



REGULAR ARTICLE

FOLKLORIC HEALTHCARE IN BULDHANA DISTRICT OF MAHARASHTRA (INDIA)

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SUMMARY

The tribal and most rural folks belong to 'have-nots' and modern healthcare facilities are beyond their reach. They have performed been still using the plant species in their ambience. The objective of the present investigation was to tap down indigenous ethnomedicinal knowledge. Regular field trips were conducted to interview, discuss and document their medicinal knowledge. Actual observations were also made during our ethnobotanical forays. Five informants at least were consulted for each claim and verified on subsequent visits. This investigation brought to light that tribal and rural people of Buldhana district utilize 55 plant species belonging to 37 families. They are beneficial in combating vast array of diseases and disorders covering almost all systems of human body. This paper communicates 61 use-reports, their botanical analysis, highlights common diseases in the study area and discusses origin of medicine in the perspective of doctrine of signatures. Further scientific investigations may help reveal biomolecules useful for human welfare.

Key words: Folkloric healthcare, Ethnomedicine, Buldhana district, Maharashtra

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1. Introduction

It is doubtless that India is one of the oldest, richest and has most diverse cultural traditions. Traditional folk medicine or ethnomedicine is the application of indigenous knowledge, skills and practices related to human healthcare. The indigenous knowledge about medicinal plants were earlier neglected in Indian scientific research. The knowledge about medicinal utilities such as *Rauwolfia serpentina* for hypertension and mental diseases, *Digitalis purpurea* for heart diseases, *Aloe vera* for burns, *Taxus baccata* for breast and uterine cancer, *Phyllanthus niruri* for liver ailment and jaundice and some others caused awareness amongst the scientific community. India has to review indigenous herbal medicine and bring it into the mainstream of national healthcare programme to alleviate the sufferings of large ever growing populace.

During the last few decades, discussions at various fora have clearly brought about a consensus on the need for recognizing and

rewarding the intellectual contributions of unknown rural and tribal men and women in relation to medicine and even other potentials. Deep understanding of the value of indigenous cultures and knowledge systems are in the better position for providing scientific information on account of awareness amongst the Indian scientists, anthropologists and researchers in medicine. In fact, the demand of natural, holistic, eco-friendly and herbal based therapeutics are increasing day by day.

In the last five decades, several small and large inventories of ethnomedicinal species in any Indian region or among only ethnic groups of India have been published on the subject (cf. Jain 1991; Jain and Srivastava, 2001). There have been very few revivals of the earlier works like the work of P.O. Bodding on the Santals (cf. Jain and Tarafder 1970). The Vidarbha region of the state of Maharashtra (India) acutely needs such ethnomedicinal forays to document its

unearthed treasure. Buldhana district is one of the districts of Vidarbha. Present authors paid attention during 2006-2008 on this line, the results of which are being reported in this communication.

Study Area

Vidarbha region of Maharashtra consists of eight districts, Buldhana being its one of north-western district. It includes 13 tehsils and extends between 19°51' and 21°17' north latitude and 75°57' and 76°59' east longitudes. It covers total area of 9745 sq.km. It is bordered with the Nimar district of Madhya Pradesh State of India on the north, whereas on the west it has common boundary with Jalgaon district of Khandesh region of Maharashtra (Map-I). The forests in the district are characterized by southern tropical dry deciduous type, which are further divided into subtypes such as superior teak forests, inferior teak forests, Anjan forests, Babul forests, mixed forests, Salai forests, grasslands and brushwood areas. *Tectona grandis*, species of *Acacia*, *Hardwickia binata*, species of *Aegle*, *Eugenia*, *Terminalia*, *Anogeissus*, *Salmalia*, *Lagerstroemia*, *Diospyros*, *Wrightia*, *Holarrhena*, *Dendracalamus*, etc. are common arboreal floral elements. Summer, rainy and winter and three seasons. May is the hottest month, whereas December is the coldest month in a year. In the day temperature rises upto 47°C in the northern part and 42°C in the southern part of the district. The air is usually dry and the relative humidity is usually higher in the south-west monsoon season. The average annual rainfall in the district is 796 mm. July is the rainiest month. The rainy days are mostly 47 in a year. The Purna and Penganga are the main rivers, apart from many tributaries (Anonymous 1976).



