INNSPUB

International Journal of Biosciences | IJB |
ISSN: 2220-6655 (Print), 2222-5234 (Online)
http://www.innspub.net
Vol. 16, No. 5, p. 284-292, 2020

RESEARCH PAPER OPEN ACCESS

Ethnobotanical survey of medicinal plants of Kantapada block of Cuttack district, Odisha, India

Harapriya Sahoo, Gyanranjan Mahalik*

Department of Botany, School of Applied Sciences, Centurion University of Technology and Management, Odisha, India

Key words: Bioactive, Diseases, Ethnomedicinal, Herbal drugs, Traditional.

http://dx.doi.org/10.12692/ijb/16.5.284-292 Article published on May 28, 2020

Abstract

This study documents the species of medicinal plants used by traditional healers and local villagers to cure different diseases. Plants were documented on the basis of plant parts used, mode of use, doses and mode of administration of herbal drugs. With extensive and intensive field survey in the study area, information regarding plants was collected from local herbal practitioners, village elders and traditional healers through conversations, interviews and discussion with the standardized ethnobotanical questionnaire. A total of 67 plantspecies belonging to 43 families were identified and documented which were used to cure different diseases. The family Fabaceae, Apocynaceae, Rutaceae, Lamiaceae and Nyctaginaceae were most dominated ethnomedicinal plant used to cure different diseases. Plants parts mostly preferred were leaves, fruits, bark and roots. It can be concluded that ethnobotanical plants can be used to discover natural products that may serve as lead for the potential source for new bioactive compound of therapeutic value.

* **Corresponding Author:** Gyanranjan Mahalik ✉ gyanranjan.mahalik@cutm.ac.in

Introduction

Ethnobotany is a multidisciplinary science defined as the dealings between plants and people. The bond between plants and human cultures is not limited to the use of plants for food, clothing and shelter, but also includes their use of holy ceremonies, ornamentation and health care (Schultes, 1992).According to World Health Organization (WHO) estimates that up to 80% of the people in developing countries still depend on traditional medicinal plants to fulfill their primary healthcare needs (WHO, 2002).

A report of 70% of the population of India is dependent traditional herbs based medicines. Biodiversity is the basis of human survival and their economic well-being and constitutes the resources upon which families, communities, nations and future generation depends (Sing, 1994). The ethnic people of different forest pockets and villages were quite aware of the uses of the plant species having ethnobotanical values. Very few works have been reported on ethnobotanical uses of plant species found in coastal area (Girach *et al.*, 1996; Girach *et al.*, 1998; Girach *et al.*, 1999; Pattanaik *et al.*, 2008). The issue of herbal medicine is speedy growing around worldwide (Mahalik *et al.*, 2017). Documentation is not the boundary for exploring the particular area in search of folklore claim of tribes in relation to health care, but the plants must be evaluated appropriately to test its authenticity. Thus, the present study was aimed to document the availability, consumption and management of herbal drugs in relation to primary healthcare (Mahalik *et al.*, 2015).

Materials and methods

Study area

Kantapada block is situated between 20.3137258 latitude and 85.7209969 longitudes. The total geographical area of the village is 291 hectares. Kantapada has a total population of 2,964 people. There are about 610 houses in Kantapada village. Cuttack is the nearest town to Kantapada which is approximately 35 km away (Fig. 1) (Swain *et al.*, 2017).

