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SIDDHA SYSTEM OF MEDICINE: A REVIEW OF BASIC CONCEPTS AND EVIDENCE-BASED HERBAL REMEDIES FOR RESPIRATORY DISEASES.

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Abstract:

Purpose of Review

The Siddha system is one of the oldest medical traditions, and it is mainly used in southern India. It possesses a vast library of classical literature in addition to a variety of herbal remedies that are remarkably effective in preventing and treating respiratory diseases. The purpose of this review is to evaluate the Siddha system of medicine and Siddha pharmacology and to evaluate the effectiveness of herbs and Siddha formulation ingredients for the symptomatic treatment of respiratory diseases.

Recent Findings

As per Siddha literature Fundamental Principles of Siddha system of medicine include theories of Five Elements (*Panchaboothams*), and Three humors (*Uyir thathukkal)* and Siddha pharmacology is used to determine diagnosis, aetiology, treatment and prognosis. Siddha medicinal herbals and formulations possessing particularly against respiratory disease are elaborated. Evidence of anti-viral properties has been brought to light for further clinical trials. Preclinical and clinical research are covered in this review article to provide a scientific basis for formulations that are frequently employed in the Siddha medical system.

Summary

Respiratory diseases that are spreading quickly throughout the world, are major health issues. The current treatment has significant side effects in addition to its own shortcomings. The need to find a safer alternative therapy to treat these epidemic diseases is critical. In this review, we have given an overview of the most common respiratory illnesses, given a brief description of the Siddha system of medicine and Siddha pharmacology, and categorized a class of plants and formulation from this system that are frequently used to treat respiratory illnesses.

Keywords: Siddha system of medicine, Respiratory diseases, Herbals, Siddha formulation, *Panchaboothams, Uyir thathukkal*.

1.Introduction:

The Siddha system of medicine is one of the ancient traditional systems of medicine, practiced in the peninsular part of India, propounded and developed by esoteric immortal personalities, "*Siddhars,*" who defined death and preached the philosophy of Siddha medicine and the theory of immortality. According to Siddha science, the universe is made up of five essential components. Earth, water, fire, air, and space are the five fundamental elements that make up this universe and everything in it, including humans. These elements are collectively referred to as the *Panchaboothams.* The three essential components known as *uyir thathukkal*, such as *vatham, pitham,* and *kabam,* are likewise generated by the combination of *Panchaboothams*, according to our Siddha foundations [(1)]. Siddhars classified diseases into 4,448 single disease entities on the basis of three humours *vatham*, *pitham* and *kabam*. Respiratory diseases are under *kabam*.

Respiratory diseases remain a major global health threat and continue to spread their destructive reach every day, despite the fact that research in respiratory medicine and related technologies is at an advanced stage. The incidence of respiratory disorders is rising quickly worldwide, despite our growing understanding of their pathophysiology [(2)]. There are several respiratory diseases, such as asthma, chronic obstructive pulmonary disease (COPD), pneumonia, sarcoidosis, and pulmonary fibrosis, that adversely affect a huge number of human populations. Many medications are on the market that can provide some brief, effective relief, but they are primarily symptomatic and transitory [(2)].

Medicine has six tastes in it. They contain panchaboothams and have a variety of tastes, including sweet, salty, sour, bitter, pungent, and astringent. When we take medicine in an appropriate amount, the panchaboothams change the three thaadhus and cure the diseases [(3)]. For diseases caused by pathogens, allergens, and irritants, we have to supplement the medicine with the opposite taste to balance them. We must select a medicine whose taste, properties, action, and ultimate taste will balance the change in the composition of the patient's humor, and we must avoid the taste that increases the imbalance. There is always a correlation between the rise of one humor and the fall of another. For each humor, there are six qualities that a physician should learn. There may be toxic effects on the body. The three humors may be vitiated. Medicine and plants that can bring each humor back to its normal state should be advised [(3)].

