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Medico-botanical investigation by the tribal people of Naogaon district, Bangladesh

A. H. M. Mahbubur Rahman¹, E. Z. M. F. Kabir¹, A. K. M. Rafiul Islam¹, A. T. M. N. Zaman¹

1. Department of Botany, University of Rajshahi, Rajshahi-6205, Bangladesh
[E-mail: ahmmahbubur_rahman@yahoo.com; Tel: +880 721 751485, Mobile: 88 01714657224]

In the present medico-botanical survey, a total of 102 plant species under 93 genera and 52 families were collected and recorded for their use in various ailments. Out of these plants species, 47 belonged to herbs, 29 trees, 12 shrubs, and 14 climbers. In majority cases, leaves of the medicinal plants were found leading in terms of their use followed by whole plant, stem, bark, latex, fruits, rhizome, bulb, tuber, seed, root and inflorescence. The study also suggested that the present information on medicinal use of plants by tribal people may be used for botanical and pharmacological research in future for the discovery of new sources of drugs.

Keyword: Medico-botany, drug discovery, Naogaon, Bangladesh.

1. Introduction

Naogaon is a district in Northern Bangladesh. It is a part of Rashahi division. **Naogaon district** is bounded by west Bangal of India on the north, Natore and Rajshahi district on the south, Joypurhat and Bogra districts on the east, Nawabganj district and West Bengal of India on the west. Today Naogaon District is considered the bread basket of Bangladesh. It is the central part of Borendra Region, with an area of about 3,435.67 square kilometres (1,326.52 sq mi), about 80% of which is under cultivation. The soil of the area is a fertile inorganic clay called dhoyass. Naogaon district's maximum temperature 37.8⁰C and minimum temperature 11.2⁰C. Annual total rainfall 1862 mm^[5].

Studies on medico-botanical information of tribal communities in Bangladesh are at initial stage. In Bangladesh so far a number of medico-botanical researches have been carried out^[2,4,14,15,17,18,19,20,21,12]. Currently, traditional knowledge of primary healthcare system of tribal communities is under great threat because of a number of factors including deforestation, habitat

degradation, biodiversity loss and modern civilization^[21]. For the sake of conservation of tribal knowledge on medicinal plants, medico-botanical study at Naogaon was essential. But none of them was devoted to medico-botany of Naogaon. The aim of the present study was to record medicinal knowledge of plants used by the tribal communities living of Naogaon.

2. Materials and Methods

In the present medico-botanical survey, a total of 102 plant species under 93 genera and 52 families were collected and recorded for their use in various ailments. A total of 250 tribal people having an age range 18-70 years were interviewed using semi-structured interviewed method^[3,13]. Professionally they were peasant, day labor, farmer, betel leaf cultivators, house wives, medicine men, small shop keepers etc. Among them 108 were female and rest 142 were male. Regular field studies were made in the study area during the period. The information about the plants used for various diseases was gathered through interviews and discussion with the

elderly people, medicine men and traditional medical practitioners were also consulted. Triangulation methods have been followed for data validation in the field^[7]. Plant specimens with flowers and fruits were collected and processed using standard herbarium techniques^[10]. Herbal plants referred by these people were authentically identified with the help of^[11] and^[1]. The voucher specimens are stored at Rajshahi University Herbarium (RUH) for future reference.

3. Results

In the present medico-botanical survey, a total of 102 species belonging to 93 genera and 52 families were recorded. For each species scientific name, local name, habit, family, ailments to be treated, mode of treatment and

part(s) used are provided (Table 1). From the available information it is revealed that this tribal people used plant species, which are not generally used by other population. Data have been gathered on the traditional uses of plant species, especially for asthma, anthelmintic, astringent, burning sensation, constipation, diarrhea, diabetes, eczema, fever, fracture, gonorrhea, headache, heart disease, itches, jaundice, kidney disease, leprosy, piles, snake-bite, ulcers, worm, wound and others.

These commonly used angiospermic plant species are arranged in alphabetical order followed by their scientific name, local name, habit, family name, part(s) used, ailments and treatment process.

Table 1: List of plants and their diversity in use of medicinal purposes by the tribal people living of Naogaon district, Bangladesh.

