

# Phyto-resources of Morni Hills, Panchkula, Haryana

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**ABSTRACT:** Forest and wild life are essential for ecological balance of an area. Forest is an important component of our environment and economy. Forest products are classified into timber forest products (TFPs) and non-timber forest products (NTFPs). Morni Hills of Haryana is rich in floristic diversity having various species of trees, shrubs, herbs and climbers. Phytodiversity also supports wild-life in this area. In Morni Hills total 186 species were found which yield timber forest products (TFPs) and non-timber forest products (NTFPs).

**KEYWORDS:** Morni Hills, Phyto-resources, Non-timber forest products (NTFPs), Timber forest products (TFPs), Haryana.

## INTRODUCTION

Forests are an important renewable natural resource dominated by various species of trees, shrubs and herbs. Forests are linked with our culture and civilization since ancient time. Wood, fuel, raw material for paper industries, timber for furniture, etc. are the major forest products, while canes, gums, resins, dyes, tannins, fibres, medicinal plants, etc are minor forest products. Besides this there are some major environmental factors which provide protection to wild life, help in balancing the gaseous cycles in atmosphere, tend to increase local rainfall and water holding capacity of soil, maintain the soil fertility and control earth's temperature, water regimes and check soil erosion and landslides (Ram et al., 2003; Joshi & Kumar, 2011). Wild food and other natural products significantly contribute to human and animal food web and often the means of survival for millions of poor rural households (Fisher, 2004; Belcher et al., 2005). Rural people in Morni Hills are dependent on plants for various products for their livelihood. They extract many forest products traditionally.

Quantitative analysis of forest vegetation and various phyto resources of Morni Hills and adjacent areas was studied by Jain, 1979; Jain et al., 1982; Jain & Singh, 1984; Rout & Gupta (1989); Kumar (2001); Kumar & Nagiyani (2006); Negi (2010); Singh & Vashistha (2014); Gupta & Kumar (2014). Singh, et al., (2017)

studied non-timber forest products in Morni and Raipur Rani Ranges of Shivalik Hills. The present paper deals with utilization of plant species as TFPs and NTFPs and hence finding out the scope of vegetation species in Morni Hills of Shivalik. The study would also help to protect more valuable plants from extinction in their natural habitats.

## MATERIAL AND METHODS:

The present study was conducted in Morni Hills (30°55' to 34°45' N latitude and 70°00' to 75°15' E longitude) during January 2017 to January 2018. It is a part of lower Shivalik (from Sanskrit, meaning 'tresses of Lord Shiva') ranges in district Panchkula, Haryana, India. It has an altitudinal range from 300 to 1400 m above mean sea level. 'Morni village' is almost the central point of Morni range which is 35 km away (by road) from Panchkula and 25 km (by road) from Raipur Rani. The river Ghaggar, the glory of Morni hills, separates Morni sub-division from Pinjore sub-division. The summer temperature of Morni range is between 18°C to 45°C and during winters is 4°C to 33°C.

Study trips were organized in a planned manner so as to cover every locality of Morni Hills. Rural and remote areas which were thus far practically unexplored, were surveyed more intensively. After extensive survey, the phyto-resources of Morni Hills have been enumerated in Table-1. Botanical names, family name, habit, common/vernacular name, plant parts used and uses have been given.

## RESULTS

In present study total 186 species were found which yield timber (TFPs) and non-timber forest products (NTFPs). Poaceae and Fabaceae with 29 species each contribute maximum

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Fig. 1. Map of Haryana showing Study Area (Morni Hills)

followed by Malvaceae (17), Apocynaceae (10), Moraceae (8), Combretaceae (6) and Amaranthaceae and Solanaceae (5 Species each). The most utilized plants species are trees (74) followed by herbs (30), grasses (27), shrubs (25), undershrubs (16), climbers (11) and liana (2) (Fig.2). Most of the species in

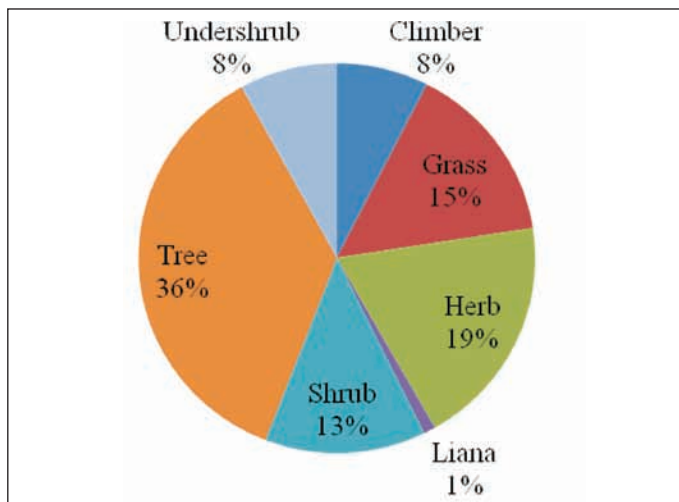


Fig. 2. Percentage contribution of various habit to the total plant species

Morni Hills have fodder value (66 species) followed by fiber (44 species), edible (29 species), horticulture/floriculture (25 species), timber (25 species), fuel wood (20 species), oil (12 species), tannin (13 species), dye (12 species) and gum yielding plants (10 species) (Fig.3.).