Given that some of these plants possess *kaya kalpam* ability, which enables the body to function for an extended period of time, it could be even more advantageous because *Siddhars'* plant selection appears to have been done with great tact, in that the plants they chose have more positive effects than just providing a temporary cure for the disease [(2)]. This review article provides information on preclinical and clinical studies in order to establish a scientific foundation for the herbal formulations commonly used in the Siddha medical system. The medications are chosen from Classical Siddha texts according to their suitability for treating conditions such as respiratory infections, bronchial asthma, fever, cough, flu-like infections, and other illnesses. Additionally detailed are the components of the medications with immune-modulatory and antiviral properties [(4)].

2. Basic concepts of the Siddha system of medicine [(5)]

Siddha Medicine had a history dated several thousand years back. It is the crystallization of the rich experiences of Tamil people's long struggle against disease. This is not only a system of medical science, but also a part of culture of the society and it employs a holistic approach in its treatment methodology and it has made enormous contribution to the health care of the people. The Siddha medical system was developed long before modern science, and it includes its own set of basic principles, anatomy, physiology, pathology, a large pharmacopeia, and a variety of internal and external medicine and therapy practices. It also has a focus on iatro-chemistry. This system holds that all substances, including food and drugs, are copies of the universe, including the human body.

According to this system, everything in the universe, including the human body, is made up of the five fundamental elements: fire, ether, earth, water, and air. The food, which the human body takes and the medicine used are all made up of these five elements. The proportion of the elements present

in the drug vary and their preponderance or otherwise is responsible for their actions and therapeutic results. This system considers the human body as a conglomeration of 3 humors, seven basic tissues and 96 thathuvams (96 philosophy of humans). The food is considered to be basic building material of human body which gets processed into humors, body tissues and waste products. The equilibrium of humors is considered as health and its disturbance or imbalance leads to disease or sickness.
This system also deals with the concept of salvation in life, the exponents of this system consider achievement of this state is possible by medicines and meditation. Siddha system of medicine has become popular all over the world which ensures prevention and promotion of health / wellbeing through principle of "Food is medicine and medicine is food", life style modification, meditation etc. and its uniqueness in treating diseases.

3.Siddha pharmacology basic concepts [6].
Siddha pharmacology known as *Gunapadam* deals with the detailed study of Siddha drugs. *Gunam* means properties of drugs, *Paadam* means detailed study. *Gunapadam* means detailed study of drugs. Innumerable varieties of herbs, mineral and animal products find mention in Siddha literature, which are used in the preparation of medicines. The basic concepts of siddha pharmacology can be briefed under four headings.
3.1 Raw drugs
3.2 Basic principles
3.3 Purification process
3.4 Preparation process.

3.1 Raw drugs based on plant origin:
Based on their origin, raw drugs are categorized in to the Plant origin of *Mooligai vaguppu*[6]
In plants, the medicinal value may be attributed to a particular part like root, leaves, bark, rhizome, fruit and flowers which is used.

3.2 Basic principles of Siddha pharmacology:
According to Siddha system of medicine, universe and human bodies are composed of primordial elements of *panchabhootham*. There is no denying the fact that the fundamental principle underlying the process of calcification of the metals and the minerals successfully eliminating their evil effects but not losing at the same time their beneficial ones is a great secret. *Gunapaadam* or Siddha pharmacology is mainly based on this *Panchabhootham* (Five elements) and *Suvai (Taste).* Suvai (Taste) has got significant place in Siddha. Our tongue experiences these tastes when a drug is administered orally. The dynamics of Siddha preparations are based on taste parameters. Six tastes are known as sweet, sour, salt, pungent (spicy), bitter and astringent [5].

3.3 Purification process (*Suddhi*)
Purification of raw drugs is a process aimed at both purification as well as concentration of the raw drug. Before using the herbs compounds, they are always subjected to processes called '*Suddhi murai'* or purification. The idea of this is to get rid of the impurities and their deleterious qualities [7].