S/N	Scientific name	Local name	Habit	Name of family	Part(s) used	Ailments	Treatment process
1	<i>Abutilon indicum</i> (L.) Sweet.	Petari	Herb	Malvaceae	Leaf, Root	Diuretic, demulcent, fever, gonorrhoea, piles	Taken infusions of the leaves and roots, applied cooked leaves
2	<i>Abrus precatorius</i> L.	Kuch	Climber	Fabaceae	Stem	Paralysis	Taken seeds paste
3	<i>Acalypha indica</i> L.	Muktajhuri	Herb	Euphorbiaceae	Leaf	Skin disease	Taken leaves juice
4	<i>Achyranthes aspera</i> L.	Apang	Herb	Amaranthaceae	Leaf, Root	Abortion, diuretic, eczema	Taken roots juice, also taken leaves paste
5	<i>Adhatoda zeylanica</i> Medic.	Bassak	Shrub	Acanthaceae	Leaf	Cough, fever	Taken leaves juice
6	<i>Aegle marmelos</i> (L.) Corr. Serr.	Bel	Tree	Rutaceae	Leaf, Fruit	Abscess, fever, dysentery, indigestion	Applied young leaves juice, also taken immature fruits decoction and ripe fruits
7	<i>Aerva lanata</i> Juss.	Chaya	Herb	Amaranthaceae	Whole plant	Diuretic, demulcent, headache, cough	Taken whole plant juice
8	<i>Ageratum conyzoides</i> L.	Ochunti	Herb	Asteraceae	Whole plant, Leaf, Stem	Skin disease, leprosy, stomach disorder, tonic, wound	Both leaves and stems paste taken, also applied whole plants juice and leaves paste
9	<i>Allium cepa</i> L.	Piaj	Herb	Liliaceae	Bulb	Cough, headache	Taken bulb/scales juice
10	<i>Allium sativum</i> L.	Rashun	Herb	Liliaceae	Bulb	Piles, rheumatism	Taken fresh bulb, also applied bulb juice
11	<i>Alstonia scholaris</i> (L.) R. Br.	Chatim	Tree	Apocynaceae	Bark	Dysentery, fever	Applied bark Juice
12	<i>Alternanthera sessilis</i> R. Br.	Chachi	Herb	Amaranthaceae	Whole plant	Lactagogue, febrifuge	Taken whole plant juice

13	<i>Aloe vera</i> Burm. f.	Ghritakumari	Herb	Aloeaceae	Leaf	Piles, menstrual disease, sex problems	Applied leaves mucilage, also taken leaves juice
14	<i>Alocasia indica</i> (Roxb.) Schott.	Mankachu	Herb	Araceae	Leaf, Tuber	Cough, constipation, kidney disease, stomachic, colic, Piles,	Taken leaves curry, also taken tuber curry and paste
15	<i>Amaranthus spinosus</i> L.	Kantanotey	Herb	Amaranthaceae	Whole plant	Asthma	Applied whole plants juice
16	<i>Amaranthus lividus</i> L.	Noteysak	Herb	Amaranthaceae	Root	Menstrual flow	Roots act as reduce menstrual flow.
17	<i>Amaranthus viridis</i> L.	Shaknotey	Herb	Amaranthaceae	Leaf	Demulcent, diuretic, snake-bite	Applied leaves paste
18	<i>Andrographis paniculata</i> (Burm. f.) Wall ex Nees.	Kalomegh	Herb	Acanthaceae	Leaf, Whole plant	Wound, itches, dysentery, diarrhea, fever, helminthiasis	Taken leaves paste, also applied whole plants juice and leaves juice mixed with salt and water
19	<i>Annona squamosa</i> L.	Ata	Tree	Annonaceae	Leaf, Root	Abscess, dysentery	Taken leaves paste, also applied roots Juice
20	<i>Ananas comosus</i> (L.) Merr.	Anaros	Herb	Bromeliaceae	Fruit	Abortion, cough, diuretic, fever, helminthiasis, worm	Taken unripe fruits juice, also taken ripe fruits
21	<i>Artocarpus heterophyllus</i> Lamk.	Kathal	Tree	Moraceae	Leaf, Root, Bark	Asthma, itches, diarrhea, excessive menstrual discharge	Taken young leaves Juice, also taken young roots Juice and bark Juice
22	<i>Aristolachia indica</i> L.	Isharmul	Climber	Aristolachiaceae	Leaf, Seed	Cough, inflammations, biliousness, ulcers, eczema	Taken leaves juice, also taken seeds paste and leaves juice mixed with castor oil
23	<i>Argemone mexicana</i> L.	Sialkanta	Herb	Papaveraceae	Root, Stem, Latex	Diuretic, diabetes, jaundice, itches, skin disease	Taken roots juice, also taken stems curry and latex
24	<i>Asparagus racemosus</i> L.	Satamuli	Climber	Liliaceae	Root, Whole plant	Diarrhoea, diabetes, jaundice, urinary disease	Taken tuberous roots juice, also taken whole plant juice
25	<i>Averrhoa carambola</i> L.	Kamranga	Tree	Averrhoaceae	Fruit	Fever, jaundice, bleeding piles	Taken fruits
26	<i>Azadirachta indica</i> A. Juss.	Neem	Tree	Meliaceae	Leaf	Worm, chicken pox, eczema, itches, helminthiasis	Taken young leaves juice mixed with water of boil rice, Leaves boiled with water and apply physically, also taken leaves paste, taken young leaves juice mixed with salt and water
27	<i>Basella alba</i> L.	Puishak	Climber	Basellaceae	Whole plant, Leaf	Demulcent, diuretic, laxative, gonorrhea, constipation	Cooked whole plant is taken, also taken leaves juice
28	<i>Blumea lacera</i> (Burm.f.) DC	Kuksim	Herb	Asteraceae	Leaf, Root	Anthelmintic, febrifuge, astringent, diuretic, bleeding piles, cholera	Applied leaves juice, also taken leaves juice mixed with black pepper and root juice mixed with black pepper
29	<i>Boerhaavia repens</i> L.	Punamava	Climber	Nyctaginaceae	Whole plant,	Stomachic, laxative, emetic, diuretic,	Taken whole plant juice, also applied both of root