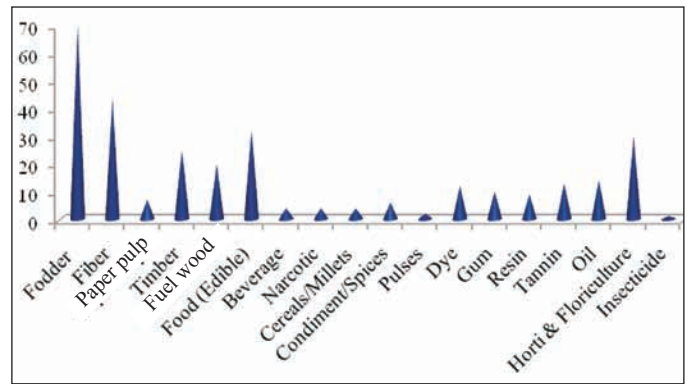


Fig. 3. Number of species under various timber and non-timber forest produce

The most common fodder yielding plants are *Albizia lebbeck* (L.) Benth., *Casearia tomentosa* Roxb., *Ficus benghalensis* L., *Ficus racemosa* L., *Ficus religiosa* L., *Grewia tiliifolia* Vahl, *Medicago polymorpha* L., *Terminalia alata* Heyne ex Roth, *Trifolium dubium* Sibth., *Ziziphus jujuba* Mill. and various species of Poaceae. *Agave americana* L., *Arundinella nepalensis* Trin, *Bambusa bambos* (L.) Voss, *Bauhinia vahlii* Wight & Arn., *Crotalaria juncea* L., *Dendrocalamus strictus* (Roxb.) Nees, *Gossypium arboreum* L., *Phragmites karka* (Retz.) Trin. ex Steud. and *Typha elephantina* Roxb. are widely used as source of fiber. *Broussonetia papyrifera* (L.) L'Hér. ex Vent., *Dendrocalamus strictus* (Roxb.) Nees, *Kydia calycina* Roxb. and *Saccharum spontaneum* L. are widely used for paper pulp. The important timber yielding species are *Albizia lebbeck* (L.) Benth., *Anogeissus latifolia* (Roxb. ex DC.) Wall. ex Guill., Perr. & A. Rich., *Dalbergia sissoo* Roxb. ex DC., *Desmodium oojeinense* (Roxb.) H. Ohashi, *Eucalyptus camaldulensis* Dehnh., *Mitragyna parvifolia* (Roxb.) Korth. and *Tectona grandis* L.f.

The tubers, leaves, fruits, and seeds of species like *Aegle marmelos* (L.) Correa, *Amaranthus viridis* L., *Colocasia esculenta* (L.) Schott, *Moringa oleifera* Lam., *Phyllanthus emblica* L., *Syzygium cumini* (L.) Skeels, *Tamarindus indica* L., *Terminalia bellirica* (Gaertn.) Roxb., *Terminalia chebula* Retz., *Ziziphus jujuba* Mill., etc are edible. Also the bark, leaves, flowers, fruits of various species like *Mallotus philippensis* (Lam.) Müll. Arg., *Butea monosperma* (Lam.) Taub., *Woodfordia fruticosa* (L.) Kurz, etc yield dye. Gum exudes from the stem of various trees either naturally or by tapping, these are *Acacia catechu* (L. f.) Willd., *Acacia nilotica* subsp. *indica* (Benth.) Brenan, *Bombax ceiba* L., *Boswellia serrata* Roxb. ex Colebr., *Butea monosperma* (Lam.) Taub., etc. The common resin yielding plants are *Mangifera indica* L., *Pinus roxburghii* Sarg., *Pistacia chinensis* subsp. *integerrima* (J. L. Stewart ex Brandis) Rech. f., *Tamarindus indica* L., *Terminalia bellirica* (Gaertn.) Roxb., etc.