3.5 Preparation of Medicines:
The Medicinal preparations belonging to the other two classes, viz., Herbals that of origin are based on the concept of antagonistic (opposed) drugs (Sathru Sarakku) and synergistic (friendly) drug (Mithuru Sarakku Herbals that of origin are based on the concept of antagonistic (opposed) drugs (Sathru Sarakku) and synergistic (friendly) drug (Mithuru Sarakku) [8]. Siddha system classifies all medicinal preparations into 64 categories, of which 32 are internal medications and 32 are external medications and methods [9].
- Internal medicines (i.e. medicine for internal use)
- External medicines (i.e. medicine for external application).

4. Resources for drugs within the Siddha medical system and the knowledge of Siddhars:
The resources of Siddha system of medicine have been categorized into three groups: Plant products (mulavargam), inorganic substances (Thathuvargam), and animal products (Jeevavargam), which are characterized by means of taste (suvai), quality (gunam), potency (veeryam), post-digestive taste (pirivu), and specific action (prabhavam), while Siddha system of medicine recognizes all the drugs only by quality as the main character [10,11].

5. Siddha medicinal plants and formulations are used to treat respiratory conditions.
The line of treatment will begin with balancing the derangement of three humors, such as vatham, pitham, and kabam. It includes internal medicines that play a significant role in reducing respiratory symptoms and enhancing innate immunity, and Siddha literature reports that many different plants and herbal formulations are used to treat a wide range of human ailments. Numerous medicinal herbs have been considered, with a focus on respiratory ailments despite their multipurpose use. Here is a description of some of the most widely used plants and herbal formulations for these ailments that have also been partially or fully validated by science [2]. and it has been tabulated below in Tables 1 and 2, respectively.

5.1 Piper longum L. (Piperaceae); Siddha name: Thippili
Piper longum fruits are typically dried and used in Siddha medicine to treat cough, colds, and asthma [12]. Additionally, it is used to treat flatulence, colic, hiccups, and hoarseness [13]. According to Siddha literature, this plant is an expectorant. Additionally, studies have demonstrated that piperine, an active ingredient in piper longum, has bronchodilator and anti-tussive properties. Piper longum extracts have been shown to have anti-inflammatory and inhibitory effects on endothelial cells through TNF alpha-induced ICAM-1 expression [14].

5.2 Piper nigrum L. (Piperaceae); Siddha name: Milagu
Piper nigrum is recommended as the best treatment for respiratory conditions such as fever with rigor, cough in Siddha texts. It exhibits bronchodilator properties [15]. To treat bronchitis and asthma, Siddha medicine prescribes giving Piper nigrum powder, which is dry and unripe, along with honey [16]. Moreover, fever and cough are treated with its decoction [17]. The main phytochemical in black pepper, piperine, is said to have against respiratory conditions and antiviral properties. According to studies, Piper nigrum milk extracts have demonstrated promising results in in vivo models of passive cutaneous anaphylaxis, while its methanolic extract has demonstrated an inhibitory effect on mast cell histamine release in vitro [18]. This plant's compound, piperine, has been shown to suppress the production of TNF- and nitric oxide in vitro [20] in addition, the plant has antibacterial [19], antispasmodic [20], and antioxidant [21] qualities.

5.3 Taxus buccata L (Taxaceae) Siddha name: Thalisapathiri
This plant, and its preparation, is described in Siddha literature as having expectorant properties and being important in the treatment of pulmonary ailments. There is proof that the alcoholic extract of Taxus buccata has bronchodilator properties. It functions by reducing the number of inflammatory cells that enter the airway by suppressing histamine, bronchial hyperactivity is also lessened [22].

