

## ETHNO-MEDICINAL PLANTS OF JHARKHAND, INDIA

**Birendra Kumar Roy, Ashok Kumar Mondal, Satish Mohabe**

**Abstract:** The present paper describes some important ethno medicinal plants of Jharkhand, which are being used by various tribes for the treatment of forty major groups of diseases, disorders and ailments (Abortion, asthma, bone fracture, burns, contraceptives, cough and cold, diarrhoea and dysentery, diabetes, digestive disorder, delivery, dog bite, ear trouble, epilepsy, eye complaints, fever, gum diseases, headache, jaundice, leprosy, leucorrhoea, miscarriage, pains, piles, post-delivery complaints, rheumatism, scorpion sting, skin diseases, snake bite, swelling, throat sore, toothache, tuberculosis, urinary disorder, venereal diseases, veterinary, vomiting, vermifuge, weakness, wound and as wormicide). These plant species have been arranged alphabetically in each group along with author citation, parts used and local names in parenthesis.

**Keywords:** Ethanobotany Studies, Jharkhand State, Flora, Tribals, Medicinal Plants.

**Introduction:** Jharkhand is the 28<sup>th</sup> State of the Indian Republic, formed by carved out from Bihar on November 15, 2000. It lies between 22° 00' and 24° 37' N latitude and 83° 15' and 87° 01' E longitude. The state is bounded by Bihar in the North, West Bengal on the East, Chattisgarh in the West and Orissa on the South with 79,714 sq. km. geographical area. The physiography of the state is hills, valley, and plateau with altitude ranging from 1000 to over 4000 feet.

Jharkhand is the home of many tribal communities along with a dynamic floristic diversity. The scheduled tribe population of Jharkhand is 26.30 % of the total population of the state. There are all together 29 scheduled tribe in the state, but the largest tribal group are Munda, Oraon, Kharia, Ho and Santhal. The tribes are mainly concentrating in Chhotanagpur Plateau and Santhal Parganas including Ranchi, Gumla, Lohardaga, Palamau, Hazaribagh, Singhbhum, Giridih, Dhanbad, Sahibganj, Godda, Pakud, Dumka and Deoghar districts. Due to close association of forest, the tribes possess a unique knowledge about the medicinal uses of plant

wealth of their surroundings from many generations. They depend mostly on ethno medicines for the treatment of different diseases, disorders and ailments. This traditional knowledge is now fast disappearing due to modernization, habitat destruction and tendency of the younger generation to discard traditional health system. A considerable ethno-medico- botanical work has been done by a large number of ethnobotanists on the state viz. (Bodding, 1925, 1927; Bondya *et al.*, 2004; Chandra, 1995; Chandra and Pandey, 1984, 1985; Chandra *et al.*, 1985, 1987; Chaudhuri, 1974; Chaudhuri, and Pal, 1976; Chaudhuri *et al.*, 1977; Girach and Aminuddin, 1995; Goel *et al.*, 1984, 1987, 1987; Goel and Mudgal, 1988; Guha, 1957; Gupta, 1963, 1981, 1987; Hembrom, 1991, 1994, 1996; Hembrom and Goel, 2005; Islam & Jha, 2003; Jain, and Tarafder, 1970; Jain, 1989, 1996, 2003; Jain *et al.*, 1990, 1994; Jaipurian, 2003; Jha *et al.*, 1997; Jha and Verma, 1996; Kumar, 1997; Kumar and Goel, 1998; Kumar, 1992; Kumari *et al.*, 1991; Mahato and Mahato, 1996; Mahato *et al.*, 1996, 1992; Manna and Samaddar, 1984; Pal, 1980; Pal and Jain, 1998; Pal and Srivastava, 1976; Pandey *et al.*, 1998; Paul, 1977; Prasad *et al.*, 1998; Prasad, 1988; Raghav *et al.*, 2005; Ram and Saha, 1998; Rani, and Mishra, 2002; Roy Choudhuri, 1963; Sahoo and Mudgal, 1993(1997); Sahu *et al.*, 2003; Saren *et al.*, 2006; Sarkar & Agarwal, 1978; Sharma, 1981, 1988; Sharma & Sinha, 1980; Shukla and Verma 1996; Singh, 2003; Singh and Singh, 1992; Singh and Sinha,

\*Corresponding author

**Departemnt of Botany, Madhyanchal Professional University, Ratibad-462042, Bhopal**

E-mail: birendrakumarroy1969@gmail.com

Published on Web 30/03/2023, www.ijsonline.org

1991; Singh *et al.*, 1992, Singh, 1987; Singh, 1955; Sinha *et al.*, 1981; Sinha and Nathwat, 1989,1989, 1991; Srivastawa and Verma, 1981; Srivastava, 2006; Tarafder,1978, 1983a, 1983b, 1983c 1983d, 1984a, 1984b, 1984c, 1984d,1984e, 1985, 1986,1987; Tarafder & Chaudhuri, 1981; Topno, 1997; Trebedi, 1986; Trevedi *et al.*, 1985,1987;Uniyal, 1995; Upadhyay *et al.*, 1998; Verma and Pandey, 1990; Verma *et al.*, 1999; Vidhyarthi and Gupta, 2004).In this present paper, author has given emphasis on disease wise ethno medicinal plants, which might be useful for further ethno-pharmacological investigation.

**Enumeration:** In the present paper, the plant species have been arranged alphabetically in each group of diseases, disorders and ailments along with parts used, author citation, parts used and local names in brackets.

**Abortion:** Bark of *Anogeissus latifolia* (Roxb. ex DC.) Wall. ex Guill. (Dhauta, Dhaonta), leaf of *Bacopa monnieri* (L.) Penn. (Brahmi), fruit pulp of *Cassia fistula* L. (Bandur lauri, Harri, Amaltas, Bandar lahari), root of *Clerodendrum serratum* (L.) Spreng. (Bhanwar muili, Bharangi), leaf, flower and seed of *Datura metel* L. (Tuntura, Datura), root of *Desmodium gangeticum* (L.) DC. (Sinar), fruit of *Trichosanthes palmata* Roxb. and root of *Vitex negundo* L. (Sindwar, Sinduar, Hudri, Sindwair, Sunduwar and Tursi) are given in asthma, bronchitis, lung infection and as expectorant.

**Asthma:** Bark of *Anogeissus latifolia* (Roxb. ex DC.) Wall. ex Guill. (Dhauta, Dhaonta), leaf of *Bacopa monnieri* (L.) Penn. (Brahmi), fruit pulp of *Cassia fistula* L. (Bandur lauri, Harri, Amaltas, Bandar lahari), root of *Clerodendrum serratum* (L.) Spreng. (Bhanwar muili, Bharangi), leaf, flower and seed of *Datura metel* L. (Tuntura, Datura), root of *Desmodium gangeticum* (L.) DC. (Sinar), fruit of *Trichosanthes palmata* Roxb. and root of *Vitex negundo* L. (Sindwar, Sinduar, Hudri, Sindwair, Sunduwar and Tursi) are given in asthma, bronchitis, lung infection and as expectorant.

**Bone fracture:**Roots of *Vitis repanda* W. & A. (Harjora, Harjarwa) is used on bone fracture in tribal belt of Jharkhand.

**Burns:** Seed of *Argemone mexicana* L. (Bakula, Rangeni Kata, and Sial Kanta), root of *Bombax ceiba* L. (Mur-red, Simbal), rhizome of *Curculigo orchoides* Gaertn. (Baia Shir, Kitamuli, Masvaru, and Talmuli) and fruit of *Martynia annua* L. (Budisarsar) are used in the treatment of burns.

**Contraceptives:** Root of *Flemingia chappar* Buch.-Ham. ex Benth. and leaf juice of *Vitex negundo* L.

(Sindwar, Sinduar, Hudri, Sindwair, Sunduwar and Tursi) are used as contraceptives in the tribal area of Jharkhand.