					Root, Leaf	dropsy, pain, dysentery, epilepsy, jaundice, anaemia, ophthalmia, gonorrhoea	and leaves juice
30	<i>Bombax ceiba</i> L.	Shimul	Tree	Bombacaceae	Bark, Root	Dysentery, excessive menstrual discharge, diabetes, sex problems	Taken barks juice, also taken immature roots juice
31	<i>Borassus flabellifer</i> L.	Tal	Tree	Arecaceae	Fruit	Diuretic	Taken unripe fruit pulp
32	<i>Cassia sophera</i> L.	Kalkasunda	Herb	Caesalpinaceae	Leaf	Dyspepsia	Taken leaves and roots decoction
33	<i>Carica papaya</i> L.	Papaya	Tree	Caricaceae	Latex, Fruit	Itches, constipation, indigestion, liver disease, diarrhoea	Taken latex, also taken, also applied ripe and unripe fruits
34	<i>Cajanus cajan</i> (L.) Millsp.	Arhar	Shrub	Fabaceae	Leaf, Root	Diabetes, jaundice	Applied roots Juice, also taken young leaves juice
35	<i>Calotropis procera</i> (Aiton) W.T. Aiton	Akanda	Shrub	Asclepiadaceae	Leaf	Piles	Taken leaves extract
36	<i>Celosia criatata</i> L.	Moragphul	Herb	Amaranthaceae	Whole plant	Biliousness, dysentery, diarrhea, snake-bite, demulcent, astringent, ophthalmia	Taken whole plant juice, also applied whole plant paste
37	<i>Centella asiatica</i> (L.) Urban	Thankuni	Herb	Apiaceae	Whole plant, Leaf	Dysentery, eczema, headache	Taken whole plant vegetable, also taken young leaves paste
38	<i>Chenopodium album</i> L.	Batuashak	Herb	Chenopodiaceae	Leaf	Digestive, stomachic, constipation,	Taken young leaves curry
39	<i>Cissus quadrangularis</i> L.	Harzora	Climber	Vitaceae	Bark	Bone fracture	Taken bark Paste
40	<i>Citrus grandis</i> (L.) Osborne	Jambura	Tree	Rutaceae	Fruit	Anaemia	Taken ripe fruits Juice
41	<i>Clerodendrum viscosum</i> Vent.	Bhant	Shrub	Verbenaceae	Leaf	Vomiting, worm, dyspepsia	Applied leaves juice
42	<i>Coccinea grandis</i> (L.) J. Voigt.	Telakucha	Climber	Cucurbitaceae	Leaf	Diabetes, fever	Taken young leaves vegetable
43	<i>Cocos nucifera</i> L.	Narikel	Tree	Arecaceae	Root, Fruit	Diuretic, menstrual disease, diarrhoea	Taken roots juice, also taken green coconut water
44	<i>Costus speciosus</i> Sm.	Costus	Herb	Costaceae	Rhizome	Diabetes, high fever	Taken rhizome juice
45	<i>Colocasia esculenta</i> (L.) Schott.	Kachu	Herb	Araceae	Leaf, Tuber	Constipation, colic, digestive,	Taken leaves curry, also taken tuber curry and paste
46	<i>Curcuma longa</i> L.	Holdi	Herb	Zingiberaceae	Rhizome	Abscess, eczema	Taken rhizome paste
47	<i>Cucurbita pepo</i> L.	Mistikumra	Climber	Cucurbitaceae	Stem	Tooth infection	Stem decoction gargling
48	<i>Cuscuta reflexa</i> Roxb.	Samalata	Climber	Convolvulaceae	Whole plant	Liver disease	Taken whole plant decoction
49	<i>Cynodon dactylon</i>	Durba	Herb	Poaceae	Leaf,	Skin disease, stop	Taken young leaves

