

Traditional Uses of *Abrus precatorius* L.

Chandrakumar Patle¹, Harshwardhan Khobragade²

¹Department of Botany, Dharampeth M P Deo Memorial Science College, Nagpur, Maharashtra

²Department of Botany, Tai Golwalkar Mahavidyalaya, Ramtek, Dist- Nagpur, Maharashtra

Email address: ckpatle@gmail.com

Abstract— *Abrus precatorius* L. is the plant species belonging to family Leguminosae (Fabaceae). Data analysis indicates that, this plant species is traditionally used for the treatment of about 50 diseases and ailments.

Keywords— *Abrus precatorius*, Traditional use.

I. INTRODUCTION

Abrus precatorius L. is the plant species belonging to family Leguminosae (Fabaceae). It is twiner, perennial, Leaves up to 8-12 cm long; leaflets oblong or elliptic- oblong, glabrous above, hairy beneath. Flowers are pinkish- purple, fading white in racemes. Pods are two to four cm long, linear oblong, beaked. Seeds, 3-5, ellipsoid, bright scarlet with a black spot. Fls. & Frts.: August – March.



TABLE 1.

Sr No	Name of Country	No of records
1	Ethiopia	1
2	Nigeria	1
3	India	50*

*Assam (1), Chhattisgarh (1), Gujrat (1), Himachal Pradesh (1), Jammu and Kashmir (1), Jharkhand (1), Karnataka (1), Kerala (1), Sikkim (1), Tripura (1), Uttar Pradesh (1), West Bengal (1), Uttrakhand (2), Madhya Pradesh (4), Rajasthan (4), Andhra Pradesh (5), Orissa (5), Maharashtra (8) and Tamil Nadu (10).



The present review is on the basis of total 58 research papers in which traditional medicinal plant *Abrus precatorius* L. was reported as traditional medicine in India as well as from Nigeria and Ethiopia (Table 1). This plant species was reported from different parts of India for various types of diseases and ailments. The detail is given in the following paragraphs.

Abdominal Pain: Tribal and Non tribal medicine men of Tripura state give fresh roots with betel leaf to patients to treat abdominal pain (Majumdar *et al*, 2006).

Abortion: People of Sekhawati region of Rajasthan used small quantity of seed powder for abortion (Katewa and Galav, 2005). In Southern Rajasthan seeds taken for 2 days (Meena and Yadao, 2010). People of lower foot hills of Himachal Pradesh also used for the same purpose (Prakash and Aggarwal, 2010).

Ammenorrhagia: For the treatment of Ammenorrhagia seed powder is taken with water daily in the morning for seven days by Banjara tribe of Yavatmal district of Maharashtra (Bhogaonkar and Kadam, 2006).

Antiseptic: Birhore tribes of Jharkhand used root paste as antiseptic (Mairh, 2010).

Asthma: Fresh or dried leaves eaten by people of Akole tahsil of Ahmednagar District (Khyade, 2010). Jaunsari tribe of Garhwal Himalaya, Utranchal used leaves, seed and root decoction to treat asthma (Bhatt and Negi, 2006). Leaves

reported from Chatara block of Sonebhadra district, Uttar Pradesh by Singh (2010).

Blood purification: Root, seed and leaves used for blood purification by locals of Samba district of Jammu and Kashmir (Bhellum and Singh, 2012). Concentrated seed extract is taken reported from Mokhada, District Thane (Sonawane *et al*, 2012).

Bronchitis: Seed powder is given in small quantity to reduce pain due to asthma (Rout *et al*, 2009).

Cold and Colic: To relieve from cold, pounded leaves are used by Malamalar tribe of Parambikulam wild life sanctuary Kerala, (Yesodharan and Sujana, 2007).

Conception: People of Chandaka Denuded forest patches of Bhubaneswar Orissa used root extract with the root extract of 'satawar' (*Asparagus racemosus* Willd.) and plant of Nirmuli (*Cuscuta reflexa* Roxb.) one tsp, thrice a day, for three days after menstruation to check conception (Behra *et al*, 2008).