**Diaorrhoea and Dysentery:** Bark of *Acacia nilotica* (L.) Willd.ex Del. ssp. *indica* (Benth.) Bren. (Babul), plant of *Aerva lanata* (L.) Juss. ex Schult. (Midni, Lupora), stem bark of *Alstonia scholaris* (L.) R.Br. (Chhatni, Chatian), gum of *Anogeissus latifolia* (Roxb. ex DC.) Wall. ex Guill. (Dhauta, Dhaonta), bark of *Bauhinia purpurea* L. (Singda, Koinar), root bark of *Calotropis gigantea* (L.) R.Br. (Palati, Akanta, Akwan, Palti), root of *Croton roxburghii* Balak. syn. *C. oblongifolius* Roxb. (Kuti-Kun-Jaw, Miridi, Putri, and Gote Potri), root of *Desmodium gangeticum* (L.) DC. (Sinar), stem bark of *Desmodium oojeinensis* (Roxb.) Ohashi (Sanan), tuber of *Dioscorea bulbifera* L. (Darukanda), fruit, seed oil and bark of *Diospyros melanoxylon* Roxb. (Tiril, Kend, Tendu, Kendu, Terel), root of *Elephantopus scaber* L. (Asma-ri-red, Nankijari, Marachuta, Mejurjhuti, Chirchitri and Bugrorenti), plant of *Emilia sonchifolia* (L.) DC. (Buang- dumbo, Teli), leaf of *Gloriosa superba* L. ( Kari-hari, Nagaser), root of *Glossogyne pinnatifida* DC. (Otebarangu, Bajardanti), bark of *Holarrhena antidysenterica* (Buch.-Ham.) Wall. (Karaia, Korea, Hat dudhia, Toa and Koroiya), stem bark of *Litsea glutinosa* (Lour.) C.B.Robinson (Meda, Meda bokla), plant of *Mimosa pudica* L. (Lajouni, Jajwanti, Chauimaui), root of *Nyctanthes arbor-tristis* L. (Saparum, Khirsari, Harsingar), leaf of *Phyllanthus reticulatus* Poir. , fruit of *Punica granatum* L. (Anar), fruit of *Solanum nigrum* L. (Makoi), and fruit of *Syzygium cumini* (L.) Skeels (Kudda, Jamun) are given in the treatment of diarrhea, dysentery and cholera.

**Cough and Cold:** Seed of *Abrus precatorius* L. (Gunj, Karjani, Ghunchi, and Kanijari), leaf of *Adhatoda vasica* Nees (Vasaka, Basak), leaf of *Aegle marmelos* (L.) Corr. (Bel), stem bark of *Anogeissus latifolia* (Roxb. ex DC.) Wall. ex Guill. (Dhauta, Dhaonta), plant of *Barleria cristata* L. (Bantishi), bark of *Cleistanthus collinus* (Roxb.) Benth. ex Hook.f. (Dauntha), root of *Clerodendrum serratum* (L.) Spreng. (Bhanwar muili, Bharangi), root of *Desmodium gangeticum* (L.) DC. (Sinar), fruit of *Emblca officinalis* Gaertn. syn. *Phyllanthus emblica* L. ( Emli, Aura, Meral, Aonla, Aoula), leaf of *Nyctanthes arbor- tristis* L. (Saparum, Khirsari, Harsingar), root of *Polygala crotalarioides* Buch.-Ham. ex DC. Chanbida, Nilkanthi, Nil Kanti), fruit and flower of *Solanum nigrum* L. (Makoi), fruit of *Terminalia chebula* Retz. (Rolla, Harra), seed of

*Thespesia lampas* (Cav.) Dalz. ex Dalz. ex Gibs. (Bankapas, Ban Kapasi), and root of *Vitex negundo* L. (Sindwar, Sinduar, Hudri, Sindwair, Sunduwar and Tursi) are used by the tribe in cough and cold.

**Diarrhoea and Dysentery:** Bark of *Acacia nilotica* (L.) Willd. ex Del. ssp. *indica* (Benth.) Bren. (Babul), plant of *Aerva lanata* (L.) Juss. ex Schult. (Midni, Lupora), stem bark of *Alstonia scholaris* (L.) R.Br. (Chhatni, Chatian), gum of *Anogeissus latifolia* (Roxb. ex DC.) Wall. ex Guill. (Dhauta, Dhaonta), bark of *Bauhinia purpurea* L. (Singda, Koinar), root bark of *Calotropis gigantea* (L.) R.Br. (Palati, Akanta, Akwan, Palti), root of *Croton roxburghii* Balak. syn. *C. oblongifolius* Roxb. (Kuti-Kun-Jaw, Miridi, Putri, and Gote Potri), root of *Desmodium gangeticum* (L.) DC. (Sinar), stem bark of *Desmodium oojeinensis* (Roxb.) Ohashi (Sanan), tuber of *Dioscorea bulbifera* L. (Darukanda), fruit, seed oil and bark of *Diospyros melanoxylon* Roxb. (Tiril, Kend, Tendu, Kendu, Terel), root of *Elephantopus scaber* L. (Asma-ri-red, Nankijari, Marachuta, Mejurjhuti, Chirchitri and Bugroidenti), plant of *Emilia sonchifolia* (L.) DC. (Buang- dumbo, Teli), leaf of *Gloriosa superba* L. ( Kari-hari, Nagaser), root of *Glossogyne pinnatifida* DC. (Otebarangu, Bajardanti), bark of *Holarrhena antidysenterica* (Buch.-Ham.) Wall. (Karaia, Korea, Hat dudhia, Toa and Koroia), stem bark of *Litsea glutinosa* (Lour.) C.B.Robinson (Meda, Meda bokla), plant of *Mimosa pudica* L. (Lajouni, Jajwanti, Chauimau), root of *Nyctanthes arbor-tristis* L. (Saparum, Khirsari, Harsingar), leaf of *Phyllanthus reticulatus* Poir. , fruit of *Punica granatum* L. (Anar), fruit of *Solanum nigrum* L. (Makoi), and fruit of *Syzygium cumini* (L.) Skeels (Kudda, Jamun) are given in the treatment of diarrhea, dysentery and cholera.

**Diabetes:** Root of *Abrus precatorius* L. (Gunj, Karjani, Ghunchi, Kanijari), wood of *Pterocarpus marsupium* Roxb. (Bija, Bijasal), seed and bark of *Syzygium cumini* (L.) Skeels (Kudda, Jamun) are used in the treatment of diabetes.

**Digestive disorder:** Seed of *Abrus precatorius* L. (Gunj, Karjani, Ghunchi, Kanijari), leaf of *Aegle marmelos* (L.) Corr. (Bel), plant of *Andrographis paniculata* (Burm.f.) Wall. ex. Nees (Chirak, Kalmegh, Kamraj, Chireita, Chiraita), root of *Aristolochia bracteolata* Lamk. (Rajgurumba, Gadh), root of *Asparagus racemosus* Willd. (Sataur, Atkir, Satmul, Satawar, Satur and Gogotram), root and flower of *Bauhinia purpurea* L. (Singda, Koinar), root of *Blumeopsis flava* (DC.) Gagnep. (Mageba, Bansonso), root of *Bombax ceiba* L.

