

Traditional Knowledge of herbal vendors in North Maharashtra

Y. A. Ahirrao^{1*}, M. V. Patil² and D. A. Patil³

¹ S.S.V.P. Sanstha's Arts, Commerce and Science College, Shindkheda, District Dhule, M.S. (India)

^{2&3} Post-Graduate Department of Botany, S.S.V.P. Sanstha's L.K. Dr.P.R. Ghogrey Science College, Dhule-424005, M.S. (India)

Corresponding author: yaabotany@gmail.com

Abstract

Herbal vendors carry on their family business of selling botanicals of medicinal significance in public places. They have been largely ignored in India in tapping their traditional ethnomedicinal knowledge. They were interviewed during 2009 to 2014 in Dhule, Nandurbar, Jalgaon, Buldhana and Nasik district of North Maharashtra. Information was tapped in respect of plant, plant part used, common plant names, disease treated, medicinal recipes, doses, period of administration, etc. The present investigation fruits, which are generally ignored as medicinal source, are considered. Fruit plants belonging to total 66 species, 59 genera and 45 families are documented. As many as 67 diseases and a few for beauty care are documented. Out of total 106 use-reports, 96 use-reports are found to be lesser known to the science. This fact obviously indicates that traditional knowledge of herbal vendors in India ought not be ignored henceforth for the welfare of mankind.

Key Words: Herbal Vendors, Traditional knowledge, Ethnomedicine, North Maharashtra.

Introduction

Mankind is absolutely dependent on nature. He derived bioresources for his sustenance since time immemorial and is very successful in selecting useful plants because of his superior intellect. Food was/is his first necessity. After food, medicine is his first discovery. After which man initiated organized agriculture, he grew mainly grain crops and some fruit yielding trees (Patil, 2019). Cultivation of fruits is thought to be a profitable enterprise and a luxury. However, in modern period, they are being considered a necessity for maintaining health. They promote health, even check diseases, and hence classed as 'protective foods'. Some fruits are useful as food and as well as medicine, e.g. citrus, grapes, nuts, etc. They contain nutraceuticals that have positive impact on human health. They thus constitute themselves a class enjoying nutraceutical properties. The present authors tapped traditional knowledge of herbal vendors in five districts viz., Jalgaon, Dhule, Nandurbar, Buldhana and Nasik district in northern part of Maharashtra state. This communication particularly focuses on fruits as sources of medicine.

Methodology

The herbal vendors conduct their family business of selling botanicals of medicinal significance. They have their own traditional knowledge of treating people for various diseases. They carry on their business on some public

places such as railway stations, bus stands, courtyards, highways, cross-roads, government offices, city chowks, places of pilgrims and temples, bazars (hats), etc. An inventory was conducted during 2009 to 2014 to tap their medicinal knowledge. They were interviewed from time to time. Enquiry was made to know plant and their parts used, common plant names, disease treated, type of medicinal recipe, doses and period of administration, etc. Samples of botanicals were purchased. They were deciphered taxonomically using various national, state, regional and district floras (Hooker, 1872-1897; Cooke, 1958; Naik, 1998; Sharma *et al.* 1996; Singh *et al.* 2000, 2001; Shah, 1978; Patil, 2003; Kshirsagar and Patil, 2008; Lakshminarsimha and Sharma, 1991; Diwakar and Sharma, 2000, etc.). The use-reports were also compared with the classical literature. (Anonymous, 1948-1976; Watt, 1889-1893; Ambasta, 1986; Jain, 1991; Bhattacharjee, 1998) to pinpoint unique applications. The results obtained are presented in the Table-I.

Results and Discussion

Although enormous wealth of indigenous plant-lore has been unearthed from different societies and geographical regions in India, still information on this line is hidden and intact in native cultures. Indian subcontinent being rich in biodiversity and ethnicity, provides us unparalleled chances



Table I. Fruits used for treating human diseases.