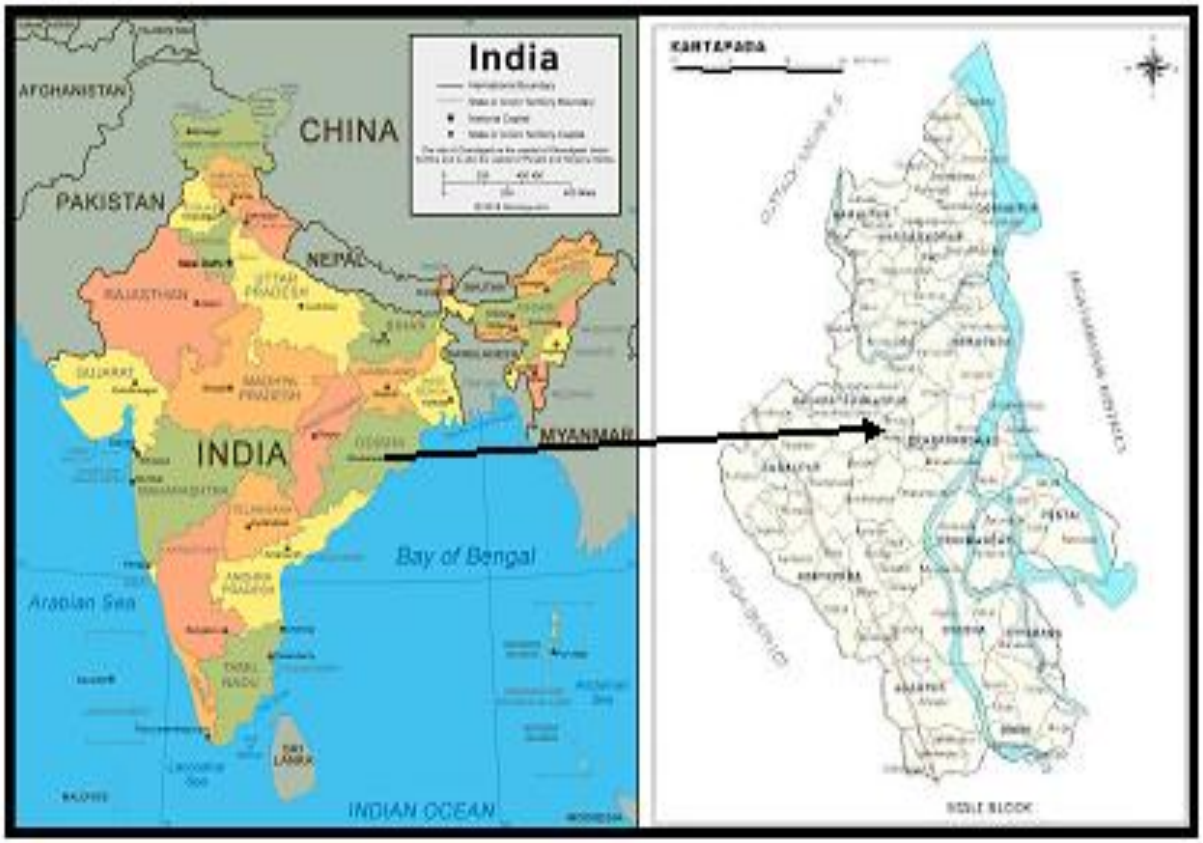

Fig. 1. Map of study area.

Field survey

Various tribes and traditional healers rich villages situated in study area were surveyed. Folklore claims and data were documented along with voucher specimens (Mahalik *et al.*, 2015).

Data collection

The complete information regarding the plants, dosages, duration, process of preparation, mode of administration, protection to be taken etc. was recorded in standard questionnaires (Fig.2) (Dash *et al.*, 2018).

Plant collection and identification

The supportive plant specimens were collected, processed, critically studied, identified and preserved in the Herbarium.

Different Herbaria of Bhubaneswar that held the specimens of earlier workers were visited and checked their identity. Voucher specimens were identified by referring standard local floras (Haines, 1921; Saxena and Brahmam, 1994).

Results and discussion

In the present ethnomedicinal study will provides information on 67 medicinal plants belongs to 43 families was compiled from various habitats of the study area.

Table 1. List of Ethno-medicinal plants used by traditional healers of Kantapada block of Cuttack district of Odisha for the treatment of various diseases.

Sl. No.	Botanical name with family name	Vernacular name	Parts used	Mode of administration and diseases cured
1	*Abrus precatorius* L. Fabaceae	Crab's eye (E); Ratti (H); Gunjaa (S); Kaincha (O)	Leaves, Root	Dried leaves and root powder (5-10 g) is given orally in case of eyesight problem. Decoction of young leaves is given orally for cough. Leaf powder is also taken orally to cure the urine problem.
2	*Abutilon indicum* (L.) Sweet Malvaceae	Indian mallow (E); Kanghi (H); Atibalaa (S); Pedipedica (O)	Leaves	The paste of seven leaves with seven black pepper is taken in empty stomach with rice washed water in the early morning to cure jaundice
3	*Achyranthes bidentata* Bl. Amaranthaceae	The prickly chaff flower (E); Apamaraga (H); Apamaraga (S); Apamaranga (O)	Root	The root is prescribed in the treatment of rheumatism. The herb is taken as vegetable to reduce hypertension, back pains and menstrual pains.
4	*Acorus calamus* L. Acoraceae	Sweet flag (E), Bach (H); Bhadra (S); Bacha (O)	Rhizome	Rhizome of *A. calamus* used medicinally for a wide variety of ailments such as gastrointestinal diseases and treating pain.
5	*Aegle marmelos* (L.) Corr. Rutaceae	Wood apple (E); Bel (H); Sivadrumah (S); Bela (O)	Fruits, Leaf	Fruit pulp absorbs the toxins produced by bacteria and other pathogens in the intestine, thus helping in the treatment of dysentery. Leaf (10 g) juice mixed with honey is useful for treating fever and various intestinal disorders.
6	*Aloe vera* (L.) Burm.f. Liliaceae	Indian aloe (E); Gheekuamri (H); Ghritakumari (S); Gheekuamri (O)	Whole plant	*A. vera* is best known for treating skin related problems.
7	*Andrographis paniculata* (Burm.f.) Wall.ex Nees Acanthaceae	Creat (E); Kirayat (H); Bhunimba (S); Bhuinimba (O)	Leaves	It is used to treat the common cold. 6 g of the leaves takes early morning with one glass of lukewarm water for 5 to 7 days to reduce fever and tonsillitis.
8	*Argemone mexicans* L. Papaveraceae	Mexican Prickly puppy (E); Satyanashi (H); Khirini (S); Odosamari (O)	Flower, Leaves	The flowers are soaked in water overnight and cleaning the eyes with this water helps to improve eyesight. The juice (15 g) of leaves helps in treating various skin diseases.
9	*Artocarpus heterophyllus* L. Moraceae	Jackfruit (E); Katahal (H); Panasam (S); Panasa (O)	Seed, Fruits, Leaves	The pulp and seeds of the fruit are regarded as a cooling agent. The ashes of leaves with or without oil are used to treat diarrhea, stomach ache and wounds.
10	*Azadirachta indica* A.Juss.	Neem (E); Neem (H); Pakvakrita (S); Nimba (O)	Leaves	*A. indica* leaf (20-25 g) paste is applied to the skin