Conjunctivitis: Leaf decoction reported from Katei baba sacred grove and nearby area of Adhalwadi from Akole taluka Ahmednagar, Maharashtra for the treatment of Conjunctivitis (Waghchaure *et al*, 2011).

Contraceptive: Malasar tribals of Coimbatore district of Tamil Nadu used seeds as contraceptive (Venkatswamy, 2010). Murthy (2012) also reported seeds as natural contraceptive.

Cough: Tribals of Nimasar region of Madhya Pradesh used roots for the treatment of cough (Ray *et al*, 2011). Mali (2012) reported from Peth and Trimbakeshwar of Nasik district (MS), roots, leaves and seeds used for curing of throat and dry cough. Singh (2010) also reported leaves for the same from Chatara block of Sonebhadra district of Uttar Pradesh. Joshi and Tyagi (2011) also reported from Himalayan region.

Diarrhea: Mukesh Kumar (2014) reported fruits given with fodder to animals to treat diarrhea from Khordha district of Odisha.

Diabetes: Leaves and seeds reported from Himalayan region for the treatment of diabetes (Joshi & Tyagi, 2011).

Dysentery: Root paste mixed with cow milk and given to treat dysentery by people of Shrikakulam district of Andhra Pradesh (Rao & Shreeramlu, 1985).

Exzema: Seed paste is applied to cure eczema by Alagarkoli hills reserve forest of Tamil Nadu (Ganeshan *et al*, 2007-2008).

Eye Disease: Leaf decoction is used to wash eyes early in the morning for one month to cure poor eyesight (Tirkey, 2006). Reddy *et al* (2011) reported root extract for the treatment of conjunctive and irritation of eye from Sheshachal hill range of Andhra Pradesh.

Fever: Leaf used by People of Chatara block of Sonebhadra district of Uttar Pradesh for the treatment of fever (Singh, 2010). Dey *et al* (2010) reported for the same from Tribals of Ajoydha hills region Purulia district of West Bengal.

Hair fall: Murthy (2012) reported that seed powder is applied by Gond people of Adilabad district of Andhra Pradesh to reduce hair fall and to improve hair growth. Malasar tribals of Coimbatore district of Tamil Nadu used seed as hair tonic (Venkatswamy, 2010).

Headache: Root paste is applied on forehead to get relief from headache by Birhore tribes of Jharkhand (Mairh, 2010).

Hydrophobia: In Madhya Pradesh of Betul district, Seeds with jaggery prescribed in treatment of Hydrophobia (Jain *et al*, 2010).

Indigestion: Seed decoction is taken orally to clean the stomach during indigestion and food poisoning by People of Udaigiri forest in Eastern Ghat of Odisha (Shadangi *et al*, 2012).

Intestinal worms: Tribes of Bijargarh of West Nimar district of Madhya Pradesh used seeds in treatment of worms (Mahajan, 2007).

Joint pain: Warmed seed paste is applied over the affected joints by people of Kalakad Mundanthurai Tiger reserve, Western Ghats of Tamil Nadu (Sutha *et al*, 2010). For Sciatica, Stiffness of shoulder joints and paralysis seed paste is applied by villagers in Southern districts of Taminl Nadu (Rajendran *et a*, 2008).

Jaundice: Irula tribe of Thirumurthi Hill of Western Ghats, Tamil Nadu used root paste in Jaundice (Vijayalakshmi *et al*, 2013). Natarajan *et al* (2012) reported Malayali tribe of Kalrayan hill; Tamil Nadu used root paste for the same.

Kidney Stone: Leaf juice taken early morning for 15 days for kidney stone by indigenous folklore of Nizamabad district of Andhra Pradesh (Vijaygiri & Sharma, 2010).

Laryngitis: Fresh leaves crushed in Til (*Sesamum indicum*) oil and extract is mashed on the throat to relieve laryngitis by people of Karanji Ghat area of Patharadi tahsil in Ahmednagar district of Maharashtra (Salave *et al*, 2011).

