www.gbtrp.com
IJBT Special Issue Vol. No. 2: 1-7.
ISSN: 0976 - 4313

Original Article

International Journal of Biological Technology

Diversity of Leafy Vegetables in Nilgiris, Nilgiri Biosphere Reserve, Southern India

Sasi, R., Rajendran, A. and R. Sivalingam*

Department of Botany, School of Life Sciences, Bharathiar University, Coimbatore- 641 046, Tamil Nadu, South India.

Received: 28.08.2011; Revision: 13.10.2011; Accepted: 15.10.2011; Published: 15.12.2011

Abstract

The present study provides an overview of the use and status of 34- Leafy vegetables in Nilgiri, Nilgiri Biosphere Reserve. Consumption of traditional greens is a major source of vitamins and micronutrients. They are reported to be rich in protein, essential minerals and vitamins. The lack of knowledge especially on the nutritive value of these greens among the public is the main drawback in their production and consumption.

Key words: Traditional uses, Greens, Medicines, Nilgiri Biosphere Reserve.

Introduction

India has a tribal population of 42-million, of which some 60- percent live in forest areas and depend for various edible products (Jain and Chauhan, 1998). Studies of traditional uses of wild plants and their products throughout the world have increased over recent years (Lev and Amar, 2000; Ghorbani, 2005; Teklehaymanot *et al*., 2007). They are major sources of food for tribal inhabitants of forests as well as aged poor villagers. About 1000 species of these plants provide sustenance to tribal inhabitants in India. India is endowed with an array of leafy vegetables suited tropical, subtropical and temperate climates to be grown the entire round (Mini and Krishnakumary, 2004). About 30, 000 edible plants are found throughout the world, of which 7,000 are grown or collected as food (Natarajan, 2002). Leafy greens form the second important category of vegetables next to starchy vegetables and they are typically low in calories. Majority of the Indian population is vegetarian and a daily intake of atleast 100g of fresh leafy vegetable is recommended by the nutrition experts (Reddy, 1999).

**Corresponding Author*: drsivar@gmail.com

Leafy vegetables hold an important place in well balanced diets. The idea itself of a well-balanced diet changed in recent years and more vegetable and fruits are advised (Ames and Gold, 1996; Bazzano, 2002; Gillman, 1995). Leafy vegetables have no poisonous alkaloids and do not cause any gastrological disturbance when they are consumed as food. They are plant species of which the leafy parts, which may include young, succulent stems, flowers and very young fruit, are used as vegetable.

The nutritional value of traditional leafy vegetables is higher (Sundriyal and Sundriyal, 2001; Nordeide *et al*. 1996; Orech *et al*. 2007) than several common vegetables. Leafy greens also contain antioxidants which offer protection against many chronic diseases like heart disease and certain type of cancers (Saxena, 1999). All over the world there has been a general observation that the indigenous knowledge on resource use has degraded severely due to changing perception of the forest dwellers, commercialization and socio-economic transformation (Gadgil *et al.*, 1993; Silori and Rana, 2000).

One of the most critical issues on the national and global agenda is the need to preserve biodiversity for future generations while trying to understand and document the indigenous knowledge of resource management

www.gbtrp.com
IJBT Special Issue Vol. No. 2: 1-7.
ISSN: 0976 - 4313

International Journal of Biological Technology

practices (Farooque *et al*., 2004). The percentage of threatened species in the fragile mountainous region has been observed comparatively much higher in Nilgiris because of the dependence of the local people on biological resources for their livelihoods.

Study area

The Nilgiri, often referred to as the Nilgiri Hills, one of the most spectacular natural mountain range, in the Western most part of Tamil Nadu at the junction of Karnataka and Kerala states of Southern India. The Nilgiris is a component of the Western Ghats mountain range in India, which is recognized as one of the hotspots of biological diversity in the world (Myers *et al*, 2000). The Nilgiris is situated at an elevation of 900- 2636 metres above MSL. Its latitudinal and longitudinal dimensions being 130 KM (Latitude: 10 – 38 WP 11- 49 N) by region generally receives 2000- 7000mm of rainfall and is rich in natural resources.