5.4 Adhatoda vasica Nees (Acanthaceae); Siddha name: Adathodai
In Siddha medicine, *Adhatoda vasica* leaf extract is used to treat cough [23] eosinophilia [24], and bronchial asthma. In certain regions, traditional healers treat asthma with an oral combination of this plant's leaves and Hibiscus rosa-sinensis flowers [25]. An isolated active ingredient from Adathoda vasica called vasicinone has bronchodilator anti-inflammatory and antispasmodic properties to this plant [26]. This plant contains certain mucolytics that are very useful in the treatment of respiratory disease, including benzylamines, bromhexine, and ambroxol[27].

5.5 Zingiber officinale L (Zingiberacae) Siddha name: Inji

In Siddha medicine, *Zingiber officinale* herb is recommended as the best treatment for respiratory conditions such as Cough, Throat infection, Hoarseness of voice,Bronchial asthma [28]. According to studies, ginger prevents airway obstruction and related ca 2+ signaling in murine airway smooth muscle cells by blocking plasma membrane cachannels. Zingiber officinale rhizomes have been found to have bronchodilator properties by researchers [29].

5.6 Ocimum sanctum L. (Lamiaceae); Siddha name: Thulasi

Ocimum sanctum L leaves are used in Siddha medicine to treat fever, cough, bronchitis, asthma, eosinophilia, and chronic cough [28]. According to reports, O. sanctum leaves contain a crude extract and terpenoid that have demonstrated encouraging antiviral qualities against the H9N2 virus [30]. It prevents mast cell degranulation [31]. In guinea pigs and rats, the volatile oil from fresh leaves and the fixed oil from seeds demonstrated anti-inflammatory activity against inflammation induced by carrageenan, serotonin, histamine, and PGE-2[32].

5.7 Glycyrrhiza glabra L(Ranunculaceae)Siddha name:Adhimathuram

In Siddha medicine, Glycyrrhiza stimulates mucus secretions in the trachea, which has demulcent and expectorant properties [28]. According to studies Glycyrrhia compounds are highly efficient in decreasing the production of chemokines. In addition, it functions as a bronchodilator and is useful in the treatment of COPD. Active ingredients in this plant include glycyrrhizinic acid, glycyrrhetinic acid, liquorice acid, glabrolide, isoglaborlide, and liquiditic acid [33].

5.8 Solanum trilobatum L. (Solanaceae); Siddha name: Thuthuvalai

In Siddha system of medicine, the entire plant is used to treat esinophilia, bronchitis, and asthma [28]. Its anti-inflammatory properties have been demonstrated [34]. A clinical study has validated the traditional claim regarding this herb's benefit in treating bronchial asthma [35].

5.9 Solanum xanthocarpum (Solanaceae); Siddha name: Kandankatthiri

In Siddha system of medicine, Solanum xanthocarpum fruits are used to treat cough [28] and bronchial asthma [36]. Clinical studies have validated the traditional claim regarding this herb's efficacy in treating bronchial asthma [37]. The drug's ability to reduce histamine levels in lung and bronchial tissue may be the reason for its beneficial effects on bronchial asthma [38].

Table 1: According to Siddha literature Siddha herbo- mineral formulations to manage respiratory diseases [39].

S.no	Siddha herbo- mineral formulations	Indications
1	*Thalisathi chooranam*	Hoarseness of voice, coryza
2	*Thirikadugu chooranam*	Cold, cough, dyspnea
3	*Korosanai mathirai*	Breathlessness,
4	*Swasakudora mathirai*	Dyspnea, cold
5	*Adathodai Manapaagu*	Reduces phlegm
6	*Thoothuvalai Nei*	Chronic Cough
7	*Kandankathiri chooranam*	Hoarseness of voice, Wheezing
8	*Thippilli rasayanam*	Wheezing, reduce excessive sputum production
9	*Gowri chindhaamani*	Wheezing, dyspnoea
10	*Kasthuri karuppu*	Cold, cough, wheezing
11	*Poorna chenrothayam*	Chronic cough, Wheeze
12	*Neerkovai mathirai (External application)*	Breathlessness, Cold, Headache

