A Contribution to the Medicinal Weeds Growing in the Campus of Narasinha Dutt College, Howrah

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Weeds are considered as unwanted, aggressive and disturbing plants in the vegetation setting made by human. However, these plants are often found to be rich with medicinal properties. A survey of the weeds growing in the century old campus of Narasinha Dutt College of Howrah district, West Bengal, was conducted in 2018-19. All of the weeds were identified by standard Botanical procedure and consultancy of taxonomic literature. In the survey, 37 of them (from 20 families, with Asteraceae as most common group) were found to have medicinal properties. Some exotic weeds like Eclipta prostrata, Cleome viscosa, Croton bonplandianus, etc., were also recorded. To have an idea about awareness about their medicinal value as well as importance of their conservation in nature, a questionnaire survey was conducted. The study population (n = 117) included students of the college and other nearby area without or with Botany as their subject, faculty members and others. In the questionnaire survey, 98.29% of the total population expressed their belief about the medicinal properties of the plants growing around. Regarding the medicinal utility of individual weed species of the campus, the population response varied from 50.5% - 90.4%, whereas 7.0% - 39.4% were not sure about their medicinal usefulness and 0.9%-22.4% of them expressed that these plants have no medicinal values at all. Majority (89.7%) of the people, including students, affirmed that the conservation of commonly growing weed plants are also necessary for maintaining plant biodiversity spectrum in the environment. Such awareness level will be very much helpful in plant biodiversity conservation and sustainable development to protect environment.

Keywords: *Weeds, Narasinha Dutt College Campus, medicinal value, awareness, biodiversity conservation.*

JOCAS
Journal of Commerce, Arts and Science
Volume: 3, Issue : 1, December 2020

1. Introduction

Over the centuries plants have important contribution in the health care system of local communities as the local population used the available plant resources for the treatment against different health problems. Interestingly, some common weeds also play a major role in treatment of ailments in different cases. Actually, the knowledge about traditional herbal medicines is the original source of many modern day medicines. Similarly, different phytochemicals with therapeutic properties are obtained from different plants growing around us in the environment.

Though most of the time weeds are unwanted, invasive, troublesome, but they have highly medicinal properties and cost effective also. A number of authors like Ambasta *et al.* (1986), Pal and Jain (1998), Majid *et. al* (2012), Bandyopadhyay *et al.* (2014) and others discussed about different medicinal uses of several plant species for the treatment of different disease.

However, sometimes people generally do not have any clear idea about such plants, which apparently seems not to be useful for mankind.

Narasinha Dutt College is one of the biggest and oldest colleges in Howrah district of West Bengal, India and established since 1924. This college covers 2.8 acre of land with good numbers of herb, shrub and tree including both aquatic and terrestrial plants. Present study aims to enlist and understand the medicinal uses of the weed species grown in the college campus in different seasons. In addition, an online questionnaire based population survey was also carried out to observe the level of awareness on the recorded weeds with medicinal properties.

2. Methodology

The weeds growing in the campus of Narasinha Dutt College were recorded throughout the year of 2018-2019. The identification of the plants was carried out by consultation of relevant literature (Anonymous, 1997-2020; Bennet, 1979; Prain 1903)) and matching with the authenticated herbarium specimens. Digital photographs of the weeds growing in the campus were also taken to confirm the identity. Medicinal properties and the uses of the weeds growing in the college campus were studied and recorded with the help of literature on medicinal plants of India (Ambusta *et* al.,1986; Anonymous, 1948-1976; Auti *et al.*, 2004; Bhattacharya, 1976-1993; Chatterjee and Pakrashi, 1991-2001; Chopra *et al.*, 1956, 1969; Zingare *et al.*, 2012) and West Bengal (Anonymous, 1997).

An online survey about the recorded medicinally useful weeds were conducted by Google Questionnaire among students and teachers of the college, students of other colleges and general people (n = 117) of the nearby districts of Howrah, Kolkata and North 24-Parganas was conducted in September, 2020. This questionnaire survey was carried out to get an idea about public awareness on medicinal value of different weeds growing around us. In the questionnaire, the local names of the relevant plants were mentioned for general understanding. The population was categorized into following groups - Students with Botany major from the college and other colleges, students with Botany combination (from the college and other colleges), students without Botany subject combination (from the college and other colleges), faculty members (of the college and other colleges) and others. The recorded responses were analyzed thoroughly to get the clear idea about awareness level in the population inside and outside the campus (Howrah, Kolkata, North 24 Parganas district of West Bengal) about the usefulness of the recorded medicinal weeds from the campus.