(Mur-red, Simbal), Bark of *Butea monosperma* (Lamk.) Taub. (Bendo, Paras, Palas, Dhak), leaf and fruit of *Cassia fistula* L. (Bandur lauri, Harri, Amaltas, Bandar lahari), leaf of *Cassia tora* L. (Chakar, Chakor), root of *Cissampelos pareira* L. (Parai, Nankijari, Parhi, Chatakpar, Pitusing and Bandarkana), plant of *Commelina benghalensis* L. (Kanchare), root of *Croton roxburghii* Balak. syn. *C. oblongifolius* Roxb. (Kuti-Kun-Jaw, Miridi, Putri, Gote Potri), root of *Desmodium gangeticum* (L.) DC. (Sinar), root of *Desmodium pulchellum* (L.) Backer (Eth- Ka-Jar), fruit of *Emblia officinalis* Gaertn. syn. *Phyllanthus emblica* L. (Emli, Aura, Meral, Aonla, Aoula), plant of *Emilia sonchifolia* (L.) DC. (Buang-dumbo, Teli), plant of *Equisetum debile* Roxb. ex Vauch. (Hajorua), fruit of *Ficus racemosa* L. syn. *F. glomerata* Roxb. (Dumbri, Gular), root of *Holarrhena antidysenterica* (Buch.-Ham.) Wall. (Karaia, Korea, Hat dudhia, Toa and Koroia), root of *Lygodium flexuosum* (L.) Sw. (Kalijhiri, Kalijhak, Nagenacha, Mahadebjat, Bish and Sita chouri), root of *Meyna laxiflora* Robins. (Katob, Mauna, Ber-Ka-Mowna-Gach), bark of *Mitragyna parviflora* (Roxb.) Korth. (Karmi), plant of *Polygonum barbatum* L. (Garbera- aha, Senso), bark of *Pongamia pinnata* (L.) Pierre (Karanj), flower of *Pterospermum acerifolium* willd. (Mackchand, Mackchun), seed of *Ruellia suffruticosa* Roxb. (Charpandu, Ranu), resin of *Shorea robusta* Roxb. ex Gaertn. f. (Sal, Sakhua), root of *Smilax zeylanica* L. (Ram Pawan, At- Ker, Ram datoon), stem bark of *Spodias pinnata* (L.f.) Kurz (Amra), plant of *Swertia angustifolia* Buch.-Ham. (Chiraita), fruit of *Syzygium cumini* (L.) Skeels (Kudda, Jamun), bark and leaf of *Tamarindus indica* L. (Emli, Tetar), fruit of *Terminalia bellirica* (Gaertn.) Roxb. (Bahera, Bahaira), fruit of *Terminalia chebula* Retz. (Rolla, Harra), and root of *Thalictrum foliosum* DC. (Jurbula) are used in digestive disorder including indigestion, stomach pain, gastric trouble, as appetizer, constipation, biliousness, burning sensation etc.

**Delivery:** Root of *Achyranthes aspera* L. (Chirchiti, Sitirked, Chirchiri, and Chirdhiri), root of *Adhatoda vasica* Nees (Vasaka, Basak), leaf of *Aristolochia bracteolata* Lamk. (Rajgurumba, Gadh), root of *Elephantopus scaber* L. (Asma-ri-red, Nankijari, Marachuta, Mejurjhuti, Chirchitri and Bugroidenti), root of *Gloriosa superba* L. (Kari-hari, Nagaser), flower of *Hibiscus rosa-sinensis* L. (Urhul), root of *Moringa oleifera* Lam. (Munga, Sajna), bark of *Sterculia urens* Roxb. and root of *Thespesia lampas* (Cav.) Dalz. ex

Dalz.ex Gibs. (Bankapas, Ban Kapasi) are used to accelerate and for easy, smooth and painless delivery.

**Dog bite:** Plant of *Achyranthes aspera* L. (Chirchiti, Sitirked, Chirchiri, Chirdhiri), flower of *Calotropis gigantea* (L.) R.Br. (Palati, Akanta, Akwan, Palti), bark of *Cassia fistula* L. (Bandur lauri, Harri, Amaltas, Bandar lahari), leaf of *Clerodendrum viscosum* Vent. (Chamgar, Ghato, Bhand), plant of *Lygodium flexuosum* (L.) Sw. (Kalijhiri, Kalijhak, Nagenacha, Mahadebjat, Bish and Sita chouri), root of *Sida acuta* Burm. f. (Bariatu, Ipidipium, Bariari), root of *Xeromphis spinosa* (Thunb.) Keay syn. *Randia dumetorum* (Retz.) Lam. (Kharhar, Loto and Mouna) and fruit of *Solanum nigrum* L. (Makoi) are used in jackal, monkey and dog bite including hydrophobia.

**Ear trouble:** Seed of *Argyrea nervosa* (Burm. f.) Bojer syn. *A. speciosa* (L.f.) Sweet (Marang- harlu, Jamru chalam, Chherisim), seed of *Cassia fistula* L. (Bandur lauri, Harri, Amaltas, Bandar lahari), fruit of *Trichosanthes palmata* Roxb., root of *Vernonia cinerea* (L.) Less. syn. *Vernonia conyzoides* DC. (Kaliziri, Jonkitin, Ranu) are used in earache, pus discharges and infection in ear.

**Epilepsy:** Seed oil of *Celastrus paniculata* Willd. (Kujri- daru, Malkan- gui, Minjni, Kujri), whole plant of *Centella asiatica* (L.) Urban (Chokiada, Bengsak, Brihmi, Ben sag), plant and root of *Ipomoea hispida* (Vahl) Roem. & Schult. (Pitohri) and leaf of *Martynia annua* L. (Budisarsar) are given in epilepsy.

**Eye complaints:** Seed of *Argemone mexicana* L. (Bakula, Rangeni Kata, Sial Kanta), root and leaf of *Clerodendrum serratum* (L.) Spreng. (Bhanwar muili, Bharangi), plant of *Cynodon dactylon* (L.) Pers. (Dubilata), fruit of *Emblia officinalis* Gaertn. syn. *Phyllanthus emblica* L. (Emli, Aura, Meral, Aonla, Aoula), plant and root of *Emilia sonchifolia* (L.) DC. (Buang-dumbo, Teli), seed of *Flemingia chappar* Buch.-Ham. ex Benth. (Gal Phuli), fruit of *Solanum nigrum* L. (Makoi), stem bark of *Symplocos racemosa* Roxb. (Lodh, Ratan Gaur, Ratanganda), root of *Thalictrum foliosum* DC. (Jurbula) and plant of *Vernonia cinerea* (L.) Less. syn. *Vernonia conyzoides* DC. (Kaliziri, Jonkitin, Ranu) are used in the treatment of redness, swelling, pain, inflammation, conjunctivitis etc. in eyes.

**Fever:** Bark of *Adina cordifolia* (Willd.ex Roxb.) Beth. & Hook.f. ex Brandis (Karam, Karam), plant and root of *Aerva lanata* (L.) Juss. ex Schult. (Midni, Lupora), leaf of *Andrographis paniculata* (Burm.f.) Wall. ex. Nees (Chirak, Kalmegh, Kamraj, Chireita, Chiraita), root of