**Table-1:** Phytoresources of Morni Hills

S. No.	Botanical Name	Family	Habit	Local / Common Name	Plant Part Used	Uses
1	<i>Abutilon indicum</i> (L.) Sweet	Malvaceae	Undershrub	Kanghi	Stem, Bark	Fiber, Dye, Gum
2	<i>Acacia catechu</i> (L. f.) Willd.	Fabaceae	Tree	Khair	Wood, Bark	Gum, Tannin
3	<i>Acacia leucophloea</i> (Roxb.) Willd.	Fabaceae	Tree	Reru	Leaves, Stem, Branches	Fodder, Fuel wood
4	<i>Acacia nilotica</i> subsp. <i>indica</i> (Benth.) Brenan	Fabaceae	Tree	Babool	Stem, Branches, Leaves, Pods	Fodder, Timber, Fuel Wood, Gum, Tannin
5	<i>Acacia pennata</i> (L.) Willd.	Fabaceae	Climber	-	Bark	Tannin
6	<i>Aegle marmelos</i> (L.) Correa	Rutaceae	Tree	Bel	Root, Leaves, Fruit	Food, Tannin
7	<i>Agave americana</i> L.	Agavaceae	Shrub	Ramban	Stem	Fiber
8	<i>Agave cantala</i> (Haw.) Roxb. ex Salm-Dyck	Agavaceae	Shrub	Cantala	Stem	Fiber
9	<i>Ailanthus excelsa</i> Roxb.	Simaroubaceae	Tree	Indian Tree of Heaven	Stem, Branches	Fuel wood
10	<i>Albizia lebeck</i> (L.) Benth.	Fabaceae	Tree	Kala Siris	Stem, Branches, Leaves, Seed	Fiber, Fodder, Timber, Oil
11	<i>Albizia procera</i> (Roxb.) Benth.	Fabaceae	Tree	Safed Siris	Stem, Branches	Timber
12	<i>Alysicarpus bupleurifolius</i> (L.) DC.	Fabaceae	Herb	-	Whole plant	Fodder
13	<i>Alysicarpus vaginalis</i> (L.) DC.	Fabaceae	Herb	-	Whole plant	Fodder
14	<i>Amaranthus viridis</i> L.	Amaranthaceae	Herb	Chaoulai	Whole plant, Leaves	Fodder, Vegetable
15	<i>Ampelocissus latifolia</i> (Roxb.) Planch.	Vitaceae	Climber	-	Leaves	Dye
16	<i>Anethum sowa</i> Roxb. ex Fleming	Apiaceae	Herb	Sowa	Fruits	Condiment/Spices
17	<i>Annona squamosa</i> L.	Annonaceae	Tree	Sarifa	Bark, Fruits	Fiber, Food
18	<i>Anogeissus latifolia</i> (Roxb. ex DC.) Wall. ex Guill., Perr. & A. Rich.	Combretaceae	Tree	Chal	Stem, Branches, Leaves	Timber, Fodder, Fuel wood, Gum, Tannin
19	<i>Apluda mutica</i> L.	Poaceae	Grass	-	Whole plant	Fodder
20	<i>Argemone mexicana</i> L.	Papaveraceae	Herb	Satyanashi	Seeds	Oil
21	<i>Artemisia japonica</i> Thunb.	Asteraceae	Undershrub	-	Leaves	Insecticide
22	<i>Artocarpus lacucha</i> Buch.-Ham.	Moraceae	Tree	Dav	Bark	Fiber
23	<i>Artocarpus heterophyllus</i> Lam.	Moraceae	Tree	Kathal	Bark, Fruits	Fiber, Food
24	<i>Arundinella nepalensis</i> Trin.	Poaceae	Herb	-	Stem, Branches	Fiber
25	<i>Arundo donax</i> L.	Poaceae	Grass	Nal	Leaves	Fiber
26	<i>Asparagus racemosus</i> Willd.	Asparagaceae	Climber	Satavar	Tubers	Food
27	<i>Azadirachta indica</i> A. Juss.	Meliaceae	Tree	Neem	Stem, Branches, Leaves, Seeds	Timber, Gum, Fodder, Oil
28	<i>Bambusa bambos</i> (L.) Voss	Poaceae	Grass	Bans	Stem, Branches	Fiber, Timber
29	<i>Bauhinia purpurea</i> L.	Fabaceae	Tree	Purple Kachnar	Stem, Branches	Fiber, Timber
30	<i>Bauhinia racemosa</i> Lamk.	Fabaceae	Tree	White Kachnar	Stem, Branches	Fuel wood
31	<i>Bauhinia vahlii</i> Wight & Arn.	Fabaceae	Liana	Maljhan	Bark, Stem	Fiber
32	<i>Bauhinia variegata</i> L.	Fabaceae	Tree	Kachnar	Stem, Branches	Fuel wood
33	<i>Berberis asiatica</i> Roxb. ex DC.	Berberidaceae	Shrub	Daru Haldi, Kilmora	Fruit	Edible
34	<i>Berberis lycium</i> Royle	Berberidaceae	Shrub	Indian Lycium	Fruit	Edible
35	<i>Bombax ceiba</i> L.	Malvaceae	Tree	Semal	Wood, Seeds, Seeds Fiber	Gum, Oil, Fiber
36	<i>Boswellia serrata</i> Roxb. ex Colebr.	Bursaceae	Tree	Salai	Stem, Branches	Paper Pulp, Timber, Gum
37	<i>Bothriochloa pertusa</i> (L.) A. Camus	Poaceae	Grass	-	Whole plant	Fodder
38	<i>Brachiaria ramosa</i> (L.) Stapf	Poaceae	Grass	-	Whole plant	Fodder
39	<i>Bridelia retusa</i> (L.) A. Juss.	Phyllanthaceae	Tree	Kanjhi, Spinous Kino Tree	Stem, Branches, Bark	Fuel wood, Tannin
40	<i>Broussonetia papyrifera</i> (L.) L'Hér. ex Vent.	Moraceae	Tree	Paper Mulberry	Leaves	Paper Pulp
41	<i>Butea monosperma</i> (Lam.) Taub.	Fabaceae	Tree	Palash, Dhak	Bark, Stem, Branches, Flowers, Seeds	Fiber, Timber, Dye, Gum, Oil

