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# RESPIRATORY PROBLEMS AND THEIR HOME REMEDIES – A SURVEY IN GINGEE TALUK, TAMIL NADU, INDIA

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## ABSTRACT

The local population of Gingee taluk of Villupuram district has a good knowledge of ethnomedicinal plants as they were using 20 medicinally important plants to cure their respiratory problems. Respiratory problems like tuberculosis, whooping cough, respiratory infections, asthma, fever and cold are commonly found diseases in the study area. 25 informants use 20 medicinal plants as home remedies to cure their ailments. This present study analyzes the data collected from the study area by applying the quantitative ethnobotanical devices, use-value (UV), factor informant consensus (Fic) and fidelity level (Fl%).

**Keywords: Ethnomedicinal, Respiratory, Use-Value, Factor Informant Consensus, Fidelity Level, Gingee**

## INTRODUCTION

The Current Health Scenario in Rural India **[1]** with its changing socio-political demographic and morbidity patterns has been drawing global attention in recent years. The reason being about 75% of health infrastructure, medical man power and other health resources are concentrated in urban areas where 27% of the populations live and while 75% of India's population lives in rural areas, and less than 10% of the total health budget is allocated to this sector **[1].**Often the allotted health budgets rarely reach the target area. Contagious, infectious and waterborne diseases such as diarrhoea, amoebiasis, typhoid, infectious hepatitis, worm infestations, measles, malaria, tuberculosis, whooping cough, respiratory infections, pneumonia and reproductive tract infections dominate the morbidity pattern, especially in rural areas **[1]**. Unsafe and unhygienic birth practices, unclean water, poor nutrition, subhuman habitats, and degraded and unsanitary environments are continued to become challenges to the public health system **[2]**.

Over 72 % of all households in GingeeTaluk of Villupuram district use traditional solid fuels, such as crop residue and firewood to meet their cooking needs. The burning of solid fuels indoors in open fires or traditional cooking stoves ("munadupu") results in high levels of toxic pollutants in the kitchen area. The diseases are carried in the air through coughing, sneezing or even breathing, such as measles, tuberculosis (TB), whooping cough and pneumonia **[1]**. WHO states that 3.5% of respiratory problems are due to solid fuel use is 3.5 percent in India. Exposure to indoor air pollutants is a major risk factor for chronic obstructive pulmonary disease (COPD) in adults and acute lower respiratory infections (ARI) among young children **[3]**.In rural areas, the inhabitants continued to follow rich, undocumented, traditional medicine systems, in addition to the recognized cultural systems of medicine such Ayurveda, *Unani*, *Siddha* and Naturopathy, to maintain positive health and to prevent disease **[1]**. Besides this, modern treatment facilities do not reach aborigines or the people who live far away from the town.

The World Health Organization (WHO) estimates that 4 billion people, 80% of the worldpopulation, presently use herbal medicine for some aspect of primary health care **[4]**. About 65% of Indian population today depends on traditional system of medicine [**5]**. Ethnomedicine also referred as traditional medicine is the study of traditional medical practice which is concerned with the cultural interpretation of health, diseases and illness and also addresses the healthcare seeking process and healing practices of people **[6]**. Plants have traditionally served as man's most important weapon against pathogen. Medicinal plants are widely used by all section of the community, whether directly as folk remedies or the medicaments of the different indigenous system as well as in modern medicine **[5, 7, 8]**. Home remedies are especially aimed in uplifting the health profile of all individuals. Even though modern medical systems are available at some places in rural areas, people are still depending on the rich local health traditions for the treatment of various illnesses **[9]**. The present paper is underlined with some common medicinal plants that are specifically used to cure respiratory diseases in Gingeetaluk, Villupuram district, Tamil Nadu.