Sr. No.	Plant Name & Family	Local Name	Habit	Wild (W)/ Cultivated (C)	Dicot/ Monocot/ Gymno	Use- Reports			
						Recipe	Disease	Dose	Period
1.	<i>Adansonia digitata</i> L. Bombacaceae	Gorakh chinch	Tree	C	D	Pulp	i) Abdominal pain, Fever, ii) Acidity	One tea spoon	i) Three nights, ii) Seven nights
2.	<i>Anamirta cocculus</i> (L.) Wight & Arn. Menispermaceae	Kakmari	Shrub	W, C	D	Extract	Conceive	Two pills	Eight days at morning
3. *	<i>Ananas comosus</i> (L.) Merr. Bromeliaceae	Ananas	Herb	C	M	Juice	Acidity	A glassful	Till cure
4.	<i>Anogeissus latifolia</i> (Roxb. ex DC.) Wall. ex Guill. & Perr. Combretaceae	Dhawada	Tree	W	D	Powder	Post-delivery infection		Daily consumed
5.	<i>Apama siliquosa</i> L. Aristolochiaceae	Chakrani	Shrub	W	D	Unripe fruit	Stomach pain		Till cure
6.	<i>Atalantia monophylla</i> DC. Rutaceae	Jungli nimbu	Tree	W	D	Juice Powder	i) Pimples ii) Jaundice iii) Sexual vigour	One teaspoon	i) Four nights ii) Twice a day for fifteen days iii) Three months twice a day
7.	<i>Balanites aegyptiaca</i> (L.) Delile Balanitaceae	Hingan kai	Tree	W	D	Juice	Snake bite Scorpion Sting	Half cup	Till cure
8.	<i>Careya arborea</i> Roxb. Lecythidaceae	Kumbia	Tree	W	D	Powder	Reduces body weight	One teaspoon	Daily morning
9.	<i>Carica papaya</i> L. Caricaceae	Papai	Tree	W	D	Latex of fruit Unripe fruit Ripe fruit juice	i) Kidney-stone ii) Liver problems iii) Blood circulation	i) One teaspoon ii) One spoonful iii) Half cup	i) Twice a day for three days ii) Thrice day for one month iii) Evening for thirty days
10.	<i>Carvia callosa</i> (Nees) Bremek. Acanthaceae	Karvi	Herb	W	D	Extract	Improve lactation	Half cup	Seven days for twice a day
11.	<i>Cassia auriculata</i> L. Caesalpinaceae	Awali	Shrub	W	D	Juice	Improve digestion	Half cup	Early morning
12.	<i>Catunaregam spinosa</i> (Thunb.) Tirveng. Rubiaceae	Gelfal	Tree	W	D	Pulp Fruit infusion, Slurry	i) Head-ache ii) Goiter iii) Cough iv) Overcome madness	i) One to two drops ii) A cupful	i) Till cure ii) Till cure iii) Morning Forty nights iv) Till cure

13.	<i>Celastrus paniculatus</i> Willd. Celastraceae	Malkangan i	Shrub	W	D	Powder	Tonic	Spoonful	Fifteen days once daily
14.	<i>Citrullus colocynthis</i> (L.) Schrad. Cucurbitaceae	Endrayan	Climber	W	D	Juice	i) Intestine problem ii) Asthma	Half cup	Morning for seven days
15.	<i>Citrus × aurantifolia</i> (Christm. ex Panz) Swingle Rutaceae	Nimbu	Tree	W	D	Juice, Paste, Decoction	i) Bile ii) Piles iii) Diabetes	i) Spoonful ii) Spoonful iii) Half cup	i) Twice a day for two days ii) Three days for night iii) Three days for morning
16.	<i>Citrus × limon</i> (L.) Burm. f. Rutaceae	Nimbu	Tree	C	D	Juice, Powder	i) Jaundice ii) Pimples iii) Sexual vigour	i) Spoonful ii) One teaspoon	i) Twice a day for fifteen days ii) Twice a day for three months
17.	<i>Citrus medica</i> L. Rutaceae	Nimbu	Tree	C	D	Juice	Improve digestion	One teaspoon	Daily morning
18.	<i>Citrus × reticulata</i> Blanco. Rutaceae	Santari	Tree	C	D	Juice,	i) Tuberculosis ii) Prevent vomiting	Half cup	Daily
19.	<i>Citrus × sinensis</i> (L.) Rutaceae	Mosambi	Tree	C	D	Paste Juice	i) Tooth-ache ii) Respiratory infection	One teaspoon	i) Twice a day for one month ii) One month at night
20. *	<i>Cocos nucifera</i> L. Arecaceae	Naral	Tree	C	M	Water	Head-ache	Few drops	Till cure
21. *	<i>Colocasia esculenta</i> (L.) Schott Araceae	Ran alu	Herb	C	M	Paste	Black spots		Three days twice a day
22.	<i>Commiphora mukul</i> (Hook. ex Stocks) Engl. Burseraceae	Gugal dhoop	Shrub	W	D	Cooked fruit	Improve eye sight	Few fruits	Till cure
23.	<i>Cordia dichotoma</i> (Ruiz & Pav.) Gürke Boraginaceae	Bhokara	Tree	W	D	Decoction	i) Lung infection ii) Hair greying	One teaspoon	Daily for fifteen nights
24.	<i>Cordia gharaf</i> (Forssk.) Ehrenb and Asch. Boraginaceae	Gondani	Tree	W	D	Ripe fruit Powder	i) Sexual vigour ii) Relieve back pain iii) Increase sperm count	One teaspoon	Twice daily till cure
25.	<i>Cucumis melo</i> L. Cucurbitaceae	Chibud	Climber	C	D	Fruit pieces	i) Yellow urination ii) Limb pain	Few pices	Thrice a day till cure
26.	<i>Cucurbita maxima</i> Duch. ex Lam. Cucurbitaceae	Tambada bhopala	Climber	C	D	Juice	Jaundice	One drop	Morning for three days