	(L.) Pers.				Whole plant	bleeding, wound	paste, also applied whole plant Paste
50	<i>Dalbergia sissoo</i> Roxb.	Sissoo	Tree	Fabaceae	Wood	Abscess	Taken wood paste
51	<i>Datura metel</i> L.	Dhutra	Shrub	Solanaceae	Leaf	Asthma, rheumatism	Taken leaves cigarette, also applied leaves paste
52	<i>Dillenia indica</i> L.	Chalta	Tree	Dilleniaceae	Fruit	Hair tonic	Taken fruits juice
53	<i>Dioscorea bulbifera</i> L.	Pataalu	Climber	Dioscoreaceae	Tuber, Leaf	Bone fracture, boils	Taken both of tuber and leaves paste
54	<i>Eclipta alba</i> (L.) Hassk.	Kalokeshi	Herb	Asteraceae	Leaf	Wound, skin disease, hair disease	Taken young leaves paste
55	<i>Enhydra fluctuans</i> Lour.	Helencha	Herb	Asteraceae	Leaf	Inflammation, leucoderma, bronchitis, biliousness, small pox, gonorrhoea, headache	Taken leaves juice, also applied leaves juice mixed with milk and taken leaves paste
56	<i>Erythrina variegata</i> L.	Madar	Tree	Fabaceae	Leaf, Bark, Root	Toothache, fever, menstrual disease	Applied leaves juice, also taken bark juice and roots juice
57	<i>Euphorbia hirta</i> L.	Dudhia	Herb	Euphorbiaceae	Leaf	Bronchitis, cough	Taken leaves juice
58	<i>Feronia limonia</i> (L.) Swingle	Kathbel	Tree	Rutaceae	Leaf, Fruit	Vomiting, diuretic	Taken leaves Juice, also applied fruit pulp
59	<i>Ficus benghalensis</i> L.	Bot	Tree	Moraceae	Leaf	Abscess	Applied leaves paste
60	<i>Ficus recemosa</i> L.	Jogdumur	Tree	Moraceae	Latex	Piles, diabetes	Taken latex, also taken curry made from unripe fruit
61	<i>Glycosmis pentaphylla</i> (Retz.) DC	Datmajan	Shrub	Rutaceae	Leaf, Fruit	Jaundice, dysentery	Applied leaves juice, also taken ripe fruits juice
62	<i>Gnaphalium pulvinatum</i> Delile.	Banpalang	Herb	Asteraceae	Leaf	Astringent, wound, gout	Taken leaves paste
63	<i>Heliotropium indicum</i> L.	Hatisur	Herb	Boraginaceae	Leaf	Fever, skin disease	Taken leaves decoction, also applied leaves paste
64	<i>Justicia gendarussa</i> Burm. f.	Jagathmadan	Herb	Acanthaceae	Leaf	Asthma, fracture, itches, wound	Taken leaves juice, also applied leaves paste
65	<i>Kalanchoe pinnata</i> (Lamk.) Pers.	Patharkuchi	Herb	Crassulaceae	Leaf	Cough, dysentery, diuretic, diabetes, fracture	Applied young leaves juice, also taken leaves paste
66	<i>Leucas aspera</i> L.	Setadron	Herb	Lamiaceae	Leaf	Fever, worm	Taken young leaves juice
67	<i>Launaea asplenifolia</i> DC.	Tik-chana	Herb	Asteraceae	Root	Lactagogue	Applied root juice combination with other drugs
68	<i>Lawsonia inermis</i> L.	Mehendi	Shrub	Lythraceae	Leaf	Wound, burning sensation	Taken leaves paste
69	<i>Mangifera indica</i> L.	Am	Tree	Anacardiaceae	Leaf	Toothache	Taken young leaves decoction
70	<i>Mikania cordata</i> (Burm.f.) B. L. Rob.	Assamlata	Climber	Asteraceae	Leaf	Cut injury	Applied leaves juice
71	<i>Mimosa pudica</i> L.	Lajjabati	Climber	Fabaceae	Root	Fever, snake-bite	Taken roots decoction,