Fig.1: Study area map of Nilgiri Biosphere

People

Apart from the biological richness of the Nilgiri Biosphere another most important character of the Nilgiris area is its cultural polyvalence. These ethnic groups "form an inseparable component of the ecosystem. The Nilgiri is the home of six tribal groups with high anthropological importance. They are *Todas*, *Kotas*, *Krumbas*, *Paniyas*, *Irulas* and *Kattunayakas*. *Todas* or Tudas are dairy men usually living in higher altitudes. *Kotas* or kotagiri are musicians and excellent craftsmen. *Kurumbas* are considered to be experts in magico- religious and they practice hunting-food gathering. *Paniyas* are dark skinned people, work as labourers. *Irulas* or darkness, the main occupation is hunting snakes and rats. *Kattunayakas* or forest dwellers, hunting and gathering honey.

Fig.2 Local medical practitioner of Nilgiris

Methodology

Wild vegetable survey of the study area was conducted during 2010- 2011. Identification of the collected specimens was made with the help of *Flora of The Presidency of Madras* (Gamble, 1915- 1935), Flora of British India (Hooker, 1875 – 2006) and *Flora of Tamil Nadu* (Nair and Henry, 1983; Henry *et al*., 1987 and Henry *et al*., 1989). Collection of plant material and preparation of herbarium specimens were done as per the prescribed methodology (Jain and Rao, 1977). During field visits, ethnobotanical information was gathered through oral interviews and discussion with knowledgeable local ethnic people. The information of leafy vegetables was cross checked by interacting with different groups of rural people. The voucher specimens are deposited in the Department of Botany, Bharathiar University Herbarium (BUH), Coimbatore, Tamil Nadu.

Enumeration

The identified plants are presented in the table form. Plants are arranged alphabetically with Botanical names followed by family, habit, part(s) used, and medicinal use (Table- 1).

www.gbtrp.com
IJBT Special Issue Vol. No. 2: 1-7.
ISSN: 0976 - 4313

International Journal of Biological Technology

Table- 1: List of wild leafy vegetables used by the tribals of Nilgiris

Plant Name	Family	Habit	Part (s) used	Medicinal uses	Herbarium Voucher No.
Acalypha indica L.	Euphorbiaceae	Herb	Leaves & twigs	Pneumoniae, asthma, rheumatism and several other ailments (Bourdy and Walter, 1992)	BUH 6939
Achyranthes aspera L.	Amaranthaceae	Herb	Leaves	Oedema, dropsy and piles, boils and eruptions of skin (Saurabh Srivastav *et al*., 2011)	BUH 6944
Alternanthera sessilis R. Br.	Amaranthaceae	Herb	Leaves & twigs	Eyesight improvement (Balakrishnan, 2009)	BUH 6945
Amaranthus caudatus L.	Amaranthaceae	Herb	Leaves & twigs	Anthelmintic, astringen (Prakash Veeru, 2009)	BUH 6948
Amaranthus lividus L.	Amaranthaceae	Herb	Leaves & twigs	Antimutagenic and anticarcinogenic (Thunyawan Nuntatovattana, 2010)	BUH 6954
Amaranthus spinosus L.	Amaranthaceae	Herb	Leaves	Laxative, abscesses, boils and wounds (Mahroof Khan, 2009)	BUH 6972
Amaranthus tricolor L.	Amaranthaceae	Herb	Leaves & twigs	Increases bile and aid digestion (http://www.herb-nature.tk/2011/02/spinach-amaranthus-tricolor-l.html)	BUH 6966
Amaranthus viridis L.	Amaranthaceae	Herb	Leaves & twigs	Constipation, inflammation, eczema, bronchitis, anemia, leprosy (Ashok Kumar, 2009)	BUH 6963
Boussingaultia baselloides Kunth	Basellaceae	Climber	Leaves	-	BUH 6940
Asystasia gangetica T. And.	Acanthaceae	Herb	Leaves	Asthma (Akah, 2003)	BUH 6962
Bacopa monnieri L.	Scrophulariaceae	Herb	Leaves	Abdominal pain & blood purifier (Jain & Sumita, 2005)	BUH 6964
Boerhaavia diffusa L.	Nyctaginaceae	Herb	Leaves	Dyspepsia, jaundice, enlargement of spleen, and abdominal pain (Kirtikar and Basu, 1956)	BUH 6969
Cansjera rheddii Gmel.	Opiliaceae	Shrub	Young leaves	Poisonous bites (Ayyanar & Ignachtimuthu, 2005)	BUH 6949
Cardiospermum halicacabum L	Sapindaceae	Climber	Leaves	Body pain & rheumatism Jaundice (Rajendran et al, 2008)	BUH 6942
Centella asiatica (L.) Urban	Apiaceae	Herb	Leaves	Dysentry, cough, fever, tuberculosis, boils etc., (Jain & Sumita, 2005)	BUH 6956
Chenopodium album L.	Chenopodiaceae	Herb	Leaves & twigs	Appetite, anthelmintic, laxative, diuretic (Neerja yadav, 2007)	BUH 6960
Cissus quadrangularis L.	Vitaceae	Climber	Leaves	Bone fractures (Enamul Kabir Shaheen *et al*., 2010)	BUH 6947
Commelina benghalensis L.	Commelinaceae	Herb	Leaves	Demulcent, refrigerant, laxative and leprosy (Mahroof Khan, 2009)	BUH 6965
Coccinia grandis (L.) Voigt.	Cucurbitaceae	Climber	Leaves	Stomatitis (Ganesan, 2008)	BUH 6953
Colocasia esculenta (L.) Schott.	Araceae	Herb	Petiole	Skin diseases (Ayyanar & Ignachtimuthu, 2005)	BUH 6967
Diplocyclos palmatus (L.) C.Jeff.	Cucurbitaceae	Climber	Young leaves	Joints pain (Samuel & Andrews, 2010)	BUH 6968
Drymaria cordata Willd.	Caryophyllaceae	Herb	Leaves	Wounds (Samuel & Andrews, 2010)	BUH 6946
Eclipta alba Hassk.	Euphorbiaceae	Herb	Leaves & twigs	Fever, cough, cold, eye troubles and hair growth ((Balakrishnan, 2009))	BUH 6941
Eryngium foetidum L.	Apiaceae	Herb	Leaves	Burns, earache, fever,	BUH 6943

