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Medicinal plants from Gangetic plains of West Bengal and yoga for the management of lifestyle diseases

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Abstract

Lifestyle diseases are the diseases caused due to our mode of living, unhealthy diets such as junk and fast food, the alcoholism, and other drug habits. Developing habit of late sleeping and late awaking, using fatty food proportionate to physical exercise through nature of working and maximum sitting for work causing blood pressure, cancer, diabetes, hypertension causing cardiac arrest. Regular exercise, pranayama and yogasana plays a vital role for this management. Besides, herbal drugs are also useful the management of the lifestyle diseases. Seeking out this an exploration of herbs related with the formulation of medicines and tradition use of medicines described in different herbal system of medicines have been made in the Gangetic areas in West Bengal from Rajmahal hill to Gangasagar. During the course of exploration, 34 plants were found being used in different herbal medical systems or having the properties and having the chemical alkaloids and pharmacological properties are mentioned in this paper.

Keywords: Gangetic plain, lifestyle diseases, medicinal plants, diabetes, yoga

Introduction

The Ganges flows near Rajmahal in West Bengal and then flows in a south-easterly direction. Near north of Dhulian in Murshidabad district it is divided into two parts. One arm reaches Bangladesh as Padma and the other flows south through West Bengal as Bhagirathi River and Hooghly River.

Diseases that are related to the lifestyle of a person or group of people are called lifestyle diseases, which include arteriosclerosis, heart disease, including stroke, obesity with type II diabetes; and diseases associated with alcohol consumption and smoking and related drugs. Regular exercise and yoga help prevent obesity, heart disease, high blood pressure, diabetes, colon cancer and premature death. Lifestyle diseases are non-communicable diseases that are often caused by lack of physical activity, unhealthy diets such as junk and fast food, alcohol, drugs and smoking. It starts from an individual and eventually spreads to entire countries *viz.* Like India, the country was expected to suffer an economic loss of more than \$236 million in 2015 due to unhealthy lifestyle and poor diet ^[1].

Nowadays, lifestyle-related diseases are common due to lack of awareness of human health care. In general, changing eating habits, busy schedules and promoting various health risks cause various disorders in the body, namely: cancer, depression and stroke, diabetes, high blood pressure and obesity. In addition to a strenuous lifestyle, they cause diseases such as Alzheimer's disease, arthritis, arteriosclerosis, asthma, cancer, chronic liver disease, chronic obstructive pulmonary disease, metabolic syndrome, chronic kidney failure, osteoporosis, stroke, depression, obesity and vascular dementia. People face these problems in normal life. These disorders are interrelated and require lifestyle and eating habits changes as well as incorporating regular yoga, meditation and herbal medications. Plants are a rich source of food and medicine for oral consumption in various ways including fresh use as vegetables, salads, sauces, spices, decoctions of plant parts, powdered plant parts, pills made from fermented plant parts, etc. to maintain the health of the body and prevent civilization diseases.

In search of remedies through locally available herbs, a reconnaissance was conducted involving villagers in the team to share knowledge on managing health problems associated with these riverine diseases of the holy river Ganges in West Bengal. The starting point of river Ganga in West Bengal is Farakka in Hazarduari district with its terminus at Gangasagar where the holy river Ganga flows into the Bay of Bengal. During the exploration, 338, medicinal plants with properties to cure and combat various diseases in humans and animals were recorded. Particular emphasis was placed on the treatment of various diseases of civilization, with preventive medication also including the fight against the diseases *viz.* obesity, high blood pressure, diabetes, depression, cancer and the growing problem of infertility under consultation of medicinal use and studies on medicinal properties of the plants reported for such types of treatment [2-40]. At the same time, awareness of yogasanas and pranayama for the treatment of diseases of civilization was also raised. The following plants have been recorded that have been associated with the treatment of lifestyle diseases [41, 42].