	Meliaceae			to treat acre, measles, and chicken pox. Juice of *A. indica* leaf used to cure diabetes.
11	*Bacopa monnieri* (L.) Pennel Plantaginacae	Moneywort (E); Brahmi (H); Brahmi (S); Prusni parnni (O)	Leaves	Five to six leaves were taken with one glass of water to improve memory.
12	*Boerhavia diffusa* L. Nyctaginaceae	Hog weed (E); Biskhapara (H); Shothagni (S); Puruni (O)	Root, Leaves, Whole plant	The root of *B. diffusa* used as an analgesic, anti-diabetic. Whole plant used as a leafy vegetable which is very good for health, especially for heart diseases and anemia patient.
13	*Calotropis procera* (Ait.) R.Br. Apocynaceae	Milkweed (E); Mudar (H); Alarka (S); Arakha (O)	Leaves, Latex, Bark	The leaves are used for the treatment of asthma. The latex is used for treating ringworm. An infusion of bark powder is used in the treatment of leprosy and elephantiasis.
14	*Catharanthus roseus* (L.) G.Don Apocynaceae	Periwinkle (E); Sadabahar (H); Sadampuspa (S); Sadabihari (O)	Leaves	The leaf (5-10 g) extract is useful for the treatment of dysentery,blood pressure and diarrhea. It is also used as an anti-cancer agent.
15.	*Carica papaya* L. Caricaceae	Papaya (E); Papita (H); Erand karkati (S); Amrutabhanda (O)	Flower	Flowers (5-10 g) powders are mixed with 1 lit of water and taken empty for twice a day for 15 days to cure jaundice.
16	*Cedrus deodara* (Lamb.) G. Don. Pinaceae	Devdar (E); Devdar (H); Devdar (S); Deodar (O)	Bark	Bark is ground and mixed with 3-4 black pepper and makes a paste. Then the paste is applied to reduce pain and inflammation of joints and muscles.
17	*Centella asiatica* (L.) Urban Apiaceae	Indian pennywort (E); Brahmi buti (H); Sarasvati (S); Thalkudi (O)	Leaves	The Leaf of *C. asiatica* helps in enhancing memory and clarity, because of its diuretic nature. It is used for the treatment of dysuria
18	*Cinnamomum aromaticum* Nees	Chinese cinnnamon (E); Dalchini (H); Gudatvac (S); Dalchini (O)	Bark	Bark is used as a spice. Daily dose of Cinnamon in food control the Type-2 diabetes.
19	*Cinnamomum tamala* Nees Lauraceae	Indian Bay leaf (E); Tejpatta (H); Tamalapattra (S); Tejapatra (O)	Leaves, Bark	The leaves are dried and used as a flavoring agent. The powdered leaves are used in the treatment of colic and diarrhea. The 5 g of dried bark powdered was taken with lukewarm water to treat stomach pain.
20	*Citrus limon* (L.) Burm.f. Rutaceae	Lemon (E); Nimbu (H); Limpaka (S); Lembu (O)	Fruit	The fruit juice is used as a drink. The fruit is rich in vitamin C which helps the body to cure infections, wound healing and skin diseases.
21	*Cliteria ternatea* L. Fabaceae	Butterfly pea (E); Aparajit (H); Aparajita (S); Aparajita (O)	Flower, Root	The flowers are mixed with water in a preparation used to treat eye infections. The root (3 g) mixed with dried zinger (5 g) and takes orally to cure urinary related problems.
22	*Cocos nucifera* L. Arecaceae	Coconut (E); Nariyal (H); Narikela (S); Nadia (O)	Fruit, Root	Coconut milk is diuretic. Fruit juice is taken to treat kidney problems. The root is used to cure stomach ache.
23	*Cymbopogon citratus* (DC.) Stapf Poaceae	Lemon grass (E); Gandhatrina (H); Bhustrina (S); Dhanuantari (O)	Whole plant, Oil	The plant is used principally as tea in the treatment of digestive problems. The oil obtained from the plant is an effective antifungal and antibacterial.
24	*Dillenia indica* L. Dilleniaceae	Elephant apple (E); Chalta (H); Avartaki (S); Ou (O)	Fruits, Leaves, Bark	The fruit is toxic and laxative. It is used in the treatment of abdominal disorders. The bark and leaves are astringent.
25	*Eclipta prostrata* (L.) L. Asteraceae	False daisy (E); Bhringaraj (H); Bhringaraj (S); Bhrungraj (O)	Leaves, Whole plant	The plant is considered to be the best remedy for the hair. The fresh leaf extract is given orally twice a day for one week to cure body pain. The whole plant ash, mixed with half spoon of honey, thrice a day for 3 months to cure asthma
26	*Euphorbia hirta* L. Euphorbiaceae	Asthma weeds (E); Bara dudhi (H); Nagarjuni (S); Chitakutei (O)	Whole plant	The whole plant is used to treat respiratory system disorders like bronchitis, asthma, cough etc.
27	*Ferula asafetida* L. Umbelliferae	Wild Asafoetida (E); Hing (H); Badhika (S); Hengu (O)	Latix	Hing is very helpful in digestion. Pinch of Hing mixed with clove give great relief in reducing dental problem immediately.
28	*Gymnema sylvestre* (Retz) R.Br.ex Schult. Asclepidaceae	Cow plant (E); Gurmar (H); Madhunashini (S); Gudamari (O)	Leaves	The leaf extracts reduce the sugar intake and helps in the treatment of diabetes. The leaf extracts are also used in the treatment of eye diseases, cough