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42	<i>Calotropis gigantea</i> (L.) W. T. Aiton	Apocynaceae	Shrub	Swetark	Bark, Seeds	Fiber
43	<i>Calotropis procera</i> (Aiton) Dryand.	Apocynaceae	Shrub	Madar	Bark, Seeds	Fiber
44	<i>Canavalia gladiata</i> (Jacq.) DC.	Fabaceae	Climber	-	Whole plant, Seeds	Fodder, Pulses
45	<i>Capillipedium parviflorum</i> (R. Br.) Stapf	Poaceae	Grass	-	Whole plant	Fodder
46	<i>Carissa spinarum</i> L.	Apocynaceae	Shrub	Jangli Karonda	Leaves, Fruits	Fodder, Food
47	<i>Cascabela thevetia</i> (L.) Lippold	Apocynaceae	Tree	Pili Kaner	Flowers	Floriculture
48	<i>Casearia tomentosa</i> Roxb.	Salicaceae	Tree	Chila	Leaves	Fodder
49	<i>Cassia fistula</i> L.	Fabaceae	Tree	Amaltas	Bark	Tannin
50	<i>Catharanthus roseus</i> (L.) G. Don	Apocynaceae	Undershrub	Sadabahar	Flowers	Horticulture
51	<i>Catunaregam spinosa</i> (Thunb.) Tirveng.	Rubiaceae	Tree	Mountain Pomegranate, Mainphal	Fruits	Food
52	<i>Celosia argentea</i> L.	Amaranthaceae	Herb	Safed Murga	Whole plant	Fodder
53	<i>Celtis australis</i> L.	Cannabaceae	Tree	Kharak	Leaves	Fodder
54	<i>Cenchrus setiger</i> Vahl	Poaceae	Grass	-	Whole plant	Fodder
55	<i>Chenopodium album</i> L.	Amaranthaceae	Herb	Bahtwa	Whole plant	Fodder
56	<i>Chenopodium murale</i> L.	Amaranthaceae	Herb	-	Whole plant	Fodder
57	<i>Chloris barbata</i> Sw.	Poaceae	Grass	-	Whole plant	Fodder
58	<i>Chrysopogon aciculatus</i> (Retz.) Trin.	Poaceae	Grass	-	Whole plant	Fodder
59	<i>Chrysopogon fulvus</i> (Spreng.) Chiov.	Poaceae	Grass	-	Whole plant	Fodder
60	<i>Combretum indicum</i> (L.) DeFilipps	Combretaceae	Climber	Madhu Malati	Flower	Floriculture
61	<i>Commelina benghalensis</i> L.	Commelinaceae	Herb	Kankaua	Whole plant	Fodder
62	<i>Corchorus olitorius</i> L.	Malvaceae	Herb	Banphal	Bark	Fiber
63	<i>Cordia dichotoma</i> G. Forst.	Boraginaceae	Tree	Lasura	Fruits	Food
64	<i>Corymbia citriodora</i> (Hook.) K.D. Hill & L.A.S. Johnson	Myrtaceae	Tree	Lemon-Scented Gum Eucalyptus	Leaves	Oil