Leucoderma: Root paste with rhizome of *Curcuma longa* taken to treat leucoderma until cure by Paliyars aboriginal communities in Virudhunagar district of Tamil Nadu (Maria *et al*, 2014). In Rajasthan, Traditional medicinal practitioners used seed paste and roots of *Plumbago zeylanica* for the treatment of leucoderma (Sharna & Kumar, 2007). Mairh (2010) reported root paste used by Birhore tribe of Jharkhand. Venkataswamy (2010) reported seed paste used by Malasar tribals of Coimbatore district of Tamil Nadu while Prakash and Agarwal (2010) reported root paste from lower foot hills of Himalchal Pradesh.

Menstrual Diseases: Birhore tribe of Jharkhand used root paste in treatment of menstrual diseases (Mairh, 2010).

Mouth Ulcer: People of southern Rajasthan chewed leaves in mouth ulcer (Meena & Yadao). Negi *et al* (2012) reported leaf or seed of red variety chewed to help cure tongue or mouth ulcer. Punjani (2002) also reported for mouth ulcer treatment from Aravalli hills in North Gujarat.

Nervous Disorder: Tribals of Ajoydha hills region of Purulia district of West Bengal used roots in nervous disorder (Dey *et al*, 2010). Rajendran *et al* (2008) also reported for nervous system disorder used by villagers in southern districts of Tamin Nadu.

Paralysis: Rajendran *et al* (2008) reported seed locally applied in paralysis.

Poisonous bite: Dried seed powder is used as antidote for poisonous bite by medicine men of Tripura state (Majumdar *et al*, 2006). For any poisonous bite people of Sirumalai hills of Dindugul district, Western Ghats, Tami Nadu used fresh roots with seeds in the form of paste and consumed with water or cow milk for five to seven days (Vikneshwaran, 2008).

Prevent Implantation: A teaspoon of decoction or root taken internally with honey for two days to prevent implantation by Paliyars aboriginal communities in Virudhunagar district of Tamil Nadu (Maria *et al*, 2014).

Rheumatism: Punjani (2002) published data from Arawali hills of North Gujarat, people of the study area used leaf paste with edible oil on painful part of the body. People also planted for ornamental purpose in their garden. Tribals and non tribals of Tripura state taken root powder with one glass of cow milk before going to bed for three days to patients suffering from rheumatic pain, joints or muscular pain (Majumdar *et al*, 2006). Purkayashtha *et al* (2007) also reported root paste for rheumatic pain.

Sciatica: In Chatara block of Sonebhadra district of Uttar Pradesh people used seeds in treatment of sciatica (Singh, 2010). Rajendran *et al* (2008) also reported seeds for the same.

Scorpion bite: Harney (2013) reported root used in scorpion bite. Singh (2010) also reported for the same from Chatara block of Sonebhadra district of Uttar Pradesh.

Sedative: Small amount of seed powder used as sedative in Sekhawati region of Rajasthan (Katewa & Galav, 2005).

Skin Disease: Tribals of Ajoydha hills of Purulia district of West Bengal used root on skin infection (Dey *et al*, 2010). Iyer reported as seeds pounded with water and paste is applied on various skin diseases by tribals of India. Yadav *et al* (2012) also reported same from Rewa district of Madhya Pradesh. Prakash and Aggarwal (2010) reported root paste used by people on skin infection from Lower foot hills of Himachal Pradesh.

Snake bite: Root paste is applied as antidote against snake bite by tribals of Betul district of Madhya Pradesh (Jain *et al*, 2010).

Spermatogenesis: Indigenous people of Nizamabad district of Andhra Pradesh used four to five leaves and small root piece of taken orally for a week time in spermatogenesis (Vijaygiri & Sharma, 2010).

Stomach trouble: Seed decoction is used by Birhore tribes of Jharkhand in stomach trouble (Mairh, 2010).