				and cold.
29	*Lawsonia inermis* L. Lythraceae	Henna (E); Mehendi (H); Ragangi (S); Manjuati (O)	Leaves, Root	The leaves are taken in the treatment of amoebic dysentery. The leaves are useful in the treatment of various skin diseases. Dying of hairs with the leaves is useful in treating lice. The roots are also used for curing jaundice.
30	*Limonia acidissima* L. Rutaceae	Wood apple (E); Kaith (H); Kapita (S); Kaintha (O)	Fruit Pulp, Leaves	The unripe pulp of the fruit is specially used in the treatment of diarrhea and dysentery. The leaves (10 g) combined with milk and sugars are helpful in the treatment of indigestion.
31	*Leucas aspera* (Willd.) Link Lamiaceae	Common leucas (E); Chhota halkusha (H); Dronapushpi (S); Bhutamari (O)	Whole plant, Leaves	The juice of the plant is used in the treatment of fevers, coughs and colds. The crushed leaves (15 g) are also used to treat mild fevers and snake bites.
32	*Magnolia champaca* L. Magnoliaceae	Golden champa (E); Champa (H); Champaka (S); Champa (O)	Flower, Leaves, Bark	The flowers and leaves are used for the treatment leprosy and colic pain. Decoction of bark and leaves are also used after childbirth.
33	*Manilkara zapota* (L.) P. Royen Sapotaceae	Sapodilla plum (E); Chikoo (H); Sapeta (O)	Leaves, Fruits	The leaf decoction is taken for fever, wounds and ulcers. The fruit is taken as a remedy for indigestion and diarrhea.
34	*Mentha spicata* L. Lamiaceae	Garden mint (E); Pudina (H); Putiha (S); Pudina (O)	Leaves	The leaves of *M. spicata* used as Carminative and helps in digestion of food. The leaf paste is applied over the skin to relieve the itching sensation.
35	*Mimusops elengi* L. Sapotaceae	Spanish cherry (E); Maulsari (H); Bakul (S); Baula (O)	Bark, Leaves, Fruits	Decoction of bark is used for the treatment of diarrhea and dysentery. The leaves are used to treat headache, toothache, wounds. The fruit can be eaten raw.
36	*Mirabilis jalapa* L. Nyctaginaceae	Four o' clock plant (E); Gulbakshi (H); Krishnakeli (S); Rangani (O)	Root	The fresh juice of the root has been taken orally twice a day for 10 days to cure urinary tract infections, diarrhea and indigestion.
37	*Momordica charantia* L. Cucurbitaceae	Bitter guard (E); Karela (H); Paraaru (S); Kalara (O)	Fruit, Leaves	The unripe fruit is traditionally used to treat the symptoms of diabetes. An infusion of leaves is used in the treatment of intestinal worms, jaundice and malaria.
38	*Moringa oleifera* Lam. Moringaceae	Drumstick tree (E); Senjana (H); Danshamula (S); Sajana (O)	Leaves	*M. oleifera* leaves were used to treat bronchitis, fevers, and eye and ear infections. Dry powdered leaves (5-10 g) were taken during meal to control high blood pressure.
39	*Murraya koenigii*(L.) Spreng. Rutaceae	Curry leaf tree (E); Kari patta (H); Alakavhaya (S); Bhursunga (O)	Leaves	The leaves (15-20 leaf) are used in the daily diet for treating constipation, colic and diarrhea. Leaves are also improved appetite and digestion.
40	*Nerium oleander* L. Apocynaceae	Oleander (E); Kaner (H); Chandata (S); Karabira (O)	Leaves	Leaf decoctions were used in the treatment of scabies and parasitic skin worms.
41	*Nyctanthes arbor-tristis* L. Nyctaginaceae	Coral jasmine (E); Har singar (H); Harsimgar (S); Gangasuili (O)	Leaves	Two spoonful of leaf juice is taken orally along with half spoon of honey or zinger to cure cough, fever and cold.
42	*Ocimum sanctum* L. Lamiaceae	Holy basil (E); Tulsi (H); Amrita (S); Tulasi (O)	Leaves	Fresh 5-6 Tulsi leaves are taken raw with honey to treat common cold, fever and cough.
43	*Paederia foetida* L. Rubiaceae	Skunk Vine (E); Gandhali (H); Bala (S); Pasaruni (O)	Leaves	The leaves are commonly used for the treatment of intestinal problems. The leaf juice is considered as an astringent.
44	*Phyllanthus emblica* L. Phyllanthaceae	Indian gooseberry (E); Amla (H); Sudha (S); Anla (O)	Fruits	The Amla fruit juice is good for treatment of hair loss. Application of Amla juice over the face helps to fight against wrinkles, pimples and ache.
45	*Phyllanthus niruri* L. Phyllanthaceae	Black catnip (E); Bhui aonla (H); Bhupatra (S); Bhuin anla (O)	Whole plant	Whole plant of *P. niruri* is used for the treatment of kidney stones, gallbladder stone liver related diseases such as liver cancer and jaundice.
46	*Piper longum* L. Piperaceae	Longpepper (E); Pipli (H); Pippali (S); Pipali (O)	Fruits, Root	The roasted fruits of *P.longum* mixed with honey and given twice a day for one month to cure rheumatism. The decoction of fruits and roots are also used for the treatment of chronic bronchitis.
47	*Plectranthus amboinicus* (Lour.)	Indian Borage (E); Patharchur (H); Karpuravalli (S);	Leaves	The infusions of leaves are taken orally for the