Methodology

Exploration of medicinal plants in the both sides of river Ganga from the initial point in West Bengal to the terminal point at Gangasagar was conducted between the distance of 10 kilometres on both sides in two different seasons i.e. October and March-April. During the course of exploration major 5 spots falling under the districts Hazarduari, Nadia, Hoogley, and South 24 Pargana districts. The places of focus are Farakka, Mayapur, Hoogley, Diamond Harbor and Gangasagar in concerned districts. Plant samples were collected and herbarium vouchers were prepared by using the usual methods [43]. The identification of the collected plant materials were made by matching with the herbarium vouchers kept in the herbarium of Patanjali Research Foundation (acronym PRFH) and deposited in the same herbarium. One set of herbarium has been kept separately for depositing to the concern Department, Government of India. Use of the plants was recorded from the various published literatures. Local villagers were consulted and awareness was developed towards the management of lifestyle health hazards through Yogasana and Pranayama. The citation of the plants have given with botanical name followed by family in parenthesis, vernacular names, place of collection, collection number in parenthesis, following the brief plant description and uses and medicinal properties.

Results

During the course of survey of medicinal plants total 338 plants were recorded having medicinal values for various formulations and folkloric published literatures with evidence of phytochemical and pharmacological research publications. Out of which following 34 medicinal evidenced for the management of various lifestyle diseases like cancer, diabetes, hypertension, obesity and strokes.

Allamanda cathartica L. (Apocynaceae): Golden Trumpet Vine, Allamanda Vine. Gangasagar (4725). A robust shrub, leaves opposite, elliptic to ovate, flowers tubular yellow, fruits spiny capsules, seeds compressed.

The plant is used as anti-cancerous in Malaysia, antidiabetic in India and hypertension in Philippines [2-4]. Different phytochemistry, pharmacologytoxicity and biotechnology has been described [5].

Antigonon leptopus Hook. & Arn. (Polygonaceae) Anantalata, Coral vine, Honolulu creeper. Gobindarampur

Hazarduari (4601). A climber, climbing with tendrils; leaves arrow shaped-cordate, flowers coral-pink, clustered. Flowers in spring.

Besides other medicinal properties the tea made from this plant is used in diabetes and the various actions have been evidenced [6-8].

Coccinia grandis (L.) Voigt (Cucurbitaceae); Ivy Gourd, Kundru, Telakucha, Kundri. Farakka, Hazarduari Mayapur (4683). A climber, stem angular, leaves lobed, glabrous, dioecious, flowers white, trimerous. Fruits globose.

Roots and leaves are used to treat diabetes, and the aqueous and ethanolic extracts of the plant exhibit hypoglycemic action [9, 10].

Cucumis maderaspatanus L. (Cucurbitaceae): Agamukhi, Paripushkara. Hazarduari (4604). Climbing or trailing herb, bristly hairy, tendrils simple, leaves arrow shaped, triangular hastate to ovate, flowers axillary calyx tubular, corolla yellow, berries small, round, in a bunch of 1-7 without stalk.

Berries possess antioxidant, antihyperlipidemic, antidiabetic, anxiolytic, catalytic, antineoplastic properties [11].

Cucumis melo L. (Cucurbitaceae); Wild Melon, senat seed, small gourd. Farakka (4569). Trailing vine, stem cylindrical, hairy, leaves simple 3 or 5 lobed; tendrils simple as supporting organ in trailing. Plants monoecious bearing male and female flowers in the same plant; flowers yellowish, small; fruits round, fleshy, seeds many, centrally placed. Fruits being anti-inflammatory, nutritious, shows the antidiabetic and anti-obesity properties.

The fruits has the antihyperlipidemic, anti-hyperglycaemic, and anti-hypothyroidism under lifestyle diseases [12].

Delonix regia (Bojer ex Hook.) Raf. (Fabaceae) Gulmohar, flame tree, Krishnachura. Diamond Harbour (4352). Tree bark dark greyish black, leaves pinnate, flowers clustered, 4-5 scarlet orange red, petals spatulate, pods long with 10-20 seeds. Widely cultivated in India.

Bark leaves and flowers are used in diabetes [10, 13].

Enydra fluctuans Lour. (Asteraceae): Buffalos' spinach. Bhatpara, Diamond Harbour, Mahula (4262). A semi-aquatic herb, growing near ponds, ditch, fish ponds; prostrate, leaves opposite, sessile, linear oblong; stem elongate, roots arising from nodes; Flowers heads with white and violet asters.

Plant and leaves are used inflammation, cancer, and diabetes [14].