				hypertension, constipation,asthma, stomach ache etc., (Pau *et al.*, 2010)	
Moringa pterosperma Gaertn.	Moringaceae	Tree	Leaves	Rheumatism, body strengthens, Synthesis of sexual hormones, solve excretory problems (Pandiarajan *et al*, 2011)	BUH 6950
Murraya koenigii Spr.	Rutaceae	Tree	Leave	Vomitt ing (Rajadurai *et al.*, 2009)	BUH 6970
Oxalis corniculata L.	Oxalidaceae	Herb	Leaves	Dysentry, Anaemia Piles etc. (Rahman *et al*., 2008)	BUH 6961
Oxalis latifolia H.B.K.	Oxalidaceae	Herb	Leaves	-	BUH 6957
Polygonum plebejum R. Br.	Polygonaceae	Herb	Leaves & twigs	Diarrhoea, dysentery (Abhijit Dey and Jitendra Nath De, 2010)	BUH 6958
Portulaca oleracea L.	Portulacaceae	Herb	Leaves & twigs	Refrigerant, liver disease, scurvy (Katewa & Galva, 2005)	BUH 6971
Rivea hypocrateriformis Choisy	Convolvulaceae	Climber	Leaves	Fertility in women (Shivalingappa, 2001)	BUH 6951
Solanum nigrum L.	Solanaceae	Herb	Leaves & twigs	Diuretic, laxative, narcotic, antispasmodic cnarcotic and antispasmodic (Mahroof Khan, 2009)	BUH 6959
Talinum triangulare (Jacq.) Wild.	Portulacaceae	Herb	Leaves & twigs	Asthma (John Samuel *et al.*, 2010)	BUH 6952
Tribulus terrestris L.	Zygophyllaceae	Herb	Young leaves & twigs	Jaundice, Urinary troubles (Rajendran *et al*., 2008; Rajadurai *et al.*, 2009)	BUH 6955

Results and Discussion

A total of 34 species belonging to 22 genera and 22 families were identified in the study. It provides a database regarding the ethno-botanical facts of these lesser-known leafy wild green edible species through frequent interactions and discussions were made with the local villagers (Fig.2). They possess a thorough knowledge on the usage of wild plants used by the in their day to-day's life. The present study observed that wild edible leaves are frequently consumed after cooking throughout various seasons of the year.