The People

The district is inhabited predominantly by the rural and primitive societies such as Basor, Bedar, Bahahi, Bhangi, Dohor, Doom, Ghasi, Katia, Kaikadi, Kori, besides artisan caste people e.g. Lohar, Sutar, Kumbhar, Beldar, Panchal, Pathrats, Ghisadi, Rangari, etc. They cohabit and communicate in the state language Marathi, apart from their own dialects. Agriculture is the main occupation in the area. Still they depend on forest produce and plants growing in other places for various daily necessities. They have their own way of life, beliefs and knowledge about local plant species from utility point of view. Many of these people have little access to modern facilities of healthcare and these are also beyond their financial reach. They have been traditionally employing their own indigenous medicaments.

Methodology

To establish rapport with few persons particularly the heads of various communities, villages and hamlets in the area under investigation was the first step. Contacts were developed during first few visits with the tribal and rural informants, experienced people ranging 50-65 years of age, medicine men/women, healers and farmers and farm labourers, etc. A special diary was prepared to take down the information with respect to plant species, part or product used, local plant name, disease treated, medicinal recipe and method of its administration, dosage, age and sex of patients treated. The information accrued was cross-checked on different visits to other localities. A discussion about a particular herb with different informants was held. Also, personal observations on different visits/occasions were made. Only the specific and reliable information verified with 5 to 8 informants has been taken into consideration.

Plant specimens or parts/products used were collected. Herbarium specimens were prepared using standard method as those of Jain and Rao (1977). Botanical identity was completed with the help of state, regional and district floras (Cooke 1958, Naik 1998, Patil 2003, Kshirsagar and Patil 2008, Patel

1968, Sharma, Karthikeyan and Singh 1996, Singh and Karthikeyan 2000a, 2000b, Diwakar and Sharma 2000). They have been deposited in the Post-Graduate Department of Botany, L.K.Dr.P.R.Ghogrey Science College, Dhule (M.S.), India. Botanical name, family name (in parenthesis), local plant name, voucher plant specimen number (in parenthesis) are given in order. Medicinal utility is then given separately under enumeration.

Enumeration

1. *Acacia leucophloea* (Roxb.) Willd. (Mimosaceae) Hiwwar (UPA205) : Fresh stem bark and leaves are extracted together. The extract is applied twice daily for 10-15 days or more to cure psoriasis.
2. *Aegle marmelos* (L.) Corr. (Rutaceae) Bel (UPA272) : 21 leaves are dipped in water overnight. 3-4 spoonful of this infusion administered orally at morning to regularize blood pressure and advised for 5-6 days.
3. *Aerva lanata* (L.) Juss. (Amaranthaceae) Pandhari-fuli (UPA27) : About 20 ml leaf extract and whey (1:2 ratio) is drunk daily once for 15 days or so to treat kidney stone. Tea is avoided during the period of treatment.
4. *Aloe vera* L. (Liliaceae) Korphad (UPA300): Pulp of leaf is wrapped in a betel leaf. It is warmed, cut into small pieces and consumed (about 5-6 gm each time) thrice daily for 3-4 days to cure whooping cough.
5. *Anisomeles indica* (L.) O.Kuentze (Lamiaceae) Uparsuri (UPA174): Roots are crushed and then decoction is prepared. About 20 ml of it is drunk once daily for 4-5 days as antipyretic.
6. *Annona squamosa* L. (Annonaceae) Sitaphal (UPA264) : Decoction of leaves is prepared after crushing them. Two spoonful of it is taken orally with a pinch of sugar daily once for three days to kill intestinal worms.
7. *Apluda mutica* L. (Poaceae) Shipi, Tikhadi (UPA75) : Fresh-leaves are dipped in water for 2-3 hours and then boiled and distilled. The oil thus obtained is used to massage over joints daily one for 15 days or more to treat rheumatism.
8. *Asparagus racemosus* Willd. (Liliaceae) Shatavari (UPA131) : Entire plants are dried and powdered. Five gm of powder is consumed at morning to overcome body weakness and to improve memory. It is advised for 15 days or more.
9. *Aspidopterys cordata* (Heyne ex Wall.) A. Juss. (Malpighiaceae) Jalki (UPA65) : A spoonful of root powder is mixed in a cup of milk and drunk daily for three consecutive days to check acidity.
10. *Barleria prionitis* L. (Acanthaceae) Kate-koranti (UPA207) : Leaves (3-4) are chewed once daily for 3-4 days to cure mouth ulcer.
11. *Biophytum sensitivum* (L.) DC. (Oxalidaceae) Lajalu (UPA281) : Few drops of leaf juice are added into eyes twice daily for 4-5 days to cure conjunctivitis.
12. *Butea monosperma* (Lamk.) Taub. (Fabaceae) Palas (UPA138) : A spoonful of flower extract is taken orally daily once for 3-4 days to improve urination.
13. *Cassine alberns* (Retz.) Kosterm. (Celastraceae) Bhutkes (UAP63) : Few drops of leaf extract are dropped into nose twice daily against head-ache till cure.
14. *Celosia argentea* L. (Amaranthaceae) Kurdu (UPA195) : About five gm of seed powder mixed in a cup of milk is drunk once daily for a week to cure kidney stone.
15. *Centella asiatica* (L.) Urb. (Apiaceae) Brahmi (UPA158) : Leaf paste is applied daily on head for a week or so as hair tonic for a fortnight.
16. *Chlorophytum borivilianum* Santapau & Fernand. (Liliaceae) Safed-musali (UPA97) : About 5 gm of powder of root-

