoti et al 1997).

21. *Ficus spec. indet.*

Vernacular names: *Dhungre, Ghansbar* – Nepali; *Paphu* – Rai.

Uses: Plant is used as fodder (Pandey 1982).

Leaves are used for making plates use in ceremony (Nepal 1999).

Plant is food for butterfly larvae (*Cyrestis thyodamus* (Common map), *Euploea core* (Common Indian crow)) (Khanal and Bhandary 1982).

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## References

- Acharya, P. 1999. *Study on ethnobiology of the Sarkis (A case study of Chapakot, Syangja district), Nepal*. Central Department of Zoology, Tribhuvan University, Kathmandu, Nepal. 95p.
- Acharya, S.K. 1996. Folk uses of some medicinal plants of Pawannagar, Dang. *Journal of Natural History Museum* 15:25-36.
- Amatya, N. & S.B. Rajbhandary. 1991. In vitro propagation of *Ficus lacor*. *Banko Janakari* 3(1):17-20.
- Amatya, S.M. 1991. *Indigenous fodder trees: their management and utilization in Terai belt of Nepal*. Central Department of Economics, Tribhuvan University, Kathmandu, Nepal. 236p.
- Amatya, S.M. 1992. Foliage biomass yield from three species of fodder tree in Nepal. *Banko Janakari* 3(3):19-20.
- Amatya, S.M. 1999. Cultivation potential of edible wild fruit trees in Nepal: an overview. In: *Wild relatives of cultivated plants in Nepal. Proceeding of National Conference on Wild Relatives of Cultivated Plants in Nepal*. Edited by R. Shrestha & B. Shresth. Kathmandu, Nepal. p.137-140.
- Bajracharya, D., S.J.B. Rana & A.K. Shrestha. 1978. A general survey and biochemical analysis of fodder plants found in Nagarjun hill forest of Kathmandu valley, *Journal of Natural History Museum* 2:105-116.
- Basnet, B.K. 1998. *Medicinal plants in Sindhuli district: utilization, trade and management practice*. Central Department of Social Science, Tribhuvan University, Kathmandu, Nepal. 24p.
- Berg, C.C. 1989. Classification and distribution of *Ficus*. *Experimentia*,45: 605-611.
- Bhandary, H.R. & P. Shrestha. 1986. Ethnobotanical investigation on the poisonous plants of Manag-Mustang and adjoining areas. *Journal of Natural History Museum* 10:133-146.
- Bhatt, D.D. 1977. *Natural history and economic botany of Nepal*. Orient Longman Limited. 238p.
- Bhatta, L.R. 1999. Ethnobotanical study in a village at Rukum district, Nepal. *Banko Janakari* 9(2):40-43.
- Bhattarai, G.P. 2002. Diversity and indigenous uses of flowering plant resources in the Churiya forests of Parsa Wildlife Reserve and adjoining areas. Central Department of Botany, Tribhuvan University. 110p.
- Bhattarai, N.K. 1992a. Folk herbal remedies of Sindhupalchok. *Fitoterapia* 63(2):145-155.
- Bhattarai, N.K. 1993a. Folk medicinal use of plants for respiratory complaints in central Nepal. *Fitoterapia* 64(2):163-171.
- Bhattarai, N.K. 1993b. Folk herbal remedies for diarrhoea and dysentery in central Nepal, *Fitoterapia* 64(3):243-250.
- Bhattarai, N.K. 1993c. Medicinal ethnobotany in the Rapti zone Nepal. *Fitoterapia* 64(6):483-493.
- Bhattarai, S., M.N. Subedi & P.P. Kurmi. 2000. Medicinal plant diversity in Tistung and Daman Botanical Garden and surrounding area. In *Proceeding of Nepal Japan Joint Symposium on Conservation and Utilization of Himalayan Medicinal Resources - 2000*. Edited by T. Watanabe, A. Takano, M.S. Bista & H.K. Sainju. Kathmandu, Nepal. p.189-191.
- CECI. 2004. *Inventory of MAPs/NTFPs and management methods. Conservation of MAPs for sustainable livelihoods in Baitadi district, Nepal*. CMAPSL, CECi, Kathmandu, Nepal. 32p.
- Chapa, D.R. 1994. Fodder and desired characteristics prioritization exercise in Kapurkot, Salyan, Nepal. *Banko Janakari* 4(2):143-150.
- Chaudhary, R.P. 1994. Plants used in the treatment of domestic cattle in Narayani zone (central Nepal). In *Proceeding of III National Conference on Science and Technology*, Royal Nepal