Table:2 Scientifically proven therapeutic effects Siddha formulations

S.no	Siddha formulations and their indications	Composition of formulation	Scientifically proven therapeutic effects.
1	***Thippili rasayanam*** [40]. *Indication: Kaasam, kshyam, Irumal, Iraippu, sethumam 96.* (Pulmonary Tuberculosis, Cough, Bronchial asthma, All kind of Kaphadiseases.	*Piper longum, Piper nigrum, Cuminum cyminum, Nigella sativa, Carum copticum, Syzygium aromaticum, Alpinia galanga, Hyocymus niger, Three myrobalans, Taxsus buccata, Plumbago zeylanica, Eletria cardamom*	• HSV-1 is inhibited by a cumin seed methanolic extract. [41]. Carum copticum essential oil has antiviral properties. • Additionally, it has a somewhat bronchodilator effect on airways affected by asthma that is similar to theophylline's effect. [42]. • Piperine, a compound found in this plant, has been demonstrated to inhibit the synthesis of nitric oxide and TNF- in vitro. [43]. • The plant also possesses antispasmodic. [44]. antioxidant. [45] and antibacterial [46] properties.
2	***Swasakudori Mathirai***[40] *Indication:Suvasam, Irumal, Kaasam* (Asthma, cough and other respiratory disorders)	*Calotropis flower, Piper nigrum*	• Flowers of the Calotropis gigantea plant are used to cure cough, asthma, catarrh, and loss of appetite [47]. • In Siddha medicine, coughs are treated by soaking powdered root bark in its own milky juice, which is then used to make bougies and inhale their fumes Because of its antispasmodic properties, Calotropis flower and pepper are commonly used in the treatment of respiratory conditions [48].
3	***Adathodai manapagu***[40]. Indication:*Kapathikam,Irumal, Suram, vayitrunoi* (Deranged Kapham, cough, fever, digestiveproblem)	*Adathoda vasica*	• The presence of alkaloids may be partially responsible for the relief of bronchial obstruction caused by its leaf extracts [48]. In addition, the plant has antitussive anti-inflammatory qualities [49]. • Strong anti-influenza virus activity has been demonstrated by the extract [50].
4	***ThalisathyChooranam***[40] Indication: *Sethumam96, Kamalai, Irumal, Thondaikattu, Kshyam, Atthisuram.*	*Taxsus bucata, Syzygium aromaticum, Eletria cardamom, Zingiber officinale(dried), Ferula asafetida,*	• The presence of lignans, flavonoids, sugar derivatives, and other compounds was revealed by phytochemical screening of T. baccata[51].

	(Kaba diseases 96, Jaundice, Cough, Throat infection, Pulmonary tuberculosis)	*Embilica ribes, Costus speciosus, Piper longum, Cuminum cyminum, Myrsticafragarns, Terminalia bellarica, Terminalia chebula, Nardostachys grandiflora, Anethum gravelons, Phyllanthus emblica, Piper nigrum, Mesua fera, Michalia champak buds, Corriandrum sativum seeds, Rhus succedanea, Carum copticum,*	• It affects lipoxygenase (LOX) enzymes, which may be used as therapeutic targets to treat autoimmune disorders, cancer, inflammation, and bronchial asthma. By promoting broncho relaxation and reducing bronchial hyper reactivity, the alcoholic extract of T. baccata leaves has a notable anti-asthmatic effect on asthma sufferers [52]. • It is known that lignans have a variety of biological properties, such as anti-inflammatory, antiviral, antibacterial, antioxidant, and anticancer properties. Numerous biological activities of flavonoids are known to exist, such as antimicrobial, antifungal, spasmolytic, antiviral, anticancer, and anti-inflammatory properties [53].