The number of wild leafy vegetables recorded in the present study area indicates the diversity of plant wealth. But tourism and urbanization has changed their life style due to encroachment in and around tribal settlements.
The majority of wild edible herbs eaten typically contain high levels of important nutrients especially for diets usually high in starch. (Sundriyal and Sundriyal (2003); Grivetti and Ogle (2000); Naithani (1984); Dovie (2002); Agate (2000); Narayanan & Kumar (2007); Agrahar-Marugakar & Pal (2004); Dovie *et al*.,(2007); Gupta *et al*., (2005); Odhav *et al*.,(2007); Ejoh *et al*., (2007); Orech *et al*., (2007).

Tribal living in the rural areas depends on wild leafy vegetables to fulfill their daily needs since there is no market in the nearby areas. The wild leafy vegetables not only important in edibility purpose but also having medicinal value. So, preservation of edible leaves is one of the strategies developed to face the times of shortage (Mnzava, 2005).

Most of these traditional leafy vegetables have a potential for income generation but fail to compete with exotic vegetables at present due to lack of awareness. (Maikhuri *et al.*, 2004; Maikhuri, 2003; Jansen van Rensburg, 2004). Hence, there is an urgent need to preserve the knowledge at the earliest.

Conclusion

The present research documenting the information regarding the leafy vegetables in the study area otherwise they may be lost in the near future, and another need of this study is domestication of this wild species. These plants are a good resource for the upliftment of the economy of rural people and they can get good revenue by selling these wild fruits and vegetables. The knowledge should be transferred properly by old people to younger generation and should be well trained in collection and processing. The traditional knowledge and wild

plant resource management practices of the ethnic people should be applied in modern strategies to get the desired results and sustainable utilization of the wild plant resources.

Reference

Abhijit Dey and Jitendra Nath De,2010. A Survey of Ethnomedicinal Plants used by the tribals of Ajoydha Hill Region, Purulia District, India. *American-Eurasian J. Sus. Agri*.,4(3): 280-290.

Agate, V.V., Tarwadi, K.V., Mangale, S. and Chiplonkar, S.A.2000. Potential of traditionally cooked green leafy vegetables as a natural sources for supplementation of eight micro-nutrients in vegetarian diets. *J. Food Com. and Ana*., 13:885-891.

Agrahar-Marugakar, D. and Pal, P.P.2004. Intake of nutrients and food sources of nutrients among the Khasi tribal women of India. *Nutrition*, 20: 268-273.

Akah, P.A., Ezike, A.C., Nwafor, S.V., Okoli, C.O.2003. Enwerem, NM. Evaluation of the anti-asthmatic property of Asystasia gangetica leaf extracts. *J. Ethnopharmacology*,89(1):25-36.

Ames, B. and Gold, L.S.1996. Mom was right, at least about fruits and vegetables. *Chem. Heal. Safe*., 3: 17-21.

Anbu Jeba, Sunilson John Samuel, Anandarajagopal Kalusalingam, Dinesh Kumar Chellappan, Rejitha Gopinath, Suraj Radhamani, Hj Azman Husain, Vignesh Muruganandham, Proom Promwichit,2010. Ethnomedical survey of plants used by the Orang Asli in Kampung Bawong, Perak, West Malaysia. *J. Ethnobiology and Ethnomedicine*, 6:5.

Ashok Kumar, B.S., Lakshman, K., Jayaveera K.N., Nandeesh, R, Mani Tripathi, S.N., Vamshi Krishn,a N., Manjunath, M. and Suresh, M.V.2009. Estimation of Rutin and Quercetin in *Amaranthus viridis* L by High Performance Layer chromatography (HPLC). *Ethnobotanical Leaflets*,13: 437-42.

Ayyanar, M. and Ignacimuthu, S. 2005. Medicinal plants used by tribals of Tirunelveli hills, Tamil Nadu, to treat poisonous bites and skin diseases. *Ind. J. Trad. Knowledge*, 4 (3): 229- 236.