- Academy of Science and Technology, Kathmandu, Nepal. p835-847.
- Chaudhary, R.P., R. Shakya and B.K. Shrestha. 1999. Nutritive values of some edible wild tropical fruits of Nepal. *Scientific World* 1(1):25-29.
- Chaudhary, R.P., R.M. Joshi, P. Budha and R.M. Kunwar. 2001. Makalu Barun Landscape Project (Biodiversity component). *Nepal Biodiversity Landscape Project*, Kathmandu, Nepal. 87p.
- Chhetry, M.K. 1996. *Ethnobotany of the Limbus: A case study from Panchathar district*, Central Department of Social Science, Tribhuvan University. 122p.
- Chopra, R.N., S.L. Nayar & I.C. Chopra. 1956. *Glossary of Indian medicinal plants*. Council of Scientific and Industrial Research, New Delhi.
- Dangol, D.R. & S.B. Gurung. 1995. Ethnobotanical studies of Darai tribe in Chitwan district Nepal. Research report NEMP/IUCN and NAHSON. p.14-52.
- Dangol, D.R. & S.B. Gurung. 2000. Ethnobotanical study of Darai tribe in Chitwan district, Nepal. In: *Proceeding of III National Conference on Science and Technology*, Royal Nepal Academy of Science and Technology, Kathmandu, Nepal. p.1194-1213.
- Dangol, N 2002. *Documentation of the ethnobotanical knowledge of the Kumal community of Chitwan district, Central Nepal*. Central Department of Botany, Tribhuvan University. 99p.
- Devkota, R. & S.B. Karmacharya. 2003. Documentation of indigenous knowledge of Medicinal plants in Gwalek, Baitadi, Nepal. *Botanica Orientalis* 3:135-143.
- Dhakal, M.R. & A. Aizz. 1996. General survey of fodder trees and shrubs of Biratnagar and surrounding locality. *Banko Janakari* 6:11-12.
- Gajurel, K.P., N.P. Suvedi & G. Upreti. 1987. Livestock farming and fodder trees in Lamjung district, Nepal. *Banko Janakari* 1(1):21-26.
- Ghimire, S.K., A.K. Shrestha, K.K. Shrestha & P.K. Jha. 2000. Plant resource use and human impact around RBNP, Nepal. *Journal of Natural History Museum* 19:3-26.
- Gurung, A. 2002. *A study on medicinal plant and their traditional uses in Chitre Parbat and Bhadaure/Tamagi Kaski, West Nepal*. Central Department of Botany, Tribhuvan University. 80p.
- Gurung, K. 2003. Indigenous knowledge on the plant resources used by the people of Tinjure area, Tehrathum, Nepal. *Botanica Orientalis* 3:118-125.
- HMG. 1970. *Medicinal Plants of Nepal*. Bulletin of the department of medicinal plants No. 3. MoFSC, Kathmandu, Nepal. 153p.
- HMG. 1982. *Wild Edible Plants of Nepal*. Bulletin of the department of medicinal plants No. 9. MoFSC, Kathmandu, Nepal. 285p.
- Jain, S.K, B.K. Sinha & R.C. Gupta. 1991. *Notable Plants in Ethnomedicine of India*, National Botanical Research Institute, Lucknow, Deep publication, New Delhi, India.
- Joshi, A.R. & K. Joshi. 2000. Indigenous knowledge and uses of medicinal plants by local communities of the Kali-Gandaki Watershed Area, Nepal. *Journal of Ethnopharmacology* 73:175-183.
- Joshi, K.K. & S.D. Joshi. 2001. *Genetic heritage of medicinal and aromatic plants of Nepal Himalaya*. Buddha academic publishers and distributors, Kathmandu, Nepal. 239p.
- Kapali, S.K. 1992. Statistical analysis of most used fodder tree species. *Banko Janakari* 3(3):13-16.
- Karki, L. 2001. *Documentation of indigenous knowledge on the utilization of plant resource by the Chepang community in Dhading district, Nepal*. Central Department of Botany, Tribhuvan University. 106p.
- Karki, M.B. 1994. Application of growth and yield modeling for improving fodder tree management in Central and Western Nepal. *Banko Janakari* 4(2):157-166.
- Karna, K. 1997. *Medicinal plants and traditional medicinal practices in Chapagaun village, Lalitpur Nepal*. Central Department of Botany, Tribhuvan University. 82p.
- Kattel, L.P. & P.P. Kurmi. 2004. *A study on plant used by traditional herbal healers in mid-west and east Nepal*. Plant Resources, Kathmandu, Nepal. 16-21.
- Kaundinya, D.P. 1998. *Study on ethnobotany of the Kumals: a case study of Chirtundhara village of Palpa, Nepal*. Central Department Zoology, Tribhuvan University. 83p.
- Khan, M.H. 1997. Documentation of indigenous knowledge in Chepang community of Shaktikhor VDC, Chitwan, Nepal. In *Proc. of the National Workshop in Nepal: Ethnobotany for conservation and community development*. Edited by K.K. Shrestha, P.K. Jha, P. Shengji, A. Rastogi, S. Rajbhandary & M. Joshi. Ethnobotanical Society of Nepal, Kathmandu, Nepal
- Khanal, B. & H.R. Bhandary. 1982. Food plants of some butterfly larvae. *Journal of Natural History Museum* 6:57-69.