*Aristolochia bracteolata* Lamk. (Rajgurumba, Gadh), root of *Asparagus racemosus* Willd. (Sataur, Atkir, Satmul, Satawar, Satur and Gogotram), seed of *Caesalpinia crista* L. (Kath Karanj), root of *Carissa spinarum* L. (Gara, Gadasur, Khunti, Karonda, Karanda, Konad), leaf of *Cassia fistula* L. (Bandur lauri, Harri, Amaltas, Bandar lahari), root of *Cassia occidentalis* L. (Barka Chakur, Chakar), plant and root of *Cissampelos pareira* L. (Parai, Nankijari, Parhi, Chatakpar, Pitusing and Bandarkana), root of *Clerodendrum serratum* (L.) Spreng. (Bhanwar muili, Bharangi), root of *Cryptolepis buchanani* R.Br. ex Roem & Schult. (Vaish- Lakashman, Medha- Singhi), leaf, seed and root of *Datura metel* L. (Tuntura, Datura), root of *Desmodium gangeticum* (L.) DC. (Sinar), seed oil and bark of *Diospyros melanoxylon* Roxb. (Tiril, Kend, Tendu, Kendu, Terel), root and stem bark of *Diospyros montana* Roxb. (Kendu), root of *Elephantopus scaber* L. (Asma-ri-red, Nankijari, Marachuta, Mejurjuthi, Chirchitri and Bugrodeni), leaf of *Emblia officinalis* Gaertn. syn. *Phyllanthus emblica* L. (Emli, Aura, Meral, Aonla, Aoula), root of *Gloriosa superba* L. (Kari-hari, Nagaser), root of *Hemidesmus indicus* (L.) R.Br. (Chotaka – dudhi, Analsing, Dudhmala, Dudhijeri), bark of *Holarrhena antidysenterica* (Buch.-Ham.) Wall. (Karaia, Korea, Hat dudhia, Toa and Koroiya), root of *Lygodium flexuosum* (L.) Sw. (Kalijhiri, Kalijhak, Nagenacha, Mahadebjat, Bish and Sita chouri), bark of *Melia azedarach* L. (Bakain, Nim), fruit of *Meyna laxiflora* Robins. (Katob, Mauna, Ber-Ka-Mowna-Gach), plant of *Mimosa pudica* L. (Lajouni, Jajwanti, Chauimau), bark of *Mitragyna parviflora* (Roxb.) Korth. (Karmi), bark of *Moringa oleifera* Lam. (Munga, Sajna), root of *Mucuna pruriens* (L.) DC. (Alkusi, Algusi), root of *Plumbago zeylanica* L. (Chitrak), root of *Polygala crotalarioides* Buch.-Ham. ex DC. (Chanbida, Nilkanthi, Nil Kanti), seed oil of *Pongamia pinnata* (L.) Pierre (Karanj), root of *Smilax zeylanica* L. (Ram Pawan, At- Ker, Ram datoon) root of *Thalictrum foliosum* DC. (Jurbula), bulb of *Urginea indica* (Roxb.) Kunth. (Ban-Piyaj, Jangli Piyaj), whole plant of *Vernonia cinerea* (L.) Less. syn. *Vernonia conyzoides* DC. (Kaliziri, Jonkitin, Ranu), leaf and root of *Vitex negundo* L. (Sindwar, Sinduar, Hudri, Sindwair, Sunduwar and Tursi), root of *Wattakaka valubilis* L. Stapf. (Par, Nak-chikni), root of *Woodfordia fruticosa* (L.) Kurz (Dhutkipul, Itchea, Dhawai, Ichha, Dhaunai), root of *Wrightia tomentosa* (Roxb.) Roem. & Schult. (Kari-dudhi), plant of *Xanthium strumarium* L., root of

*Xeromphis spinosa* (Thunb.) Keay syn. *Randia dumetorum* (Retz.) Lam. (Kharhar, Loto and Mouna) are used in fever including malarial, typhoid, intermittent and high fever with senselessness.

**Gum diseases:** Leaf of *Phyllanthus reticulatus* Poir. and leaf of *Vitex negundo* L. (Sindwar, Sinduar, Hudri, Sindwair, Sunduwar and Tursi) are used in gum diseases including swelling, pyorrhea, bed smell etc.

**Headache:** Plant of *Andrographis paniculata* (Burm.f.) Wall. ex. Nees (Chirak, Kalmegh, Kamraj, Chireita, Chiraita), leaf of *Blumeopsis flava* (DC.) Gagnep. (Mageba, Bansorso), root of *Croton roxburghii* Balak. syn. *C. oblongifolius* Roxb. (Kuti- Kun-Jaw, Miridi, Putri, Gote Potri), plant of *Ipomoea hispida* (Vahl) Roem. & Schult. (Pitohri), fruit of *Leonotis nepetafolia* (L.) R.Br. (Pogu-jata, Tompepuru, Traangia), Leaf of *Ocimum basilicum* L. (Achi-Koam, Jatni), bark of *Oroxylum indicum* (L.) Vent. (Banskali), *Spilanthes calva* DC. , root of *Trichosanthes palmata* Roxb., leaf of *Vitex negundo* L. (Sindwar, Sinduar, Hudri, Sindwair, Sunduwar and Tursi) and root of *Woodfordia fruticosa* (L.) Kurz (Dhutkiphul, Itchea, Dhawai, Ichha, and Dhaunai) are used for treating headache.

**Jaundice:** Whole Plant of *Centella asiatica* (L.) Urban (Chokiada, Bengsak, Brihmi, Ben sag), Leaf of *Phyllanthus niruri* L.(Jara amla), plant of *Solanum nigrum* L. (Makoi) and whole plant of *Urtica dioica* L. (Bichhu ghas) are used in jaundice and liver troubles.

**Leprosy:** Whole Plant of *Commelina benghalensis* L. (Kanchare), flower bud of *Hibiscus rosa-sinensis* L. (Urhul), plant of *Ipomoea hispida* (Vahl) Roem. & Schult. (Pitohri), and root of *Mucuna pruriens* (L.) DC. (Alkusi, Algusi) are used in leprosy and leucoderma.

**Leucorrhoea:** Root of *Asparagus racemosus* Willd. (Sataur, Atkir, Satmul, Satawar, Satur and Gogotram) and rhizome of *Curculigo orchioides* Gaertn. (Baia Shir, Kitamuli, Masvaru, Talmuli) are used in the treatment of leucorrhoea.

**Miscarriage:** Seed of *Butea monosperma* (Lamk.) Taub. (Bendo, Paras, Palas, Dhak), root of *Oroxylum indicum* (L.) Vent. (Banskali), fower and root of *Prosopis spicigera* L. (Mimosaceae), leaf of *Punica granatum* L. (Anar) and wood of *Symplocos racemosa* Roxb. (Lodh, Ratan Gaur, Ratanganda) are used to prevent miscarriages during pregnancy.

**Pains:** Leaf of *Abrus precatorius* L. (Gunj, Karjani, Ghunchi, and Kanijari), root of *Achyranthes aspera* L. (Chirchiti, Sitirked, Chirchiri, and Chirdhiri), stem bark of *Alstonia scholaris* (L.) R.Br. (Chhatni, Chatian), root

of *Asparagus racemosus* Willd. (Sataur, Atkir, Satmul, Satawar, Satur and Gogotram), whole plant of *Atylosia scarabaeoides* (L.) Benth. (Bonkurthy, Bankurthi), root of *Carissa caranadas* L. (Kanwad) and *Carissa spinarum* L. (Gara, Gadasur, Khunti, Karonda, Karanda, Konad), seed oil of *Celastrus paniculata* Willd. (Kujri-daru, Malkan-gui, Minjni, Kujri), whole plant of *Centella asiatica* (L.) Urban (Chokiada, Bengsak, Brihmi, Ben sag), root of *Clerodendrum viscosum* Vent. (Chamgar, Ghato, Bhand), whole plant of *Crotalaria spectabilis* Roth syn. *C.sericea* Retz. (Jhuka, Jhunjhunia), rhizome of *Curculigo orchioides* Gaertn. (Baia Shir, Kitamuli, Masvaru, Talmuli), root of *Desmodium gangeticum* (L.) DC. (Sinar), root of *Desmodium oojainensis* (Roxb.) Ohashi (Sanan), root of *Lygodium flexuosum* (L.) Sw. (Kalijhiri, Kalijhak, Nagenacha, Mahadebjat, Bish and Sita chouri), seed of *Ruellia suffruticosa* Roxb. (Charpandu, Ranu), resin of *Shorea robusta* Roxb. ex Gaertn. f. (Sal, Sakhua), root of *Smilax ovalifolia* Roxb. (Atkir), stem, leaf and fruit of *Tinospora cordifolia* (L.) Miers. (Gursilai), leaf of *Vitex negundo* L. (Sindwar, Sinduar, Hudri, Sindwair, Sunduwar and Tursi) and root of *Vitis repanda* W. & A (Harjora, Harjarwa) are used in body pain, muscle strain, chest pain, etc. by the tribal people of Jharkhand.