Strengths: Seed powder of *Annona squamosa*, *Mucuna pruriens* and *Abrus precatorius* is given to men for strength in Gond tribe of Bhandara district of Maharashtra (Gupta *et al*, 2010).

Swellings: Root decoction is taken internally by tribals of Bidar district of Karnataka as remedy for swellings of legs and hands (Prashyantkumar and Vidyasagar, 2006). From Maharashtra of Kadegaon Sangali, Jadhav (2016) reported seed paste for the same.

Throat pain: Fruits chewed or fresh root juice given orally during throat pain by Limboo tribe in South West of Khangchendzonga biosphere Reserve Sikkim (Badola Pradhan, 2013). While Punjani (2002) reported from Arawali hills in North Gujarat as leaves used in case of hoarseness or sore throat. Rao & Shreeramalu (1985) and Jadhav (2016) also reported leaves for the same from Shrikakulam district of Andhra Pradesh and Kadegaon Sangali of Maharashtra respectively.

Toothache: People of Ivanur Panchayat in Cuddalore district of Tamil Nadu used leaves in toothache.

Poisonous Plant: In some places of Lower foot hills of Himachal Pradesh, it is considered as poisonous plant and kept away from households (Prakash and Aggarwal, 2010).

II. CONCLUSION

Data analysis on the basis of the present review shows that, *Abrus precatorius* L dominantly used as traditional medicine to cure ailments in Tamil Nadu followed by Maharashtra, Andhra Pradesh and other states of India (Table 1). This plant species is also used in veterinary practices throughout the country. Present review indicates that *Abrus precatorius* L is distributed throughout the India and other countries and utilized as traditional medicine since long time. About 50 diseases cured by this plant species by local and tribal people.

ACKNOWLEDGEMENTS

Authors are thankful to Dr Akhilesh V. Peshwe, Principal, Dharampeth M P Deo Memorial Science College, Nagpur for constant encouragement and inspiration. Authors are thankful to Dr. Rajesh Singru, Principal, Tai Golwalkar Mahavidyalaya, Ramtek for moral support and help. Authors are thankful to Dr Pitambar Humane, Head Department of Botany, Dharampeth M P Deo Memorial Science College, Nagpur for constant encouragement, valuable guidance and suggestions.

REFERENCES

1. Agize M, Demissew S & Asfaw Z, Ethnobotany of Medicinal plants in Loma and Gena Bosa districts (Woredas) of Dawro Zone, Southern Ethiopia, *Topclass J of Herbal Medicine*, 2 (9) (2013) 194-212.
2. Badola HK & Pradhan BK, Plants used in healthcare practices by Limboo tribe in South- West of Khangchendzonga Biosphere Reserve, Sikkim, India, *Indian J of Traditional Knowledge*, 12 (3) (2013) 355-369.
3. Behra KK, Sahoo S & Patra S, Floristic and medicinal uses of some plants of Chandaka denudated forest patches of Bhubaneswar, Orissa, India, *Ethnobotanical leaflets*, 12 (2008) 1043-1053.
4. Bhatta VP & Negi GCS, Ethnomedicinal plant resources of Jaunsari tribe of Garhwal Himalaya, Uttaranchal, *Indian J of Traditional Knowledge*, 5 (3) (2006) 331-335.
5. Bhellum BL & Singh S, Ethnomedicinal plants of District Samba of Jammu and Kashmir State (List-II), *International J of Scientific Publication*, 2 (9)(2012) 1-8.
6. Bhogaonkar PY & Kadam VN, Ethnopharmacology of Banjara tribe of Umardhed taluka, district Yavatmal, Maharashtra for reproductive disorders, *Indian J of Traditional Knowledge*, 5 (3) (2006) 336-341.
7. Dey A & De JN, A Survey of ethnomedicinal plants used by the tribals of Ajoydha Hill region, Puruliya district, India, *Americal- Eurasian J of Sustainable Agriculture*, 4 (3) (2010) 280-290.
8. Dinesh V & Sharma PP, Traditional uses of plants in indigenous folklore of Nizamabad district, Andhra Pradesh, India, *Ethnobotanical leaflets*, 14 (2010) 29-45.
9. Ganeshan S, Pandi NR & Banumathy N, Ethnomedicinal Survey of Alagarkoil Hills (Reserved forest), Tamil Nadu, India, *eJournalof Indian Medicine*, 1 (2007-2008) 1-18.
10. Gupta R, Vairale MG, Deshmukh RR, Chaudhary PR & Wate SR, Ethnomedicinal uses of some plants used by Gond tribe of Bhandara district, Maharashtra, *Indian J of Traditional Knowledge*, 9 (4) (2010) 713-717.
11. Harney NV, Ethnomedicinal plants diversity of Bhadravati Tahsil of Chandrapur District, Maharashtra, India, *International J of Scientific and Research Publications*, 3 (8) (2013) 1-6.
12. Iyer SR, Ethnobotany of certain medicinal plants used by tribals of India against skin disease, *Ancient Science of Life*, XI (3 & 4) (1992) 143-152.