Gymnema sylvestre (Retz.) R.Br. ex Sm. (Apocynaceae); Gumar. Gangasagar (4716). Periploca of the woods, Meshashringi; Climbing shrub, liana, leaves simple, smooth, elongate, oval; inflorescence small umbels; flowers small, greenish white capsules conical.

Leaves are strong antidiabetic, also useful in obesity [15].

Ipomoea sagittifolia Burm.f. (Convolvulaceae) Purple Heart Glory, Bankalami, Bawn peyanj. Gangasagar, Hooghly (4747). A slender vine, climbing on bushes, leaves alternate, cordate to sagittate, slightly undulate, flowers purplish white, funnel shaped, corolla tubular; stamens adnate to corolla tube, bloomin is sensitive to sunlight which opens with sunrise and close with sunset.

The plant is used to increase the sexual desires, cures infertility in women and rejuvenates body cells and tissues [16].

Ixora parviflora Lam. (Rubiaceae): Nevaari. Diamond Harbour, Gangasagar (4364). Evergreen shrub, leaves coriaceous, hard, shiny, sessile, oblong to ovate oblong; flowers white or pink, arranged in simple, cyme, corolla lobes oblong, filaments short, style pubescent. Fruits small, didymous, seeds planoconvex.

Root and flowers used in cancer, cardiovascular diseases, type 2 diabetes mellitus, various neurodegenerative diseases ^[10, 17].

Leersia hexandra Sw. (Poaceae); Southern cutgrass, club-head cutgrass, and swamp rice grass. Falta (4774).

Thin, leaning grass to 1.25m tall; nodes hairy, rooting at nodes, leaf tapering, margins sharp, ligule distinct, papery, inflorescence slightly contracted, spikelets flat keeled, ridged with single flower; flowers aggregate to the branch ends with stiff short hairs.

The plant is used in obesity, diabetes hypertension, malignant nephroangiosclerosis, arteriosclerosis, and malignant retinopathy ^[18].

Leucaena leucocephala (Lam.) de Wit (Fabaceae); Subabul. Diamond Harbour, Falta (4768). A shrub or tree 2-15 m tall; younger stem green, covered with green hairs, bark grayish; leaves bipinnate with 3-10 pairs of branches, inflorescence globular clusters in the axils of leaf, which appears woollen ball on blooming, Pods elongate, linear, 8-22 cm long with 10-20 seeds.

Seeds shows antidiabetic, anticancer and antimetastatic, properties ^[19].

Litsea glutinosa (Lour.) C. B. Rob. (Lauraceae) Soft bollygum, bolly beech, Indian Laurel, Medh, Chandna. Diamond Harbour, Mahula (4402).

Tree, trunk bark blackish grey, leaves elliptic to oblong-elliptic, young leaves pilose; flowers unisexual, yellowish in colour, fruits berries small 5-6mm across.

Besides properties to cure of other diseases, it is useful in lifestyle diseases like asthma, diabetes, pain relief, and poignant sexual power ^[20].

Melochia corchorifolia L. (Malvaceae) Tikiokra, Bilipatr, Bon-pat, Chocolate Weed. Hazarduari (4582).

Herb, erect, branched; leaves in varying size and shape, ovate-oblong, cordate with narrow base, margin serrate, acute, sparsely hairy on nerves on both sides; flowers pink with yellow corolla tube, stamens and pistil.

The plant is reported that plant possesses the properties of antidiabetic, cytotoxicity effects and anti-cancer ^[21].

Moringa oleifera Lam. (Moringaceae): Tree; Sojna, Drumstick Tree, Horseradish tree Mayapur (4623; March-July Root, fruit cardiotoxic ^[10].

Nerium oleander L. (Apocynaceae); Kaner, Raktakarabi. Mayapur (4687).

Shrub, stem cylindrical with milky latex, leaves leathery with thick waxy cuticle, lanceolate, entire, acute; flowers pentamerous, sepals green, petals pink, stamen adnate to corolla tube; stigma capitate; capsules linear flat seeds hairy.

Root is useful in heart failure, asthma, corns, cancer, diabetes, immune, and also as antitumor ^[22].

Nymphaea nouchali Burm.f. (Nymphaeaceae) Blue water lily, Kumud. Sada Shapala, Neelkamal. Gangasagar (4734)

Aquatic herb with submerged root system, leaves also partially submerged, leaves round with notched base; flowers showy, with stellate appearance, pedicel long with air chambers calyx cup shaped petals bluish, fruits capsular with many brown seeds.