## MATERIAL AND METHODS

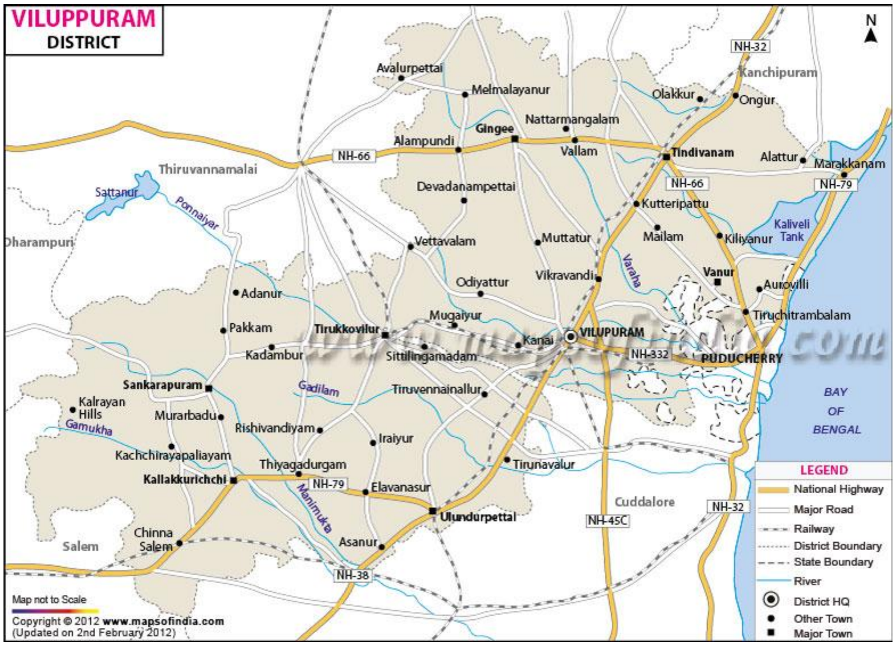
### Study Area

Gingee is a heritage town bounded by low altitude hillocks. Gingee forms part of Villupuram district and is the Taluk headquarters. It is located at a distance of 38kms north of Villupuram, 27kms west of Tindivanam and 38kms east of Thiruvannamalai. The town falls under the geographical coordinates of 12°.15'N and 79°.25'E., above the Mean Sea Level of 30.45m. The town comprises of a number of small and large hills, rocky outcrops are found here and there inside the town area. The town has undulating terrain with hard rocky surface.Gingee has a mild slope from the west to eastern part of the town towards the Shankarabarani River [**11**]. The town has hot, dry climate almost throughout the year. The maximum temperature and the minimum temperature of the town are 36 to 30 C respectively. The town receives rain mainly during the months of October, November through the North East monsoon. On an average the town receives 700mm of rainfall **[12]**.

### Review of Literature in Study Area

Muralidharanand Narasimhan reported some medicinal plants from PakkamalaiGingee hills used for topical application include skin diseases such as eczema, scabies, sores, boils, foot crack, corn and many other skin infections without distinct symptoms **[13].** They also reported ethnomedicinal plants used against gastrointestinal problems such as stomach ache, indigestion, constipation, dysentery, piles and diarrhea **[14]**. Jagatheeswari carried out a survey in the remote villages in and around in the Villupuram District and recorded some commonly occurring medicinal plants such as *Cassia auriculata , Allium cepa, Capsicum annum, Trigonellafoenum –graecum, Cuminumciminum, Moringaoleifera, Tamarindusindica, Cocosnucifera, Solanumnigrum*are used in daily life by the inhabitants. While *Piper betle, Coriandrumsativam ,Sesamumindicum, Eucalyptus globules, Zingiberofficinale, Musa paradisica, Menthaarvensis, Piper nigrum. Arachis hypogea*are commonly cultivated by them and also used for the treatment of various illnesses **[15]**. Amuthavalluvan documented the traditional ethno-medicinal practices of Kattunayakan of south & north arcot districts,Tamilnadu focusing on their utilization of medicinal plants and associated traditional healing system. Plantsin

Villupuram district areused to treat different ailments ranging from diseases **[16]**. Thamacin and Soosairajalso documented 55 ethnomedicinal plants used by herbal practitioners and local inhabitants to treat various common illnesses **[17]**.