Balakrishnan, V., Prema, P., Ravindran, K.C and Philip Robinson, J. 2009. Ethnobotanical Studies among Villagers from Dharapuram Taluk, Tamil Nadu, India. *Global J. Pharma.*, 3(1): 08-14.

Bazzano, M.2002. Fruit and vegetable intake and risk of cardiovascular disease in US adults: the first National Health and Nutrition Examination Survey Epidemiologic follow-up study, *American J. Clin. Nut*.,76: 93-99.

Bourdy, G. and Walter, A.1992. Maternity and medicinal plants in Vanuatu. I. The cycle of reproduction. *J Ethnopharma*., 37: 179-196.

Deepa, E.H., Viswanathan, R., Sangita, R., Usha Rani, M.V and Majumde,r P.P.2002. Mitochondrail DNA diversity among five tribal populations of Souther India, *Curr Sci*., 83 (2): 158- 162.

Dovie, D.B.K., Shackleton, C.M. and Witkowski, E.T.F.2007. Conceptualizing the human use of wild edible herbs for conservation in South African communal areas. *J. Environ. Man.*, 84:146-156.

Dovie, D.B.K., Shackleton, C.M. and Witkowski, E.T.F, 2002. Direct-use values of woodland resources consumed and traded in a South African village. *Inter. J. Sust. Deve. and World Eco*., 9:269-283.

Enamul Kabir Shaheen, Afser Syef, Sudhangshu Shekhar Saha, Shariful Islam, Din Al Hossain, Ariful Islam Sujan and Mohammed Rahmatullah, 2010. Medicinal plants used by the folk and tribal medicinal practitioners in two villages of Khakiachora and Khasia Palli in Sylhet District, Bangladesh. *Advances in Natural and Applied Sciences*,5(1): 9-19.

Ejoh, R.A., Nkonga, D.V., Inocent, G. and Moses, M. C. 2007. Nutritional components of some non-conventional leafy vegetables consumed in Cameroon. *Pakistan J. Nutr*., 6:712-717.

Farooquee, N.A., Majila, B.S. and Kala, C.P.2004. Indigenous knowledge system and sustainable management of natural resources in high altitude society in Kamaun Himalaya. *Indian J. Hum. Eco.*, 16(1): 33-42.

Gadgil, M., Berkes, F. and Folke, C, 1993. Indigenous knowledge for Biodiversity conservation, *Ambio.*, 22 (2-3): 151.

Gamble, J.S.1915-1935. *Flora of the Presidency of Madras,* Adlard & Co., London. (1915-1935). Vols. I-III.

Ganesan, S.2008. Traditional oral care medicinal plants survey of Tamil Nadu. *Nat. Prod. Rad*.,7 (2): 166- 172.

Ghorbani, A.2005. Studies on pharmaceutical ethnobotany in the region of Turkmen Sahra, North of Iran (Part- I): General results. *J. Ethnopharma*.,102: 58- 68.

Gillman, S.1995. Protective effect of fruits and vegetables on development of stroke in men. *J. Ameri. Med. and Asso.*, 273: 1113-1117.

Grivetti, L.E. and Ogle, B.M.2000. Value of traditional foods in meeting macro- and micro-nutrient needs: the wild plant connection. *Nutr. Res. Rev*.,13:31-46.

Gupta, S., Lakshmi, A.J., Manjunath, M.N. and Prakash. J. 2005. Analysis of nutrient and

antinutrient content of underutilized green leaf vegetables. *LWT-Food Science and Tech.,* 38:339-345.

Henry, A.N., Chitra, V. and Balakrishnan, N.P.1989. Flora of Tamilnadu, Analysis, Botanical Survey of India, Coimbatore, India. Series- I (3).

Henry, A.N., Kumari, G.R. and Chitra, V.1987. Flora of Tamilnadu, , Analysis, Botanical Survey of India, Coimbatore, India. Series- I (2).

Hooker, J. D. 1875 – 2006. *Flora of British India*. Vols. I – VI. L. Reeve and Company Ltd, The East House Book , Ashford, Kent, UK.

Jain, S.K. and Chauhan, A.S.1998. Wild edible plants of Sikkim Himalaya, *J. Non- timber for. Prod*., 5 (1,2): 20- 28.