- Kharel, T.R. & M. Siwakoti. 2002. Angiospermic plants in Chakchaki village of Jhapa district, east Nepal. *Journal of Natural History Museum* 21:187-198.
- Khatri, S. 2005. *Ethnobotanical study of Udayapur district*. Central Department of Botany, Tribhuvan University, Nepal. 88p.
- Kunwar, R.M. 2002. *Participation and benefits to rural people in community forestry: a case from Makwanpur district, Central Nepal*. Indian Institute of Forest Management, Bhopal, India. 93p.
- Kunwar, R.M. & N. Adhikari. 2005a. Ethnomedicine of Dolpa district, Nepal: the plants, their vernacular names and uses. *Lyonia* 8(1):41-47.
- Kunwar, R.M. & N. Adhikari. 2005b. Ethnobotany of *Ficus* (Fig) species in Nepal. *XVII international botanical congress abstracts*. Vienna, Austria 633p.
- Lekhak, H.D. 1998. *Fodder trees of Nuwakot district, Nepal*. Research division, Rector's Office, Tribhuvan University, Kathmandu, Nepal (A report). 25p.
- Malla, S.B. 1994. *Medicinal herbs in the Bagmati zone*, ADPI- Paper series 8, Kathmandu, ICIMOD. 85p.
- Manandhar, N.P. 1990a. Traditional phytotherapy of Danuwar tribe of Kamlakhong in Sindhuli district, Nepal. *Fitoterapia* 61(4):325-332.
- Manandhar, N.P. 1972. Fodder trees. *The Rising Nepal* 7(330):1-2.
- Manandhar, N.P. 1980. *Medicinal plants of Nepal Himalaya*. Ratna Pustak Bhandar, Bhotaghiti, Kathmandu, Nepal. 85p.
- Manandhar, N.P. 1985. Ethnobotanical notes on certain medicinal plants used by Tharus of Dang Deokhuri district, Nepal. *International Journal of Crude Drug Research* 23(4):153-159.
- Manandhar, N.P. 1986. A contribution to the ethnobotany of Mushar tribe of Dhanusa district, Nepal. *Journal of Natural History Museum* 10:53-64.
- Manandhar, N.P. 1990b. Folklore medicine of Chitwan district Nepal. *Ethnobotany* 2:31-38.
- Manandhar, N.P. 1991a. Some additional note on wild food plants of Nepal. *Journal of Natural History Museum* 12:19-32.
- Manandhar, N.P. 1991b. Medicinal plant-lore of Tamang tribe of Kavrepalanchok district, Nepal. *Economic Botany* 45:58-71.
- Manandhar, N.P. 1992. Folklore medicine of Dhading district, Nepal. *Fitoterapia*, 63(2):163-177.
- Manandhar, N.P. 1993. Ethnobotanical note on folk lore remedies of Baglung district Nepal. *Contribution to the Nepalese Studies* 20(2):183-196.
- Manandhar, N.P. 1995. A survey of medicinal plants of Jajarkot district, Nepal. *Journal of Ethnopharmacology* 48:1-6.
- Manandhar, N.P. 1998a. Ethnobotanical census on herbal remedies of Banke district, Nepal. *Contribution to the Nepalese Studies* 25(1):57-63.
- Manandhar, N.P. 1998b. Native phytotherapy among the Raute tribe of Dadeldhura district, Nepal. *Journal of Ethnopharmacology* 60:199-206.
- Manandhar, N.P. 2001. Herbal veterinary practices in Nepal. *Nepal Journal of Sciences and Technology* 3:65-68.
- Manandhar, N.P. 2002. *Plants and People of Nepal*. Timbre Press, Oregon, USA. 599p.
- Manandhar, N.P. & S.K. Acharya 2003. The application of indigenous knowledge of fodder trees in Kalikasthan, Rasuwa district, Nepal. In: *Applied ethnobotany: case studies from the Himalayan region*. Edited by A. Aumeeruddy-Thomas & P. Shengi. People and Plants working paper, WWF, UK. p.17-18.
- Mandar, L.N. & R.P. Chaudhary. 1993. Medicinal plants and their traditional uses by tribal people of Saptari district, Nepal. In *Proceeding of Ist National Botanical Conference*, Kathmandu, National Botanical Society. p.33-41.
- Maskey, K. & B.B. Shah. 1982. Sugar in some Nepalese edible wild fruits. *Journal of Nepal Chemical Society* 2:23-30.
- Mishara, G. 1998. *A study of traditional medicinal plant and its awareness among people of Dhading district, Nepal*. Central Department of Social Science, Tribhuvan University. 50p.
- Mueller-Boker, U. 1993. Ethnobotanical studies among the Chitwan Tharus. *Journal of Nepal Research Centre*, 9:17-56
- Mueller-Boker, U. 1999. *The Chitawan Tharus in Southern Nepal. An Ethnoecological approach*. Franz Steiner Verlag Stuttgart. Nepal Research Centre No. 21, Kathmandu, Nepal. 224p.
- Nakarmi, M. 2001. *Medicinal plant used by Lama community of Ichhangu village in Kathmandu, Central Nepal*. Central Department of Botany, Tribhuvan University, Nepal. 72p.
- Nepal, B.K. & P.P. Sapkota. 2005. Resource analysis and indigenous knowledge on plants use: a