							also taken roots juice
72	<i>Mimosa diplotricha</i> C. Wright ex Sauv.	Sadalajjabati	Herb	Fabaceae	Leaf	Skin disease	Leaves decoction applied physically
73	<i>Momordica charantia</i> Descourt.	Korola	Climber	Cucurbitaceae	Leaf, Fruit	Chickenpox, rheumatism, diabetes	Applied leaves Juice, also taken curry made from unripe fruits
74	<i>Moringa oleifera</i> Lamk.	Sogina	Tree	Moringaceae	Fruit, Root	Chicken pox, diabetes, paralysis, fever	Taken fruits, also taken roots decoction
75	<i>Musa paradisiaca</i> L.	Kala	Herb	Musaceae	Stem	Blood pressure	Sap of the central cylindrical stem of the fruited plants is used
76	<i>Oxalis corniculata</i> L.	Amrul	Herb	Oxalidaceae	Leaf	Anaemia, cough	Taken leaves Juice, also taken young leaves vegetable
77	<i>Ocimum sanctum</i> L.	Tulsi	Shrub	Lamiaceae	Leaf, Root	Cough, fever	Taken young leaves juice, also applied roots juice
78	<i>Ocimum americanum</i> L.	Babuitulshi	Herb	Lamiaceae	Leaf	Bronchitis	Leaves juice taken
79	<i>Persicaria hydropiper</i> (L.) Delabre	Panimarich	Herb	Polygonaceae	Leaf	Insects-bite	Applied leaves juice
80	<i>Phyllanthus emblica</i> L.	Amloki	Tree	Euphorbiaceae	Fruit	Burning sensation, vomiting, cough, indigestion, jaundice	Taken ripe and dried fruits
81	<i>Physalis minima</i> L.	Kapalputki	Herb	Solanaceae	Root	Diuretic	Taken roots Juice
82	<i>Piper betel</i> L.	Pan	Climber	Piperaceae	Leaf	Cut injury, stomachache	Leaves juice taken, also applied leaves with catechu
83	<i>Psidium guajava</i> L.	Piyara	Tree	Myrtaceae	Leaf, Bark, Fruit	Toothache, dysentery, diarrhoea, worm	Taken leaves decoction, also applied bark juice and fruits
84	<i>Punica granatum</i> L.	Dalim	Tree	Punicaceae	Fruit	Anaemia, diarrhea, dysentery	Taken ripe fruits Juice, also taken Immature fruit juice
85	<i>Ricinus communis</i> L.	Rendri	Tree	Euphorbiaceae	Leaf, Seed	Headache, rheumatism	Taken leaves paste, also applied seeds oil
86	<i>Rauwolfia serpentina</i> (L.) Benth. Ex Kurz.	Sarpagandha	Herb	Apocynaceae	Root	Blood pressure, heart disease, dysentery, diarrhoea	Applied roots juice, also taken roots decoction
87	<i>Scoparia dulcis</i> L.	Talmisri	Herb	Scrophulariaceae	Root	Snake-bite	Taken roots Juice
88	<i>Senna alata</i> (L.) Roxb.	Dadmardan	Shrub	Fabaceae	Leaf	Eczema, dad	Taken leaves decoction, also taken paste
89	<i>Senna sophera</i> (Linn) Roxb.	Kalkasunda	Herb	Fabaceae	Leaf	Dyspepsia	Taken leaves and roots decoction
90	<i>Solanum melongena</i> L.	Begun	Shrub	Solanaceae	Fruit	Pain waiver	Taken fruits paste
91	<i>Solanum nigrum</i> L.	Kakmachi	Herb	Solanaceae	Fruit	Diuretic, heart disease	Applied green fruits Juice
92	<i>Spilanthes calva</i> DC.	Nakphul	Herb	Asteraceae	Inflorescence	Toothache	Chewing inflorescence