65	<i>Crotalaria juncea</i> L.	Fabaceae	Undershrub	Sun Hemp	Bark, Whole plant	Fiber, Fodder
66	<i>Crotalaria medicaginea</i> Lam.	Fabaceae	Herb	-	Leaves, Pods	Fodder
67	<i>Cryptolepis dubia</i> (Burm. f.) M.R. Almeida	Apocynaceae	Climber	Krishnasariva	Bark, Seeds	Fiber
68	<i>Cymbopogon martinii</i> (Roxb.) W. Watson	Poaceae	Grass	-	Leaves	Oil
69	<i>Cynodon dactylon</i> (L.) Pers.	Poaceae	Grass	Durva	Whole plant	Fodder
70	<i>Cyperus rotundus</i> L.	Cyperaceae	Herb	Motha	Whole plant, Bulb	Fodder, Food
71	<i>Dactyloctenium aegyptium</i> (L.) Willd.	Poaceae	Grass	-	Whole plant	Fodder
72	<i>Dalbergia lanceolaria</i> subsp. <i>paniculata</i> (Roxb.) Thoth.	Fabaceae	Tree	-	Stem, Branches, Leaves	Timber, Fodder
73	<i>Dalbergia sissoo</i> Roxb. ex DC.	Fabaceae	Tree	Shisham	Stem, Branches	Timber
74	<i>Datura innoxia</i> Mill.	Solanaceae	Undershrub	Safed Datura	Leaves and seeds	Narcotic
75	<i>Datura metel</i> L.	Solanaceae	Undershrub	Datura	Leaves and seeds	Narcotic
76	<i>Datura stramonium</i> L.	Solanaceae	Undershrub	-	Leaves and seeds	Narcotic
77	<i>Debregeasia longifolia</i> (Burm. f.) Wedd.	Urticaceae	Tree	Orange Wild Rhea	Stem	Fiber
78	<i>Dendrocalamus strictus</i> (Roxb.) Nees	Poaceae	Grass	Bans	Stem	Fiber, Paper pulp
79	<i>Desmodium oojainense</i> (Roxb.) H. Ohashi	Fabaceae	Tree	Sandan	Stem, Branches	Timber
80	<i>Dichrostachys cinerea</i> (L.) Wight & Arn.	Fabaceae	Shrub	-	Stem, Branches	Fuel wood
81	<i>Digera muricata</i> (L.) Mart.	Amaranthaceae	Herb	-	Whole plant	Fodder
82	<i>Digitaria stricta</i> Roth	Poaceae	Grass	-	Whole plant	Fodder
83	<i>Digitaria sanguinalis</i> (L.) Scop.	Poaceae	Grass	-	Whole plant	Fodder
84	<i>Dioscorea alata</i> L.	Dioscoreaceae	Climber	Ratalu	Tubers	Food
85	<i>Diospyros melanoxylon</i> Roxb.	Ebenaceae	Tree	Tendu	Stem, Branches, Leaves	Fodder, Timber, Fuel wood, Food
86	<i>Drymaria cordata</i> (L.) Willd. ex Schult.	Caryophyllaceae	Herb	-	Whole plant	Fodder
87	<i>Duranta erecta</i> L.	Verbenaceae	Shrub	Duranta	Flowers	Floriculture