Jain, S. K. 2004. Objective ethnobotany- knowledge traditional approaches modern. *Ethnobotany*, 16 (1-2). 125.

Jain, S.K. and Rao R.R.1997. A Handbook of field and herbarium technique, (Today and Tomorrow publications, New Delhi).

Jain, S.K. and Sumita Srivastava, 2005. Traditional uses of some Indian plants among islanders of the Indian Ocean. *Ind. J. Tradi. Knowl.*, 4(4): 354- 357.

Jansen van Rensburg, W.S., Venter, S.L., Netschluvhi, T.R., Heever, E., Vorster, H.J. and De Ronde, J.A.2004. Role of Indigenous leafy Vegetables in Combating Hunger and Malnutrition, *S. Afri. J. Botany*, 70: 52- 59.

Jeyadev, C.J. and Ragupathy, M.1962. Ancient Culture and Tribal Culture (Tamil). Chennai, Publication of the Government Museum.

Karunyal Samuel, J. and Andrews, B.2010. Traditional medicinal plant wealth of Pachalur and Periyur hamlets Dindigul district, Tamil Nadu. *Ind. J. Trad Know*., 9 (2): 264- 270.

Katewa, S.S. and Galav, P.K.2005. Traditional herbal medicines from Shekhawati region of Rajasthan, *Ind. J. Trad. Know.*, 4 (3): 237- 245.

Kirtikar, K.R. and Basu, B.D.1956. Indian Medicinal Plants, Lalit Mohan Basu, Allahabad, Uttar Pradesh, India. 3 (2): 2045-2048.

Lev, E. and Amar, Z. 2000. Ethnopharmacological survey of traditional drugs sold in Israel at the 20th century. *J. Ethnopharma*., 72: 191- 205.

Mahroof Khan, Satish Kumar and Irshad Ahmed Hamal,2009. Medicinal plants of sewa river catchment area in the Northwest Himalaya and its implication for conservation. *Ethnobotanical Leaflets*, 13: 1113- 39

Maikhuri, R.K., Rao, K.S. and Saxena, K.G.2004. Bioprospecting of wild edibles for rural development in Central Himalaya, *Mountain Research and Development*,24 : 110- 113.

Maikhuri, R.K., Rao, K.S., Chauhan, K., Kandari, L.S., Prasad, P. and Rajasekharan, C. 2003. Development of marketing of medicinal plants and other forest products- can it be a pathway for effective management and Conservation. *The Indian Forester*,129: 169- 178.

Mini, C. and Krishnakumary, K.2004. Leafy Vegetables, Agrotech Publishing Academy, Udaipur.

Mnzava, N.A.2005. Conservation and use strategies. Online: WWW. Ipgri. Cigar. Org, accessed 10 October 2006.

Myers, N., Mittermeier, R.A., Mittermeier, C.G., da Fonseca, G.A.B and Kent, J.2000. Biodiversity hotspots for conservation priorities, *Nature*, 403: 853- 858.

Naithani, B.D.1984. Flora of Chamoli. Howrah: Botanical Survey of India.

Nair, N.C and Henry, A.N.1983. Flora of Tamil Nadu, Analysis, Botanical Survey of India, Coimbatore India. Series- I (1)

Narayanan, M. K. R. and Kumar, N. A. 2007. Gendered knowledge and changing trends in utilization of wild edible greens in Western Ghats. *Ind J.Trad. Knowl.*, 6:204-216.

Natarajan, B.2002. Conservation of biological diversity and indigenous traditional knowledge as exemplified by the cases of Asia and Africa. Indilinga Africa. J. *Indigenous knowledge Systems*,1: 37- 45.

Neerja Yadav, Neeru Vasudeva, Sumitra Singh and Sharma,S.K.2007. Medicinal properties of genus Chenopodium Linn. *Nat. Prod. Rad*., (2): 131- 134.

Nordeide, M.B., Hatloy, A., Folling, M., Lied, E. and Oshoug, A.1996. Nutrient composition and nutritional importance of green leaves and wild foods in an agricultural district, Koutiala, in Southern Mail. *Inter. J. Food Sci. and Nutri.* 47 (6): 455- 468.