27.	<i>Datura innoxia</i> Mill. Solanaceae	Pandhara Dhotara	Shrub	W		Paste, Juice	i) Impotency ii) Ear-ache iii) To conceive successfully	i) & ii) Two drops iii) One teaspoon	i) One month at night ii) Three days iii) Twice a day
28.	<i>Dichroa febrifuga</i> Lour. Hydrangeaceae	Khudkhola	Shrub	W	D	Fruit pieces	Reduces hoarseness of voice	Few pieces	Eight days at morning
29.	<i>Dillenia indica</i> L. Dilleniaceae	Karambel	Tree	W	D	Juice	Cough	5 to 10 ml	Night for four days
30.	<i>Elaeocarpus sphaericus</i> (Gaertn.) K. Schum. Elaeocarpaceae	Rudraksha	Tree	W	D	Pulp	Epilepsy	One teaspoon	Ten days at night
31.	<i>Emblca officinalis</i> Gaertn. Euphorbiaceae	Awala	Tree	W, C		Powder, Juice	i) Abdominal problems ii) Liver Complaints iii) Constipation	i) & ii) One teaspoon iii) One cupful	i) & ii) Twenty days twice a day iii) Daily morning
32.	<i>Eucalyptus maculata</i> Hook. Myrtaceae	Jangali nilgiri	Tree	C	D	Infusion	Ear-ache	One to drops	Night
33. *	<i>Enolophia dabia</i> (D.Don) Hochr. Orchidaceae	Kali Pandhri Mistari	Herb	W	M	i) Powder ii) Decoction	i) Relief from joint pains ii) Spermatorrhoea iii) Urinary complaints	i) One cup ii) & iii) Two spoons	i) Daily morning ii) At night after meals
34.	<i>Ficus carica</i> L. Moraceae	Anjeer	Tree	C	D	Dry fruit	i) Impotency ii) Body heat iii) Improves blood	One spoon	i) Daily at night for eight nights ii) Early morning for one month
35.	<i>Ficus hispida</i> L.f. Moraceae	Bhokada	Tree	W	D	Slury	Prevent abortion	Half cup	Consumed orally
36.	<i>Ficus palmata</i> Forsk Moraceae	Anjeri phal	Tree	W	D	Powder	i) Reduce body heat ii) Deficiency of calcium	One teaspoon	i) Twice a daily ii) Fifteen days in morning
37.	<i>Flacourtia indica</i> (Burm.f.) Merr. Flacourtiaceae	Akhadi	Tree	W	D	Powder	Cures physical weakness	Spoonful	Twice a day for a week
38.	<i>Garcinia indica</i> (Thouars) Choisy Clusiaceae	Bheranda	Tree	W	D	Decoction, Pulp	i) Cough, Acidity ii) Arthritis	i) One cup ii) Half cup	i) Twice a day for a week ii) Orally one month twice a day
39.	<i>Gmelina arborea</i> Roxb. Verbenaceae	Shewan	Tree	C	D	Juice	Blood dysentery	One spoonful	Four time a day for a week