**(*Courtesy*: http://en.wikipedia.org/wiki/Image:Viluppuram.gif) [10]**

**Medicinal Plant Survey and Data Collection**

A systematic and extensive ethnobotanical survey was carried out in different villages of Gingeetaluk during Jan 2012 to May 2014 for collection of information on ethnomedicinal species being used by the herbal practitioners and local inhabitants. Information on some respiratory problems and home remedies were gathered by conducting interviews and group discussions on the indigenous uses of plant species as medicine. The objective of the study was elaborated to the informants and they were asked to identify such indigenous plants. A total of 25 informants (15 males and 10 females) between 25 – 75 years belonging to different villages were interviewed with a standard questionnaire. The proportion of female informants was low because they depend on the male herbal practitioners for their knowledge of the indigenous plants. The informants below the age of 25 cannot be interviewed because they generally leave their villages for studies or seeking jobs and some of them do not have any knowledge of medicinal plants. This survey also included other medicinal usages of the plants but special attention was given to the respiratory problems and their home remedies. The information collected during the survey included common conditions or ailments or diseases occurring in humans due indoor air pollutions, smoking, chewing of tobacco, polluted water and filthy living conditions. The local name of the plant species, parts used, mode of preparation of medicine, dosage, single plant usage, two or three plant usage and side effects were carefully noted. Information was collected mostly from the site where the plants were collected. Some useful photographs were taken for better identification of the medicinal plants.

**Data Analysis**

The data collected through interview of the informants was analyzed using three different quantitative tools namely use value (**UV**), factor informant consensus (**F*ic***) and fidelity level (**Fl%)**. The relative importance was calculated employing the use-value of Phillips *et al*., **[18, 19],** a quantitative measure for the relative importance of species known locally.

$$\mathbf{UV = \Sigma \mathit{U/n}}$$

where U is the number of use-reports cited by each informant for a given species and n refers to the total number of informants. Use values are high when there are many use-reports for a plant, implying that the plant is important, and approach zero (0) when there are few reports related to its use. The use value, however, does not distinguish whether a plant is used for single or multiple purposes **[20, 21]**.

To test homogeneity of knowledge about the medicinal plants, the factor informant consensus (F*ic*) **[21, 22]** was used. Before performing the analysis, all the ailments were broadly classified into various categories on the basis of Heinrich *et al*., 1998. The F*ic*was calculated as:

$$\mathbf{F\mathit{ic}} = \frac{n_{ur} - n_t}{n_{ur} - 1}$$

where *nur* refersto the number of the use-reportsfor a particular use category and *nt* refers to the number of taxa used for a particular use category by all informants. F*ic* values are low (near 0) if plants are chosen randomly or if there is no exchange of information about their use among informants and approach one (1) when there is a well-defined selection criterion in the community and/or if information is exchanged between informants **[19, 23, 24]**. Becausemany plant species may be used in the same category, it is interesting to determine the mist preferred species used in the treatment of particular ailment **[20],** which can be done with the fidelity level (Fl%) of Friedman *et al.*,**[19]:**

$$\mathbf{Fl\ (\%)} = \frac{\mathbf{Np}}{\mathbf{N}} \times \mathbf{100}$$

whereNp is the number of use-reports cited for a given species for a particular ailment and N is the total number of use-reports cited for any given species. High Fl value (near 100%) is obtained for plants which almost all use reports refer to the same way of using it, whereas low Fl value is obtained for plants that are used for many different purposes **[20]**.

## RESULTS

### Characteristics of Informants

60% males and 40% female informants were the age group between the age group of 25-75yrs. Most of them had some schooling and among them 2 male graduates who have sound knowledge of the uses of traditional medicine for various ailments. The information were collected mostly from the middle age groups **(Table 1)**.

### Floristic Characteristics of Medicinal Plants

A total number of 20 species of flowering plants belonging to 15 families were observed to be medicinally important plants for curing respiratory problems in the study area. Majority of the taxa were found growing in wild forms. In terms of number of species used, Lamiaceae appeared to be the most dominant family used for curing respiratory diseases followed by Acanthaceaeand Rutaceae. Eleven families are represented by a single genus that is used in curing the disease **(Chart 1)**.

Medicinal value was observed either in the whole plant or was confined to one or more plant parts. In terms of percentage usage of organs, leaves were observed to be of utmost medicinal importance (65%) followed by root (15%), bark (10%), seed (5%) and tuber (5%) **(Chart 2)**. Various modes of administration of medicines were observed viz. about 60% oral and 40% external application.

### Use-Value of Medicinal Plants

On the basis of use-value (UV) the most important medicinal species of the present study site were *Ocimum sanctum* (100%), *Zingiber officinale* (0.80%), *Phyllanthusmadeara spatensis* (0.68%), *Leucasaspera* (0.60%), *Adhatodazeylanica* (0.56%), *Vitexnigundo* (0.52%), *Solanumtrilobatum* (0.48%) and *Mukiamaderaspatana* (0.48%) **(Table 2)**.