3. Results and Discussion

It was found that, some area of the college campus is covered with wild herbal flora which includes a number of plants with medicinal uses. Actually, the college campus is eco-friendly with rich flora of trees, shrubs, herbs, grasses and aquatic plants too. The weeds recorded are naturally grown in the campus. We have recorded 37 weed members with remarkable medicinal importance (Table 1, Figure 1a-b). These medicinal weeds belong to 20 flowering plant families altogether (Figure 2). Among these, Asteraceae was the highest contributor (six members, 16.21%), followed by Amaranthaceae, Euphorbiaceae, Poaceae and

Scrophulariaceae (three members each, 8.10%) and others.

The present study reveals that there are many herbal weed members growing in the college in different seasons, as confirmed by literature survey. Some exotic weeds like *Eclipta prostrata*, *Cleome viscosa*, *Croton bonplandianus*, *Mikania micrantha*, *Oxalis corniculata* and *Phyllunthus fraternus* (Maiti and Bakshi, 1981) are also luxuriously present in the campus, which have enormous medicinal value (Table 1). Hence much attention is needed for their *in situ* conservation in natural habitat.

For conservation of biodiversity, awareness among people is the most important aspect. Keeping this viewpoint, we conducted an online Google questionnaire survey on the recorded medicinal weeds in the campus. Among 117 responses (Figure 3), 12.82% and 28.20% was received from the students with Botany major from our college and other different colleges (of Howrah, Kolkata and North 24 Parganas districts). Students of the college with Botany combination contributed 23.07% of the population and similar group from other colleges contributed 5.98%. Students without Botany in the subject combination from the college and colleges outside contributed 0.85% and 9.4% respectively. There were 9.4% participation of the faculty members and 10.25% from others respectively. In the survey, we excluded the faculty members of Botany department, to avoid biasness.

It was found that, 98.29% of the total population expressed their belief that the plants growing around us have medicinal properties, whereas only 1.70% was not sure about it. This was really an unexpected positive observation about the awareness of people about naturally growing medicinal herbs. Furthermore, among them majority (89.7%) affirmed that the conservation of commonly growing weed plants are also necessary for maintaining plant biodiversity spectrum in the environment around us, whereas very less people (8.5%) of them was not sure about this. In the contrary, only 1.7% of the population expressed that conservation of such weeds are not necessary. More than 90% of the students (with plant science as a subject of not) are in the opinion of conservation of such weeds, even sometimes their medicinal properties are not clear to them. Such a strong notion (especially from students of present generation) will be very much helpful as a driving force for plant diversity conservation in the environment.

Regarding the idea about medicinal uses of the 37 individual weed plant species of the campus, the population response varied from 50.5% - 90.4%, whereas 7.0% - 39.4% were not sure about their medicinal usefulness and some of them (0.9%-22.4%) also expressed that these plants have no medicinal values at all (Figure 4). This was the overall response from all the students, faculties and others. This is obviously an awareness indicator among people from the study area and nearby districts of the southern part West Bengal.

Table 1. List of weed members of medicinal importance, growing at college campus during 2018-19

Sl No.	Scientific Name	Family	Vernacular name(s)	Uses
1	*Abutilon indicum* (L.)SW.	Malvaceae	Petari, Atibala	Roots used in fever, haematuria, leprosy, leucorrhoea, menorrhagia, stone in urinary bladder. Leaves used in bronchitis, fever, hemicrania, boils, toothache and in bleeding piles. Seeds used in dysentery, piles and has aphrodisiac properties.