40.	<i>Hydnocarpus laurifolius</i> (Dennst.) Sleum. Flacourtiaceae	Kutakvath	Tree	W	D	Pulp, Powder	i) Throat infection ii) Diabetes	One teaspoon	Thrice a day for one month
41.	<i>Limonia acidissima</i> L. Rutaceae	Kauth	Tree	C	D	Pulp	Bile	One teaspoon	Twice a day for seven days
42.	<i>Luffa acutangula</i> (L.) Roxb. Cucurbitaceae	Dodake	Climber	C	D	Infusion	Piles	One teaspoon	Early morning for one month
43.	<i>Lycopersicon lycopersicum</i> (L.) Karsten. Solanaceae	Tamatar	Climber	C	D	Fruit slices Ripe fruit	i) Remove black patches on face ii) Relieve weakness iii) Appetizer	About 100 ml	i) Seven days for night ii) & iii) Consumed in morning
44.	<i>Mesua ferrea</i> L. Clusiaceae	Nagchafa	Tree	W	D	Powder	Children aginst Cough	Half teaspoon	Twice daily for eight days
45.	<i>Morus alba</i> L. Moraceae	Tuti	Tree	W	D	Decoction	Diarrhoea	One teaspoon	Twice a day
46.	* <i>Musa × paradisiaca</i> L. Musaceae	Keli	Herb	C	M	Pulp	Eczema		Seven days
47.	<i>Myristica fragrans</i> Hoult. Myristicaceae	Jayphal	Tree	C	D	Powder	Epilepsy	One teaspoon	Four days
48.	<i>Neolamarckia cadamba</i> (Roxb.) Bosser Rubiaceae	Kadamb	Tree	W, C	D	Pulp	Increase sperm count	One teaspoon	At night for seven days
49.	<i>Olea europaea</i> L. Oleaceae	Karambu	Tree	C	D	Paste	Reduce baldness		One week
50.	<i>Opuntia elatior</i> Mill. Cactaceae	Nivadung	Shrub	C	D	Juice Extract	i) Cough ii) Rheumatism	i) 10 ml ii) One teaspoon	i) Three days twice a day ii) One month
51.	<i>Papaver somniferum</i> L. Papaveraceae	Afu	Herb	C	D	Powder Infusion	i) Improve lactation in women Spondylalysis	Half teaspoon	i) At night for five days ii) Seven days
52.	* <i>Pinus gerardiana</i> Wall. ex D. Don Pinaceae	Simai devdari	Tree	W	G	Pulp	i) Respiratory complaints ii) Increase sperm count	5 to 10 gm	i) One month at night ii) Forty five days at night
53.	<i>Piper retrofractum</i> Vahl Piperaceae	Chavak	Climber	C	D	Powder	Diarrhoea	One teaspoon	

54.	<i>Pongamia pinnata</i> (L.) Pierre Fabaceae	Karanj	Tree	W, C	D	Powder	Rheumatism	One spoonful	Daily
55.	<i>Punica granatum</i> L. Punicaceae	Dalimb	Shrub	C	D	Powder Juice	i) Expel intestinal worms ii) Heart problem	One teaspoon	Twice a day for three days at morning Daily morning
56.	<i>Pyrus communis</i> L. Rosaceae	Chikmagalur	Tree	C	D	Juice	i) Head-ache ii) Bladder stone	i) One teaspoon ii) Half cup	Twice a day for seven days
57.	<i>Quercus infectoria</i> G.Oliver Fagaceae	Majuphal	Tree	W	D	Paste	Foul breathing	One teaspoon	Daily once till cure
58.	<i>Sida cordifolia</i> L. Malvaceae	Bala	Herb	W	D	Paste	Urinary infection	One teaspoon	Twice a day for seven days
59.	<i>Solanum erianthum</i> D. Don Solanaceae	Kutri	Tree	W	D	Powder	i) Tooth-ache ii) Ulcer iii) Regulate menstruation	One teaspoon	i) Twice a day for fifteen days ii) Seven days for morning
60.	<i>Sphaeranthus indicus</i> L. Asteraceae	Mundi	Herb	W	D	Decoction Powder	i) Heart problems ii) Fistula	Two teaspoons	i) Twice a day for fifteen days ii) One month at night
61.	<i>Sterculia foetida</i> L. Sterculiaceae	Jangali badam	Tree	W	D	Extract	Sunstroke, Body heat	Half cup	Ten days at morning
62.	<i>Syzygium cumini</i> (L.) Skeels Myrtaceae	Jambhul	Tree	C	D	Juice	i) Heart problem ii) Indigestion iii) Dysentery iv) Kidney stone	Two teaspoons	Twice a day for one month
63.	<i>Terminalia bellirica</i> (Gaertn.) Roxb. Combretaceae	Beheda	Tree	W	D	Powder ("Triphala churna")	i) Digestive problems and constipation ii) Improve digestion iii) Bowel problem	One teaspoon One cup	i) Daily for one month ii) & iii) Twice a day
64.	<i>Terminalia chebula</i> Retz. Combretaceae	Hirada	Tree	W	D	Powder	Cough	One teaspoon	Twice a day for three days
65.	<i>Vitis vinifera</i> L. Vitaceae	Draksha	Climber	C	D	Juice	Oral ulcer		Two-three times a day
66.	<i>Ziziphus mauritiana</i> Lam. Rhamnaceae	Bora	Tree	C	D	Decoction	i) Cure Digestion ii) Acidity	Two spoons	Daily once till cure