Odhav, B., Beekrum S., Akula, U.S. and Baijnath, H.2007. Preliminary assessment of nutritional value of traditional leafy vegetables in Kwazulu-Natal, South Africa. *J. Food Com. and Ana.*, 20:430-435.

Orech, F.O., Christensen, D.L., Lasen, T., Friis, H., Aagaard-Hansen, J. and Estambale, B.A.2007. Mineral content of traditional leafy vegetables from western Kenya. *Inter. J. Food Sci. and Nutr*.,58(8):595-602.

Orech, F.O., Aagaard Hansen, J. and Friis, H. 2007. Ethnoecology of traditional leafy vegetables of the Luo people of Bondo District, Western Kenya. *Inter. J. Food Sci. and Nutr.*, 58 (7): 522- 530.

Pandiarajan, G., Govindaraj, R., Makesh Kumar, B., Sankarasivaraman, K. A.2011.

Survey of medicinally important plants in around Srivilliputtur taluk, Virudhunagar district, Tamilnadu. *Int. J. Pharm. Res, Dev*., 2 (3): 77-86.

Paul, J.H.A., Seaforth, C.E. and Tikasingh, T.2010. *Eryngium foetidum* L.: A review. *Fitoterapia*, 182 (3): 302- 308.

Prakash Veeru, Mishra Pankaj Kishor and Mishra Meenakshi,2009. Screening of medicinal plant extracts for antioxidant activity. *J. Med. Plants Res*., (2009) 3(8), 608-612.

Rajadurai, M., Vidhya, V.G., Ramya, M. and Anusha Bhaskar,2009. Ethno-medicinal Plants Used by the Traditional Healers of Pachamalai Hills, Tamilnadu, India. *Ethno. Med*., 3(1): 39-41.

Rajendran, K., Balaji, P. and Jothi Basu, M.2008. Medicinal plants and their utilization by villagers in southern districts of Tamil Nadu. *Ind. J. Trad. Know*.,7(3): 417-420.

Rahman, A.H.M.M., Anisuzzaman, M., Haider, S.A., Ferdous Ahmed, Rafiul Islam, A.K.M. and Naderuzzaman, A.T.M.2008. Study of Medicinal Plants in the Graveyards of Rajshahi city. *Res. J. Agri. Biolo. Sci.*, 4 (1): 7 0 -7 4.

Reddy, C.V.K.1999. Greens for Good Health. *Nutrition*, 33(3): 3-8.

Saxena, R.1999. How green is your diet? *Nutrition*, 33 (3):9.

Silori, C.S. and Rana, A.R.2000. Indigenous knowledge on medicinal plants and their use in Narayan Sarovar Sanctuary, Kachchh. *Ethnobotany*, 12:1-7.

Saurabh Srivastav, Pradeep Singh, Garima Mishra, Jha, K. K. and Khosa, R.L.2011. *Achyranthes aspera:* An important medicinal plant: A review. *J.Nat.Pro. and Plant Resources*, 1(1):1-14.

Shivalingappa, H., Satyanaraya, N.D. and Purohit, M.G.2001. "Antiimplantation and pregnancy interruption efficacy of Rivea hypocrateriformis in rat". *J.Ethanopharma.*,74: 245-249.

Duke, J.A.1983. Handbook of Energy Crops.

Sundriyal, M. and Sundriyal, R.C.2003. Under utilized edible plants of the Sikkim Himalaya: Need for domestication. *Curr. Sci.*, 85:731-736.

Sundriyal, M. and Sundriyal, R.C.2001. Wild Edible Plants of the Sikkim Himalaya: Nutritive values of selected species, *Econo. Bot.*, 55: 377-390.

Teklehaymanot, T., Giday, M., Mehdim, G. and Yalemtsehay, M.2007. Knowledge and use of medicinal plants by people around Debre Libons Monastery in Ethiopia, *J. Ethnopharma.*, 111: 271- 283.

Thunyawan Nuntatovattana and Linna Tongyonk, 2010. Antimutagenicity effect of the extracts from selected thai green vegetables. *J. Health Res*., 24(2): 61-66.

http://www.herb-nature.tk/2011/02/spinach-amaranthus-tricolor-l.html