93	<i>Syzygium cumini</i> (L.) Skeels.	Jam	Tree	Myrtaceae	Bark, Stem	Dysentery, wound, diabetes	Applied bark paste, also taken dry seed dust mixed with normal water
94	<i>Terminalia bellirica</i> (Gaertn.) Roxb.	Bohera	Tree	Combretaceae	Fruit, Stem	Burning sensation, rheumatism	Taken fruits, also applied oil extracted from seeds
95	<i>Terminalia arjuna</i> (Roxb.) Wight & Arn.	Arjun	Tree	Combretaceae	Leaf, Bark, Fruit	Burning sensation, blood pressure, heart disease, worm	Applied leaf soaked, also taken bark juice, dust made from dry shoot bark and, unripe fruits
96	<i>Terminalia chebula</i> Retz.	Haritaki	Tree	Combretaceae	Fruit	Constipation, indigestion, rheumatism, urinary disease	Taken ripe fruits, also applied unripe fruits
97	<i>Tamarindus indica</i> L.	Tentul	Tree	Fabaceae	Fruit, Leaf	Burning sensation, heart disease	Taken ripe fruit pulps, also taken leaves juice
98	<i>Vitex negundo</i> L.	Nishinda	Shrub	Verbenaceae	Leaf, Root	Fever, rheumatism	Taken roots juice, also applied leaves paste
99	<i>Youngia japonica</i> (L.) DC.	Youngia	Herb	Asteraceae	Leaf, Root	Wounds, antilithic properties	Taken leaves paste, also applied roots juice
100	<i>Zinnia elegans</i> L.	Zinnia	Herb	Asteraceae	Leaf, Stem	Skin disease, leprosy, boils, tetanus, wound	Both leaves and stems paste taken
101	<i>Zingiber officinale</i> Roscoe	Ada	Herb	Zingiberaceae	Rhizome	Fever, bronchitis	Applied zinger with betel and also taken juice
102	<i>Zizyphus mauritiana</i> Lamk.	Boroi	Tree	Rhamnaceae	Leaf	Headache	Taken young leaves paste

Table 2: Analysis of the data based on habit showed that leading medicinal plants species.

S/N	Habit	Number of species	Percentage (%)	Total number of species
1	Herbs	47	46.07	102
2	Shrubs	12	11.76	102
3	Climbers	14	13.72	102
4	Trees	29	28.43	102

Table 3: Number of plant parts used for medicinal purpose.

S/N	Name of plant parts	Use of plant parts	Percentage (%)	Total number of species
1	Leaf	62	60.78	102
2	Whole plant	12	11.76	102
3	Root	22	21.56	102
4	Stem	8	7.84	102
5	Bark	8	7.84	102
6	Fruit	21	20.58	102
7	Rhizome	3	2.94	102
8	Tuber	3	2.94	102
9	Inflorescence	1	0.98	102
10	Seed	2	1.96	102
11	Bulb	2	1.96	102
12	Latex	3	2.94	102

Table 4: Distribution of species among different families.