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88	<i>Echinochloa colona</i> (L.) Link	Poaceae	Grass	-	Whole plant, Seed	Fodder, Cereals
89	<i>Eclipta prostrata</i> (L.) L.	Asteraceae	Herb	Bhringraj	Whole plant	Dye
90	<i>Eragrostis unioides</i> (Retz.) Nees ex Steud.	Poaceae	Grass	-	Whole plant	Fodder
91	<i>Eragrostis amabilis</i> (L.) Wight & Arn.	Poaceae	Grass	-	Whole plant	Fodder
92	<i>Eriophorum comosum</i> (Wall.) Nees	Cyperaceae	Herb	-	Leaves	Fiber
93	<i>Erythrina variegata</i> L.	Fabaceae	Tree	-	Stem, Branches	Fuel wood
94	<i>Eucalyptus camaldulensis</i> Dehnh.	Myrtaceae	Tree	Eucalyptus	Stem, Branches	Paper pulp, Timber
95	<i>Eulaliopsis binata</i> (Retz.) C.E. Hubb.	Poaceae	Grass	-	Leaves, Whole plant	Fiber, Fodder
96	<i>Ficus benghalensis</i> L.	Moraceae	Tree	Bargad	Leaves	Fodder
97	<i>Ficus racemosa</i> L.	Moraceae	Tree	Gular	Leaves	Fodder
98	<i>Ficus religiosa</i> L.	Moraceae	Tree	Pipal	Bark, Leaves	Tannin, Fodder
99	<i>Flacourtia indica</i> (Burm. f.) Merr.	Salicaceae	Tree	Kandai	Leaves, Fruits	Fodder, Food
100	<i>Fragaria nubicola</i> (Lindl. ex Hook. f.) Lacaíta	Rosaceae	Herb	Himalayan Strawberry	Fruit	Edible
101	<i>Garuga pinnata</i> Roxb.	Burseraceae	Tree	Kharpat	Stem, Branches	Fuel wood
102	<i>Gmelina arborea</i> Roxb. ex Sm.	Lamiaceae	Tree	Gambhari	Stem, Branches	Timber
103	<i>Gossypium arboreum</i> L.	Malvaceae	Shrub	Kapas	Seed fiber	Fiber
104	<i>Grewia tiliifolia</i> Vahl	Malvaceae	Shrub	Dhaman	Leaves, Fruits	Fodder, Food
105	<i>Gymnosporia royleana</i> Wall. ex M.A. Lawson	Celastraceae	Shrub	-	Stem, Branches	Fuel wood
106	<i>Haldina cordifolia</i> (Roxb.) Ridsdale	Rubiaceae	Tree	Haldu	Leaves, Stem, Branches	Fodder, Timber
107	<i>Helicteres isora</i> L.	Malvaceae	Shrub	Marorphali	Bark	Fiber
108	<i>Hemidesmus indicus</i> (L.) W.T. Aiton	Apocynaceae	Climber	Sariva	Root	Resin, Tannin
109	<i>Heteropogon contortus</i> (L.) P. Beauv. ex Roem. & Schult.	Poaceae	Grass	-	Whole plant	Fodder, Paper pulp
110	<i>Holoptelea integrifolia</i> Planch.	Ulmaceae	Tree	Indian Elm, Chilbil	Bark, Stem, Branches	Fiber, Fuel Wood
111	<i>Hymenodictyon orixense</i> (Roxb.) Mabb.	Rubiaceae	Tree	Bhulan	Stem, Branches	Fuel wood
112	<i>Jasminum multiflorum</i> (Burm. f.) Andrews	Oleaceae	Climber	Kunda	Flowers	Floriculture
113	<i>Jasminum arborescens</i> Roxb.	Oleaceae	Climber	Chameli	Flowers	Floriculture
114	<i>Jatropha curcas</i> L.	Euphorbiaceae	Shrub	Ratanjot	Seeds	Oil
115	<i>Justicia adhatoda</i> L.	Acanthaceae	Shrub	Vasaka	Leaves	Dye
116	<i>Kydia calycina</i> Roxb.	Malvaceae	Tree	Pula	Bark, Stem, Branches	Fiber, Paper pulp, Timber
117	<i>Lannea coromandelica</i> (Houtt.) Merr.	Anacardiaceae	Tree	Jhingan	Stem, Branches	Fuel wood, Gum
118	<i>Lantana camara</i> L.	Verbenaceae	Shrub	Kuri	Stem and Branches	Fuel sood
119	<i>Lathyrus sativus</i> L.	Fabaceae	Herb	-	Whole plant	Fodder
120	<i>Launaea procumbens</i> (Roxb.) Ramayya & Rajagopal	Asteraceae	Herb	-	Whole plant	Fodder
121	<i>Lawsonia inermis</i> L.	Lythraceae	Shrub	Mehandi	Leaves	Dye
122	<i>Madhuca longifolia</i> var. <i>latifolia</i> (Roxb.) A. Chev.	Sapotaceae	Tree	Mahua	Stem, Branches, Leaves, Flowers, Fruits, Seeds	Fodder, Timber, Food, Beverages, Oil
123	<i>Mallotus philippensis</i> (Lam.) Müll.Arg.	Euphorbiaceae	Tree	Kamela	Fruits	Dye
124	<i>Malvastrum coromandelianum</i> (L.) Garcke	Malvaceae	Undershrub	-	Stem	Fiber
125	<i>Mangifera indica</i> L.	Anacardiaceae	Tree	Mango	Wood, Stem, Branches, Fruit	Timber, Food, Resin, Horticulture
126	<i>Medicago polymorpha</i> L.	Fabaceae	Herb	-	Whole plant	Fodder
127	<i>Melochia corchorifolia</i> L.	Malvaceae	Undershrub	Bilpat	Stem	Fiber
128	<i>Mirabilis jalapa</i> L.	Nyctaginaceae	Herb	-	Flowers	Floriculture