**Piles:** Whole plant of *Achyranthes aspera* L. (Chirchiti, Sitirked, Chirchiri, Chirdhiri), leaf of *Blumea lacera* (Burm.f.) DC. (Kakrendha), rhizome of *Curculigo orchioides* Gaertn. (Baia Shir, Kitamuli, Masvaru, and Talmuli), tuber of *Dioscorea bulbifera* L. (Darukanda), whole plant of *Equisetum debile* Roxb.ex Vauch. (Hajorua), peduncle of *Solanum melongena* L. (Baigan), plant juice of *Solanum nigrum* L. (Makoi) and leaf juice of *Vitex negundo* L. (Sindwar, Sinduar, Hudri, Sindwair, Sunduwar and Tursi) are used in the treatment of itching piles, bleeding piles and fistula.

**Post delivery complaints:** Stem bark of *Calotropis gigantea* (L.) R.Br. (Palati, Akanta, Akwan, Palti), leaf of *Centella asiatica* (L.) Urban (Chokiada, Bengsak, Brihmi, Ben sag), root of *Costus speciosus* (Koen.)Smith, plant of *Crotalaria alata* Buch.-Ham. (Jhunjhunka), root of *Piper longum* L. (Pipali), root of *Pogostemon parviflorus* Benth., bark of *Pterocarpus marsupium* Roxb. (Bija, Bijasal), leaf of *Punica granatum* L. (Anar), root of *Ruellia suffruticosa* Roxb. (Charpandu, Ranu), and leaf of *Vitex negundo* L. (Sindwar, Sinduar, Hudri, Sindwair, Sunduwar and Tursi) are used in fever, weakness, and to check bleeding and to remove out the placenta after delivery.

**Rheumatism:** Gum of *Boswellia serrata* Roxb. ex Colebr. (Salga, Salia), whole plant of *Crotalaria spectabilis* Roth syn. *C.sericea* Retz. (Jhuka, Jhunjhunia), root and plant of *Ipomoea hispida* (Vahl) Roem. & Schult. (Pitohri), seed oil of *Moringa oleifera* Lam. (Munga, Sajna), pseudo bulb of *Pholidota imbricata* (Roxb.) Lindl. (Patharkela), seed oil of *Pongamia pinnata* (L.) Pierre (Karanj), root of *Smilax ovalifolia* Roxb. (Atkir) and root of *Vitex negundo* L. (Sindwar, Sinduar, Hudri, Sindwair, Sunduwar and Tursi) are used in the treatment of rheumatism.

**Scorpion sting:** Plant of *Anogeissus latifolia* (Roxb. ex DC.) Wall. ex Guill. (Dhauta, Dhaonta), root of *Calotropis gigantea* (L.) R.Br. (Palati, Akanta, Akwan, Palti), root of *Desmodium gangeticum* (L.) DC. (Sinar) and root of *Rubia cordifolia* L. are used locally on the part stung by scorpion.

**Skin diseases:** Seed of *Abrus precatorius* L. (Gunj, Karjani, Ghunchi, Kanijari), plant of *Achyranthes aspera* L. (Chirchiti, Sitirked, Chirchiri, Chirdhiri), leaf of *Ageratum conyzoides* L. (Gandhari, Puru), leaf of *Argyrea nervosa* (Burm. f.) Bojer syn. *A. speciosa* (L.f.) Sweet (Marang- harlu, Jamru chalam, Chherisim), whole plant of *Bacopa monnieri* (L.) Penn. (Brahmi), gum of *Boswellia serrata* Roxb. ex Colebr. (Salga, Salia), seed of *Cassia tora* L. (Chakar, Chakor), seed oil of *Celastrus paniculata* Willd. (Kujri- daru, Malkan-gui, Minjni, Kujri), root and leaf of *Clerodendrum viscosum* Vent. (Chamgar, Ghato, Bhant), leaf of *Commelina benghalensis* L. (Kanchare), rhizome of *Curculigo orchioides* Gaertn. (Baia Shir, Kitamuli, Masvaru, Talmuli), seed, leaf and root of *Datura metel* L. (Tuntura, Datura), tuber of *Dioscorea bulbifera* L. (Darukanda), plant of *Elephantopus scaber* L. (Asma-ri-red, Nankijari, Marachuta, Mejurjhuti, Chirchitri and Bugroidenti), fruit of *Emblica officinalis* Gaertn. syn. *Phyllanthus emblica* L. (Emli, Aura, Meral, Aonla, Aoula), plant of *Euphorbia hirta* L. (Lal dhunia), whole plant of *Ipomoea hispida* (Vahl) Roem. & Schult. (Pitohri), inflorescence of *Leonotis nepetafolia* (L.) R.Br. (Pogu-jata, Tompepuru, Traangia), stem bark of *Litsea glutinosa* (Lour.) C.B.Robinson (Meda, Meda bokla), seed oil of *Melia azedarach* L. (Bakain, Nim), seed oil of *Moringa oleifera* Lam. (Munga, Sajna), root of *Nyctanthes arbor-tristis* L. (Saparum, Khirsari, Harsingar), inflorescence of *Ocimum basilicum* L. (Achi-Koam, Jatni), seed oil of *Pongamia pinnata* (L.) Pierre (Karanj), seed oil of *Schleichera oleosa* (Lour.) Oken (Kusum), wood oil of *Tectona grandis* L.f. (Sagwan), fruit of *Terminalia chebula* Retz. (Rolla, Harra) and leaf of *Vitex negundo* L. (Sindwar, Sinduar, Hudri, Sindwair, Sunduwar and Tursi) are used in skin diseases including ringworm, itches, scabies, acne, boils, blister, sores, ulcer, tumor, irritation, sprain, blood purifier etc.

**Snake bite:** Whole plant of *Achyranthes aspera* L. (Chirchiti, Sitirked, Chirchiri, Chirdhiri), leaf of *Ageratum*

*conyzoides* L. (Gandhari, Puru), plant of *Anogeissus latifolia* (Roxb. ex DC.) Wall. ex Guill. (Dhauta, Dhaonta), root and leaf of *Barleria cristata* L. (Bantishi), root of *Bauhinia vahlii* (Wt. & Arn.) Benth. (Gungu Sakam), stem bark of *Boswellia serrata* Roxb. ex Colebr. (Salga, Salia), root of *Cissampelos pareira* L. (Parai, Nankijari, Parhi, Chatakparar, Pitusing and Bandarkana), root and leaf of *Clerodendrum serratum* (L.) Spreng. (Bhanwar muili, Bharangi), root of *Clerodendrum viscosum* Vent. (Chamgar, Ghato, Bhant), root of *Desmodium gangeticum* (L.) DC. (Sinar), root of *Heteropogon contortus* (L.) P.Beauv. ex Roem. & Schult. (Saurighas, Chorant), bark of *Moringa oleifera* Lam. (Munga, Sajna), whole plant of *Rauwolfia serpentina* (L.) Benth.ex Kurz (Serpgandha) and root of *Rubia cordifolia* L. are used in snakebite as well as to keep away the snakes.

**Swelling:** Root and leaf of *Barleria cristata* L. (Bantishi), root of *Clerodendrum viscosum* Vent. (Chamgar, Ghato, Bhant), seed of *Leonotis nepetafolia* (L.) R.Br. (Pogu-jata, Tompepuru, and Traangia) is used in the treatment of swollen breast of woman and root of *Lygodium flexuosum* (L.) Sw. (Kalijhiri, Kalijhak, Nagenacha, Mahadebjat, Bish and Sita chouri) are used in the treatment of swelling.