Rhizome is useful in infertility, diabetes, cardiac diseases, cardiotoxic, aphrodisiac ^[23].

Oldenlandia corymbosa L. (Rubiaceae): Corymb Diamond Flower, pitpapra. Farakka, Mayapur (4544).

Annual herb with prostrate or erect, 4-angled stems; leaves linear-oblong or narrowly elliptic, sub sessile, rough on margins; inflorescence 2-8 flowered axillary cymes; lowers white or faintly pinkish-purplish, on slender stalks with 4 petals; stamens inserted just above the base of the corolla

tube; capsule flattened at apex, slightly laterally compressed. Plant juice-applied to be used in nervous depression ^[10,24].

Pergularia daemia (Forssk.) Chiov. (Apocynaceae): Ajasringi; Pergularia, hairknot plant. Bhatpara, Farakka, Gangasagar, Mayapur (4565).

Perennial twining herb with foul odour on battered with milky juice, stem hairy; leaves thin, broadly ovate, cordate or nearly circular, glabrous adaxially, abaxially tomentose. Inflorescence lateral cymes or racemeose, initially corymbose; flowers greenish yellow or dull white, sweet-scented, afterwards; petals five, hairy and spreading outwards; fruits follicle, with soft spines all over and a long beak; seeds densely tomentose on both sides. Flowering: August-February.

The plant is useful in cancer, and fertility ^[10,25].

Phyllanthus virgatus G. Forst. (Euphorbiaceae): Bhuiamla. Farakka, Mahula (4550).

Herb, woody at stem base; leaves alternate elliptic-oblong or nearly linear, sessile, blunt at both ends; flowers very small, sagging with slender stalks; male flowers shorter on peduncle; sepals oblong, stamens free; female flowers on longer peduncles, often together with 1 or 2 male flowers; styles free, short and recurved. Capsules sphere shaped. This plant is reported to possess antioxidant, anticancer activity and antidiabetic properties ^[26].

Pontederia hastata L. (Pontederiaceae); Arrow Leaf Pondweed Hooghly (4103).

Herb, aquatic, perennial; radical leaves with sheath broadened at base, leaf blade triangular or ovate triangular with sagittate or hastate base; floral axis erect long, inflorescences erect or suberect, sub-umbellate to shortly racemose with 10-40-flowers; Perianth tepals ovate, bluish with green mid-vein and reddish blotch; stamens with filiform filaments, style sparsely hairy; capsule oblong.

This plant is an alterative, tonic, cooling, antioxidant, antidiabetic ^[10,27].

Potamogeton natans L. (Potamogetonaceae): Broad-leaved pondweed, floating pondweed. Gobindarampur (4216).

A floating herb; stem cylindrical, unbranched, leaves phyllode, ovate, with cordate base; dark green in colour, stipulate, succulent, opaque, veins longitudinal, entire, base almost circular, apex acute, Inflorescence dense spike, pointed at apex and basally rounded, Flowering: May-September.

The plant is useful in inflammation, cancer, diabetes, asthma, obesity, neurodegenerative disorders ^[28].

Pteris vittata L. (Pteridaceae): Bhatpara, Diamond Harbour, Falta, Farakka (4782).

Fern with short creeping rhizome, covered with brown coloured narrow scales up to the petiole base; petiole and rachis hairy; fronds long, pinnules sub-oppositely attached to the rachis, sori marginal golden brown in colour.

Rhizome of this fern is an antioxidant, anticancer ^[29].

Rauvolfia serpentina (L.) Benth. ex Kurz (Apocynaceae). Sarpagandha. Mahula (4285). Woody evergreen shrub with milky sap; leaves whorled of 3-4 leaves at nodes, elliptic to ovate; adaxially dark green, abaxially pale green; flowers terminally clustered, pink or red; berries red and brown on maturity.

Useful in insanity, blood pressure and insomnia ^[10].

Rauvolfia tetraphylla L. (Apocynaceae). Sarpagandha. Bar chandrika, Hazarduari, Mayapur (4665).

Tall shrub, woody stem; leaves arranged in whorls of 3-5, ovate to oblong, flowers small white; berries red and brown on maturity. Flowering: round the year.