6. Conclusion:

This review paper is a compilation of various research studies conducted on the efficacy of ingredients of *Siddha* formulations and herbs for the symptomatic management ofrespiratory diseases, anti-viral property, Immuno-modulation and preventive aspect. Finding new, effective antiviral compounds is necessary because most viral diseases lack effective therapeutics, antiviral drug resistance emerges, and treatment of viral infections is costly. It is imperative to find and create novel antiviral products in order to get around the aforementioned difficulties. The findings make it clear that the chosen medications contain the components necessary to have an antiviral effect. The study also recommends that in order to identify the molecular level pharmacodynamic targets of Siddha medicines and achieve clinical success in the management, prevention, and eradication of respiratory infections as well as epidemic and pandemic outbreaks, more literature formulations need to be identified and clinical research could be conducted.

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Reference:

1. B. Shalini, K. Suresh, R. Uthaya Ganga, A review of millets diet as a traditional approach to pcos (garpavaayu) management. Journal of advanced zoology, issn: 0253-7214 volume 45 issue 2-year 2024 page 440:450.
2. Arjun Ram*, Duraisamy Arul Joseph, Selvakumar Balachandar, Vijay Pal Singh, Medicinal plants from Siddha system of medicine useful for treating respiratory diseases, International Journal of Pharmaceuticals Analysis, ISSN: 0975-3079, Volume 1, Issue 2, 2009, pp-20-30.
3. Shanmugavelan, Noi Nadal Noi Mudal Naadal – Part 1, 2nd reprint, Chennai, Dept of Indian

Medicine and Homeopathy, 2015.Pg.no 30-31.
4. S. Radha1*, S. P. Rajalakshmi2, K. Subash3 and K. Samraj, A Perspective Review on Siddha System of Medicine in the Management of Corona Virus Disease 2019. Journal of Natural Remedies | ISSN: 2320-3358. Vol 21 (2) | April 2021.
5. Uthamarayan CS, 2010, *Thotrakirama ariachiyum Siddha maruthuva varalarum*, 5th reprint DIM Publications, Pg no.342-343.
6. Vaithiya Rathinam K.S. Murugesa muthaliyar, 1936 Gunapadam-mooligai, published by Directorate of Indian medicine and Homeopathy Chennai-106.
7. Kannusami Pillai, Sigicha Rathna deepamPurification of raw drugs, Part-1, 2007, Department of Indian Medicine and Homeopathy, Chennai - 106.
8. Uthamarayan CS, (2014)Udal thathuvam, published by Directorate of Indian medicine and Homeopathy Chennai-106.
9. Dr.R.Thiyagarajan. L.I.M, (2009) Gunapadam-Thathu jeevam, published by Directorate of Indian medicine and Homeopathy Chennai-106, year-