- tubers mixed in milk is drunk before sleep at night as general body tonic for a fortnight.
17. *Cissampelos pareira* L. (Menispermaceae) Dhavala Vasu (JUPA323) : Some small slices of roots are wrapped in a betel leaf. It is consumed thrice a day for 7-8 days or more to combat hepatitis.
 18. *Citrullus colocynthis* (L.) Schrad. (Cucurbitaceae) Kadu-indrayan (UPA175) : A spoonful of leaf juice is drunk once daily for 15-20 days especially during post-delivery period to overcome general body weakness.
 19. *Cocculus hirsutus* (L.) Diels. (Menispermaceae) Vasani (UPA241) : Roots are debarked and paste is prepared. It is first cooked and then applied on tumor daily once until the tumor disappears.
 20. *Cordia dichotoma* (L.) Forst. f. (Boraginaceae) Bhokar (UPA105) : Stem bark powder is mixed in coconut oil. It is applied on burns daily till cure.
 21. *Crinum latifolium* L. (Amaryllidaceae) Jangli-kanda (UPA283) : Bulb along with its roots is made into paste. It is applied on body thrice daily for a week to cure eczema.
 22. *Cynodon dactylon* (L.) Pers. (Poaceae) Harli (UPA203) : Decoction is prepared from entire plants. About 10 ml of it is administered orally daily once for 5-8 days to reduce body heat.
 23. *Dolichandrone falcata* (Wall. ex DC.) Seem (Bignoniaceae) Medshing (UPA58) : Decoction prepared from crushed leaves is prepared. About 20 ml of it is drunk twice daily especially during post-delivery period to cure weakness.
 24. *Echinops echinatus* Roxb. (Asteraceae) Utkata (UPA210) : A spoonful of root powder dissolved in water and drunk at morning for 21 days to cure typhoid fever.
 25. *Ehretia aspera* Roxb. (Ehretiaceae) Lokhandi (UPA70) : Ash obtained from stem bark, roots and leaves is used daily as tooth-powder for 3-4 days. This helps cure tooth-ache, mouth-ulcer and to remove foul smell of mouth.
 26. *Enicostema axillare* (Lamk.) Raynal (Gentianaceae) Nay (UPA278) : Decoction of entire plants is prepared. About 20 ml of it is administered orally daily once for 8-15 days to cure kidney stone.
 27. *Euphorbia neriifolia* L. (Euphorbiaceae) Sabar-kand (UPA183) : Green fresh stem is first heated and then juice obtained by crushing and squeezing. A spoonful of juice is drunk once daily for three days against cough.
 28. *Ficus bengalensis* L. (Moraceae) Wad (UPA371) : The newly formed prop roots are extracted. A spoonful of extract is taken orally daily once for 7-8 days to increase milk.
 29. *Ficus religiosa* L. (Moraceae) Pimpal (UPA363) : Stem bark powder is homogenized with cow-ghee. It is applied on daily once legs or hands to reduce their stiffness.
 30. *Flacourtia indica* (Burm.f.) Merr. (Flacourtiaceae) Akhadi (UPA64) : A spoonful of dry fruit powder mixed in honey is consumed twice daily for a week to treat general body weakness.
 31. *Grewia flavesens* A. Juss. (Tiliaceae) Khadak-Chopdi (UPA20) : A spoonful of root powder mixed in 50 ml of whey is drunk daily once for seven days to treat piles. Consumption of spicy food is to be avoided.
 32. *Holarrhena pubescens* (Buch.-Ham.) Wall ex G. Don (Apocynaceae) Dudhakanda (UPA309) : Pieces of green fruits, about 5-10 gm daily twice for 15 days, consumed with bread during post-delivery period to increase milk.
 33. *Kalanchoe pinnata* (Lamk.) Pers. (Crassulaceae) Panfuti (UPA35) : Leaf extract and sugar cane or honey, one spoonful each, is consumed for seven days to treat kidney stone.
 34. *Kirganelia reticulata* (Poir.) Baill.