- case study of Humla district, Nepal. *Nepal Journal of Plant Sciences* 1:57-63.
- Nepal, M. 1999. *Ethnobotany of the Rai and Sherpa community in the Makalu Barun Conservation Area, East Nepal*. Central Department of Botany, Tribhuvan University, Kathmandu, Nepal. 150p.
- Niraula, K. 2001. *Vegetation analysis and ethnobotany of the medicinal plants in and around Tinjure hill (Terhathum and Sankhuwasabha districts, East Nepal)*. Central Department of Botany, Tribhuvan University, Kathmandu, Nepal. 103p.
- Novotny, V., Y. Basset, S.E. Miller, P. Drozd, & L. Cizek. 2002. Host specialization of leaf chewing insects in New Guinea rainforest. *Journal of Animal Ecology* 71:400-412.
- Oli, B.R. 2001. *Local knowledge on plant utilization among the major ethnic communities in the eastern Churiya Nepal*. Central Department of Botany, Tribhuvan University, Kathmandu, Nepal. 137p.
- Pandey, B. 2001. *Environmental impacts of Kaligandaki A hydroelectric project on vegetation resource in the dam and reservoir area*. Central Department of Botany, Tribhuvan University, Kathmandu, Nepal. 85p.
- Pandey, K.K. 1982. *Fodder trees and tree fodders in Nepal*. Swiss Federal Institute of Forestry Research, SDC (A report). 107p.
- Pandey, S. 2000. *Ethnobotany of Magars: a case study from Palpa district*. Central Department of Social Science, Tribhuvan University, Kathmandu, Nepal. 65p.
- Pant, S.R. & I.R. Pant. 2004. Indigenous knowledge on medicinal plants in Bhagawati village, Darchula, Nepal. *Botanica Orientalis* 4:79-83.
- Panthi, M.P. & R.P. Chaudhary. 2002. Angiosperm flora of Arghakhanchi district and adjoining areas, West Nepal. *Journal Natural History Museum* 21(1-4):7-32.
- Panthi, M.P. & R.P. Chaudhary. 2003. Ethnomedicinal plant resources of Arghakhanchi district, Nepal. *Ethnobotany* 15:71-86.
- Parajuli, S. 2001. *Medicinal plants used in cuts and wounds in Kaski district West Nepal and their antibacterial activities*. Central Department of Botany, Tribhuvan University, Kathmandu, Nepal.
- Parajuli, S.P. 2000. Ethnobotanical study at Khandbari municipality of Sankhuwasabha district, Nepal. *Banko Janakari* 10(2):29-34.
- Pathak, K.R. 2000. *Study of ethnobotany of the Danuwar: a case study of Piple, Chitwan, Nepal*. Central Department of Zoology, Tribhuvan University, Kathmandu, Nepal. 84p.
- Paudyal, S. 2000. *Ethnobotanical study of the Tharus living in central part of Dang, mid west Nepal*. Central Department of Botany, Tribhuvan University, Kathmandu, Nepal. 154p.
- Pokhrel, R.K. 1998. Indigenous technical knowledge of people on fodder tree management. *Banko Janakar*, 8(2):10-13.
- Priya, R. 2000. A contribution to some wild edible plants of Indo Nepalese border area. In *Ethnobotanical and medicinal plants of Indian subcontinent*. Edited by J.K. Maheswori. Scientific publishers, Jodhpur.
- Quattrocchi, U. 2000. *CRC World dictionary of plant names*. CRC Press New York, Vol II: p.1005-1009.
- Rai, S.K., S. Subedi & S. Mishra. 2004. Utilization pattern of medicinal plants in Thumpakhar, Sindhupalchok, Nepal. *Botanica Orientalis* 4:75-78.
- Rajbhandary, S. & D. Dhakal. 2003. Indigenous knowledge on fodder plants of Sudel village, Bhaktapur, Nepal. *NUTA Journal* 2(2).
- Rijal, A. 1994. *Ethnobotany of Padampur: an analysis of dependency and conflict*. PhD Thesis, Agricultural University Norway, Norway.
- Sah, J.P., R.L. Singh & N. Bhatta. 2002. Floristic diversity and use of plants in Ghodaghodi lake, Nepal. *Journal of Natural History Museum* 21:243-266.
- Sarkar, K. 1994. *Indigenous medicinal plants and traditional medicinal practices in Panchthar district, Nepal*. Central Department of Botany, Tribhuvan University, Kathmandu, Nepal.
- Shakya, L.R. 1992. *Fodder trees*. Hill forest development project, HMG, ADB, FINNIDA. (A report). 16p.
- Shakya, M.R., D.M. Bajracharya, G.P. Joshi & J. Shakya. 1999. Ethnobotany and plant diversity of the Royal Shukla Phanta Wildlife Reserve. In *Proceeding of III National Conference on Science and Technology*, Royal Nepal Academy of Science and Technology. p.288-296.
- Shakya, P.R. 2000. Intellectual heritage on folk medicine in Nepal. In *Proceeding of Nepal Japan Joint Symposium on Conservation and Utilization of Himalayan Medicinal Resources – 2000*. Edited by T. Watanabe, A. Takano, M.S. Bista & H.K. Sainju. Kathmandu, Nepal. p.43-49.