Useful in insanity, blood pressure and cardiovascular

depressant^[10].

Ruellia tuberosa L. (Acanthaceae) Diamond Harbour, Gangasagar (4753).

Perennial herb; roots tuberous; stem slightly, angular, with swollen nodes; leaves opposite, elliptic to ovate with acute or acuminate apex; inflorescence cymes having 3-4 flowers, corolla tubular 2-lipped blue in colour; anthers adnate to corolla tube, ovary 2-chambered with many ovules; fruits capsular. Flowering in September-October.

Tuberous root is anti-oxidant, anti-cancer, antinociceptive and anti-inflammatory activity^[30].

Sphagneticola trilobata (L.) Pruski (Asteraceae); Bay Biscayne Creeping-oxeye, merigold Singapore daisy, creeping-oxeye, trailing daisy, and wedelia. Bhatpara (4146).

Creeping, herb to 30 cm tall; stem cylindric, roots arise from nodes; leaves lightly succulent, pubescent, lobed, usually 3 lobed,; Aster peduncle varying, bracts lanceolate, stiff; head pale yellow, ray florets 8-13 per head, disc florets compact, darker; seeds achenes; flowering: September-March.

The plant is useful as anticancer, antioxidant^[31].

Swietenia macrophylla King. (Meliaceae); Mahogany, Big leaf mahogany. Diamond Harbour, Falta (4765).

Woody tree; leaves imparipinnate, attached to the central axis; fruits light gray or brown capsule to 40 cm long, growing upward direction; seeds many (to 70 in number), winged. Flowering: March.

Bark is useful in hypertension, diabetes and relieve pain, as an antioxidant and anticancer^[32].

Trema orientale (L.) Blume (Cannabaceae); Chikan, Jiban, Gio, Pigeon wood. Farakka, Hooghly (4563).

Spreading shrub or small tree growing in open with drooping habit; bark greenish-light grey; leaves alternate, simple with early dropping stipules, veins three arising from one point at base, papery, younger leaves hairy, sometimes smooth on maturity, base unequal, serrate; flowers small, greenish, arranged in dense bunch, unisexual; fruits small green. Flowering: September-November.

Leaves are useful in diabetes respiratory diseases, and oliguria^[33, 34].

Trichosanthes dioica Roxb. (Cucurbitaceae) Parwal, Pointed gourd; Potol. Farakka (4232).

Perennial climbing plant, sprawling on ground or climbing on support with the help of tendrils; root tuberous, arising from tap root, Vines are cylindrical; leaves simple, cordate, dark green; flowers monoecious, calyx tubular at base, corolla tubular white, tubular, filaments short with free anthers, fruits with pointed ends, pulp yellowish seeds grey. Flowering: September-March

The fruits of this plant is useful in diabetes; also a cardio tonic

[35, 36].

Vachellia nilotica subsp. *indica* (Benth.) Kyal. & Boatwr. (Fabaceae). Babul. Farakka, Gangasagar, Gobindarampur (4507).

A large tree; bark blackish grey or dark brown fissures longitudinal on maturity, young branches smooth and grey or brownish; spines paired, slender and straight from a single base, whitish to reddish brown in colour. Leaves 5-11 pairs of pinnae; each pinna further divided into 7-25 pairs of small leaflets, bright green in colour; flowers bright yellow, numerous, in downy round heads in clusters of 2 to 6, on individual pubescent axillary stalks. Pods flat, curved 5-12 seeded.

Bark is useful in diabetes mellitus antioxidant activity, and used for treatment of human immunodeficiency virus and cancer^[10, 36, 37].

Xanthium strumarium L. (Asteraceae) Arishta, Chhota Dhatura, Clotbur. Hazarduari, Hooghly (4573).

Annual herb; stem short, stout, hairy; inflorescence in racemes in leaf axils or at the end of branches; flowers greenish white or green, many, male at the top and female ovoid, covered with hooked bristles; fruits ovoid, enclosed in the hardened involucre, with 2 hooked beaks and hooked bristles.

It is a bitter, tonic, useful in cancer; diaphoretic, sedative, sudorific, salivation^[38].