2	*Acalypha indica* L.	Euphorbaceae	Muktajhuri	Roots are used as laxative, anthelmintic and to treat asthma & stomachache. Whole plant is used as diuretic, purgative and to cure cough, toothache and headache. Leaf juice is applied as eye drop and in scorpion sting.
3	*Aerva aspera* L.	Amaranthaceae	Apang	Roots used as contraceptive and as haemostatic agent after abortion. Whole plant is used in dropsy, dysentery, dyspepsia, piles. Seeds used in piles.
4	*Ageratum conyzoides* L.	Asteraceae	-	The whole plant is anti-inflammatory, anti-allergic, anti-diarrhoeal properties, leaves haemostatic, applied on wounds, boils and skin diseases. Roots used as antidysenteric and anthelmintic.
5	*Alternanthera sessilis* DC.	Amaranthaceae	Sanchi	The whole plant is used as galactogogue and febrifuge. Fresh leaf juice is applied to treat eye diseases. Young shoots taken as nutritious vegetables.
6	*Amaranthus spinosus* L.	Amaranthaceae	Kantanotey	The whole plant is used as laxative, diuretic, stomachic, antipyretic. Also used in the treatment of internal bleeding, excessive menstruation, ulcerated mouth and diarrhoea and anaemia. Roots used in leucorrhoea, menorrhagia, leprosy, gonorrhea and eczema.
7	*Boerhaavia diffusa* L.	Nyctaginaceae	Punornova	Plants used to cure intestinal colic, kidney disorder, dropsy, cough, haemorrhoids, insomnia, asthma, jaundice, skin and eye diseases. Roots are used as diuretic, expectorant and promotes delivery.
8	*Cleome viscosa* L.	Cleomaceae	Hurhure	Leaves are used in diarrhea, blood dysentery, boils, earache, skin diseases. Roots used to treat stones in urinary bladder.
9	*Coccinia grandis* (L.) Voigt.	Cucurbitaceae	Telakucha	Plant is laxative, used in gonorrhea, cough and cold. Roots and leaves are given in diabetes, jaundice, asthma and cough. Fruits used to cure cough, asthma, bronchitis, foul breath and leprosy.

10	*Coix lacryma-jobi* L.	Poaceae	Gurgura	Grains are anti-inflammatory, antipyretic, antiseptic, hypoglycemic, hypotensive, sedative and vermifuge. In folk medicine used for the treatment of abdominal tumours and gastrointestinal lung cancer. Infusion is useful as immune enhancer. Roots are used to treat menstrual disorder.
11	*Commelina benghalensis* L.	Commelinaceae	Kanchira	The plant is astringent, demulcent, laxative and mucilaginous. It increases fertility of women and used to treat leprosy, dropsy, rheumatic pain, ringworm and eczema. Decoction of leaves and roots is given in diarrhoea and in stomach disorder.
12	*Cheilocostus speciosus*(J. Koenig) C. Specht	Costaceae	Keu	Rhizomes are astringent, cooling, aphrodisiac, purgative, anthelmintic, febrifuge, expectorant, tonic, improves digestion and clear toxins from body.
13	*Croton bonplandianus* Baill.	Euphorbiaceae	Bon Tulsi, Lankasira	Plant parts are useful for ring worm infection, improvement of liver function, wound healing, anti oxidant and anti-tumour activity.
14	*Cynodon dactylon* (L.) Pers.	Poaceae	Durba	Plants are used as anti-catarrhal, antidysenteric, antipyretic, astringent, demulcent and laxative. Used to treat haemophysis, haemorrhoid, leprosy, diarrhoea and dysentery, general debility, dropsy and hysteria. Fresh juice and paste applied to stop bleeding from nose and cuts and wounds.
15	*Cyperus rotundus* L.	Cyperaceae	Mutha	Roots used to treat diarrhoea, dyspepsia and other stomach problem. Also used in fever with thirst, burning sensation in hands and feet and in epilepsy.
16	*Eclipta prostrata* L. (L.)	Asteraceae	Keshut	The plant is astringent, emetic, febrifuge, purgative and tonic. Leaves used in jaundice, dropsy, anaemia, eczema, dermatitis and bleeding wounds. Plants promote hair growth.
17	*Eleusine indica* (L.) Gaertn	Poaceae	Chamghas	Plant, especially root is anthelmintic, astringent, diuretic, febrifuge and laxative. It is used in liver complains and dysfunction of gallbladder. Paste of plant externally used in sprain and backache.