- Shakya, S.M., D.R. Dangol & A. Srivastav. 1995. *Exploration of wild or under exploited plant species used as vegetable in some villages of Chitwan district, Nepal*. Research Report NEMP/IUCN and NAHSON. p.93-115.
- Shrestha, A.K. 1997. *Documentation of indigenous knowledge on the utilization of plant resources by the Tharu communities around Royal Bardia National Park, West Nepal*. Central Department of Botany, Tribhuvan University, Kathmandu, Nepal.
- Shrestha, K. 1983. Wild leafy and fruity vegetables consumed by the local inhabitants of Dharan. *Journal of Natural History Museum* 7:35-42.
- Shrestha, K. 1990. Report on edible wild plants from Pokhara and its northern region. *Journal of Natural History Museum* 11:85-98.
- Shrestha, K. & R.M. Kunwar. 2003. Plants. In *Babai river valley: fish and biodiversity survey, Riyal Bardia National Park, Nepal*. ZSL conservation report no. 3. Edited by S. Oliver. London: The Zoological Society of London. 119p.
- Shrestha, K.K., N.N. Tiwari, S. Rajbhandary, S. Shrestha, Y. Uprety & R.C. Poudel. 2003. *NTFPs in the critical bottlenecks and corridors of Terai Arc Landscape Nepal: documentation, utilization, trade and people's livelihood*. (A report) WWF Nepal program and Ethnobotanical Society of Nepal, Kathmandu. 125p.
- Shrestha, P. 1985. Research note: contribution to the ethnobotany of Palpa area. *Contribution to the Nepalese Studies* 12(2):63-74.
- Shrestha P 1988a. Ethnobotanical observation on the Tamang of Kathmandu valley, In *Proceeding of National Conference of Science and Technology*, Royal Nepal Academy of Science and Technology, Kathmandu, Nepal.
- Shrestha, P. 1988b. Contribution the ethnobotany of the Tamang of Kathmandu valley. *Contribution to the Nepalese Studies* 15(2):247-266.
- Shrestha, P. 1989. Ethnobotanical observation of Helambu and adjoining area. *Banko Janakari* 2(2):121-126.
- Shrestha, P.M. & S.S. Dhillion. 2003. Medicinal plant diversity and use in the highlands of Dolakha district, Nepal. *Journal of Ethnopharmacology* 86:81-96.
- Shrestha, T.B. 1999. *Nepal country report on biological diversity*. Kathmandu: IUCN Nepal. ix, 133p.
- Singh, K.K. 1994. Ethnobotanical heritage of the Tharu tribe, UP India. *Applied Botany Abstract* 14(2):13-19.
- Singhm, S.C. 1968. Some wild plants of food value in Nepal. *Tribhuvan University Journal* 4(1):50-56.
- Siwakoti, M. & S. Siwakoti. 2000. Ethnobotanical uses of plants among the Satar tribes of Nepal. In *Ethnobotany and medicinal plants of Indian subcontinent*, edited by J.K. Maheswori. Scientific publishers, Jodhpur, India. p.79-108.
- Siwakoti, M. & S.K. Varma. 1996. Medicinal pants of the Terai of eastern Nepal. *J. Econ. Taxon Bot. Additional series*. 12:423-438. Scientific publishers, Jodhpur, India.
- Siwakoti, M., S. Siwakoti & S.K. Varma. 1997. Ethnobotanical notes on wild edible plants used by Satar tribes of Nepal. *Tribhuvan University Journal* 20:57-64.
- Singha Durbar Vaidya.Khana Vikas Samiti. 2001. *Ayurvedic pharmacology*(Bheshaja – Guna - Vijnana). Singha Durbar VaidyaKhana Vikas Samiti, Kathmandu, Nepal. 154p.
- Subedi, B.P., L.D. Chintamani & D.A. Messeschmidt. 1998. *Tree and Land Tenure in the Eastern Terai, Nepal: A case study from the Siraha and Saptari districts, Nepal*. Community Forestry Case Study Series 9. FAO, Rome, Italy. 120p.
- Thapa, B., D.H. Walker and & F.L. Sinclair. 1997. Indigenous knowledge of the feeding value of tree fodder. *Animal Feed Science Technology* 67:97-114.
- Thapa, R.H. 2000. *Ethnobotanical study of Danuwar tribe in Lalitpur district, Nepal*. Central Department of Botany, Tribhuvan University, Kathmandu, Nepal. 70p.
- Thapa, S. 2001. *Documentation of traditional uses of plants by Tharu community around Royal Sukla-Phanta Wildlife Reserve, Far west Nepal*. Central Department of Botany, Tribhuvan University, Kathmandu, Nepal. 61p.
- Tiwari, B.N. 1994. Indigenous techniques for propagation of fodder trees in the western hills of Nepal. *Banko Janakari* 4(2):181-183.
- Tiwari, R.D. 1983. *Reports on fodder plants of Parsa district*. Biology instruction committee, Thakur Ram Campus, Birgunj, Nepal. 32p.
- Tiwari, R.D. 2001. Ethno-medicinal plants of Parsa district Nepal. In *Environment and Agriculture:*