**Throat sore:** Leaf of *Moringa oleifera* Lam. (Munga, Sajna), plant of *Spilanthes calva* DC., gum of *Sterculia urens* Roxb. and fruit of *Terminalia chebula* Retz. (Rolla, Harra) are used in the treatment of throat infection.

**Toothache:** Bark of *Acacia nilotica* (L.) Willd.ex Del. ssp. *indica* (Benth.) Bren. (Babul), seed of *Argemone mexicana* L. (Bakula, Rangeni Kata, Sial Kanta), root of *Atylosia scarabaeoides* (L.) Benth. (Bonkurthy, Bankurthi), plant of *Blumeopsis flava* (DC.) Gagnep. (Mageba, Bansonso), fruit of *Datura metel* L. (Tuntura, Datura), whole plant of *Elephantopus scaber* L. (Asma-ri-red, Nankijari, Marachuta, Mejurjhuti, Chirchitri and Bugroidenti), leaf of *Emilia sonchifolia* (L.) DC. (Buang-dumbo, Teli), whole plant of *Glossogyne pinnatifida* DC. (Otebarangu, Bajardanti), fruit of *Melia azedarach* L. (Bakain, Nim), plant of *Spilanthes calva* DC., and leaf and twig of *Vitex negundo* L. (Sindwar, Sinduar, Hudri, Sindwair, Sunduwar and Tursi) are used in the treatment of toothache, swelling and caries.

**Tuberculosis:** Seed oil of *Celastrus paniculata* Willd. (Kujri- daru, Malkan- gui, Minjni, Kujri), seed of *Holarrhena antidysenterica* (Buch.-Ham.) Wall. (Karaia, Korea, Hat dudhia, Toa and Koroiya) and leaf of *Martynia annua* L. (Budisarsar) are given in the treatment of tuberculosis.

**Urinary disorder:** Root of *Asparagus racemosus* Willd. (Sataur, Atkir, Satmul, Satawar, Satur and Gogotram), root of *Mimosa pudica* L. (Lajouni, Jajwanti, Chauimaui), leaf of *Phyllanthus reticulatus* Poir., root of *Pueraria tuberosa* (Roxb. ex Willd.) DC. (Bandundi, Sarur) and root of *Smilax ovalifolia* Roxb. (Atkir) are used in renal trouble, gravel complaint, blood discharge and other urinary disorder.

**Venereal diseases:** Seed of *Argyrea nervosa* (Burm. f.)

Bojer syn. *A. speciosa* (L.f.) Sweet (Marang- harlu, Jamru chalam, Chherisim), bark of *Cleistanthus collinus* (Roxb.) Benth. ex Hook.f. (Dauntha), fruit of *Emblia officinalis* Gaertn. syn. *Phyllanthus emblica* L. (Emli, Aura, Meral, Aonla, Aoula), twig of *Sida acuta* Burm. f. (Bariatu, Ipidipium, Bariari), root of *Smilax ovalifolia* Roxb. (Atkir), leaf of *Syzygium cumini* (L.) Skeels (Kudda, Jamun), root and fruit of *Thespesia lampas* (Cav.) Dalz.ex Dalz.ex Gibs. (Bankapas, Ban Kapasi) and root of *Vitex negundo* L. (Sindwar, Sinduar, Hudri, Sindwair, Sunduwar and Tursi) are used in burning sensation in vagina, gonorrhoea, spermatorrhoea, irregular menstruation cycle, hydrocele and genital related diseases.

**Veterinary:** Leaf of *Abrus precatorius* L. (Gunj, Karjani, Ghunchi, Kanijari), bark of *Alstonia scholaris* (L.) R.Br. (Chhatni, Chatian), leaf of *Argyrea nervosa* (Burm. f.) Bojer syn. *A. speciosa* (L.f.) Sweet (Marang- harlu, Jamru chalam, Chherisim), plant of *Atylosia scarabaeoides* (L.) Benth. (Bonkurthy, Bankurthi), fruit of *Cassia fistula* L. (Bandur lauri, Harri, Amaltas, Bandar lahari), root of *Dillenia indica* L. (Korkot), whole plant of *Elephantopus scaber* L. (Asma-ri-red, Nankijari, Marachuta, Mejurjhuti, Chirchitri and Bugroidenti), leaf of *Emblia officinalis* Gaertn. syn. *Phyllanthus emblica* L. (Emli, Aura, Meral, Aonla, Aoula), plant of *Euphorbia hirta* L. (Lal dhunia), bark of *Litsea glutinosa* (Lour.) C.B.Robinson (Meda, Meda bokla), bark of *Pueraria tuberosa* (Roxb. ex Willd) DC. (Bandundi, Sarur), root of *Smilax zeylanica* L. (Ram Pawan, At- Ker, Ram datoon), leaf and branch of *Sterculia urens* Roxb., root of *Trichosanthes palmata* Roxb., bulb of *Urginea indica* (Roxb.) Kunth. (Ban-Piyaj, Jangli Piyaj) and whole plant of *Vernonia cinerea* (L.) Less. syn. *Vernonia conyzoides* DC. (Kaliziri, Jonkitin, Ranu) are used in diarrhoea, swelling, esophagus trouble, hoof disease, injury, fracture and other diseases of cattle/animals.

**Vomiting:** Root of *Achyranthes aspera* L. (Chirchiti, Sitirked, Chirchiri, Chirdhiri), root of *Desmodium gangeticum* (L.) DC. (Sinar), stem bark of *Diospyros montana* Roxb. (Kendu), whole plant of *Elephantopus scaber* L. (Asma-ri-red, Nankijari, Marachuta, Mejurjhuti, Chirchitri and Bugroidenti) and plant of *Swertia angustifolia* Buch.-Ham. (Chiraita) are used to check vomiting.

**Vermifuge:** Fruit granules of *Mallotus philippensis* (Lamk.) Muell.-Arg. (Gari- Sandari, Ruri- gach, Rori and Thipaj kanla), leaf of *Melia azedarach* L. (Bakain, Nim), pseudo-bulb of *Pholidota imbricata* (Roxb.) Lindl. (Patharkela), whole plant of *Urtica dioica* L., root of *Vitex negundo* L. (Sindwar, Sinduar, Hudri, Sindwair, Sunduwar and Tursi) and root of *Wattakaka valubilis* L. Stapf. (Par, Nak-chikni) are used for killing/removing tapeworm, thread worm, round worm, hook worm, pin worm, ascaris, and other intestinal worms.

**Weakness:** Roots of *Asparagus racemosus* Willd. (Sataur,

Atkir, Satmul, Satawar, Satur and Gogotram), leaf of *Atylosia scarabaeoides* (L.) Benth. (Bonkurthy, Bankurthi), leaf of *Centella asiatica* (L.) Urban (Chokiada, Bengsak, Brihmi, Ben sag), root of *Crotalaria alata* Buch.-Ham. (Jhunjhunka), root of *Diplocyclos palmatus* (L.) Jeffrey (Kaoputki), root of *Rubia cordifolia* L., plant of *Swertia angustifolia* Buch.-Ham. (Chiraita), fruit of *Terminalia chebula* Retz. (Rolla, Harra), root of *Thalictrum foliosum* DC. (Jurbula) and leaf and root of *Vitex negundo* L. (Sindwar, Sinduar, Hudri, Sindwair, Sunduwar and Tursi) are used as tonic in weakness for vigor, vitality and strength.