S/N	Family name	Number of species	Percentage (%)	Total number of species
1	Acanthaceae	3	2.94	102
2	Aloeaceae	1	0.98	102
3	Amaranthaceae	6	5.88	102
4	Apiaceae	1	0.98	102
5	Apocynaceae	2	1.96	102
6	Araceae	2	1.96	102
7	Aristolachiaceae	1	0.98	102
8	Asteraceae	10	9.80	102
9	Anacardiaceae	1	0.98	102
10	Annonaceae	1	0.98	102
11	Asclepiadaceae	1	0.98	102
12	Arecaceae	2	1.96	102
13	Averrhoaceae	1	0.98	102
14	Basellaceae	1	0.98	102
15	Boraginaceae	1	0.98	102
16	Bombacaceae	1	0.98	102
17	Bromeliaceae	1	0.98	102
18	Caesalpiniaceae	1	0.98	102
19	Caricaceae	1	0.98	102
20	Crassulaceae	1	0.98	102
21	Chenopodiaceae	1	0.98	102
22	Costaceae	1	0.98	102
23	Cuscutaceae	1	0.98	102
24	Cucurbitaceae	3	2.94	102
25	Combretaceae	3	2.94	102
26	Dioscoriaceae	1	0.98	102
27	Dilleniaceae	1	0.98	102
28	Euphorbiaceae	4	3.92	102
29	Fabaceae	9	8.82	102
30	Lamiaceae	3	2.94	102
31	Liliaceae	3	2.94	102
32	Lythraceae	1	0.98	102
33	Malvaceae	1	0.98	102
34	Meliaceae	1	0.98	102
35	Moringaceae	1	0.98	102
36	Moraceae	3	2.94	102
37	Musaceae	1	0.98	102
38	Myrtaceae	2	1.96	102
39	Nyctaginaceae	1	0.98	102
40	Oxalidaceae	1	0.98	102
41	Papaveraceae	1	0.98	102
42	Piperaceae	1	0.98	102
43	Poaceae	1	0.98	102
44	Punicaceae	1	0.98	102
45	Polygonaceae	1	0.98	102
46	Rhmnaceae	1	0.98	102
47	Rutaceae	4	3.92	102
48	Scrophulariaceae	1	0.98	102
49	Solanaceae	4	3.92	102
50	Verbenaceae	2	1.96	102
51	Vitaceae	1	0.98	102
52	Zingiberaceae	2	1.96	102

Table 5: Number of medicinal plants used in different categories of ailments.

S/N	Categories of ailments	Number of species	Percentage (%)	Total number of species
1	Abortion	2	1.96	102
2	Abscess	5	4.90	102
3	Asthma	4	3.92	102
4	Anthelmintic	1	0.98	102
5	Astringent	3	2.94	102
6	Anaemia	4	3.92	102
7	Anthelitic properties	1	0.98	102
8	Bone fracture	3	2.94	102
9	Biliousness	3	2.94	102
10	Blood pressure	3	2.94	102
11	Burning sensation	4	3.92	102
12	Bronchitis	3	2.94	102
13	Boils	2	1.96	102
14	Cough	6	5.88	102
15	Constipation	5	4.90	102
16	Cholera	1	0.98	102
17	Colic	2	1.96	102
18	Chicken pox/small pox	4	3.92	102
19	Dad	1	0.98	102
20	Dysentery	14	13.72	102
21	Diarrhoea	7	6.86	102
22	Diuretic	14	13.72	102
23	Demulcent	4	3.92	102
24	Diabetes	9	8.82	102
25	Dropsy	1	0.98	102
26	Digestive	1	0.98	102
27	Dyspepsia	3	2.94	102
28	Eczema	6	5.88	102
29	Epilepsy	1	0.98	102
30	Emetic	1	0.98	102
31	Fever	17	16.66	102
32	Febrifuge	2	1.96	102
33	Gonorrhoea	3	2.94	102
34	Gout	1	0.98	102
35	Helminthiasis	3	2.94	102
36	Headache	5	4.90	102
37	Heart disease	4	3.92	102
38	Hair disease	1	0.98	102
39	Itches	4	3.92	102
40	Infammations	2	1.96	102
41	Injury	2	1.96	102
42	Insect-bite	1	0.98	102
43	Indigestion	3	2.94	102
44	Jaundice	7	6.86	102
45	Kidney disease	1	0.98	102
46	Lactagogue	2	1.96	102
47	Leprosy	2	1.96	102
48	Liver disease	2	1.96	102
49	Laxative	2	1.96	102
50	Leucoderma	1	0.98	102
51	Menstrual disease	2	1.96	102

52	Ophthalmia	2	1.96	102
53	Piles	7	6.86	102
54	Paralysis	1	0.98	102
55	Pain	2	1.96	102
56	Rheumatism	7	6.86	102
57	Snake-bite	4	3.92	102
58	Skin disease	8	7.84	102
59	Stomachic	4	3.92	102
60	Stop bleeding	1	0.98	102
61	Sex problems	2	1.96	102
62	Tonic	2	1.96	102
63	Toothache	4	3.92	102
64	Tetanus	1	0.98	102
65	Ulcers	1	0.98	102
66	Urinary disease	1	0.98	102
67	Vomiting	3	2.94	102
68	Wound	7	6.86	102
69	Worm	5	4.90	102