Abbreviations: (i) M: Monocotyledons, (ii) D: Dicotyledons, (iii) G: Gymnosperms, (iv) : Lesser known use-report.

for profound research. Herbal vendors who conduct their traditional family business in public places have largely been overlooked. Sinha (1996) endeavoured to tap medicolore from herbal vendors in Delhi region. Survey of literature indicates that there has been no efforts to study them as an exclusive topic of research. There are only a few stray attempts in our country (Mahekar and Yadav, 2008; Sikarwar *et al.*, 2012). Thus there is a paucity of information from herbal vendors in India. The present authors, therefore, extended research in five districts of Maharashtra state.

Indian ethnobotanists and ethnographers analysed research activities, gaps and futuristic themes. They suggested guidelines for intensive ethnobotanical investigations from time to time (Jain, 2004, 2006, 2010, 2012, 2013; Goel and Tripathi, 2009; Pushpangadan *et al.*, 2013; Sudhir Chandra, 1996). Goel and Tripathi (*loc.cit.*) reviewed ethnobotanical spectrum and provided a graphic view of different studies by Indian workers. These authors endeavoured to disclose phases of Indian Ethnobotany. It appeared that plant part-specific investigations have not generally been projected. There are ethnobotanical investigations which informed use-reports specifically on different aspects (Jain, 1991; Patil, 2012). Fruits have been although studied ethnobotanically, mostly their edibility is marked out (Rout, 2007). Their medicinal importance is rarely brought out. The present authors emphasized their importance while tapping down knowledge of herbal vendors.

A detailed study of the ethnomedicinal knowledge of herbal vendors in North Maharashtra region led to the documentation with particular emphasis on fruits of total 66 species belonging to 59 genera and 45 families. Of these, the dicotyledons play a major role with 60 species, 39 genera and 39 families, while monocotyledons are represented by just 05 species, 05 genera and 05 families. Gymnospermous fructification belongs to a single species, Analysis of habit categories revealed total 42 trees, 09 shrubs, 07 climbers and 08 herbs. The trees played a major role. Of these, some taxa are under cultivation (28 species), whereas some others are wild ones (34 species). There are four species which were found both under cultivation as well as in wild landscapes.

Fruits have been found beneficial to combat as many as 67 different human diseases. In three cases, the fruits are used for beauty care, e.g. pimples, removal of black spots on skin and to prevent hair-fall. There is hardly any human affliction which is not fairly cured by fruits. The herbal vendors advise a vast array of human health complaints. The medicinal recipes advised by them are in the form of powder (21), juice (21), extract (04), infusion (04), decoction (07), pulp (09) and paste (07). The figures in parenthesis indicate number of use-reports. The recipe *viz.*, fruit powder and fruit juice find fair place in their treatments.

It is very interesting to note comparison of use-reports. As stated earlier, the use-reports obtained from herbal vendors are compared with the classical literary sources. Out of total 106 use-reports of the present account, as many as 96 use-reports are lesser known to the science. This fact indicates the importance of traditional knowledge of herbal vendors. This source of information should not be ignored for the welfare of mankind.

Acknowledgements

Authors are thankful to the authorities of SSVS Sanstha for laboratory and library facilities.