	Spreng. Lamiaceae	Rukuna hatapochha (O)		treatment of digestive problem, diarrhea and coughs.
48	*Pongamia pinnata* (L.) Pierre Fabaceae	Indian beech (E); Karanj (H); Karanjah (S); Karanja (O)	Leaves, Flowers	The infusion of the leaves and flowers are used to relieve rheumatism and diabetes.
49	*Psidium guajava* L. Myrtaceae	Guava (E); Amrood (H); Amratapalam (S); Pijuli (O)	Leaves, Bark, Fruits	A decoction of the leaves or bark is used as a lotion for skin diseases, ringworms. The fruit is eaten raw to cure constipation.
50	*Rauwolfia serpentina* (L.) Benth.ex Kurz Apocynaceae	Indian snakeroot (E); Sarpagandha (S); Nakuli (S); Patalagaruda (O)	Bark, Leaves, Root	The bark, leaves and roots are used against snake & scorpion bite. The roots are used to lower the high blood pressure.
51	*Rosa indica* L. Rosaceae	Damask Rose (E); Gulab (H); Atimanjula (S); Golapa (O)	Petals	Application of the paste of the petals over the body helps to regulate excessive sweating. Petals are used for making herbal tea to control acidity.
52	*Ricinus communis* L. Euphorbiaceae	Castor (E); Arandi (H); Amanda (S); Jada (O)	Seed, Leaves	Castor oil and seeds are used to cure rheumatism, constipation, boils and skin disorders. Decoction of leaves is used by women to increase the secretion of milk.
53	*Santalum album* L. Santalaceae	Sandalwood (E); Chandan (H); Anindita (S); Chandan (O)	Wood	Pastel and oil of sandalwood are used for burning sensation, itching, rashes etc.
54	*Saraca asoca* (Roxb.) de Wilde	Ashok tree (E); Sita Asoka (H); Asokah (S); Ashoka (O)	Flower, Bark, Seeds	The flowers are diuretic. The bark is said to have a stimulating effect on uterine and ovarian tissue. The seeds are used in the treatment of urinary discharge.
55	*Solanum nigrum* L. Solanaceae	Black night shade (E); Mokoi (H); Kakamaci (S); Nunununia (O)	Fruits	The ripe fruit is diuretic to laxative. It is used in the treatment of fevers and diarrhea.
56	*Strychnos nux-vomica* L. Loganiaceae	Poison nut (E); Bailewa (H); Kapilu (S); Kochila (O)	Leaves, Fruits	The leaves are used in the treatment of skin diseases. The oil obtained from fruits was used for the treatment of body paralysis and joint pain.
57	*Swertia chirata* Buch.-Ham.ex Wall. Gentianaceae	Chirayita (E); Chirayata (H); Ardhatikta (S); Chiritta (O)	Whole plant	A decoction of the whole plant is used to cure malaria. The whole plant paste is used for the treatment t of skin related problems.
58	*Syzygium armaticum* L. Myrtaceae	Clove (E); Lavang (H); Lavanga (S); Labanga (O)	Flower (Bud)	Cloves are taken as a tea in the treatment of stomach upsets. The flower buds are chewed to fresher the breath and to cure pain in toothache.
59	*Tabernaemontana divaricata*(L.) R.Br. ex Roem.& Schult. Apocynaceae	Crape jasmine (E); Chandini (H); Nandivrksah (S); Tagara (O)	Root, Flower	The decoction of the roots is used to treat hypertension and headache. The flowers mixed with oil apply to sore eyes.
60	*Tamarindus indica* L. Fabaceae	Tamarind (E); Imli (H); Amlamu (S); Tentuli (O)	Leaves, Flower	The leaves and flowers (3-5 g) are used to make a sweetened tea that is drunk by children as a remedy for measles and rheumatism.
61	*Terminalia bellirica* (Gaertn.) Roxb. Combretaceae	Beach almond (E); Bahera (H); Akshah (S); Bahada (O)	Fruits	The decoction of green fruit is used for the treatment of digestive, cough and respiratory problems. The ripe fruit is used in case of diarrhea, leprosy and piles.
62	*Terminalia chebula* Retz. Cambretaceae	Myrobalan (E); Harad (H); Kayastha (S); Harida (O)	Fruits	The fruit posse's anti-diabetic effects chewing the raw fruit enhance digestion. It helps to improve skin complexion.
63	*Tinospora cordifolia* (Willd.) Hook.f.&Thoms. Menispermaceae	Gulbel (E); Giloy (H); Guruchi (S); Guduchi(O)	Stem	It is useful in the treatment of heart diseases leprosy and rheumatoid arthritis.
64	*Withania somnifera* (L.) Dunal Solanaceae	Indian ginseng (E); Ashwagandha (H); Ashvagandha (S); Ashwagandha (O)	Root	Root paste of *W. somnifera* added to *C. longa* (Haladi) is applied to the skin for treating wounds, backache and one sided paralysis.
65	*Zingiber officinale* Rosc. Zingiberaceae	Ginger (E); Adrak (H); Adraka (S); Ada (O)	Rhizome	Ginger is commonly used to cure various types of stomach problems, cold, cough etc.
66	*Zingiber zerumbet* (L.) Smith Zingiberaceae	Shampoo ginger (E); Banadrak (H); Ahava (S); Bana ada (O)	Rhizome	The decoction of the rhizome is used in the treatment of asthma. The rhizome paste is applied externally to cure rheumatic joint pains.
67	*Ziziphus jujube* Mill. Rhamnaceae	Indianjujube (E); Badara (H); Kolah (S); Barakoli (O)	Fruits	*Z. jujube*is used for improving muscular strength and weight. It is also used to reduce constipation

