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Medicinal Plants Curing Respiratory Diseases from Gyanpur region Uttar Pradesh

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Abstract- The paper describes for the first time an illustrated documentation of some diverse potential herbal plants treating respiratory diseases . A total of about 32 species of various such respiratory curing plants, has been enumerated and these belong to 21 families and 25 genera. Their taxonomy, ecology and means of their conservation have been discussed in great details.
Keywords: Pharmacological, Bronchitis, Tuberculosis ,Introduction .

I. INTRODUCTION

Inspite of enormous progress in modern medical system, about 80% of the world population still depends on traditional systems of medicine for primary health care, which is true in Indian scenario also Agharkar, 1954 Chopra, (1982)... Medicine in contemporary india is a fascinating blend of traditional system with conventional one and often been used for various historical, cultural and ecological and socio economical reasons Anonymous 2000. Jain, (1996).

The respiratory system includes the nasal and oral cavities, the sinuses and larynx as the upper airway, and the trachea, bronchi, bronchioles, and alveoli as the lower airway. Lung disease refers to several types of diseases or disorders that prevent the lungs from functioning properly. Lung disease can affect respiratory function, or the ability to breathe, and pulmonary function, which is how well lungs work.There are many different lung diseases, some of which are caused by bacterial, viral, or fungal infections. Other lung diseases are associated with environmental factors, including asthma, mesothelioma, and lung cancer. Chronic lower respiratory diseases is a set of conditions that includes chronic obstructive pulmonary disease (COPD), emphysema, and chronic bronchitis. Together, chronic lower respiratory diseases are a leading cause of death. Respiratory diseases such as asthma and COPD involve a narrowing or blockage of airways that reduces air flow. In other lung conditions−such as pulmonary fibrosis, a lung tissue scarring that can be caused by different factors, and pneumonia, a bacterial or viral infection in which air sacs fill with fluid−the lungs have reduced ability to hold air. Bronchial asthma is a disorder of the airways causing swelling and narrowing; which leads to wheezing, shortness of breath, chest tightness, and coughing. Most common asthma triggers of bronchial asthma are dust, animal dander, weather changes, pollution, mold, pollen, respiratory infections, stress, and tobacco smoke (Sigurs et al 2000). The main pathophysiological characteristics of asthma are inflammation and airway remodeling, which include goblet cell hyperplasia, subepithelial fibrosis, collagen deposition, mucosal gland, hyperplasia, smooth muscle hypertrophy, and changes in the extracellular matrix.

OBSERVATION:- In the present study, some medicinal plants curing respiratory diseases having about 32 species, belonging to 21 families and 25 genera. Among them, 8 are trees, 6 are shrubs, 12 are herbs and 5 are climbers. These grow in diverse ecological habitats ranging from aquatic, terrestrial, xerophytic places. Table- 1 and Plate - 1, Figs (1 -4), showing the documentation of some potential respiratory disorders curing plants with its botanical name, vernacular name, habit, family, plant parts used, flowering/ fruiting period and their phytochemicals.

Abrus precatorius (L.)Gaertn., Fabaceae Lindl.Ratti(h)- Deciduous woody twiner, stipule linear; leaf rachis bristle- tipped, hairy; leaflets are oblong, measuring 2.5 cm long and 8-20 paires, oblong, rounded and apiculate at apex, glaberous above, appresses hairy beneath. Racemes axillary, pedunculate. Flowers pale- violet, turning red; pedicels short. Calyx appressed- hairy outside; teeth very short. Corolla: vexillum clawed, wings falcateshorter than keel. The plant produces short and stout brownish pods, which curl back on opening to reveal pendulous red and black seeds, 4-6 peas in a pod. Flowering & fruiting sept- jan.

Phytochemicals- Abrasine, Abruguinone, Abrus agglutinin, Abruslactone, Abrus agglutinin APA-1, Abrus agglutinin APA-2, Precasin, Precatorian, Abrusgenic acid. In leaf Abrine, Abrusoside- A, and Abrusoside-B.

Pharmacological uses-: Seed powder in small amounts cure asthmatic pain

Acorus calamus L., Araceae Juss Vach

Perennial herb, with a creeping, rhizomatous rootstock. Leaves sessile, equitant, linear- gladiate, acute, suboblique at apex. Spadix long- peduncled. Spathe linear, foliaceous, narrowed in to an unequal, shortly acuminate apex. Spadix straight or slightly curved, obtuse.