### Factor of Informant Consensus

As many as 10 respiratory ailments were observed to be cured by 20 plant species in the study area. The commonly occurring respiratory ailments were classified into 10 different ailment categories according to Heinrich *et al*., (1998). The maximum species (13) were used to cure common cough followed by cold (11), asthma (2) and other respiratory diseases **(Chart 3)**.

**Fidelity Level**

Fidelity level values in this study area varied from 0.24% to 100%. For the better accuracy, species mentioned by less than 5 informants were not considered in the final analysis. *Ocimum sanctum* (100%), *Zingiber officinale* (0.80%), *Phyllanthusmadearaspatensis* (0.68%), *Leucasaspera* (0.60%), *Adhatodazylenica* (0.56%), *Vitexnegundo* (0.52%), *Mukiamadera spatana* (0.48%), *Solanum trilobatum* (0.48%) and *Andrographis paniculata* (0.24%) were the species with high level fidelity level and used to the commonly occurring respiratory diseases in the study area **(Chart 4)**.

**Table 1: Demographic Description of the Informants**

| Informants | | |
|---|---|---|
| **Age group** | **Female** | **male** |
| **25-34** | **1 (4%)** | **2(16%)** |
| **35-44** | **4(16%)** | **3(12%)** |
| **45-54** | **1(4%)** | **5(20%)** |
| **55-64** | **2(16%)** | **2(16%)** |
| **65-74** | **2(16%)** | **3(12%)** |
| **75-84** | | |
| **Educational level** | | |
| **never attended school** | **3(12%)** | **4 (16%)** |
| **attended school for 1-5 classes** | **4 (16%)** | **5(20%)** |
| **attended school for 6-10 classes** | **2(8%)** | **3(12%)** |
| **attended school for 11-12 classes** | **1(4%)** | **1(4%)** |
| **Graduate** | | **2(16%)** |
| **post graduate** | | |
| **Experience** | | |
| **less than 3 years** | **1 (4%)** | **3 (12%)** |
| **3-6 years** | **1(4%)** | **2 (12%)** |
| **6-10 years** | **4(16%)** | **4 (16%)** |
| **10-15 years** | **2 (8%)** | **3(12%)** |
| **15-20 years** | **1(4%)** | **2(12%)** |
| **more than 20 years** | **1(4%)** | **1(4%)** |
| **Profession** | | |
| **farmers** | **2 (8%)** | **5 (20%)** |
| **independent practitioners** | **1(4%)** | **2 (8%)** |
| **coolie** | **1 (4%)** | **2(8%)** |
| **house care taker** | **5 (20%)** | **3 (12%)** |
| **student** | **0 (0%)** | **2 (8%)** |
| **teacher** | **1 (4%)** | **1 (4%)** |