- (Euphorbiaceae) Karad-Kamuni (UPA165): Green fruits and leaves (1:1 ratio) about 5 gm with some jaggery consumed daily once for three days or more against rheumatism.
35. *Mangifera indica* L. (Anacardiaceae) Amba (UPA194) : Stem bark powder mixed in coconut oil is applied daily on wounds till cure.
 36. *Maytenus emarginatus* (Willd.) Ding Hou (Celastraceae) Yenkal (UPA81) : Tender leaves (5-6) are chewed once daily for 2-3 days as a remedy against mouth ulcer and tooth-ache.
 37. *Morinda pubescens* J.E. Sm. (Rubiaceae) Bardoi (UPA73) : A spoonful of stem bark powder mixed in a cup of whey is drunk daily once for 5-7 days to kill intestinal worms.
 38. *Moringa oleifera* Lamk. (Moringaceae) God-Shevga (UPA99) : Paste prepared from stem bark powder and its leaf juice is applied once daily on joints for a week to treat rheumatism.
 39. *Mucuna prurens* (L.) DC. (Fabaceae) Kach-kuiri (UPA188) : Fruit hairs are removed, powdered and mixed in jaggery. Pellets are prepared from it. Two pellets per day, are consumed for a week or so to kill intestinal worms.
 40. *Nymphaea pubescens* Willd. (Nymphaeaceae) Kamal (UPA37) : Five gm of seeds are powdered and mixed with honey. It is consumed daily to once as a remedy against paralysis till cure.
 41. *Ocimum americanum* L. (Lamiaceae) Ran-tulas (UPA322) : Seed powder is mixed in water. This infusion is applied on eyes twice a daily to cure eye infection for 3-4 days.
 42. *Phyllanthus amarus* Schumach & Thonn. (Euphorbiaceae) Bhui-awala (UPA96): Entire plants are dried and powdered. Powder is applied as tooth-powder twice daily for a week to treat tooth-ache and bleeding gums.
 43. *Plumeria alba* L. (Apocynaceae) Chafa (UPA249): Flowers are cut into pieces, deeped in coconut oil and then made into paste. This paste is applied twice daily to cure scabies and ringworm till cure.
 44. *Pterocarpus marsupium* Roxb. (Fabaceae) Ragat-bel (UPA93) : About 25 ml of decoction of stem bark is administered orally twice daily for three or more days to increase blood circulation.
 45. *Semecarpus anacardium* L.f. (Anacardiaceae) Biba (UPA43) : About 25 ml of decoction prepared from fresh stem bark is mixed in equal quantity of milk and a pinch of sugar. It is drunk once daily for three consecutive days to treat rheumatism.
 46. *Solanum virginianum* L. (Solanaceae) Ran-wange, Bhui-ringi (UPA316) : Extract of fruit juice is applied once daily for three days to reduce eye burning.
 47. *Spermadictyon suaveolens* Roxb. (Rubiaceae) Padri (UPA57) : Stem bark ash is applied directly on wounds daily once to check itching.
 48. *Terminalia arjuna* (Roxb.) Wight & Arn. (Combretaceae) Arjun-sadada (UPA3543) : A spoonful of stem bark powder is homogenized with honey. Petlets are prepared. A pellet a day is consumed at morning to cure wounds for 5-8 days.
 49. *Thespesia lampas* (Cav.) Dalz. & Gibs. (Malvaceae) Ranbhendi (UAP338) : Decoction is prepared using crushed leaves. Two spoonful of it daily once is administered orally for 7-8 days to cure piles.
 50. *Trachyspermum ammi* (L.) Sprague (Apiaceae) Owa (UPA162) : Cigar filled with seeds is smoked twice daily for few days to cure cough.
 51. *Tridax procumbens* L. (Asteraceae) Kambarmodi, Tukdi (UPA237) : Leaf extract is mixed in cow ghee or honey (1:1 ratio). About 2-3 spoonful of it is drunk daily once for 3-4 days to check passing of blood through urination.
 52. *Vitex negundo* L. (Verbenaceae)