18	*Euphorbia hirta* L.	Euphorbiaceae	Dudhi	The plant is used to treat respiratory system disorder including bronchitis, asthma, cough, cold and laryngeal spasm. It is also used in diarrhoea, dysentery, colic, peptic ulcer. Latex is used in removing warts and in sores and wounds.
19	*Heliotropium indicum* L.	Boraginaceae	Hatisur	The plant is used to treat warts, inflammations and tumors. Decoction of plant is given to cure diarrhoea, diabetes, veneral diseases. Infusion of leaf is used as eye-lotion and to clean wounds. Flowers are used as abortifacient.
20	*Kyllinga brevifolius* (Rottb.) Hassk.	Cyperaceae	Nirbish	Plants are analgesic, anti-inflammatory, antimalarial, diuretic and febrifuge. Used in fever, throat pain, cough, bronchitis and diarrhoea.
21	*Leucas aspera* (Willd.) Link.	Lamiaceae	Swetdrone, Dondokalas	Leaves used as carminative, anthelmintic, antipyretic, expectorant. Used to treat colic, dyspepsia, skin eruption, psoriasis, intermittent fever, cough, amoebiasis, amenorrhoea and dysmenorrhoea.
22	*Lindernia crustacea* (L.)F. Muell.	Scrophulariaceae	-	Plant is used to treat dysentery, diarrhoea, vomiting, amenorrhoea. Leaf decoction is applied topically to boils and itches.
23	*Ludwigia octovalvis* (Jacq.) Raven	Onagraceae	Bon Lobongo	Plants used as vermifuge, purgative. Also useful in dysentery.
24	*Mazus pumilus* (Burm.f.) Stennis	Scrophulariaceae		Plant is aperients, emmenagogue, febrifuge and tonic. Juice of the plant is used in the treatment of typhoid.
25	*Mikania micrantha* H. B. K.	Asteraceae	Tara Lota/Japani Lota	Decoction of the leaves is used in skin rashes, useful as poultice in snake bite. Its extract has antimicrobial properties too.
26	*Mimosa pudica* L.	Fabaceae	Lajjabati	The plant is antibacterial, antivenom, antifertility, anticonvulsant, anti depressant and aphrodisiac. Roots are used to treat leprosy, dysentery, uterine complaint, asthma, leucoderma, piles, arthritis.

27	*Oldenlandia corymbosa* L.	Rubiaceae	Khetpapra	The plant is anthelmintic, diaphoretic, digestive diuretic, febrifuge and stomachic. Leaves are used in stomach disorder and jaundice.
28	*Oxalis corniculata* L.	Oxalidaceae	Amrul	Plants are use to cure dyspepsia, dysentery, piles, anaemia, fever, boils and scurvy.
29	*Phyllanthus fraternus* Webster	Phyllanthaceae	Bhui-amla	Plant is antipyretic, antiseptic, diuretic. Used in dropsy, diarrhoea, dysentery, jaundice, asthma, gonorrhoea and menorrhagia.
30	*Phyllanthus virgatus* Frost. F.	Phyllanthaceae	Bhui-amla	Plants are used as antiseptic, treatment of jaundice, gonorrhoea, skin diseases, eye trouble. Paste of its root is applied to mammary abscess.
31	*Physalis minima* L.	Solanaceae	Bontepari	Plants are used as diuretic, carminative and antipyretic. Fruit is alterative, appetizer, laxative and tonic. Root is febrifuge and vermifuge.
32	*Scoparia dulcis* L.	Scrophulariaceae	Bon dhone	Plant used to treat stone in gall bladder, diabetes, mouth ulcer, toothache. Roots used in diarrhoea and dysentery, menorrhagia.
33	*Sida acuta* Burm. *F.*	Malvaceae	Berala	Roots are antipyretic, stomachache and tonic. Used in nervous and urinary disorder. Leaves are demulcent and diuretic. Used for haemorrhoid and impotence.
34	*Solanum nigrum* L.	Solanaceae	Kakmachi	Plant used in asthma, bronchitis, rheumatism, gout, jaundice and general debility. Roots used in urinary disease. Leaves used as laxative.
35	*Sphagneticola calendulacea* (L.) Pruski	Asteraceae	Maha-Bhringaraj	Plant is astringent, acrid, anti-inflammatory, cardio tonic and vulnerary. Leaves promote hair growth and used to treat headache, skin problems and jaundice.
36	*Tridax procumbens* L.	Asteraceae	Tridaksha	Leave extracts are useful as anticoagulant, antifungal, anti-insect and healing of wounds.