**Wound:** Whole plant of *Achyranthes aspera* L. (Chirchiti, Sitirked, Chirchiri, Chirdhiri), leaf and inflorescence of *Ageratum conyzoides* L. (Gandhari, Puru), leaf of *Argemone mexicana* L. (Bakula, Rangeni Kata, Sial Kanta), bark of *Boswellia serrata* Roxb. ex Colebr. (Salga, Salia), root of *Carissa spinarum* L. (Gara, Gadasur, Khunti, Karonda, Karanda, Konad), seed oil of *Celastrus paniculata* Willd. (Kujri- daru, Malkan-gui, Minjni, Kujri), plant of *Lygodium flexuosum* (L.) Sw. (Kalijhiri, Kalijhak, Nagenacha, Mahadebjat, Bish and Sita chouri), fruit of *Martynia annua* L. (Budisarsar), leaf of *Vitex negundo* L. (Sindwar, Sinduar, Hudri, Sindwair, Sunduwar and Tursi) and root of *Vitis repanda* W. & A. (Harjora, Harjarwa) are used for cut, wound, injury, sore and inflammation.

**Wormicide:** Bark of *Adina cordifolia* (Willd.ex Roxb.) Beth. & Hook.f. ex Brandis (Karam, Karam), seed and bark of *Butea monosperma* (Lamk.) Taub. (Bendo, Paras, Palas, Dhak), root of *Carissa spinarum* L. (Gara, Gadasur, Khunti, Karonda, Karanda, Konad), root of *Dioscorea alata* L. (Pahadkanda, Chupri- Au), whole plant of *Elephantopus scaber* L. (Asma-ri-red, Nankijari, Marachuta, Mejurjhuti, Chirchitri and Bugroidenti), and leaf of *Vitex negundo* L. (Sindwar, Sinduar, Hudri, Sindwair, Sunduwar and Tursi) are used to kill sore worm.

**Acknowledgements:** The author is grateful to the Director, Botanical Survey of India, Kolkata and Deputy Director, Central Botanical Laboratory, Howrah for all necessary facilities.

### References

1. Boddington, P.O. (1925) Studies on Santal medicine and connected folklore. I. Santals and diseases. *Mem. Asiatic Soc. Bengal* 10(1): 1-132.
2. Boddington, P.O. (1927) Studies on Santal medicine and connected folklore. II. Santals medicine. *Mem. Asiatic Soc. Bengal* 10(2): 133-426.
3. Bondya, Sutanu Lal and Sharma, H. P. (2004) Ethnobotanical studies on plants used in diabetes (Madhumeha) under the Baharagora Block of Jharkhand. *Ethnobotany* 16 (1- 2):139-140.
4. Chandra, K. (1995) An Ethnobotanical study on some medicinal plants of district Palamau (Bihar). *Sachitra Ayurveda* (Aug.) :311-314.

5. Chandra, K. and Pandey, B.N. (1984) Some folk medicine of Singhbhum. *Sachitra Ayurveda* 36(4):253-257.
6. Chandra, K. and Pandey, B.N. (1985) Medicinal plants of Santal Pargana, district Dumka (Bihar) Part I. *Sachitra Ayurveda* 37(3): 307-314.
7. Chandra, K., Pandey, P. and Pandey, B.N. (1987) Ethnobotany of Santhal pargana district Dumka (Bihar). *Bull. Medico- ethno-bot. Res.* 8:134-146.
8. Chandra, K., Pandey, B.N., and Lal, V.K. (1985) Folklore medicinal plants of Dumka(Bihar). *Ancient Science of Life*4:181-185.
9. Chaudhuri, Rai H.N. (1974). Green Medicine. *Indian Mus.Bull.* 9(1):35-40.
10. Chaudhuri, Rai H.N. and Pal, D.C. (1976) Poor man's medicine. *Man and Life* 2:126-131.
11. Chaudhuri, Rai H.N., Pal, D.C., Tarafder, C.R. and Guha, A. (1977) "Ranu"- A Tribal tablet. *Vanyajati* 25(2): 9-13.
12. Girach, R.D. and Aminuddin (1995) Ethnomedicinal uses of plants among the tribals of Singhbhum district, Bihar, India. *Ethnobotany* 7:103-107.
13. Goel, A.K., Sahoo, A.K. and Mudgal, V. (1984) A contribution to the ethnobotany of Santal Pargana. B.S.I. Howrah. pp. 1-37.
14. Goel, A.K., Sahoo, A.K. and Mudgal, V. (1987) Medico-ethnobotany of Santal Pargana (Bihar): Stomach and gastric troubles. *The Eastern Anthropologists* 40(2):161-167.
15. Goel, A.K., Sahoo, A.K. and Mudgal, V. (1987) Ethnobotanical notes on some plants used for birth control in Santal Pargana, Bihar. *J. econ. taxon. Bot.* 11(2):493- 495.
16. Goel, A.K. and Mudgal, V. (1988) A survey of medicinal plants used by the tribals of Santal Pargana (Bihar). *J. econ. taxon. Bot.* 12(2):329-335.
17. Guha, U. (1957) Five folk tales of the Santal. *Indian Folklore* 2(1): 34-40.
18. Gupta, S.P. (1963) An appraisal of chhotanagpur tribal pharmacopia. *Bull. Bihar Tribal Res. Inst.* 5(2): 1-18.
19. Gupta, S.P. (1981) Native medicinal uses of plants by the Asurs of Netarhat Plateau (Bihar). p.218-231. In Jain,S.K. (ed.) *Glimpses of Indian Ethnobotany.* Oxford and IBH, New Delhi.
20. Gupta, S.P. (1987) Study of plants during ethnobiological research among tribals.p.12-22.
21. In Jain,S.K. (ed.) *A Manual of Ethnobotany*, Scientific Publishers, Jodhpur. Hembrom, P.P. (1991) Tribal medicine in Chotanagpur and Santal Parganas of Bihar, India. *Ethnobotany* 3:97-99.
22. Hembrom, P.P. (1994) Adivasi Oushadh (Horopathy), Paharia sewa samiti, Satia (DST, Government of India, New Delhi)-in Hindi.
23. Hembrom, P.P. (1996) Contact therapy practiced by Mundas of Chotanagpur, Bihar. *Ethnobotany* 8:36-39.
24. Hembrom, P.P. and Goel, A.K. (2005) Horopathy: Ethnomedicine of Mundas. *Ethnobotany* 17:89-95.
25. Islam, M.A. and Jha, R.K. (2003) Ethnopharmacology of tribals of Ranchi district of Jharkhand. *J. econ. taxon. Bot.* 27(2):300-310.
26. Jain, S. K. and Tarafder, C.R.(1970) Medicinal plant lore of the Santals (a revival of P.O. Boddington's work). *Econ. Bot.* 24:241-278.
27. Jain, S.P. (1989) Tribal remedies from Saranda Forest Bihar, India-I. *Int. J. Crude Drug Res.* 27(1):29-32.
28. Jain, S.P. (1996) Ethno-Medico-Botanical survey of Chaibasa, Singhbhum district, Bihar. *J. econ. taxon. Bot. Add. Ser.* 12:403-407.
29. Jain, S.P. (2003) Comparative Ethno-Medico –Botanical studies of tribes of Netarhat Plateau, Chhotanagpur and Singhbhum districts of Jharkhand, India. *J. econ. taxon. Bot.* 27(2): 295-299.
30. Jain, S.P., Abraham, Z. and Shah, N.C. (1990) Herbal remedies among "Ho" tribes in Bihar. p.115-122. In Jain, S.K.(ed.) *Contribution to the ethnobotany of India.* Scientific Publishers, Jodhpur.
31. Jain, S.P., Singh, S.C. and Puri, H.S. (1994) Medicinal plants of Netarhat, Bihar, India. *Int. Jour. Pharmacog.* 32(1):44-50.
32. Jaipurari, M.K. (2003) Threatened Herbal heritage of tribal land Jharkhand. *Indian Forester* 129(1): 48-54.
33. Jha, P.K., Chaudhari, R.S. and Chaudhari, S.K. (1997) Studies of medicinal plants of Palamau (Bihar)-(IInd part). *Biojournal* 9(1-2):21-38.
34. Jha, R.R. and Verma, S.K. (1996) Ethnobotany of Sauria Paharias of Santal Pargana, Bihar –I. Medicinal Plants. *Ethnobotany* 8:31-35.
35. Kumar, Kaushal (1997) Pharmacognostical studies on some Ethnomedicinal plants of Santhal Parganas(Bihar). Ph.D. thesis submitted to B.H.U., Varanasi.
36. Kumar, K. and Goel, A.K. (1998) Little known Ethno-medicinal plants of Santal and Paharia tribes of Santal Pargana, Bihar, India. *Ethnobotany* 10:66-69.
37. Kumar, M. (1992) Ethnomedicinal studies of plants of Chotanagpur Plateau, Bihar. *Int. J. Mendel* 9(2-4): 137-139.
38. Kumari, M., Tirkey and Singh, M.P. (1991) Studies of tribal medicinal plants of Hazaribagh. *New Botanists* 18(1-2):105-107
39. Mahato, A.K. and Mahato, Pushpa (1996) Ethnobotanical wealth of Chhotanagpur plateau –IV. Some medicinal plants against intestinal worms. *J. econ. taxon. Bot. Add. Ser.*12:389-391.
40. Mahato, A.K., Mahato, Pushpa and Prasad, R.(1996) Ethnobotanical wealth of Chhotanagpur plateau, India. Part –III. Some medicinal plants used against diarrhea by the people of Singhbhum district, Bihar. *Adv. Plant Science* 9(1):25-28.
41. Mahato, A.K., Ram, R.L. and Mahato, Pushpa (1992)