Phytochemicals: B-asrone, calamen, calamenol, calameon, glucoside, acorin, a-asarone, galagin, 2.4.5-trimethoxy benzaldehyde, b-asarone, calamendiol and spathulenol

Pharmacological uses: Decoction of Leaves used for curing cough & bronchitis

Acacia arabica auct.non(Lam.)Willd. ,Fabaceae, babul

Small tree, straight 4-10m tall, bark blackish, rough, deeply fissured. Pinnae 3-7 pairs, 2-5 cm long; leaflets 8-20 pairs, subsessile, 3-7x1-1.6m m, linear- oblong, apex obtuse, base oblique. Spines 1.5-3.5 cm long, straight polished white. Pods 8-15x1.2-1.7 cm, beaked. Flowering & fruiting feb-nov.

Phytochemicals: octacosanol, betulin, flavonoids, a-amyrin and B-sitosterol, enzyme, arabin, tannic and gallic acids, cresol, methyl salicylate, complex salts of calcium.

Pharmalogical uses: whole plant is used as anthelmintic, aphrodisiac, diuretic, expectorant, emetic and nutritive activities. Stem and bark is used to cure wound ulcers, leprosy, leucoderma ,small pox, skin diseases and burning sensation. Wood is used for treating respiratory disease

Acalypha indica L. Euphorbiaceae Juss, Kuppi

Erect , annual herb, 30-70cm height, with many spreading or ascending branches, leaves membranous, 5x4cm, ovate or rhomboid ovate, serrate, cuneate at base, arranged in a mosaic; flowers small, greenish, in lax erect, axillary, spikes; male clustered towards the top; females solitary or paired, each enclosed by a foliar, 6x6mm bract, capsuler concealed by persistant bracts, seeds ovoid, pale brownish, shining. Flowering & fruiting sept – jan

Phytochemicals: kaempferol, b-sitosterol, y-sitosterol, acalyphine, acalyph-amide, quinines and glycosides.

Pharmacological uses: Leaf paste with pepper cures cold & cough

Achyranthes asperaL. Amaranthaceae Juss chirchita, apamarg

Erect annual herb, leaves large, ovate, acute or acuminate, glabrous. Flowers greenish white, deflexed, in terminal spikes elongating in fruits, bracts and bracteoles persistent , ending in a spine, utricle oblong, seeds sub cylindrical, brown

Phytochemicals: achyranthin, saponin A&B, ecdysterone, ecdstone, inokosterone and aminoacids.

Pharmacological uses: Leaf juices used for curing bronchitis

Cleome viscosa L., Cleomaceae, Horan, Hurhur

Pubescent herb, very variable in size, flowers whitish- yellow, solitary, viscid pubescent, stamens 12 or more. Fruit 1.5-7.5 cm reniform. Flowering and fruiting April- Oct.

Phytochemicals: rutin, b-sitosterol , d-glucoside, tannins, saponins, flavonoids, steroids, alkaloids, phenols, terpenpids, flavonoids- Q and kaempferol.

Pharmacological uses: Seeds are used for treating cough

Datura metal L. Solanaceae Juss Dhatura

Erect, perennial, widely branched herb, stem flexuous, nearly glaberous or short hairy; lenticillate. Leaves ovate- triangular to elliptic, obliquely rounded at base, acute or acuminate, repand- dentate to lobed, short hairy and glaberous. Petiole 1-15 cm long, flowers 0.5-1cm long pedicels, calyx subterete, 5-6 cm long; lobes triangular, acuminate, corolla white or purple; lobes 5, with an acumen of 1-2 cm long; fruit pendulous, globose, glabrous or hairy, with conical prickles. Flowering and fruiting throughout the year.

Phytochemicals: hyos cyamine, hyoscine, meteloidine, tropine, pseudotropine, scopolamine, hyoscine, hyoscyamine, daturanolone and fastusidine.

Pharmacological uses: Leaf juices cures bronchial asthma

Diospyros malabarica(Desr) Kostel. Ebenaceae Gurke Tendu patta

Dense, spreadingly- branched trees upto 15m high, leaves distichous, upto 20 cm long, ovate- oblong to oblong, coriaceous, reddish when young, dark green above and glaucous- green beneath. Flowers dioceous, axillary, tetramerous. Female flowers solitary, drooping; calyx sglobose, upto 6cm across, slightly accrescent, pubescent outside; corolla white, glaberous. Male flowers1-5 together, with stamens and staminodes. Berry subglobose, upto 6cm across, pulpy 4-8 seeded, covered with rusty scurf, which brushes off at the maturity of fruit. Flowering and fruiting April- October

Phytochemicals: lanceolarin, biochanin A-7-apiosyl-glucoside, 7-hydroxy-3,4-methyl-enedioxyisoflavone, latifolin, dalatione.