Ziziphus nummularia (Burm.f.) Wight & Arn. (Rhamnaceae): Jhar Beri, Bhubadari, Bhui kul. Gangasagar (4749).

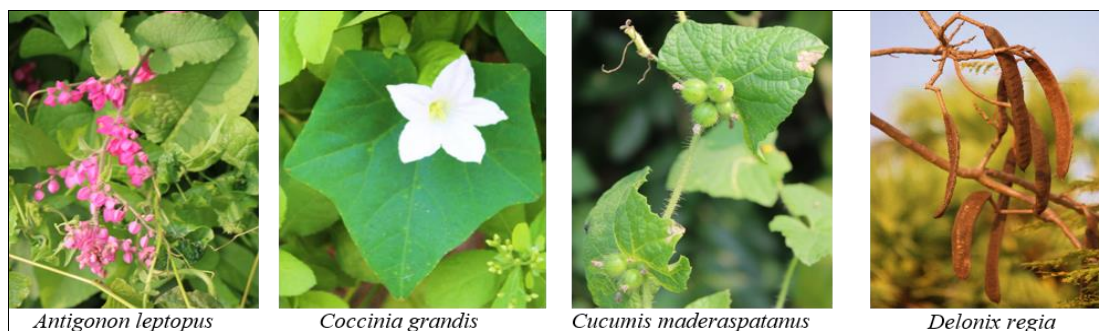
Bushy, shrub with many branches; spines unequal in pairs, bigger straight, smaller recurved; leaves very small, round, ovate-round to elliptic, green and thickly velvety; flowers very small, creamish; sepals velvety, lanceolate; petals wedge-like longer than stamens; stamen are short; fruits round, ripe fruits reddish brown-black with 2 seeds. Flowering: March-June.

This plant is an anti-inflammatory, antioxidant, antidiabetic, anticancer, and analgesic^[39].

Ziziphus oenopolia (L.) Mill. (Rhamnaceae) Makoh, Siakul. Mayapur (4661). A departing shrub with tomentose branches; spines in different sized pairs; leaves alternate, ovate or ovate lanceolate having three main veins and several secondary veins; inflorescence cymes tomentose, in the axils of leaf, flowers very small, velvety tomentose, fruits small round to oval drupes.

This plant is useful as antidiabetic, anticancer, antioxidant, analgesic and antinociceptive, hypolipidemic activity, anti-inflammatory, immunomodulatory activities^[40].

Results have been presented with photographs of the medicinal plants used in lifestyle diseases (Figure 1).



Antigonon leptopus

Coccinia grandis

Cucumis maderaspatanus

Delonix regia



Fig 1: Photographs of medicinal plants useful in lifestyle disease management

Discussion and Conclusion

During the course of exploration, out of maximum numbers of plants for curing lifestyle diseases were from Apocynaceae^[6] followed by Cucurbitaceae^[4], Asteraceae and Fabaceae^[3], Poaceae, Rhamnaceae and Rubiaceae^[2] plants and rest of the families i.e. Acanthaceae, Canabaceae, Convolvulaceae, Euphorbiaceae, Lauraceae, Meliaceae, Moringaceae, Nymphaeaceae, Polygonaceae, Pontederiaceae, Potamogetonaceae, Pteridaceae (fern), with only one plant (Figure 2). While considering the category of habit of plants 8 species were each under the herbs and shrubs, 7 species climbers or twinner, 6 species were trees, 4 species were aquatic herbs and only a liana. (Figure-3).

Different parts of the plants viz. whole plants of herbs viz. *Allamanda cathartica*, *Antigonon leptopus* *Ipomoea sagittifolia*, *Leersia hexandra*, *Melochia corchorifolia*, *Oldenlandia corymbosa*, *Pergularia daemia*, *Phyllanthus virgatus*, *Pontederia hastata*, *Potamogeton natans*, *Sphagneticola triloba*, and *Xanthium strumarium* are used.