**Table 2: Ethnomedicinal Plant Species Used for Curing Different Respiratory Ailments Along With Their Use-Value**

| Botanical Name | Local Name | Family | Habit | Plant part & Citation | Total Citation | Use value |
|---|---|---|---|---|---|---|
| *Abrusprecatorius.L* | Kundumani | Fabaceace | climber | Roots are made into paste and taken for cough and cold. | 4 | 0.16 |
| *Adhatodazeylanica*Medik. | Adadhoda | Rutaceace | herb | leaves along with the roots *of Solanumsurattense* and fruits of *Piper longum* are taken in equal proportions and ground into powder. This is mixed with honey and taken twice in a day for about a week to cure cold and cough in children. | 14 | 0.56 |
| *Andrographispaniculata* (Burm.f.) Wall.exNees. | Siriyanangai | Acanthaceae | herb | Half a glass of decoction made from the leaves of *Andrographis Evolvulusalsinoides* and *Mollugopentaphylla* in equal proportions is administered orally to cure cold, cough and asthma in children. | 6 | 0.24 |
| *Anisomelesmalabarica*(L.) R. Br. | Paimeratti | Lamiaceae | herb | The juice of the leaves are administered orally with honey to reduce cold and fever in children. | 2 | 0.08 |
| *Asparagus racemosus*Wild. | Thannervitankodi | Liliaceace | herb | Root decoction is used to cure cough, bronchitis | 2 | 0.08 |
| *Averalanata* (L.) Juss. | | Amaranthaceae | climber | Leaves are made into decoction and given to children to relieve cold and cough. | 1 | 0.04 |
| *Barleriaprionitis* L. | Karunta | Acanthaceace | herb | Dried bark is used for cough. | 2 | 0.08 |
| *Indigoferalongeracemosa*Boiv.ex.Baillon. | | Papilionoideae | herb | Root paste is applied on the forehead, throat and chest to relieve cold and cough in children. | 3 | 0.12 |
| *Coleus aromatics*.Lour | Karpuravalli | Lamiaceae | herb | Leaf juice is used for headache, fever, chronic cough and asthma. | 1 | 0.04 |
| *Leucasaspera (*Willd.) Link | Thumbai | Lamiaceace | shrub | fresh leaves are boiled in water and its decoction can be taken orally to relieve fever. The stream inhalation of the same plant relieves cough. | 15 | 0.60 |
| *Limoniaacidissima* | Vila | Rutaceace | herb | Leaves are made into paste and it is administered with honey early in the morning in the empty stomach to cure cold in children. | 3 | 0.12 |
| *Mukiamaderaspatana*L. | Musumusukai | Cucurbitaceace | herb | Tender leaves are ground with little salt and its paste is given | 12 | 0.48 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | orally to the children to cough and cold in children. | | |
| *Ocimum sanctum*L. | Thulasi | Lamiaceace | herb | Fresh leaves or leaf juice is administered orally to children to cure cold and cough. Some herbal practitioners suggest when it is taken in empty stomach early in the morning. | 25 | 100 |
| *Oroxylumindicum* | | Bignoniaceae | herb | The seed decoction when orally taken is very effective for cough | 2 | 0.08 |
| *Phyllanthusmadearaspatensis*L. | Kizhanelli | Euphorbiaceace | shrub | Leaves are ground into powder form and given orally to the children to stop vomiting. | 17 | 0.68 |
| *Sscopariadulcis* L. | Sarkaraivembu | Scruopulariaceae | herb | leaf extract is used in congestion | 4 | 0.16 |
| *Solanumtrilobatum* L. | Thuthuvalai | Solanaceae | herb | Leaves are eaten orally to cure throat infection and cold. Some suggest that flowers are also very effective in curing. | 12 | 0.48 |
| *Thespesiapopulnea* Cav. | Poovarasan | Malvaceae | treee | The bark decoction is commonly used for liver diseases. | 5 | 0.20 |
| *Vitexnegundo*L. | Nochi | Verbenace | herb | Leaves are made into powder and it is warmed up slightly and it is then bound with a handkerchief and tied on the forehead of the children to cure headache. Leaf decoction mixed with *Piper longum* and given orally to the children to cure headache and ear pain. | 13 | 0.52 |
| *Zingiberofficinale* Roscoe. | Inchi | Zingiberaceae | herb | Fresh juice taken from ginger is internally taken to cure liver diseases. When the dried ginger is taken with palm sugar candy it helps in curing cough and cold. | 20 | 0.80 |