37	*Vernonia cinerea* Less.	Asteraceae	Choto kuksim	Plants are stomachic, astringent and tonic. Possess anti-cancerous property. Roots used in stomachache, diarrhoea and dropsy. Seed cures diseases caused by round-worms and thread worms, cough, flatulence, intestinal colic, dysuria, leucoderma, psoriasis and other skin diseases.

Figure 1a. Weeds growing in the campus during 2018-19 : (1)*Abutilon indicum*, (2) *Acalypha indica,* (3) *Aerva aspera,* (4) *Ageratum conyzoides,* (5) *Alternanthera sessilis*, (6) *Amaranthus spinosus*, (7) *Boerhaavia diffusa,* (8) *Cleome viscosa,* (9) *Coccinia grandis*, (10) *Coix lacryma-jobi*, (11) *Commelina benghalensis*, (12) *Cheilocostus speciosus*, (13) *Croton bonplandianus*, (14) *Cynodon dactylon*, (15) *Cyperus rotundus*, (16) *Eclipta prostrata*, (17) *Eleusine indica*, (18) *Euphorbia hirta*, (19) *Heliotropium indicum,* (20) *Kyllinga brevifolius.*

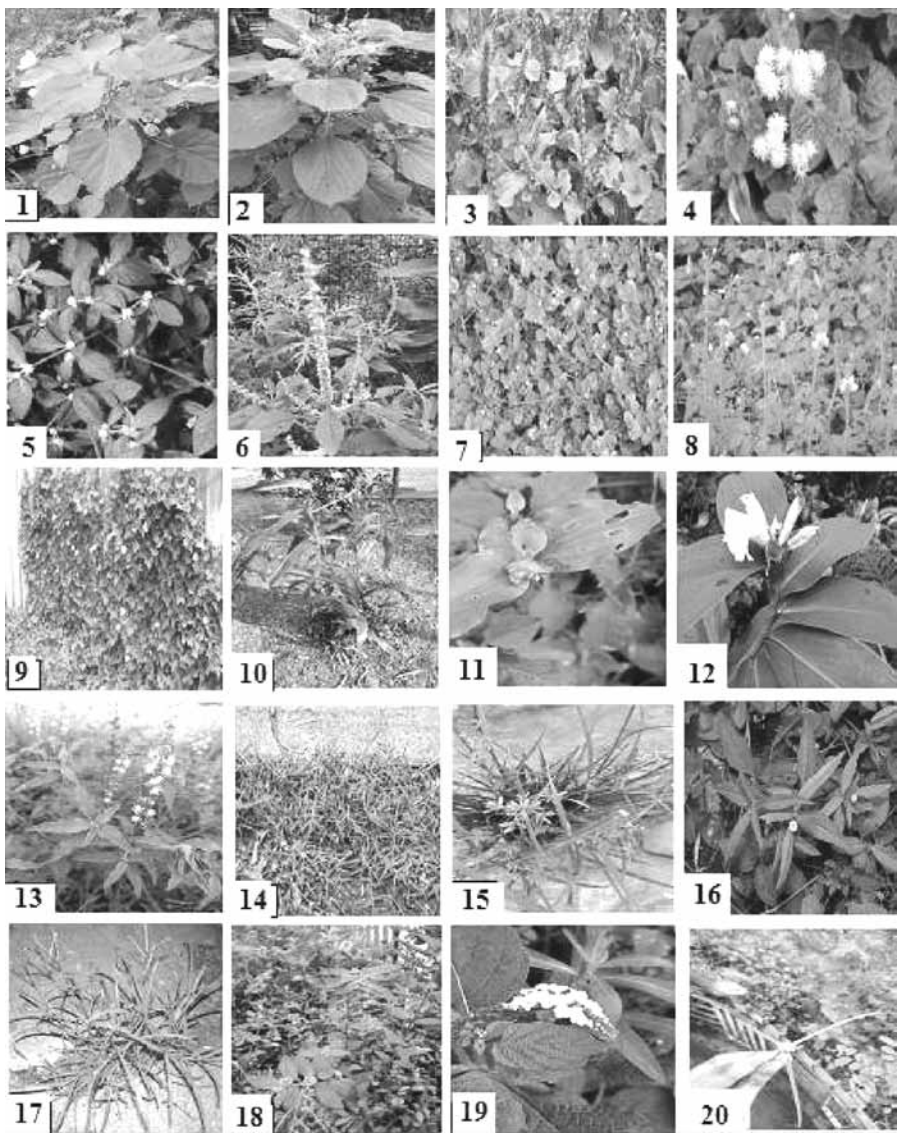


Figure 1b. Weeds growing in the campus during 2018-19: (21) *Leucas aspera*, (22) *Lindernia crustacea*, (23) *Ludwigia octovalvis,* (24) *Mazus pumilus, (*25) *Mikania micrantha*, (26) *Mimosa pudica*, (27) *Oldenlandia corymbosa*, (28) *Oxalis corniculata*, (29) *Phyllanthus fraternus*, (30) *Physalis minima,* (31) *Scoparia dulcis,* (32) *Sida acuta,* (33) *Solanum* nigrum, (34) *Sphagneticola calendulacea,* (35) *Tridax procumbens,* (36) *Vernonia cinerea.*

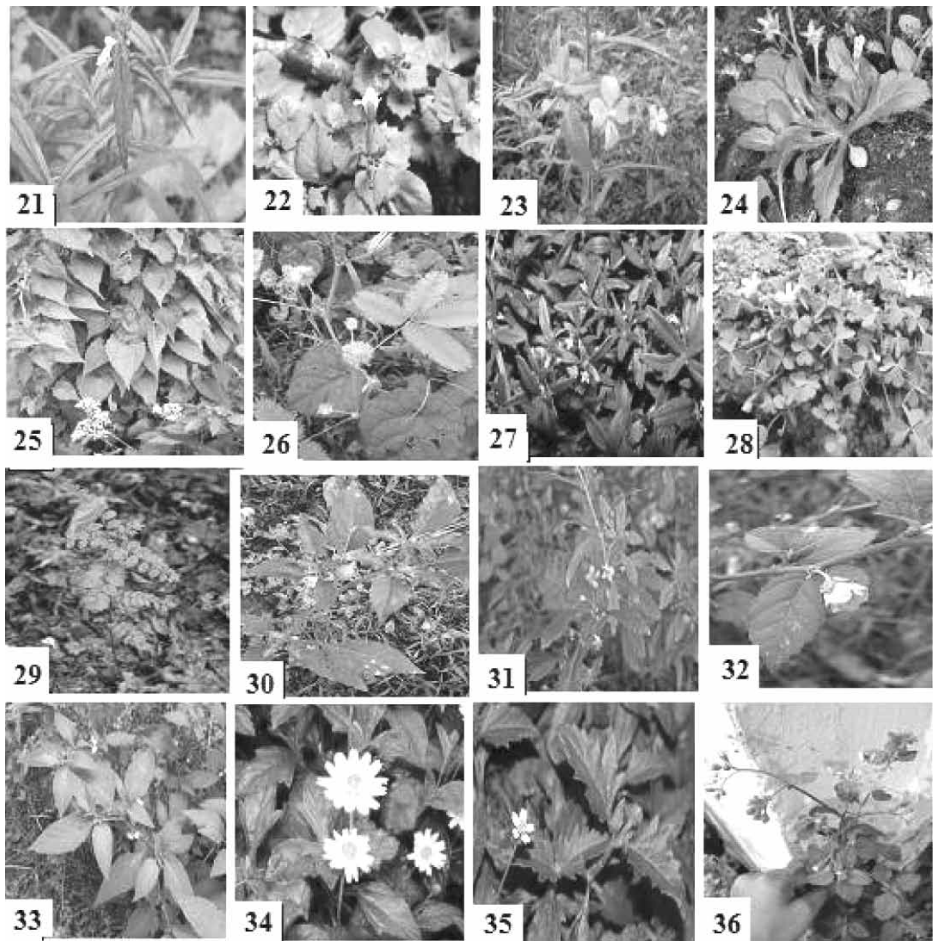


Figure 2. Weed members different flowering plant families (n=20) growing at college campus recorded during 2018-2019.