The roots of *Moringa oleifera*, *Nerium oleander*, *Rauwolfia serpentina*, *R. tetraphylla* and *Ruellia tuberosa*; stem bark of *Swietenia macrophylla*, *Vachelia nilotica* subsp. *indica* and *Litsea glutinosa*; stem bark and leaves of *Delonix regia*; leaves of *Gymnema sylvestris* and *Trema orientale* is having the properties of curing lifestyle diseases. Aerial shoot i.e. plant and leaves of *Enydra fluctuans*; leaf and fruit of *Coccinea grandis*; rhizome of *Nymphaea nouchali* and *Pteris vittata* are useful in the management of lifestyle diseases. Flowers of *Ixora parvifolia*; fruits of *Cucumis maderaspatanus*, *C. melo*, *Moringa oleifera* and *Trichosanthes dioica* and the seeds of *Leucaena leucocephala* are having the properties of curing lifestyle diseases. Every parts separately of *Ziziphus numularia*, and *Z. oenopolia* are useful in the management of lifestyle diseases covering cancer, cardiac diseases, diabetes, hypertension, and respiratory diseases. The graphical representation of each plant parts used has been shown (Figure-4).

Plants possessing properties of multiple management of

marked lifestyle diseases like cancer, cardiac diseases and diabetes are *Allamanda cathartica*, *Nerium indicum* and *Swietenia macrophylla*. Other group of plants having properties of anticancer and antidiabetes are *Enydra fluctuans*, *Leucaena leucocephala*, *Melochia corchorifolia*, *Phyllanthus virgatus*, *Ziziphus nummularia* and *Z. oenopolia*. In another combination of lifestyle disease management i.e. cancer, cardiac, diabetes and sexual weakness called infertility, plants of *Nymphaea nouchali* and *Pergularia daemia* are helpful. *Ipomoea sagittifolia* is helpful in the management of cardiac, diabetes and sexual infertility.

Plants related to asthma and other respiratory disease, cancer diabetes and neural problems is only *Potamogeton natans*. For cardiac and diabetes managements is *Trichosanthes dioica*. Plants of *Litsea glutinosa*, *Moringa oleifera* and *Trema orientale* are helpful in the management of cardiac disorders and diabetes. *Cucumis melo* is useful in the management of cardiac, diabetes and hyperthyroidism. For

single obesity and diabetes plants of *Antigonon leptopus*, *Coccinia grandis*, *Delonix regia*, *Leersia hexandra*, *Pontederia hastata*, and *Vachelia nilotica* are reported for this type of management. The plant *Oldenlandia corymbosa* manages the condition of depression. Thus, different part of all these 34 medicinal plants in list can be useful in the management of various lifestyle diseases like cancer, cardiovascular diseases, diabetes, depression, hypertension, infertility and obesity.

Besides herbal managements yogasana viz. Surya Namaskar, Uttanasana, Bhujangasana, Paschimottanasana, Setu Bandhasana, Savasana, and pranayams viz. Anulom Vilom Pranayama (Alternate Nostril Breathing), balances the nervous system, reduces stress, improves lung function, and enhances focus and concentration nurtures physical, mental, and emotional well-being, raising a balanced and energetic life^[41, 42].