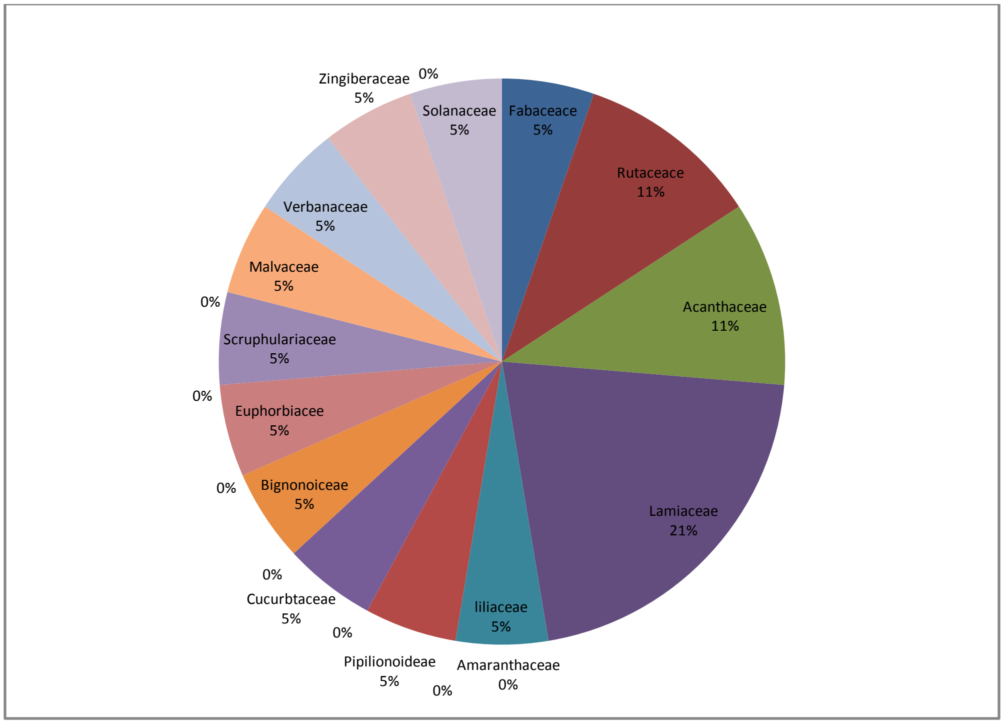



**Chart 1: Distribution of Medicinal Plants**

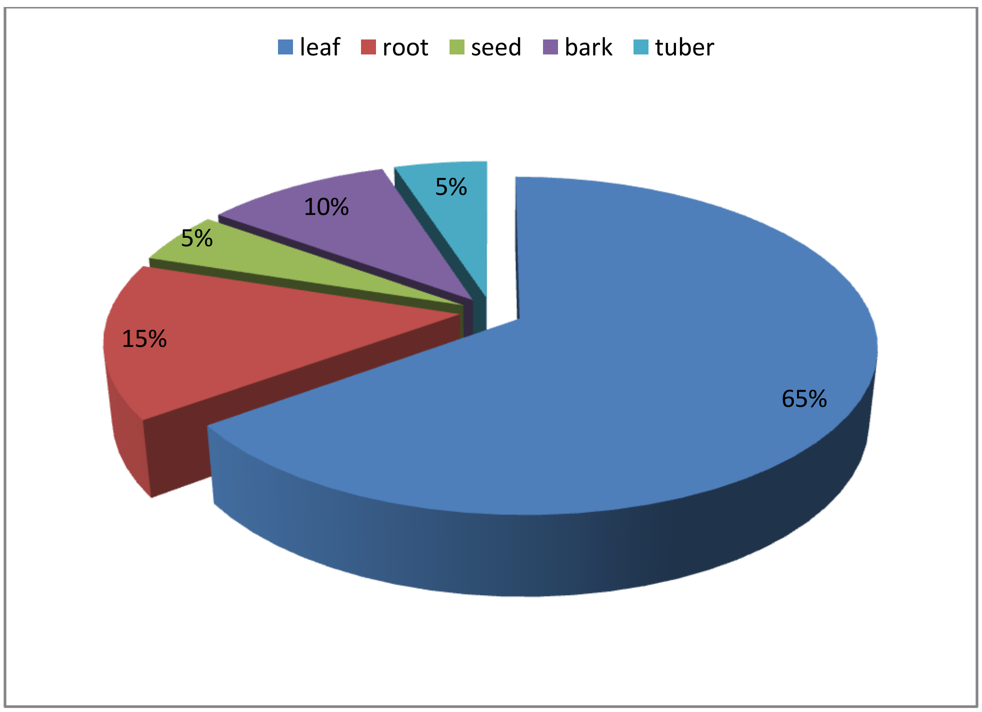



**Chart 2: Plant parts used for the treatment**

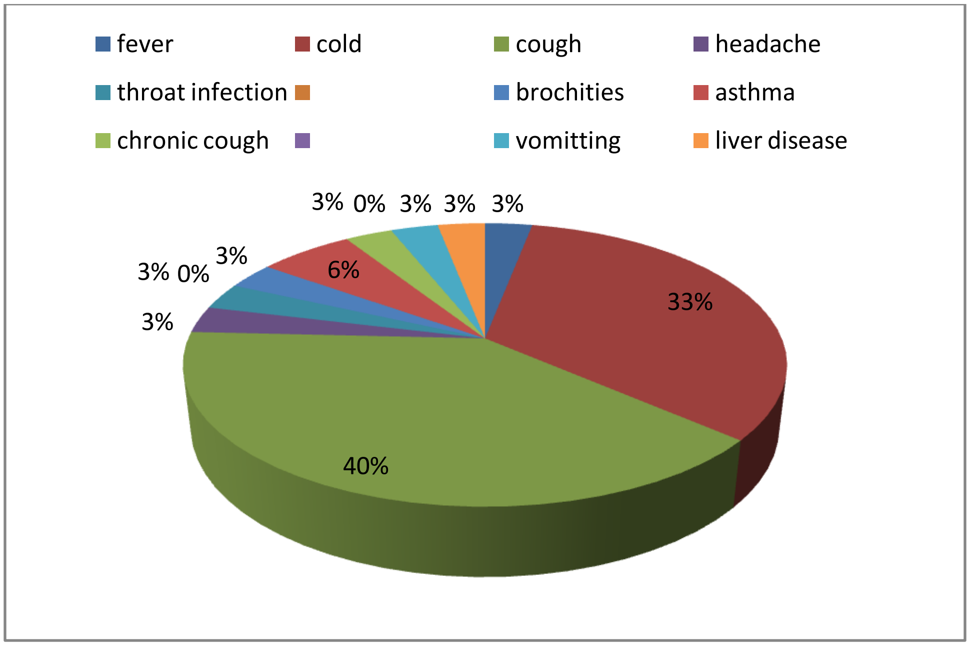



**Chart 3: Respiratory Diseases**

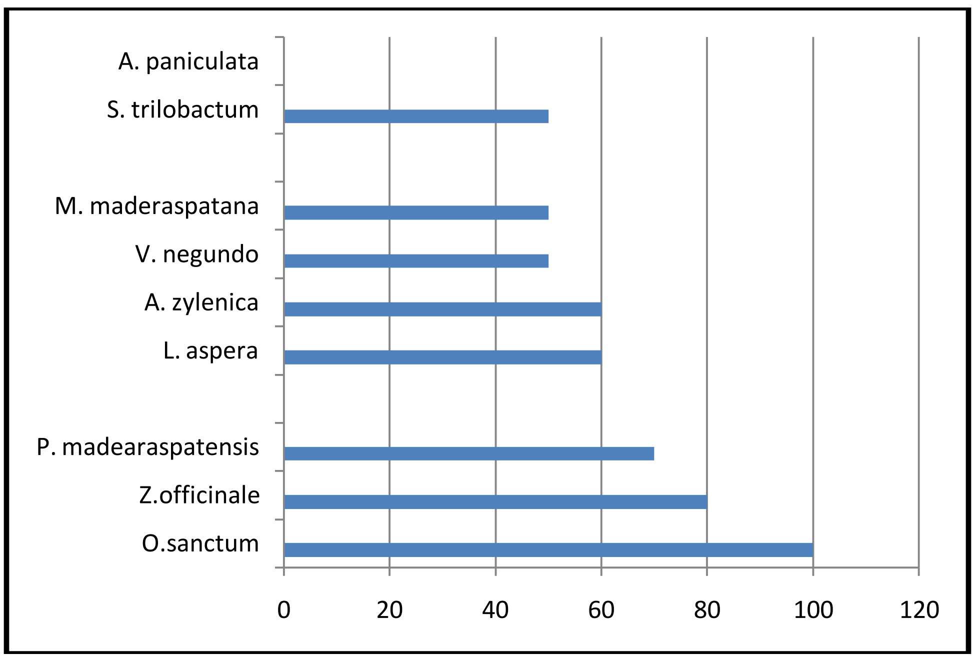



**Chart 4: Commonly Used Plants for the Treatment**

## DISCUSSION AND CONCLUSION

The local population of Gingeetaluk of Villupuram district had a good knowledge of ethnomedicinal plants as they were using 20 medicinally important plants to cure their respiratory problems. Older informants had greater knowledge of ethnomedicinal plant species than the younger informants. Since the respiratory problems are very common villages due to indoor cooking, burning of fuel, smoking, tobacco chewing and other practices both by male and female and also due to lack of proper medical facilities in most villages, the inhabitants depend more directly from the plant sources to cure their illness. Practices of curing the respiratory diseases are age old, the informants become conscious of their poor health due to unhealthy living and make conscious effects to understand the various respiratory ailments that shorten their life span on earth and at the same time every effect is made to preserve and conserve their traditional knowledge of the medicinal plants and render every services to build up the harmonious relationship with nature.

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