Pharmacological uses: Ripened fruit cures cough

Madhuca indica J.F. Gmel., Sapotaceae Juss Mahua

A large sized, deciduous tree, bark dull black, leaves clustered at the ends of branches, elliptic, obovate or broadly lanceolate, prominently nerved beneath. Flowers cream, coloured, peculiarly musty, sweet- scented, drooping, rusty- tomentose, in dense fascicles at the ends of leafless branches. Flowering and fruiting Feb- Sept.

Phytochemicals: saponin, glucoside, sapogenin, triterpenoids, steroids, saponin, flavonoids and glycosides.

Pharmacological uses: Decoction of boiled flower cures cough & cold

Murraya koengii(L.) Spreng.; Rutaceae Juss., kari patta

Unarmed deciduous shrub, or small tree. Leaves pinnate, rachis pubescent; inflorescence paniculate, corymbose, flowers small, white fragrant, berry purplish black, when ripe whitish, seeds green. Flowering and fruiting Jan-June.

Phytochemicals : girinimbine, mahanimbin, isomahanimbine, essential oil and koeingin.

Pharmacological uses: Leaves cures cough

Musa paradisiacal L., Musaceae Juss., Kela

Leaves pruinose on the lower surface, peduncle densely pubescent, racemes erect- pendant or drooping, male buds well developed or absent. Berries seed less. Flowering and fruiting Apr- Nov.

Phytochemicals: serotonin, nor-epinephrine, dopamine, catecholamine, 14 a-methyl-9b and 19 cyclo-5a-ergost-24en-2b-ol.

Pharmacological uses: Fruit cures respiratory problem

Ocimum indicum, Lamiaceae Lindle., tulsi

A much branched, woody herb, often purplish in colour. Leaves 3-5 x1.2 cm, ovate elliptic- oblong to oblong, entire or crenate- serrate, hairy, minutely dotted. Flowers purplish – pink, whorled, in racemes, often forming panicles. Bracts broad, ovate, acuminate, not exceeding calyx. Nutlets broad ellipsoid and smooth. Flowering and fruiting Oct- Mar.

Phytochemicals: eugenol, methyl eugenol, cis-ocimene, pinene, camphor, trans-ocimene, A-pinene, camphene, beta-myrcene, ethylamyl carbinol, 1-phellandrene and diarrhea

Solanum nigrum L. Solanaceae Juss., Makoy

Diffused much branched herbs upto 1m height; leaves ovate to ovate- lanceolate, sinuate or lobed; flower in umbeliform, extra- axillary cyme; peduncle 1-5cm long, appressed hairy, calyx lobes ovate rounded, corolla pubescent; berries round, smooth up to 7mm across, seeds minutely pitted, yellow. Flowering Oct- June

Phytochemicals: solasomine, solamargine, soladulcidine, tomatidine, 5a-solasodanol and demissidine

Pharmacological uses: berries cures asthma, bronchitis

Tinospora cordifolia(Willd.) Hook.F. & Thoms., Menispermaceae Juss., Gurach

A glaberous, climbing shrub. Leaves cordate, petiolateous beneath, cordate and 7- nerved, membranous; flowers small, yellow; male ones in fascicled in the axils of bracts, outer 3 sepals ovate- oblong, inner 3 broadly elliptic to suborbicular, female flowers petals flat, staminode 6; carpels 3, style short, stigma lobed. Drupelets 1-3 , orange red. Flowering Feb- Aug.

Phytochemicals: glucosides, giloin, syringing, palmarin, protoberberine, gilenin, columbin, tinocordifolin and tinosporic acid.