- Ethnobotanical wealth of Chhotanagpur plateau –I. Some medicinal plants used in dysentery. *Geobios* 11:123-124.
42. Manna, M. K. and Samaddar, U.P. (1984) On the occurrence of useful plants of Netarhat Plateau of Palamau district, Bihar. *J. econ. taxon. Bot.* 5(3):539-546.
  43. Pal, D.C. (1980) Observation on folklore about plants used in veterinary medicine in Bengal, Orissa and Bihar. *Bull. bot. surv. India* 22(1-4):96-99.
  44. Pal, D.C. and Jain, S.K. (1998) Tribal Medicine. Naya Prakashan Calcutta. pp.317.
  45. Pal, D.C. and Srivastava, J.N. (1976) Preliminary notes on the ethnobotany of Singhbhum district, Bihar. *Bull. bot. surv. India* 18:247-250.
  46. Pandey, B.N., Das, P.K., Jha, A.K. and Ojha, A.K. (1998) Ethnobotanical profile of South Bihar with special reference to East Singhbhum, Jamshedpur. *Acta Botanica* 20(1):31-38.
  47. Paul, S.R. (1977) Medicinal plants of Netarhat, Bihar (India). *Qurt. J. Crude Drug Res.* 15:79-97.
  48. Prasad, A.N., Singh, B.K. and Dangi, M.K. (1998) Ethnomedicinal plants of Hazaribagh forest mine region (series-I). *Int. J. Mendel* 15(1-2):47-48.
  49. Prasad, U.N. (1988) Survey Report on availability resources of medicinal plants in the tribal and other areas of North and South Chhotanagpur division as well as tribal area of Dumka and other areas of Gaya, Aurngabad, Nawada and Monghyr districts (Unpublished). Chapter 9:56-62.
  50. Raghav, C.S., Suneja, Poonam, Bhatt, K.C., Tomar, J.B. and Malik, S.S. (2005) Exploration of medicinal and aromatic plants in tribal areas of Jharkhand and West Bengal for Chemo-ethnobotanical studies. p.147-158. In: Prabhujji, S.K. et al. (eds) *Recent Advances in Medicinal Plant Research: Vision 21st Century*. Satish Publication House, New Delhi.
  51. Ram, R.L. and Saha, V. (1998) Ethnobotanical wealth of Ranchi district, Bihar. Part I: Herbal medicinal plants used against dysentery. *Adv. Plant Sci.* 11(1):249-252.
  52. Rani, Sandhya and Mishra, G.D. (2002) Some medicinal plants used by the tribes of Jharkhand. *Indian Med. Homoeo. Jour.* 1(4):16-19.
  53. Roy Choudhuri, P.C. (1963) Folklore in aid of medicine. *Folklore* 4(9):308-309.
  54. Sahoo, A.K. and Mudgal, V. 1993. (1997) Ethnobotany of South Chotanagpur (Bihar). *Bull. bot. surv. India* 35(1-4):40-59.
  55. Sahu, H.B., Bondya, S.L., Kumar, J. and Sharma, H.P. (2003) Studies on ethno-medicinal properties of plant barks used as drugs by the indigenous people of Ranchi district of Jharkhand. *Int. J. Mendel* 20(3-4):83-84.
  56. Saren, A.M., Halder, A.C. and Singh, Harish (2006) Ethnomedicinal plants of Mahilong Forest Range in Ranchi District, Jharkhand. *J. econ. taxon. Bot.* (in Press).
  57. Sarkar, P.K. and Agarwal, V.S. (1978) Notes on *Pholidota imbricate* Lindl. (Orchidaceae) and its local uses in Ranchi district, Bihar. *Bull.bot.surv.India* 20(1-4):182-183.
  58. Sharma, P.C. (1981) Folklore antifertility plant drug of Bihar. *Bull. Medico- ethno- bot. Res.* 2: 296-302.
  59. Sharma, P.C. (1988) Some interesting medicinal folklores from Bihar. *Bull. Medico-ethno- bot. Res.* 9(3-4):89-95.
  60. Sharma, P.C. and Sinha, G. N. (1980) Folklore medicinal plants of Ranchi district (Bihar). *Nagarjun* 24(1):1-3.
  61. Shukla, Gyanesh and Verma, B.K.(1996) Roots- A vital plant part to cure body ailments among tribal / rural folklore of western Bihar. *J. econ. taxon. Bot. Add. Ser.* 12: 392-394.
  62. Singh, C.B. (2003) Forest flora in the life and economy of the tribals of Santhal Parganas, Jharkhand. *Jour. Non-Timber Forest Prod.* 10(1-2): 20-33.
  63. Singh, L.B. and Singh, C.L. (1992) An Ethno-Medico-Botanical study of Deoghar district (Bihar). *Biojournal* 4(1-2):83-86.
  64. Singh, L.B. and Sinha, S.K. (1991) Ethnobotany of Paharia tribe of Sahibganj District, Bihar. *Environment and Ecology* 9(2): 541-543.
  65. Singh, L.B., Verma, A.K. and Sinha, S.S.N. (1992) Preliminary observations on the ethnomedicinal plants of Godda district (Bihar). *J. econ. taxon. Bot. Add. Ser.* 10:205- 208.
  66. Singh, M.P. (1987) Tribal medicinal plants used in animals diseases of Chotanagpur. *Indian Forester* 113(11):758-759.
  67. Singh, Thakur Balwant (1955) Bihar ki vanaspatiyan. Sree Baidyanath Ayurveda Bhawan Pvt. Ltd. Publication, Patana.
  68. Sinha, G.N., Pandey, B.N. and Sharma (1981) Geographical distribution of ayurvedic medicinal plants in Bihar-I Haritakyedivarga. *Sachitra Ayurveda* 34(1): 30-33.
  69. Sinha, R.K. and Nathwat, G.S. (1989) Antifertility effects of plants used by the street herbal vendors for birth control. *Ancient Science of Life* 9(2):66-68.
  70. Sinha, R.K. and Nathwat, G.S. (1989) Medicinal plants and plant products used by the street herbal vendors in the treatment of poliomyelitis in children. *Jour. Research & Education in Indian medicine* 8(1):23-26.
  71. Sinha, R.K. and Nathwat, G.S. (1991) Plants and plant products used in the treatment of some respiratory