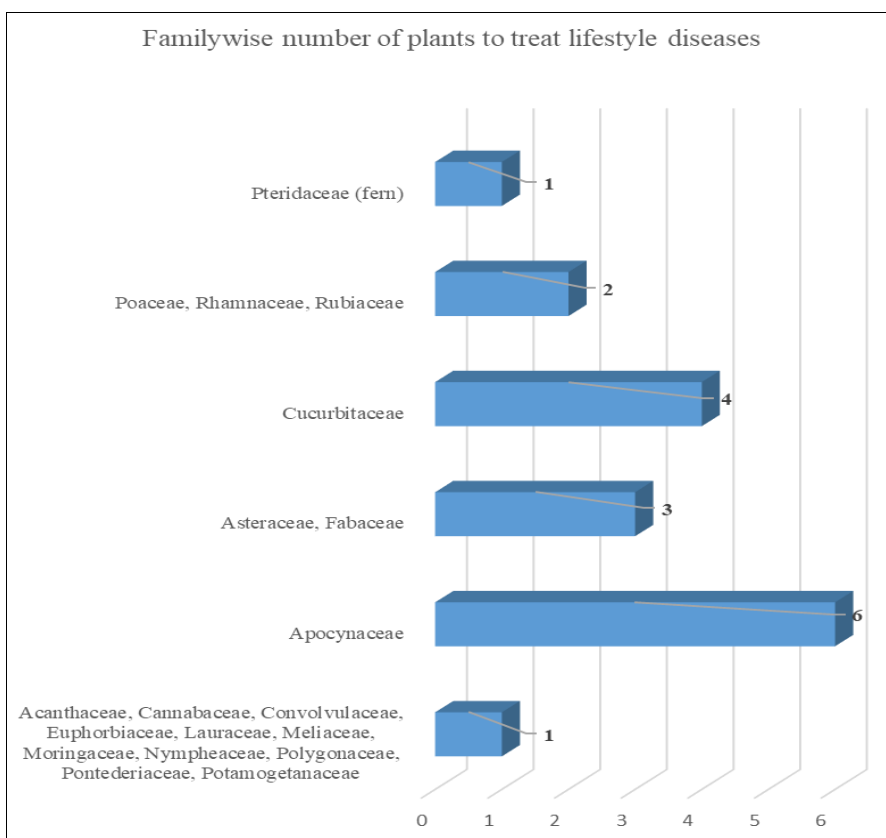


Fig 2: Family wise occurrence of plants for managing the lifestyle diseases

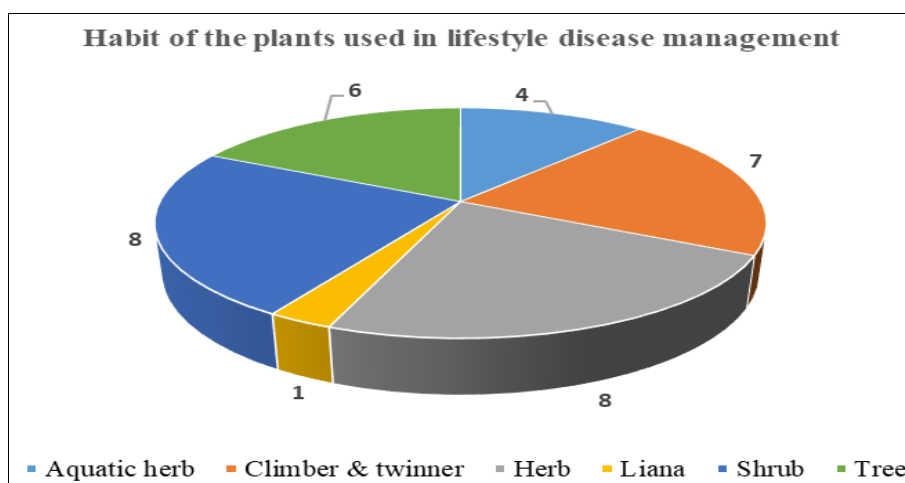


Fig 3: Graph showing the habit of the plants

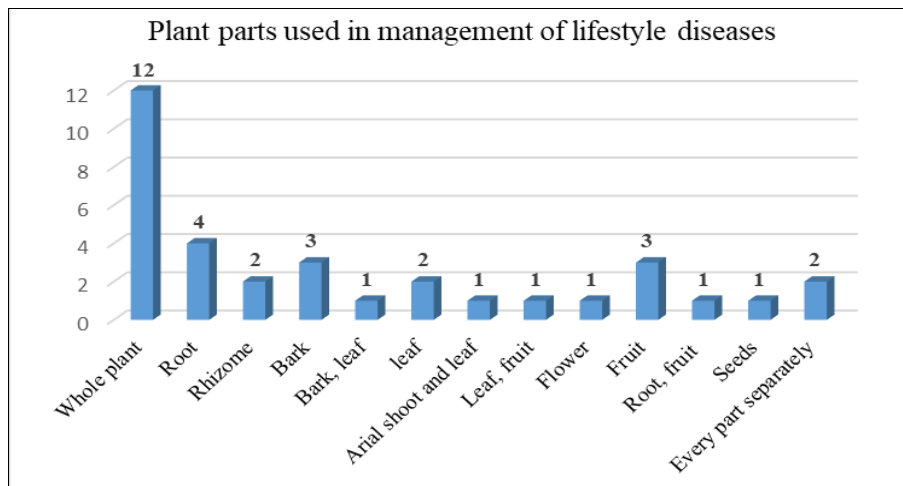


Fig 4: Plant parts used in different management of lifestyle diseases

Conflict of interest

There is no any conflict of interest amongst the authors.

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