Pharmacological uses: cures cough and cold

Results and Conclusion:

In the present study, some medicinal plants curing respiratory diseases having about 32 species, belonging to 21 families and 25 genera growing in various habitats of the Gyanpur region of Uttar Pradesh documented. Among them, 8 are trees, 6 are shrubs, 12 are herbs and 5 are climbers. These grow in diverse ecological habitats ranging from aquatic, terrestrial, xerophytic places. Their taxonomy, botanical names ,vernacular names, family, parts used have been studied in great detail. The lower respiratory tract consists of the airways and structures below the larynx, including the trachea, bronchi, and lungs. Several diseases can affect this region, leading to various respiratory symptoms and complications. Bronchitis: This condition is characterized by the inflammation of the bronchial tubes, which carry air to the lungs. Acute bronchitis is often caused by viral or bacterial infections, resulting in a persistent cough, chest discomfort, and mucus production.Pneumonia is an infection that affects the lung tissue, causing inflammation and fluid accumulation. It can be caused by bacteria, viruses, or fungi, and symptoms may include fever, cough, shortness of breath, and fatigue. Chronic obstructive pulmonary disease (COPD): COPD is a progressive lung disease that commonly includes chronic bronchitis and emphysema. It is typically caused by long-term exposure to irritants such as cigarette smoke. Symptoms include persistent cough, wheezing, breathlessness, and frequent respiratory infections. Asthma is a chronic inflammatory disease that affects the airways and causes recurring episodes of wheezing, coughing, chest tightness, and shortness of breath. It can be triggered by various factors like allergens, exercise, or respiratory infections. Bronchiectasis: This condition involves the abnormal widening and scarring of the bronchial tubes, often due to recurrent infections or genetic factors. It leads to chronic coughing, sputum production, and repeated respiratory infections. Pulmonary fibrosis is a progressive lung disease where the lung tissue becomes scarred and stiff. It can be caused by various factors, including occupational exposure, medications, and autoimmune diseases. Symptoms include shortness of breath, dry cough, fatigue, and unexplained weight loss. Lung cancer is a malignant tumor that can originate in any part of the lungs. It is commonly associated with smoking but can also occur in non-smokers. Symptoms may include persistent cough, chest pain, coughing up blood, and unexplained weight loss.These are just a few examples of lower respiratory tract canal diseases. It's essential to seek medical attention if you

experience any respiratory symptoms or suspect a respiratory condition to receive an accurate diagnosis and appropriate treatment. The respiratory diseases like cough, cold, asthma, bronchial asthma, tuberculosis curing medicinal property of these plants is due to the presence of organic chemicals in the plant tissues that produce a definite physiological action on the human body .The most important of these substances are essential oils, glucosides, resins, mucilages, tannins, steroids and alkaloids. Increased human activities, large scale deforestation, road constructions, biodegradation in Gyanpur, and as a center of carpet industries, more and more carpet industry are mushrooming which is responsible for the depletion of diuretic plant diversity of that region and other ecological pressures are posing a direct threat to the medicinal plants of Gyanpur, if suitable measures are not taken immediately, some of the rare forms will vanish soon. Proper planning is needed to conserve the natural resources. State government should take urgent initiative to conserve the biodiversity by developing botanical gardens, reseve areas etc. In present scenario there is urgent need to conserve these diuretic medicinal plants and in view of this , suitable measures for their ex-situ and in-situ conservation should be taken in Gyanpur region.

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Table-1 list of medicinal plants curing Respiratory diseases

S.No.	Botanical name/ family	Local name	habit	Plant parts	Pharmacological uses
1	*Abrus precatorious* (Linn)/ Fabaceae	ratti	climber	seed	Seed powder in small amounts cure asthmatic pain
2	*Acorus calamus (Linn.)/ Arecaceae*	ghorbuch	herb	leaf	Decoction of Leaves used for curing cough & bronchitis
3	*Acacia catechu (Linn)/ Fabaceae*	katha	tree	wood	Wood is used for treating respiratory disease
4	*Acacia sinuate (Lour)*/ Fabaceae	shikakai	shrub	fruit	Fruit is used for curing cough and cold
5	*Acalypha hispida* (Burm.)/ Euphorbiaceae	kuppi	herb	leaf	Leaf paste with pepper cures cold & cough
6	*Achyranthus aspera* (Linn.) / Amaranthaceae	latjeera	herb	leaf	Leaf juices used for curing bronchitis
7	*Alpinia galanga* (Willd)/ Zingiberaceae	kulinjan	herb	Leaf, root	Leaves and root are used for cough & cold
8	*Argyreia speciosa (Sweet)/ Conv*ovulaceae	samudrasokh	shrub	leaf	Decoction of leaves treat cough
9	*Artocarpus heteophyllus (Lamk.)*/ Moraceae	kathal	tree	root	Root paste is used in asthma
10	*Bacopa monneiri (Linn.)* / Poaceae	brahmi	herb	leaf	Powdered dried leaves cures asthma
11	*Caesalpinia crista* (Linn.)/ Caesalpiniaceae	katila	climber	seed	Cough and cold cured by seeds
12	*Cassia fistula (Linn.)*/ Fabaceae	Amaltas	tree	root	Root pulp helps in treating respiratory diseases
13	*Cassia obstusifolia (Linn.)* Fabaceae	panwad	shrub	leaf	Crushed leaves in water , extract cures asthma
14	*Cassia occidentalis (Linn.) Fabaceae*	kasondhi	shrub	Root, stem, leaf	Decoction of plant treats bronchial asthma
15	*Catharanthus roseus* (Linn.)Apocyanaceae	sadabahar	herb	leaf	Leaf extract with other herbs cures asthma
16	*Cleome gynandra (Linn.)/ (Linn.)* cleomaceae	hulia	herb	seed	Seeds are used for treating cough
17	*Cordia myxa* (Roxb.)/ Boriginaceae	lasora	tree	leaf	Leaves treat whooping cough
18	*Curcuma longa (Linn.)*	haldi	herb	rhizome	Dried powder rhizome is