13. Jadhav RR, Ethnobotanical and Ethnomedicinal survey of Kadegaon Tahsil, Sangli (Maharashtra) India, *Journal of Medicinal Plants Studies*, 4 (1) (2016) 11-14.
14. Jain SC, Jain R & Singh R, Ethnobotanical Survey of Sariska and Siliserh Regions from Alwar district of Rajasthan, India, *Ethnobotanical leaflets*, 13 (2009) 171-188.
15. Jain SK, Notable foreign medicinal uses for some plants of Indian tradition, *Indian J of Traditional Knowledge*, 2 (4) (2003) 321-332.
16. Jain SP, Singh SC, Srivastava S, Singh J, Mishra NP & Prakash A, Hitherto unreported ethnomedicinal uses of plants of Betul district of Madhya Pradesh, *Indian J of Traditional Knowledge*, 9 (3) (2010) 522-525.
17. Joshi B & Tyagi V, Traditional knowledge and utilization of medicinal plants of Himachal region, *Nature and Science*, 9 (5) (2011) 1-6.
18. Katewa SS & Galav PK, Traditional herbal medicines from Shekhawati region of Rajasthan, *Indian J of Traditional Knowledge*, 4 (3) (2005) 237-245.
19. Kjyade MS, Awasarkar UD, Deshmukh RR & Petkar AS, Ethnobotanical reports about few Important diseases from Akole Tehsil of Ahmednagar District (MS) India, *Asian J Exp. Biol. Sci.*, 1 (2) (2010) 393-403.
20. Kumar M, Butt TA, Hussaini SA, Kumar K, Khan H, Aminuddin & Samiulla L, Ethnomedies in the Khordha forest division of Khordha district Odisha, India, *International J of Current Microbiology and Applied Sciences*, 3 (1) (2014) 274-280.
21. Mahajan SK, Traditional herbal remedies among the tribes of Bijararh of West Nimar district, Madhya Pradesh, *Indian J of Traditional Knowledge*, 6 (2) (2007) 375-377.
22. Mairh AK, Mishra PK, Kumar J & Mairh A, Traditional botanical wisdom of Birhore tribes of Jharkhand, *Indian J of Traditional Knowledge*, 9 (3) (2010) 467-470.
23. Majumdar K, Saha R, Datta BK & Bhakta T, Medicinal plants prescribed by different tribal and non-tribal medicine men of Tripura state, 5 (4) (2006) 559-562.
24. Mali PR, Ethnobotanical studies of peth and trimbakeshwar district Nashik, Maharashtra, India, *Trends in Life Sciences*, 1 (4) (2012) 35-37.
25. Manikandan S, Ethnomedicinal Flora of Ivanur Panchayat in Cuddalore District, Tamil Nadu, India, *International J of Research in Plant Sciece*, 3 (2) (2013) 39-46.
26. Maria francis Jeffrey BN, Arnon S & Mehalingam P, An ethnobotanical study of medicinal plants used by the *Paliyars* aboriginal community in Virudhunagar district, Tamil Nadu, India, *Indian J of Traditional Knowledge*, 13 (3) (2014) 613-618.
27. Meena KL & Yadav BL, Some ethnomedicinal plants of Southern Rajasthan, *Indian J of Traditional Knowledge*, 9 (1) (2010) 169-172.
28. Meena KL & Yadav BL, Some traditional ethnomedicinal plants of southern Rajasthan, *Indian J of Traditional Knowledge*, 9 (3) (2010) 471-474.