The most dominated families belong to Fabaceae followed by Apocynaceae, Rutaceae, Lamiaceae and Nyctaginaceae (Fig. 3). Of the plants species described, 28 species are herbs (42%), 7are shrubs (10%), 26 are trees (39%) and 6are climbers (9%) (Fig.4).

Questionnaire for collecting Ethnomedicinal data during Ethnobotanical Study
Informants' consent for the participation in the study:

I..... (name of informant) hereby give my full consent and conscious to participate in this study and declare that to the best of my knowledge the information that I have provided are true, accurate and complete.

Date..... (Signature/Thumb impression of Informant)

Informants' details:
Name.....
Gender.....
Age.....
Address.....
.....
.....
Location/Residence.....
Data about medicinal plant and its use:
Plant (Local name).....
Habit (Tree/ Herb/ Shrub/Climber/.....)
Plant part used.....
Cultivated / Wild. .....
If cultivated, cultivated for.....
If wild, availability in natural resources (easy/ difficulty/ very difficult)
Conservation needs .....
Method of collection and storage.....
Name of disease(s) treated.....
Method of crude drug preparation.....
Mode of administration.....
Dosage .....
Other uses (if any).....

Remarks:
Plant identified as .....
(Botanical name and family)
Information provided by informants will be used for research purposes only

Signature of Researcher

Fig. 2. Ethnobotanical questionnaire.