	Zingiberaceae				used to cure cough & cold
19	*Cuscuta reflexa (Roxb.)* Convolvulaceae	amarbel	climber	stem	Stem treats cough
20	*Datura metel (Linn.)* Solanaceae	dhatura	herb	leaf	Leaf juices cures bronchial asthma
21	*Dioscorea bulbifera (Linn.)/ Dioscoreaceae*	ratalu	climber	leaf	Powdered leaf cures cough and cold
22	*Diospyros melanoxylon (Roxb.)* Ebenaceae	tendu	tree	fruit	Ripened fruit cures cough
23	*Ficus carica (Linn)*/ Moraceae.	anjir	tree	leaf	Leaves treats respiratory ailments
24	*Hemidesmus indicus* (Linn.) /Asclepediaceae	ananthmool	shrub	leaf	Leaves paste cures cough
25	*Lablab purpureus* /(Linn.) Fabaceae	sem	climber	Leaf	Leaves treats cough
26	*Madhuca longifolia (Koen.)/ Sapotaceae*	mahua	tree	flower	Decoction of boiled flower cures cough & cold
27	*Murraya koenigii* (Linn.)/ Rutaceae	Meethi neem	shrub	leaf	Leaves cures cough
28	*Musa paradisiacal (Auct.)*/ Musaceae	kela	herb	fruit	Fruit cures respiratory problem
29	*Ocimum sanctum (Linn.)* Lamiaceae	tulsi	herb	leaf	Leaves cures respiratory ailments, cures cough and cold
30	*Ocimum basilicum (Linn.)* Lamiaceae	Kali tulsi	herb	leaf	Leaves decoction cures cough & cold
31	*Pterocarpus marsupium (Roxb.)*/ Fabaceae	sal	tree	stem	Dried stem treats asthma and tuberculosis
32	*Solanum xanthocarpum (B*urm.) / Solanaceae	bhatkataiya	shrub	root	Cough is cured by root extract