References

- Ambasta, S. P. 1986. *The Useful Plants Of India*. Publication and Information Directorate, CSIR, New Delhi.
- Anonymous 1948-1976. *The Wealth of India: A Dictionary of Indian Raw Materials and Industrial Products*. Vol. 1-11. Publication and Information Directorate, CSIR. New Delhi.
- Bhattacharjee, S. K. 2008. *Handbook of Medicinal Plants*. Pointer Publishers, Jaipur.
- Chandra, S. 1996. Landmarks of Indian ethnobotany. In: *Ethnobotany in Human Welfare* (ed. Jain, S.K.). Deep Publications, New Delhi. pp. 372-379.
- Cooke, T. 1958. *The Flora of The Presidency of Bombay*. Vol. I-II. Bot. Surv. India, Calcutta. (Repr. Ed.)
- Diwakar, P. G. & Sharma, B. D., 2000. *Flora of Buldhana District*, Bot. Surv. India, Calcutta.
- Goel, A.K. & Tripathi, S. 2009. Ethnobotanical spectrum of Indian flora: An overview during the past 20 years in the journal *Ethnobotany* **21**: 131-154.
- Hooker, J.D. 1872-1887. *The Flora of British India* Vol. 1-7. L. Reeve & Co. Ltd., London.
- Jain, S.K. 1991. *Dictionary of Indian Folk Medicine And Ethnobotany*. Deep Publications, New Delhi.
- Jain, S.K. 2004. Objective ethnobotany—Knowledge traditional, approaches modern. *Ethnobotany* **16**: 1-9.
- Jain, S.K. 2006. Ethnobotany in New Millennium some thoughts on future direction in Indian Ethnobotany. *Ethnobotany* **18**: 1-3.
- Jain, S.K. 2010. Ethnobotany in India: some thoughts on future work. *Ethnobotany* **22**: 1-4.
- Jain, S.K. 2012. Ethnobotany – good, bad and path-breaking! *Ethnobotany* **24**: 1-3.
- Jain, S.K. 2013. Ethnobotany today: Focus on socio-economic welfare. *Ethnobotany* **25**: 18-21.
- Kshirsagar, S. R. & Patil, D. A. 2008. *Flora of Jalgaon District (Maharashtra)*. Bishen Singh Mahendra Pal Singh, Dehradun.
- Mahekar, Priti & Yadav, S.R. 2008. Fruit and seed drugs used in folk medicines in South western Maharashtra. In: *Ethnobotany & Taxonomy of Angiosperms* (ed. Alka Chaturvedi). Rashtrasant Tukadoji Maharaj, Nagpur University, Nagpur. pp. 187-202.
- Naik, V. N. 1998. *Flora of Marathwada*. Vol. I-II. Amrut Prakashan, Aurangabad.

- Patil, D. A. 2003. *Flora of Dhule and Nandurbar Districts (Maharashtra)*. Bishen Singh Mahendra Pal Singh, Deharadun.
- Patil, D. A. 2012. Indian ethnobotany: genesis through ages. *World Journal of Science and Technology* **2(6)**: 1-14.
- Patil, D. A. 2019. *Food Crops: Evolution, Diversity and Advances*. Scientific Publishers, Jodhpur.
- Pushpanagadan, P., Ijnu, T.P. & George, V. 2013. Opportunities for ethnobotanical studies on medicinal and aromatic plants in India. *Ethnobotany* **25**: 22-32.
- Rout, S. D. 2007. Ethnobotany of diversified wild edible fruit plants in Simlipal Biosphere Reserve, Orissa. *Ethnobotany* **19**: 137-139.
- Sharma, B. D., Karthikeyan, S. & Singh N. P. (eds.) 1996. *Flora of Maharashtra State: Monocotyledons*. Bot. Surv. India, Calcutta.
- Sikarwar, R.L.S. 2012. Ethnomedicinal plants sold by herbal vendors in the Kamadgiri Parikrama Marg in Chitrakoot (M.P.). *Ethnobotany* **24**: 114-118.
- Singh, N. P., Karthikeyan, S., Lakshminarsimhan, P. & Prasanna P. V. (eds.) 2000. *Flora of Maharashtra State. Dicotyledons*. Vol. I. Bot. Surv. India, Calcutta.
- Singh, N. P., Lakshminarsimhan, P., S. Karthikeyan & Parasanna P. V. (eds.) 2001. *Flora of Maharashtra State: Dicotyledons*. Vol. II. Bot. Surv. India, Calcutta.
- Watt, G. 1889-1896. *Dictionary of Economic Products*. Vol. 1-6. Periodical Experts, Shahdara, Delhi.