29. Mohapatra SP, Prusty GB & Sahoo HP, Ethnomedicinal observations among forest dwellers of the Daitari range of Hills of Orissa, India, *Ethnobotanical leaflets*, 12 (2008) 1116-1123.
30. Murthy EN, Ethno medicinal plants used by gond of Adilabad district, Andhra Pradesh, India, *International Journal of Pharmacy & Life Science*, 3 (10) (2012) 2034-2043.
31. Natarajan V, Anbazhagan M & Rajendran R, Studies on ethnomedicinal plants used by the Malayali tribe of Kalrayan Hill, Tamil Nadu state, *Research in Plant Biology*, 2 (1) (2012) 15-21.
32. Negi RS, Pareek A, MEnghani E & Ojha CK, Ethno-medicinal Studies at Sanchor and Mount ABU regions, located in Sirohi district of Rajasthan, *Cibtech J of Pharmaceutical Sciences*, 1 (1) (2012) 14-21.
33. Padal SB, Chandrasekhar P & Vijayakumar Y, Ethnomedicinal uses of some Fabaceae Family plants of Narsipatnam division, Visakhapatnam district, Andhra Pradesh, India, *International J of Innovative research and Development*, 2 (6) (2013) 808-822.
34. Pradeep Kumar R, Ethnomedicinal plants used for oral health care in India, *International J of Herbal Medicine*, 2 (1) (2014) 81-87.
35. Prakash V & Aggarwal A, Traditional uses of ethnomedicinal plants of lower foot- hills of Himachal Pradesh- I, *Indian J of Traditional Knowledge*, 9 (3) (2010) 519-521.
36. Prashantkumar P & Vidyasagar GM, Documentation of traditional knowledge on medicinal plants of Bidar district, Karnataka, *Indian J of Traditional Knowledge*, 5 (3) (2006) 295-299.
37. Punjani BI, Ethnobotanical aspects of some plants of Aravali Hills in North Gujrat, *Ancient Science of Life*, XXI (4) (2002) 268-280.
38. Purkayastha J, Dutta M & Nath SC, Ethnomedicinal plants from Dibru-Saikhowa biosphere reserve, Assam, *Indian J of Traditional Knowledge*, 6 (3) (2007) 477-480.
39. Rajendran K, Balaji P & Basu MJ, Medicinal plants and their utilization by villagers in southern districts of Tamil Nadu, *Indian J of Traditional Knowledge*, 7 (3) (2008) 417-420.
40. Rao KP & Sreeramulu SH, Ethnobotany of Selected medicinal plants of Srikakulam District, Andhra Pradesh, *Ancient Science of Life*, IV (4) (1985) 238-244.
41. Ray S, Sheikh M & Mishra S, Ethnomedicinal plants used by tribals of East Nimar region, Madhya Pradesh, *Indian J of Traditional Knowledge*, 10 (2) (2011) 367-371.
42. Reddy SR, Redd AM, Philomina NS & Yasodamma N, Ethnobotanical survey of Sheshachala Hill range of Kadapa district, Andhra Pradesh, India, *Indian J of Fundamental and Applied Life Sciences*, 1 (4) (2011) 324-329.
43. Rout SD, Panda T & Mishra N, Ethno- medicinal plants used to cure different diseases by Tribals of Mayrbhanj district of North Orissa, *Ethno- Med*, 3 (1) (2009) 27-32.
44. Salave AP, Reddy PG & Diwakar PG, Some unreported ethnobotanical uses from Karanji Ghat areas of Pathardi tahsil in Ahmednagar district (M.S.) India, *International J of Applied Biology and Pharmaceutical technology*, 2 (4) (2011) 240-245.