Figure 1. Showing Map of Gyanpur region, Uttar Pradesh

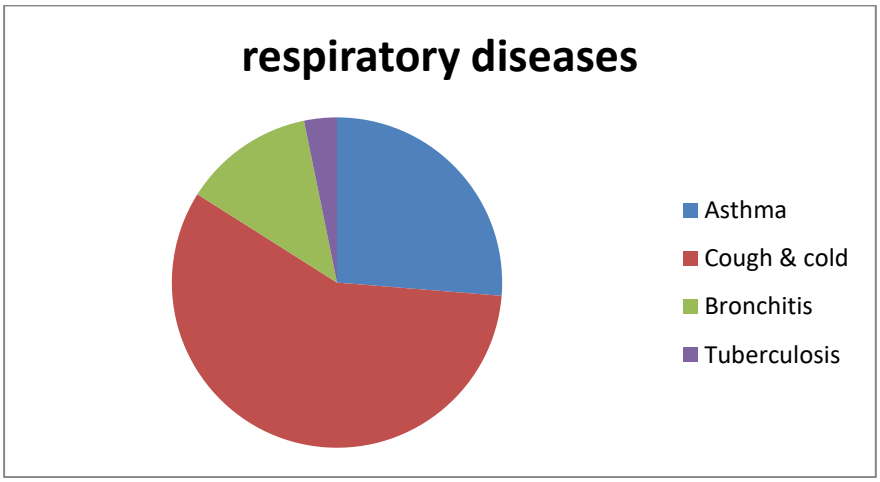

Figure-2. Ratio of disease response to diversity of medicinal plants

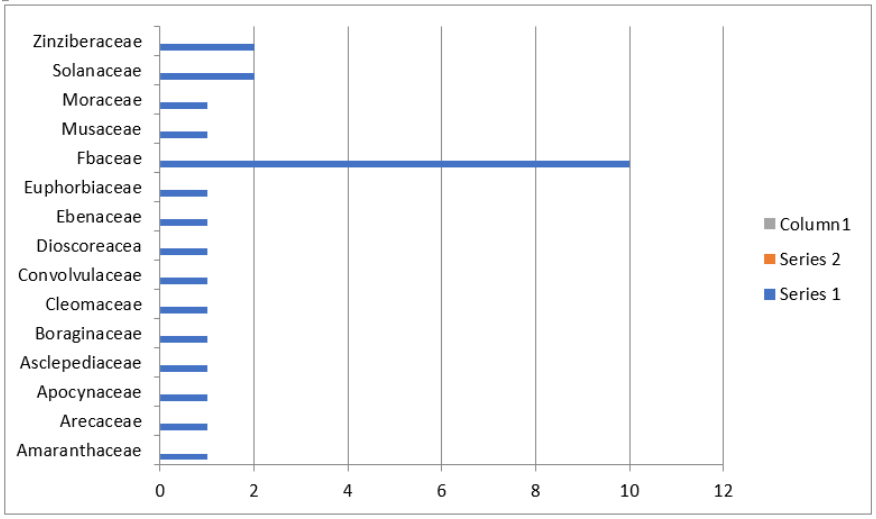

Figure- 3. Respiratory plant species representation within each family

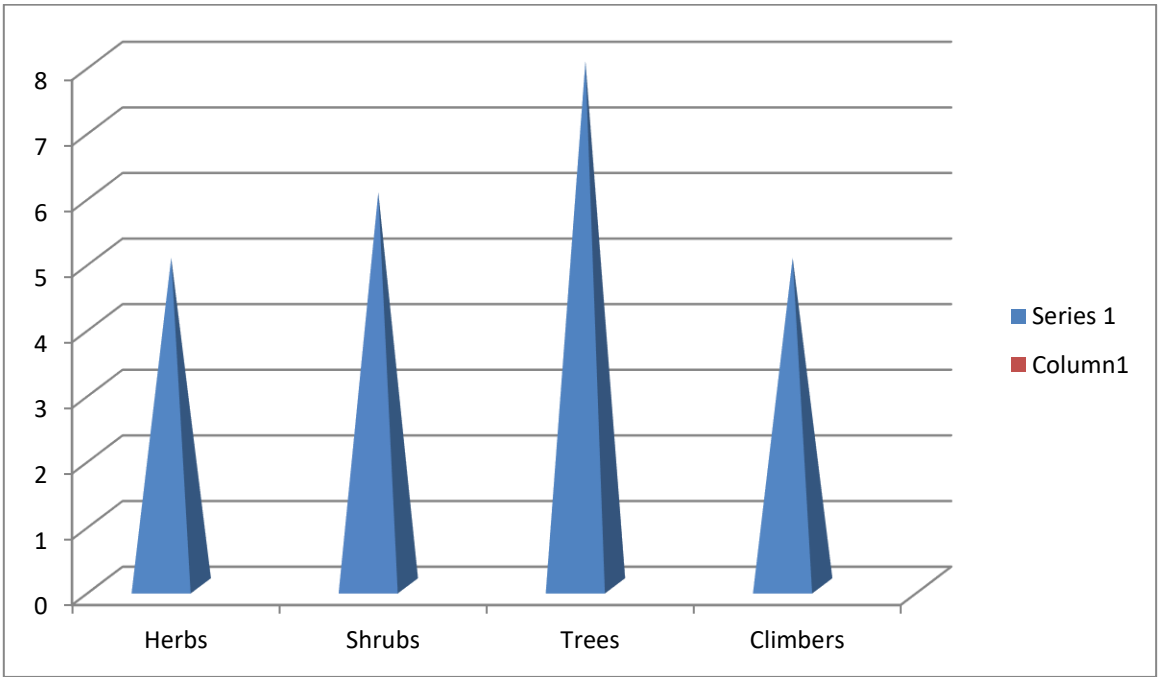

Figure-4 Habit representation of respiratory diseases curing plants