129	<i>Mitragyna parvifolia</i> (Roxb.) Korth.	Rubiaceae	Tree	Kemp	Stem, Branches	Timber, Fuel wood
130	<i>Moringa oleifera</i> Lam.	Moringaceae	Tree	Sahjan	Fruit, Seeds	Food, Oil, Horticulture
131	<i>Morus alba</i> L.	Moraceae	Tree	Sahtoot	Leaves, Fruits	Fodder, Horticulture
132	<i>Mucuna pruriens</i> (L.) DC.	Fabaceae	Climber	Velvet Bean	Seed	Food
133	<i>Murdannia nudiflora</i> (L.) Brenan	Commelinaceae	Herb	-	Whole plant	Fodder
134	<i>Murraya koenigii</i> (L.) Spreng.	Rubaceae	Shrub	Curry tree, Kari Patta	Leaves	Condiment/Spices
135	<i>Nerium oleander</i> L.	Apocynaceae	Tree	Oleander	Flowers	Floriculture
136	<i>Nicotiana tabacum</i> L.	Solanaceae	Herb	Tabacco	Leaves	Narcotic
137	<i>Nyctanthes arbor-tristis</i> L.	Oleaceae	Tree	Parijat	Flowers, Seeds	Dye, Oil, Floriculture
138	<i>Oxalis corniculata</i> L.	Oxalidaceae	Herb	Creeping Wood Sorrel	Leaves	Food
139	<i>Paspalidium flavidum</i> (Retz.) A. Camus	Poaceae	Grass	-	Whole plant, Seeds	Fodder, Cereals
140	<i>Peristrophe bicalyculata</i> (Retz.) Nees	Acanthaceae	Undershrub	-	Whole plant	Fodder
141	<i>Phoenix sylvestris</i> (L.) Roxb.	Arecaceae	Tree	Khajur	Stem juice	Beverages
142	<i>Phragmites karka</i> (Retz.) Trin. ex Steud.	Poaceae	Grass	-	Leaf	Fiber
143	<i>Phyllanthus emblica</i> L.	Phyllanthaceae	Tree	Amla	Stem, Branches, Leaves, Fruit	Timber, Food, Dye, Tannin
144	<i>Pinus roxburghii</i> Sarg.	Pinaceae	Tree	Chir-Pine, Cheer	Wood	Resin
145	<i>Pistacia chinensis</i> subsp. <i>integerrima</i> (J. L. Stewart ex Brandis) Rech. f.	Anacardiaceae	Tree	Kakrashringi	Gall	Resin
146	<i>Pithecellobium dulce</i> (Roxb.) Benth.	Fabaceae	Tree	Jungle Jalebi	Stem, Branches, Leaves, Fruit	Fodder, Fuel wood, Food
147	<i>Polypogon monspeliensis</i> (L.) Desf.	Poaceae	Grass	-	Whole plant	Fodder
148	<i>Prosopis juliflora</i> (Sw.) DC.	Fabaceae	Tree	Vilayati Kikar	Stem, Branches	Fuel wood
149	<i>Punica granatum</i> L.	Lythraceae	Shrub	Anar	Fruits	Horticulture
150	<i>Ricinus communis</i> L.	Euphorbiaceae	Tree	Arandi	Seed	Oil
151	<i>Saccharum spontaneum</i> L.	Poaceae	Grass	Kans	Leaves, Whole plant	Fiber, Paper pulp
152	<i>Santalum album</i> L.	Santalaceae	Tree	Chandan	Wood	Oil
153	<i>Senna auriculata</i> (L.) Roxb.	Fabaceae	Shrub	Tarwar	Bark	Tannin
154	<i>Setaria palmifolia</i> (J. Koenig) Stapf	Poaceae	Grass	-	Whole plant	Fodder
155	<i>Setaria verticillata</i> (L.) P. Beauv.	Poaceae	Grass	-	Whole plant, Seeds	Fodder, Cereals/Millet
156	<i>Sida acuta</i> Burm. f.	Malvaceae	Undershrub	-	Stem	Fiber
157	<i>Sida cordata</i> (Burm. f.) Borss. Waalk.	Malvaceae	Undershrub	-	Stem	Fiber
158	<i>Sida cordifolia</i> L.	Malvaceae	Undershrub	Bala	Stem	Fiber
159	<i>Sida rhombifolia</i> L.	Malvaceae	Undershrub	-	Stem	Fiber
160	<i>Solanum americanum</i> Mill.	Solanaceae	Herb	Makoy	Fruits	Food
161	<i>Sorghum halepense</i> (L.) Pers.	Poaceae	Grass	-	Whole plant	Fodder
162	<i>Spergula arvensis</i> L.	Caryophyllaceae	Herb	-	Whole plant	Fodder
163	<i>Stellaria media</i> (L.) Vill.	Caryophyllaceae	Herb	-	Whole plant	Fodder
164	<i>Sterculia villosa</i> Roxb.	Malvaceae	Tree	Udal	Bark, Wood	Fiber, Gum, Resin
165	<i>Streblus asper</i> Lour.	Moraceae	Tree	Sand Paper Tree, Choria	Bark	Fiber
166	<i>Syzygium cumini</i> (L.) Skeels	Myrtaceae	Tree	Jamun	Stem, Branches, Fruits	Timber, Food, Horticulture
167	<i>Tabernaemontana divaricata</i> (L.) R. Br. ex Roem. & Schult.	Apocynaceae	Tree	Tagar	Flowers	Floriculture
168	<i>Tamarindus indica</i> L.	Fabaceae	Tree	Imli	Stem, Branches, Leaves, Pods	Timber, Food, Fodder, Beverages
169	<i>Tectona grandis</i> L. f.	Lamiaceae	Tree	Teak	Stem, Branches	Timber
170	<i>Terminalia alata</i> Heyne ex Roth	Combretaceae	Tree	Sain	Stem, Branches, Leaves, Wood	Fodder, Timber, Resin