4. Discussion

In the present medico-botanical survey, a total of 102 species belonging to 93 genera and 52 families were recorded. For each species scientific name, local name, habit, family, ailments to be treated, mode of treatment and part(s) used are provided (Table 1). Analysis of the data based on habits showed that leading medicinal plant species 46.07% belonged to herbs, 11.76% shrubs, 28.43% trees and 13.72% climbers (Table 2). Giday^[9] reported that herb is the leading to medicinal species in his article on Zay people of Ethiopia whereas Teklehamyanot and Giday^[16] reported same result among the people of Zegie Peninsula, Northwestern Ethiopia. The present report on leading medicinal species as herb, is similar to the above findings.

Use of plant parts as medicine shows variation. Leaves (60.78%) are the leading part used in a majority of medicinal plants followed by 20.58% fruits, 21.56% roots, 7.84% bark, 11.76% whole plant, 7.84% stem, 2.94% latex, 1.96% bulb, 2.94% rhizomes, 1.96% seed, 2.94% tuber and 0.98% inflorescence (Table 3). Harvesting leaves for medicinal use has also been reported from Southern Ethiopia^[22]. Herbal preparation that involves roots, rhizomes, bulbs, barks, stems or whole plants affects mother plants^[6]. In the present study area this threat was minimal as leaves were the leading plants parts used for medicinal purposes.

Distribution of medicinal plant species in the families shows variation (Table 4). Asteraceae is represented by 10 species, Fabaceae is represented by nine species and Amaranthaceae is represented by 6 species. Each of Euphorbiaceae, Solanaceae and Rutaceae is represented by four species. Three species in each was recorded by six families. A single species in each was recorded by 34 families while two species in each was recorded by six families. The survey indicated that the common medicinal plant families in the study area are Amaranthaceae, Apocynaceae, Araceae, Acanthaceae, Asclepiadaceae, Asteraceae, Caricaceae, Combretaceae, Cucurbitaceae, Liliaceae, Meliaceae, Moringaceae, Moraceae, Rutaceae and Solanaceae. These findings of common medicinal plant families in the study is in agreement with Yusuf^[23] and Ghani^[8].

The survey has also recorded 69 categories of uses of 102 medicinal plants (Table 5). This is the indication of rich knowledge of medicinal uses of plants by the tribal people in the study area. Among them, 17 species were used to cure fever, 14 species for each of dysentery and diuretic, 9 species for diabetes, 8 species for skin disease, 7 species for each of rheumatism, wound, piles, jaundice and diarrhea, 6 species for each of eczema and cough. Thirty nine categories of ailments were treated by two to five species and other eighteen categories of ailments were treated

by only one species. Use of species in different ailments showed also variations (Table 1). *Boerhaavia repens* L. has been used for treatment of 12 ailments, *Celosia criatata* L. and *Enhydra fluctuans* Lour. has been used for treatment of 7 ailments in each, *Alocasia indica* (Roxb.) Schott., *Andrographis paniculata* (Burm. f.) Wall ex Nees., *Ananas comosus* (L.) Merr., *Blumea lacera* (Burm.f.) DC has been used for treatment of 6 ailments in each and each of *Abutilon indicum* (L.) Sweet., *Ageratum conyzoides* L., *Aristolachia indica* L., *Argemone mexicana* L., *Azadirachta indica* A. Juss., *Basella alba* L., *Carica papaya* L., *Kalanchoe pinnata* (Lamk.) Pers., *Phyllanthus emblica* L. and *Zinnia elegans* L. for 5 ailments. For treating two to four ailments 57 species were used. The remaining 28 species of the total were used for the treatment of a single ailment. Among the medicinal use of plants, the survey reported a good number of new uses those were not mentioned in the previous literatures^{[23][8]}.

5. Conclusion

The present findings are probably the first record of medico-botanical knowledge for Naogaon district using standard research protocols. The present study may be a preliminary contribution to the medico-botany of this area using standard research methods, focusing on medicinal plants and their local uses for the healthcare. This healthcare knowledge transmitted orally from one generation to generation. This detailed information will be helpful for the pharmacognosist, botanist and pharmacologist for the collection and identification of the plant for their research work. The study also suggested that the present information on medicinal use of plants by tribal people may be used for botanical and pharmacological research in future for the discovery of new sources of drugs.

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