- Biodiversity, agriculture and pollution in South Asia*. Edited by P.K. Jha, S.R. Baral, S.B. Karmacharya, H.D. Lekhak, P. Lacoul & C.B. Baniya. Ecological Society of Nepal. p.238-244.
- Turin, M. 2003. Ethnobotanical notes on Thangmi plant names and their medicinal and ritual uses. *Contribution to the Nepalese Studies* 30(1):19-52.
- Upadhyay, L.R. 1992. Use of fodder in Jhapa and Sunsari district in the Eastern Terai. *Banko Janakari* 3(3):17-18.
- Uprety, Y. 2005. *Ethnobotanical study on Bankariya ethnic group in Makawanpur district*. Central Nepal. University Grant Commission, Kathmandu, Nepal (A report). 46p.
- Upton, P. 1990. Fodder trees, attitudes and preferences of the farmers of south of Lalitpur district, Nepal. *Banko Janakari* 2(3):243-60.
- Vihari, V. 1995. Ethnobotany of cosmetics of Indo-Nepal border. *Ethnobotany* 7(1/2):89-94.
- Yadav RKP 1999. Medicinal plants and traditional medicinal practice in the Eastern part of Parsa district, Nepal. In *Proceeding of III National Conference of Science and Technology*, Royal Nepal Academy of Science and Technology, Kathmandu. p.1421-1426.