10. Krishnamurthy K.H., Mouli C.G. (1984) Siddha system of medicine: A historical appraisal. Indian journal of history of science 19, 43-53, available at Internet: http://www.new.dli.ernet.in/rawdatauploa d/upload/insa/INSA_1/20005abd_43.pdf [37]
11. Zysk K.G. (2008). Siddha Medicine in Tamil Nadu. © Nationalmuseet og Kenneth G. Zysk, Tranquebar Initiativets Skriftserie, ISBN: 978-87-7602-102-3 (PDF).
12. Shanmugavelu M. (2004) Noikaluku Siddha parikaram. Part-I. Indian medicineHomeopathy department. Government of India.
13. Walter T.M. (2005) Catalogue of Siddha medicinal plants, available from Internet: http://openmed.nic.in/2055/01/Siddha_h erbs.pdf.
14. Mathew JE, Srinivasan KK, Dinakaran V and Joseph A. Mast cell stabilizing effects of Euphorbia hirta. J Ethnopharmacol. 2009; 122:394-396.
15. Vaithiya Rathinam K.S. Murugesa muthaliyar (2008), Gunapadam-mooligai, published by Directorate of Indian medicine and Homeopathy Chennai-106.
16. Shanmugavelu M. (2004) Noikaluku Siddha parikaram. Part-I. Indian medicineHomeopathy department. Government of India.
17. The Siddha Pharmacopoeia of India, (2008) Part-I, Government of India, Ministry of health and welfare, Department of Ayurveda, Yoga and Naturopathy, Unani, Siddha and Homoeopathy (AYUSH).
18. Arjun ram, Duraisamyaruljoseph, Selvakumar Balachandar, Vijay Pal Singh, Medicinal plants from Siddha system of medicine useful for treating respiratory diseases, International journal of pharmaceutical analysis, Vol 1, issue 2, 2009,pp 20-30.
19. Pradeep C.R. and Kuttan G. (2003) Immunopharmacology and Immunotoxicology, 25, 337-46.
20. Naseri M.K. and Yahyavi H. (2008) Pakistan Journal of Biological Sciences: PJBS. 11, 1492-6.
21. Agbor G.A., Vinson J.A., Oben J.E. and Ngogang J.Y. (2007) Journal of Herbal Pharmacotherapy, 7, 49-64.
22. Reddy S.V., Srinivas P.V., Praveen B., Kishore K.H., Raju B.C., Murthy U.S. and Rao, J.M. (2004) Phytomedicine: International Journal of Phytotherapy and Phytopharmacology, 11, 697-700.
23. How to cite this article: M. T .Praveena. (2018). A Review of Siddha medicinal herbs in the management of chronic obstructive pulmonary disease. Int. J. Curr. Res. Biol. Med. 3(8): 10-14. DOI: http://dx.doi.org/10.22192/ijcrbm.2018.03.08.00.
24. The Siddha Pharmacopoeia of India, (2008) Part-I, Government of India, Ministry of health and welfare, Department of Ayurveda, Yoga and Naturopathy, Unani, Siddha and Homoeopathy (AYUSH).
25. Walter T.M. (2005) Catalogue of Siddha medicinal plants, available from Internet: http://openmed.nic.in/2055/01/Siddha_h erbs.pdf.
26. Chakraborty A. and Brantner A.H. (2001) Phytotherapy Research, 15, 532-4.