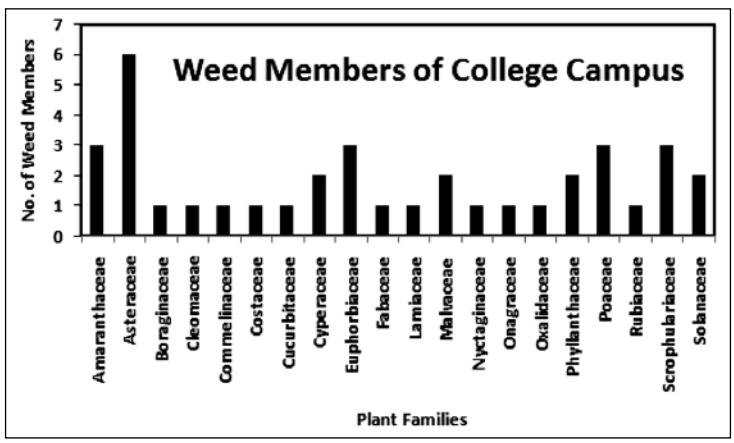


Figure 3. Percentage contribution of different study groups in the population (n = 117) of the online questionnaire on awareness about medicinally important weeds growing in college campus.

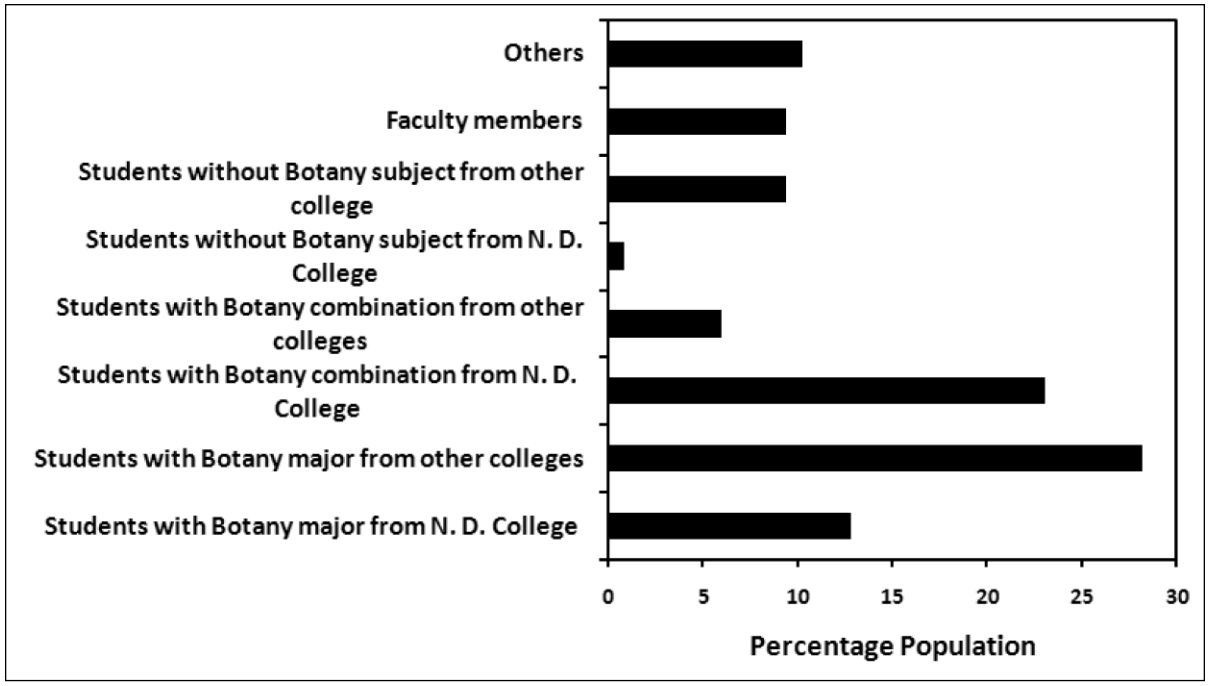
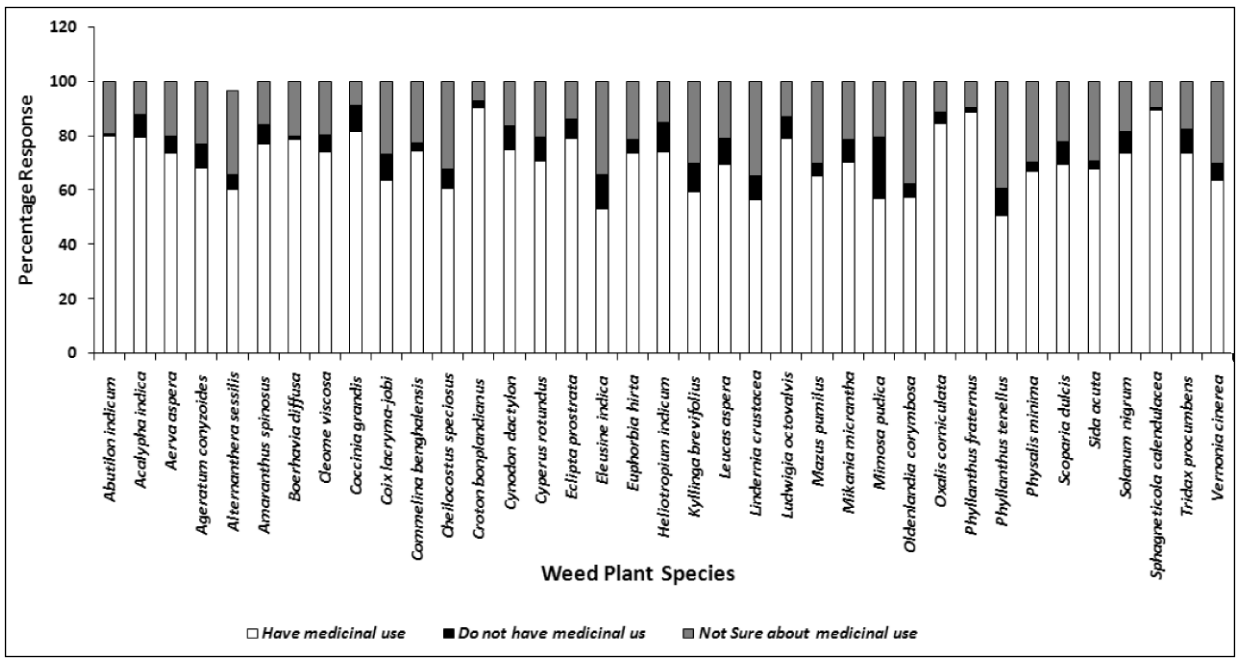


Figure 4. Outcome of the online awareness questionnaire survey conducted on medicinally important weeds growing in the college campus.



4. Conclusion

Biodiversity conservation is very much essential at the global, regional and local levels all around the globe. Most of the megadiversity nations have their so called 'development' by habitat destruction of different plant species leading to loss of biodiversity. As a result, the entire ecosystem of the world is going to lose its balance. We have to be aware that different levels of anthropogenic activities often endanger the existence and finally lead to the extinction of species. The educational institutes also have an important role to enlighten people, especially students, about the conservation of biological resource for long term sustainable development of the society. The present study clearly indicated that there are a number of weeds growing around us, which have medicinal values and most of the people are already aware about this. Such awareness will be very much helpful to develop environmental policies for sustainable development, based on the idea that "We have to nurture the nature for our future".

Acknowledgments

We wish to express our deep sense of gratitude to the students of Semester III Botany Honours students (2019) for their participation and help in the floristic survey in the campus. Thanks are due to our respected Principal Dr. Soma Bandyopadhyay for her support and participation in the survey. We are also thankful to all the participants (students, faculties and others) for their spontaneous participation in the online questionnaire survey on the medicinal plants and biodiversity conservation.

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