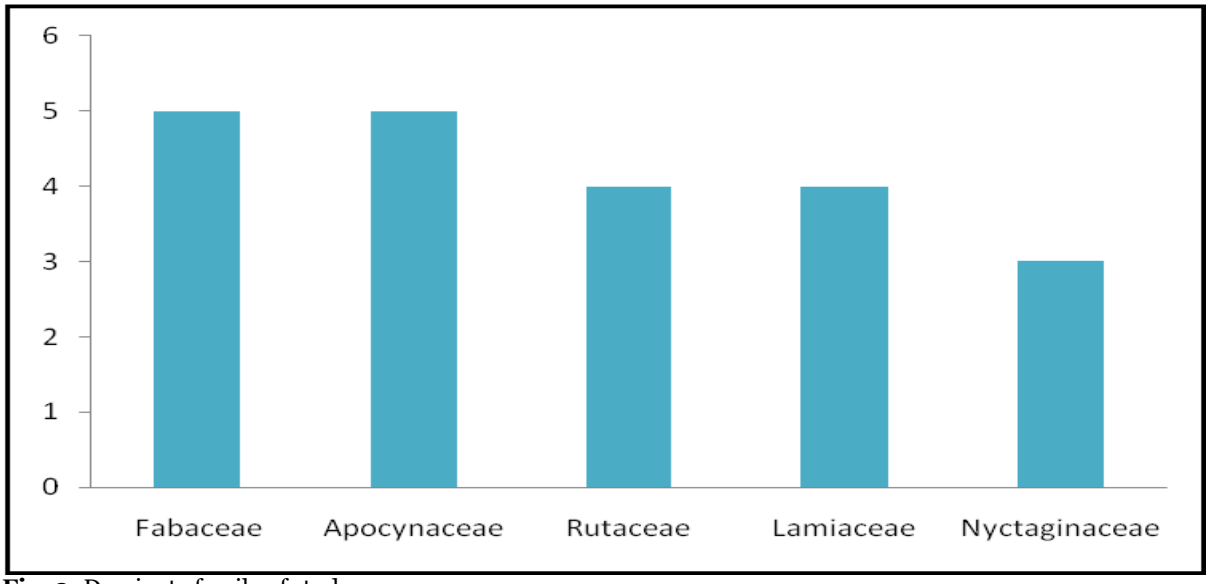

Fig. 3. Dominate family of study area.

The plant parts used for preparation of herbal drugs were leaves, roots, whole plant, flower, bark, rhizome, rhizome, fruits, pulp, seeds, latex, oil, petals and stem. The most frequently utilize parts were leaves (43) followed by fruits (13), roots (12) and bark (11) (Fig. 5). The information on the mode of uses of medicinal plants used against treatment of various diseases was documented from the traditional healers and was described in table 1.

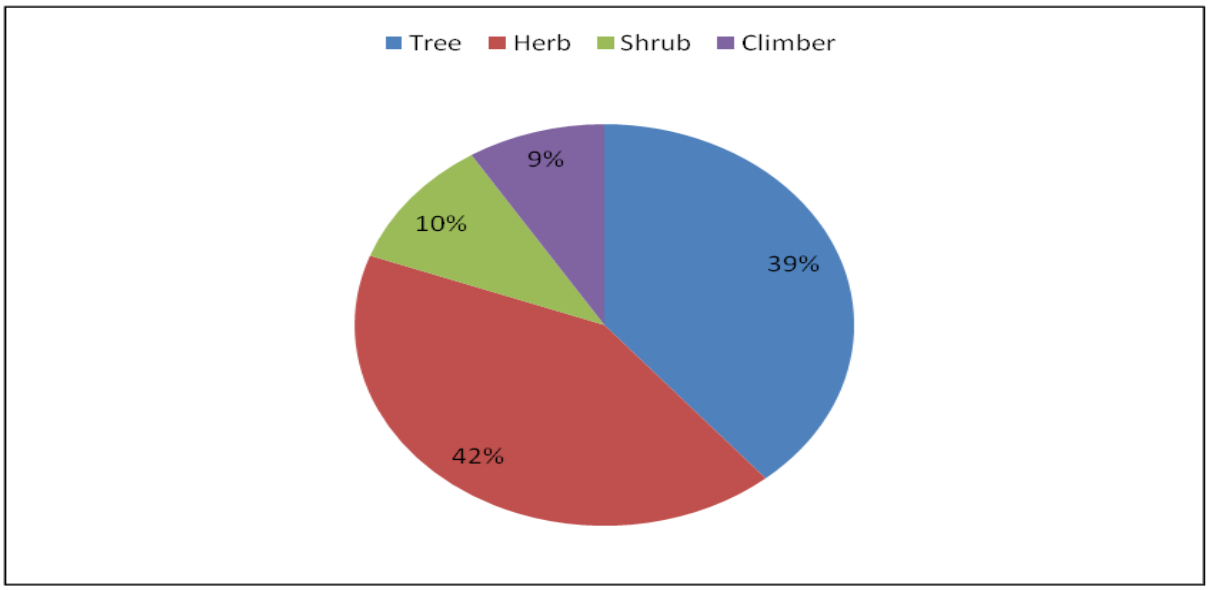

Fig. 4. Habit-wise distribution of plant species (%).