27. M. T .Praveena. (2018). A Review of Siddha medicinal herbs in the management of chronic obstructive pulmonary disease. Int. J. Curr. Res. Biol. Med. 3(8): 11. DOI: http://dx.doi.org/10.22192/ijcrbm.2018.03.08.00.
28. Mudhaliyar KSM, HPIM. Gunapadam Mooligai, Directorate of Indian Medicine and Homeopathy, Chennai-106, 13 -861.
29. Thitiyamangprayol, S Anjeevkupittayanant, nuannoichudapongse, Participation of citral in the bronchodilatory effect of ginger oil and possible mechanism of action fitoterapia, vol.89 sep 2013, pages 68-73.
30. Ghoke et al. Evaluation of antiviral activity of *Ocimumsanctum* and Acacia arabica leaves extracts against H9N2 virus using embryonated chicken egg model. BMC Compl Alternative Med. 2018; 18:174. https://doi.org/10.1186/s12906-018-2238-1. PMid:29866088. PMCid:PMC5987647.
31. Mali Praha R and Asif K. Studies on antiasthmatic activity of aqueous extract of roots Terminalia chebula L. IRJP.2011;104-110.
32. Prakash P. and Gupta N. (2005) Indian Journal of Physiology and Pharmacology, 49,125-131.
33. Khare C.P. (2007) Indian medicinal plants: an illustrated dictionary. Published by springer, ISBN: 978-0-387-70637-5.
34. Sachiko Matsui, Hiroatsu Matsumoto, Yoshiko Sonoda, Kumi Ando, Eriko Aizu-Yokota, Toshitsugu Sato, Tadashi Kasahara, Glycyrrhizin and related compounds down-regulate production of inflammatory chemokines IL-8 and eotaxin 1 in a human lung fibroblast cell line, International IMMUNE pharmacology, vol.4, issue 13, 2004,page 1633-1644.
35. Emmanuel S., Ignacimuthu S., Perumalsamy R. and Amalra, T. (2006) Fitoterapia, 77, 611-612.
36. Govindan S., Viswanathan S., Vijayasekaran V. and Alagappan R. (1999) Journal of Ethnopharmacology, 66, 205-210.
37. The Siddha Pharmacopoeia of India, (2008) Part-I, Government of India, Ministry of health and welfare, Department of Ayurveda, Yoga and Naturopathy, Unani, Siddha and Homoeopathy (AYUSH).
38. Govindan S., Viswanathan S., Vijayasekaran V. and Alagappan R. (1999) Journal of Ethnopharmacology, 66, 205-210.
39. Khare C.P. (2007) Indian medicinal plants: an illustrated dictionary. Published by springer, ISBN: 978-0-387-70637-5.
40. .Dr. K. N. Kuppusamy mudhaliar, Dr.K.S.Utthamarayan, Siddha vaidhyathirattu.
41. Motamedifar.The effect of cumin seed extracts against herpes simplex virus type 1 in vitro cell culture. Iran J Basic Med Sci. 35(4):304–9.
42. Goncalves JL, Lopes RC, Oliveiradb, Costa SS, Miranda MM, Romanos MT, et al. In vitro antirota virus activity of some medicinal plants used in brazil against diarrhea. J Ethnopharmacol. 2005; 99:403. https://doi.org/10.1016/j.jep.2005.01.032. PMid:1587 6501.
43. Pradeep C.R. and Kuttan G. (2003) Immunopharmacology and Immunotoxicology, 25, 337-46.
44. Naseri M.K. and Yahyavi H. (2008) Pakistan Journal of Biological Sciences: PJBS. 11, 1492-6.
45. Agbor G.A., Vinson J.A., Oben J.E. and Ngogang J.Y. (2007) Journal of Herbal Pharmacotherapy, 7, 49-64.
46. Reddy S.V., Srinivas P.V., Praveen B., Kishore K.H., Raju B.C., Murthy U.S. and Rao, J.M. (2004) Phytomedicine: International Journal of Phytotherapy and Phytopharmacology, 11, 697-700.
47. Parhira S, Yang ZF, Zhu GY, Chen QL, Zhou BX, et al. In vitro anti-influenza virus activities of a new lignan glycoside from the latex of Calotropis gigantean. Plos One. 2014; 9(8):1–13. https://doi. org/10.1371/journal.pone.0104544. PMid:25102000. PMCid:PMC4125211.
48. Khare C.P. (2007) Indian medicinal plants: an illustrated dictionary. Published by springer, ISBN: 978-0-387-70637-5.
49. Khare C.P. (2007) Indian medicinal plants: an illustrated dictionary. Published by springer, ISBN: 978-0-387-70637-5.
50. Dhuley JN. (1999) Journal of Ethnopharmacology, 67, 361-5.

51. Chavan R, Chowdhary A. In vitro inhibitory activity of Justicia adhatoda extracts against influenza virus infection and hemagglutination. Int J Pharmaceut Sci Rev Res. 2014; 25(2):231–6.
52. Parmar VS, Jha A, Bisht KS, Taneja P, Singh SK, Kumar A, et al. Constituents of yew trees. Phyto chemistry. 1999; 50:1267–304. https://doi.org/10.10 16/S0031-9422(98)00702-X
53. 49. Steinhilber D. A target for anti-inflammatory drugs revisited. Curr Med Chem. 1999; 6:71–85.
54. Patel KV, Gandhi TR. Evaluation of effect of Taxus baccata leaves extract on broncho constriction and bronchial hyper reactivity in experimental animals. Global J Pharmacol. 2009; 3(3):141–8.