Contd...

171	<i>Terminalia arjuna</i> (Roxb. ex DC.) Wight & Arn.	Combretaceae	Tree	Arjun	Wood	Resin
172	<i>Terminalia bellirica</i> (Gaertn.) Roxb.	Combretaceae	Tree	Bahera	Wood, Fruits	Resin, Food
173	<i>Terminalia chebula</i> Retz.	Combretaceae	Tree	Harad	Fruits	Food, Tannin
174	<i>Thespesia lampas</i> (Cav.) Dalzell & A. Gibson	Malvaceae	Shrub	Ban-Kapas	Bark	Fiber
175	<i>Toona ciliata</i> M. Roem.	Meliaceae	Tree	Tun	Bark	Dye
176	<i>Trema orientalis</i> (L.) Blume	Cannabaceae	Shrub	-	Bark	Fiber
177	<i>Trema politoria</i> (Planch.) Blume	Cannabaceae	Tree	-	Bark	Fiber
178	<i>Trifolium dubium</i> Sibth.	Fabaceae	Herb	-	Whole plant	Fodder
179	<i>Typha elephantina</i> Roxb.	Typhaceae	Shrub	Pater	Fruits	Fiber
180	<i>Urena lobata</i> L.	Malvaceae	Undershrub	-	Stem	Fiber
181	<i>Ventilago denticulata</i> Willd.	Rhamnaceae	Liana	Kali Bel	Bark	Fiber
182	<i>Woodfordia fruticosa</i> (L.) Kurz	Lythraceae	Shrub	Dhataki	Flowers, Wood	Dye, Resin
183	<i>Wrightia tinctoria</i> R.Br.	Apocynaceae	Tree	Dhudi	Flowers	Dye
184	<i>Zingiber officinale</i> Roscoe	Zingiberaceae	Herb	Sonth	Rhizome	Condiment/Spices
185	<i>Ziziphus jujuba</i> Mill.	Rhamnaceae	Tree	Ber	Bark, Stem, Branches, Fruits	Fuel wood, Food, Tannin, Horticulture
186	<i>Ziziphus nummularia</i> (Burm. f.) Wight & Arn.	Rhamnaceae	Undershrub	Jhar Ber	Leaves, Fruits	Fodder, Food

A number of plant species are used for various other purposes. These are

1. Bamboo sticks and poles from *Bambusa bambos* (L.) Voss and *Dendrocalamus strictus* (Roxb.) Nees.
2. Basket and Mats: *Dendrocalamus strictus* (Roxb.) Nees., *Phoenix sylvestris* (L.) Roxb. and *Saccharum spontaneum* L.
3. Platters and bowls from leaves of *Bauhinia vahlii* Wight & Arn., *Butea monosperma* (Lam.) Taub. and *Madhuca longifolia* var. *latifolia* (Roxb.) A. Chev.
4. Thatching of huts by *Oryza sativa* L., *Phoenix sylvestris* (L.) Roxb., *Saccharum spontaneum* L., etc.
5. Weighing (Ratti-the Jeweller's weight) with seeds of *Abrus precatorius* L.
6. *Ailanthus excelsa* Roxb., *Boswellia serrata* Roxb. ex Colebr. are used for the preparation of matchsticks.
7. Detergent for washing hairs obtained from *Sapindus emarginatus* Vahl.
8. The leaves of *Diospyros melanoxylon* Roxb. are largely used for making bidis for smoking.

## DISCUSSION

Forest based resources have played a key role in the sustenance of human civilization since time immemorial and are serving a large number of human population throughout the world (Murphy et al., 2005). The most common plant species which have multiple uses are *Acacia nilotica* subsp. *indica* (Benth.) Brenan (as fodder, timber, fuel wood, gum, tannin), *Anogeissus latifolia* (Roxb. ex DC.) Wall. ex Guill., Perr. & A. Rich. (as timber, fodder, fuel wood, gum, tannin), *Azadirachta indica* A.

Juss. (as timber, gum, fodder, oil), *Bombax ceiba* L. (as gum, oil, fiber), *Boswellia serrata* Roxb. ex Colebr. (as paper pulp, timber, gum), *Butea monosperma* (Lam.) Taub. (as fiber, timber, dye, gum, oil), *Kydia calycina* Roxb. (as fiber, paper pulp, timber), *Madhuca longifolia* var. *latifolia* (Roxb.) A. Chev. (as fodder, timber, food, beverages, oil), *Mangifera indica* L. (as timber, food, resin, horticulture), *Phyllanthus emblica* L. (as timber, food, dye, tannin), *Syzygium cumini* (L.) Skeels (as timber, food, horticulture) and *Ziziphus jujuba* Mill. (as fuel wood, food, tannin, horticulture). Singh et al. (2017) reported total 143 and 105 species respectively in Morni and Raipur Rani Ranges which yield non-timber forest products (NTFPs). In their investigation important NTFPs yielding species are *Aegle marmelos* (L.) Correa (aromatic, edible, medicine, gum, dye and fodder), *Arundinella nepalensis* Trin (fibre, fodder, basket and chairs), *Butea monosperma* (Lam.) Taub. (medicine, gum, dye, fibre and fodder), *Ficus benghalensis* L. (medicine, edible, fibre and fodder), *Terminalia bellirica* (Gaertn.) Roxb. (medicine, gum and tannin), *Woodfordia fruticosa* (L.) Kurz (medicine, gum, tannin and dye) and *Ziziphus jujuba* Mill. (medicine, edible, fodder and tannin).

## CONCLUSION

On the basis of above study it is concluded that flora of Morni hills has a number of plants useful to mankind in various ways. For the first time the detailed study (Flora of Morni Hills, under publication) was conducted to know the various phytoresources of Morni Hills. These resources, if properly managed, have the potential to enhance rural income and also relieve forest from population pressure.

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