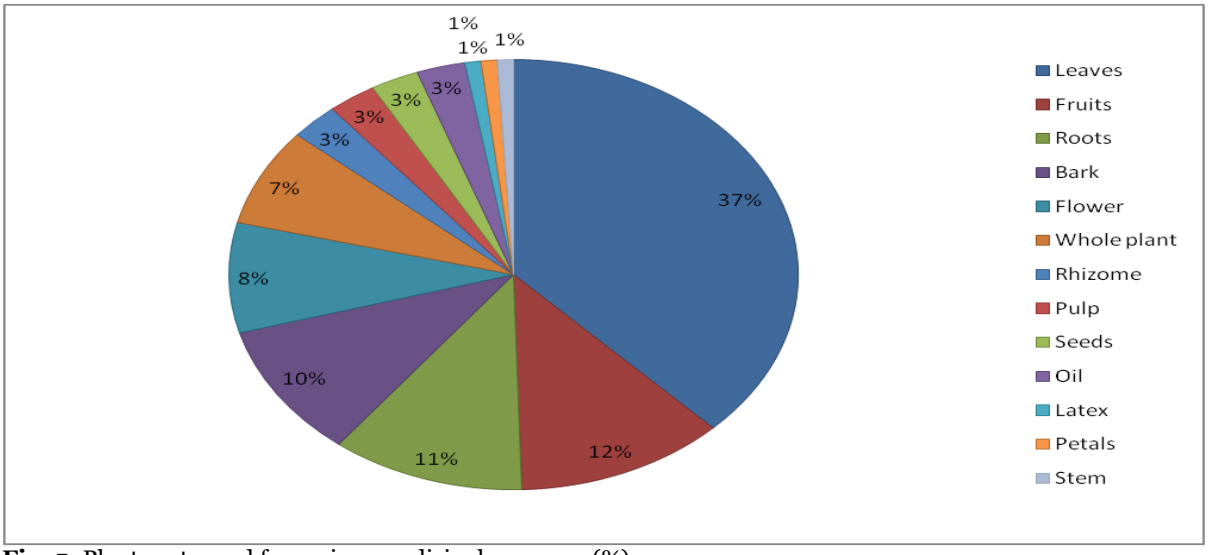

Fig. 5. Plant parts used for various medicinal purposes (%).

Conclusion

The findings of this study predicted that most of the medicinal plants used by traditional healers of study area contain medical substances in the leaves, roots, whole plant, flower, bark, rhizome, rhizome, fruits, pulp, seeds, latex, oil, petals and stem part of surveyed plants. More investigations must be carried out to evaluate the bioactive compounds present and mechanism of action of medicinal plants with anti-diabetic effect.

Acknowledgement

The authors are grateful to local people and traditional healers of Kantapada block of Cuttack district, Odisha for their valuable knowledge transfer. The authors are also grateful to the HOD, Department

of Botany and Dean, School of Applied Sciences, Centurion University of Technology and Management (CUTM), Odisha, India for their help and suggestions to carry out research work successfully.

Conflict of interest

Authors do not have any conflict of interest to declare.

References

Dash G, Mohanty KKGR, Sahoo D, Mahalik G, Parida S. 2018. Traditional medicinal plants used for the treatment of asthma in Bhubaneswar, Odisha. International Journal of Herbal Medicine **6(5),** 57-60.

Girach RD, Ahmed M, Brahmam M, Misra MK. 1996. Native phytotherapy among rural population of district Bhadrak, Orissa. In Jain, S.K. (Ed.), Ethnobiology in Human Welfare, Deep Publications, New Delhi, p 162-164.

Girach RD, Singh S, Ahmed M, Brahmam M, Misra MK. 1998. Euphorbiaceae in native health practices of district Bhadrak, Orissa, India. Fitoterapia (Milano) **69(1),** 24-28.

Girach RD, Singh S, Brahmam M, Misra MK. 1999. Traditional treatment of skin diseases in Bhadrak district, Orissa. Journal of Economic and Taxonomic Botany **23(2),** 499-504.

Haines HH. 1921. The Botany of Bihar and Orissa, 6 parts London. Botanical Survey of India, Calcutta (Rep. Edn. 1961) (1921-25).

Mahalik G, Sahoo S, Satapathy KB. 2015. Ethnobotanical survey of plants used in treatment of urinary disorders in Dhenkanal district of Odisha, India. Journal of Environmental Science, Toxicology and Food Technology **9(8),** 58-63. https://doi.org/10.9790/2402-09815863

Mahalik G, Sahoo S, Satapathy KB. 2017. Evaluation of phytochemical constituents and antimicrobial properties of *Mangifera indica* L. Leaves against urinary tract infections-causing pathogens. Asian Journal of Pharmaceutical and Clinical Research **10(9),** 169-173. http://dx.doi.org/10.22159/ajpcr.2017.v10i9.19034

Pattanaik C, Reddy CS, Dhal NK. 2008. Phytomedicinal study of coastal sand dune species of Orissa. Indian Journal of Traditional Knowledge **7,** 263-268.

Saxena HO, Brahmam M. 1994. The Flora of Orissa, Vol. 1-4. Regional Research Laboratory and Forest Development Corporation of Orissa, Bhubaneswar (1994-96).

Schultes RE. 1992. Ethnobotany and technology in the Northwest Amazon: A partnership. Sustainable harvest and marketing of rain forest products 7-13.

Sing KS. 1994. People of India Vol.111, Oxford University Press, New Delhi.

Swain S, Patel P, Nandi S. 2017. A multiple linear regression model for precipitation forecasting over Cuttack district, Odisha, India. In 2017 2nd International Conference for Convergence in Technology. IEEE, p 355-357. http://dx.doi.org/10.1109/I2CT.2017.8226150

WHO (World Health Organization). 2002. Traditional Medicine Strategy2002-2005. Geneva: World Health Organization.