- Nirgudi (UPA179): Paste is prepared from leaves of this plant and those of *Azadirachta indica* A. Juss. and *Pongamia pinnata* (L.) Pierre (in 1:1:1 ratio). It is applied on joints daily once for 7-10 days to cure rheumatism and also advised similarly for sprains.
53. *Watakaka volubilis* (L.f.) Stapf. (Asclepiadaceae) Kawali (UPA91): Root pieces are dipped in a cup of tea for about 30 minutes. It is then drunk to get relief from pains due to piles.
54. *Withania somnifera* (L.) Dunal (Solanaceae) Askand, Ashwagandha (UPA340) : Paste is prepared using root powder, milk, white of an egg and some edible oil. It is used twice daily for body massage to cure paralysis. It is advised till cure.
55. *Woodfordia fruticosa* (L.) Kurz. (Lythraceae) Dhayti (UPA141): Two to four spoonful of flower extract is administered orally daily once for 4-6 days to improve irregular urination.

2. Results and Discussion

During our field studies, we documented plant species as employed by the local people of Buldhana district (Maharashtra). This work is focused on human medicinal plant uses. These are analysed and discussed in the following.

1. Botanical analysis : This communication includes ethnomedicinal claims of total 55 ethnotaxa belonging 54 genera and 37 angiospermic families. Majority of these, 49 species belonging to 48 genera and 34 families, are dicotyledonous angiosperms. Only 06 species belonging to 06 genera and three families are monocotyledonous angiosperms. It is worth to note that 40 species are exclusively wild, 14 species cultivated and 06 species are found wild and under cultivation as well. Trees (20 species) provide major share of ethnomedicinal recipes as the herbaceous taxa (22 species), whereas shrubs (06 species) and lianas and vines (07 species) are less associated with the ethnomedicine.

2. Use reports, parts used, recipes and diseases : This paper includes total 61 use-reports. Of these, leaves are most commonly used (19 use-reports) in the area under study. Similarly, stem-bark and roots are widely employed (11 and 10 use-reports respectively). The other parts used are fruits (05 use-reports), flowers (03 use-reports), seeds (04 use-reports), and rarely stem (01 use report) in the area. Entire plants (04 use-reports) are also noted for preparing ethnomedicinal recipes. The people of the area administer their medicine in the form of juice, extract, infusion, decoction, powder, paste, ash, oil, pulp, etc. Some are consumed, chewed or smoked directly. Recipes in the form of powder are commonly associated with 15 use-reports. Extract and decoction find place in 08 use-reports, whereas paste in 07 use-reports. Other recipes are rarely used. All these plant parts/products and various recipes are beneficial in the treatment of nearly 40 diseases or disorders. Some of the remedies are salutiferous in nature. They are used like adaptogenic drugs e.g. ginseng, for better health. They are useful for particular health aspect which is not a disease in itself or to enhance healthiness e.g. *Asparagus racemosus*, *Chlorophytum borivillianum*, *Holarrhena pubescens*, *Centella asiatica*, *Ficus benghalensis*, *Citrullus colocynthis*, *Flacourtia indica*, etc. Similar observations are made (Patil and Patil 2001, Patil 2004, Reddy *et al.* 1998) from other parts of Indian region. It is notable that few ethnotaxa are useful for treating more than single disease condition, e.g. *Asparagus racemosus* (body weakness and to improve memory), *Ehretia aspera* (tooth-ache, mouth ulcer, foul smell of mouth), *Maytenus emarginatus* (mouth ulcer and tooth-ache) and *Phyllanthus amarus* (toothache and bleeding gums). Some plant species are used by directly (without any preparation), for example, *B.prionitis* (simply chewing leaves), *Cissampelos pareira* (consumption of root pieces), *Holarrhena pubescens* (consumption of

- fruit), *Kirganelia reticulata* (consumption of fruits and leaves) and *Maytanus emarginata* (chewing of leaves).
3. Doctrine of signature : According to this doctrine, the inner qualities and the healing powers of the herbs might be divulged by external signs (cf. Arber 1999; Patil 2004). Ethnotaxa of the present account can be focused from viewpoint of the said doctrine. *Holarrhena pubescens* yields white latex. It is used to increase milk. *Pterocarpus margupium* has red bark, simulating in colour to blood, is used to increase blood circulation. Patil (2004, 2005, 2007) pointed out many such ethnotaxa from Indian region and also some classic medicinally useful taxa employed in organized system of medicine like Ayurveda and other modern medicine. Such studies from other parts of the world may help reveal medicinal significance of plant species employed there.
 4. Domestic substances: While preparing various medicinal recipes, the people of Buldhana district also use some domestic substances such as cow-ghee, whey, honey, jaggery, sugar, coconut-oil, egg and also a betel leaf. These probably render the recipe acceptable by the sufferers or increase efficacy of the drug used. They may also act as preservation for a while. Studies on this line, however, are still desirable.
 5. Common complaints: The area was combed ethnomedicinally in all seasons. As many as 40 different complaints about human health are noticed in this endeavour. It is worth to note further that few diseases e.g. kidney-stone, various disorders of urination and rheumatism are more prevalent in the study area. The former two complaints appear to be due quality of drinking water, which is usually fetched from nature usually without any treatment in tribal/rural region.
 6. Local plant names: Many categories have been established for coining of plant names (cf. Jain 1963; Patil 1998; Pawar and Patil 1999; Patil and Patil 2000). Few names also from the present study area