45. Shadangi AK, Panda RP & Patra AK, Ethnobotanical studies of wild flora of G. Udaygiri forest in Eastern Ghat, Odisha, *IOSR J of Environmental Science, Toxicology and Food Technology*, 2 (2) (2012) 25-37.
46. Sharma LK & Kumar A, Traditional medicinal practices of Rajasthan, *Indian J of Traditional Knowledge*, 6 (3) (2007) 531-533.
47. Singh PK, Kumar V & Tiwari RK, Medico- Ethnobotany of Charara Block of District Sonebhadra, Uttar Pradesh, India, *Advances in Biological Research*, 4 (1) (2010) 65-80.
48. Soladoye MO, Adetaya MO, Chukwama EC & Adetunji AN, Ethnobotanical Survey of plants used in the treatment of Haemorrhoids in South- Western Nigeria, 1 (4) (2010) 1-15.
49. Sonawane VB, Saler RS, Sonawane MD & Kadam VB, Ethnobotanical studies of Mokhada, District Thane, *International J of Life Sciences & Pharma Research*, 2 (2) (2012) 88- 93.
50. Sutha S, Mohan VR, Kumaresan S, Murugan C & Athiperumalsami T, Ethnomedicinal plants used by the tribals of Kalakad- Mundanthurai Tiger Reserve (KMTR), Western Ghats, Tamil Nadu for the treatment of rheumatism, *Indian J of Traditional Knowledge*, 9 (3) (2010) 502-509.
51. Tirkey A, Some ethnomedicinal plants of family – Fabaceae of Chhattisgarh state, *Indian J of Traditional Knowledge*, 5 (4) (2006) 551-553.
52. Venkataswamy RV, Mubarak HM, Doss A, Ravi TK & Sukumar M, Ethnobotanical Study of medicinal plants used by Malasar tribals in Coimbatore district of Tamil Nadu (Souuth India), *Asian J. Exp. Biol. Sci.*, 1 (2) (2010) 387-392.
53. Vijayalakshmi N, Anbazhagan M & Arumugam K, Studies on Ethno-medicinal plants used by the Irulas tribe of Thirumurthi Hill of Western Ghats, Tamil Nadu, India, *International J of Research in Plants Sciences*, 4 (1) (2014) 8-12.
54. Vijayalakshmi N, Anbazhagan M & Arumugam K, Studies on Ethno-medicinal plants used by the Irulas tribe of Thirumurthi Hill of Western Ghats, Tamil Nadu, India, *International J of Research in Plant Sciences*, 4 (1) (2014) 8-12.
55. Vikneshwaran D, Viji M & Raja LK, A survey of the Ethnomedicinal flora of the Sirumalai Hills, Dindugul district, India, *Ethnobotanical leaflets*, 12 (2008) 948-953.
56. Waghchaure CK, Naik SS & Abhang AR, Ethno-medico- botanical studies on Katei Baba sacred grove and Nearby area of Adhalwadi from Akole taluka, Ahmednagar district (Maharashtra), *Internation J of Pharma and Bioscience*, 2 (3) (2011) 393-398.
57. Yadav M, Khan KK & Beg MZ, Ethnobotanical plants used for curing skin diseases by tribals of Rewa district (Madhya Pradesh), *Indian J Life Sci.*, 2 (1) (2012) 123-126.
58. Yasodharan K & Sauana KA, Ethnomedicinal knowledge among *Malamasasar* tribe of Parambikulam wildlife sanctuary, Kerala, *Indian J of Traditional Knowledge*, 6 (3) (2007) 481-48.