appear worth mentioning, for example, (i) *Pterocarpus massupium*, called Regat-bel, regat mean blood. Its use is reflected in the remedy i.e. blood circulation. Other local plant names are usually after the qualities or characters of useful parts. e.g. (i) *Chlorophytun borivillianum*, called safed-musali, meaning pestle-like white root tubers, (ii) *Holarrhena pubescens*, known as Dudhkanda, meaning milk yielding part (elongated follicles in this case).

3. Conclusion

The present results are encouraging to take more intensive investigation in other parts of Buldhana district. It may help compile a remarkable catalogue of ethnomedicine. This and future bio-prospection projects will lead to the development of new drugs. Such attempts may help rescue traditional knowledge and will be useful tool to fight against currently alarming acculturation. It may also aid in constituting necessary information to be collected or an example of wise environmental management and understanding.

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References Cited

- Anonymous. Gazetteer of India, Maharashtra State Gazetteers, Buldhana District, Bombay : Gazetteers Department, Govt. of Maharashtra, (1976).
- Cooke, T. Flora of The Presidency of Bombay, Vol.1-III. Calcutta : B.S.I. (1958).
- Diwakar, P.G. and Sharma, B.D. Flora of Buldhana District (Maharashtra), Calcutta : B.S.I., (2000).
- Jain, S.K. and Rao, R.R. Handbook of field and Herbarium Methods. New Delhi : Today and Tomorrow (1977).
- Jain, S.K. and Srivastava, S. "Indian ethnobotanical literature in last two

- decades – A graphic review and future directions". *Ethnobotany* 13 (2001):1-8.
- Jain, S.K. and Tarafder, C.R. "Medicinal plantlore of the Santals – A Review of P.O. Bodding's work". *Econ.Bot.* 24 (1970): 241-278.
- Jain, S.K. Dictionary of Indian Folk medicine and Ethnobotany. New Delhi : Deep Publications, (1991).
- Jain, S.K. "The origin and utility of some vernacular plant names". *Proc.Nat.Acad.Sci.* B33(IV) (1963) :525-530.
- Kshirsagar, S.R. and Patil, D.A. Flora of Jalgaon District (Maharashtra). Dehradun : Bishen Singh Mahendra Pal Singh, (2008).
- Naik, V.N. Flora of Marathwada, Vol.I-II. Aurangabad : Amrut Prakashan, (1999).
- Patel, R.I. Forest Flora of Melghat. Dehradun : Bishen Singh Mahendra Pal Singh, (1968).
- Patil, D.A. Flora of Dhule and Nandurbar Districts (Maharashtra). Dehradun : Bishen Singh Mahendra Pal Singh, (2003).
- Patil, D.A. "Vernacular names : Their origin and utility in Dhule district (Maharashtra)". *Ethnobotany* 10 (1998):130-132.
- Patil, M.V. and Patil, D.A. "Bases and utility of vernacular plant names in Nasik district (Maharashtra)". *J.Swamy Bot.Cl.* 17(3-4) (2000) : 83-85.
- Pawar, Shubhangi and Patil, D.A. "The Origin and utility of vernacular plant name in Khandesh region of Maharashtra". *J.Swamy Bot.Cl.* 17(1999):43-47.
- Sharma, B.D., Karthikeyan, S. and Singh, N.P. "Flora of Maharashtra State : Monocotyledons". Calcutta : B.S.I., (1998).
- Singh, N.P. and Karthikeyan, S. Flora of Maharashtra State : Dicotyledons, Vol.II. Calcutta : B.S.I., (2006b).
- Singh, N.P. and Karthikeyan, S. Flora of Maharashtra State : Dicotyledons, Vol-I. Calcutta:B.S.I.(2000a).