VOLUME-9, ISSUE-4, APRIL -2020 • PRINT ISSN No. 2277 - 8160 • DOI : 10.36106/gjra

Original Research Paper



Paper

Ayurveda

EVIDENCE BASED HOLISTIC SOLUTIONS FROM YOGA & AYURVEDA TO COMBAT VIRAL INFECTIONS

T. R. Shantala Priyadarshini	Director, Dr.Vijay's Ayurveda Research & Therapy center, Mysore, India
Remitha.K.K*	Associate Professor, Sushrutha Ayurveda Medical college, Bangalore, India *Corresponding Author
Roja L.D	PG Scholar IPGT & RA, Jamnagar, India.
ABSTRACT Antiviral activities of more than 200 herbs have been investigated in other nations in search of a solution	

for viral conditions. Research is being conducted on war footage adopting all available methods to test antiviral herbs to discover a solution to save lives and resources. Ayurveda management stands in the forefront in combating viral conditions for more than three decades. Many nations have tried an integrated approach and it is essential to check why it is imperative for us to adopt similar solutions with evidence. This article includes lifestyle modifications with aspects of Yoga, diet, seasonal and daily routine, administering the specific rasayana and many more characteristic methods which will make the management more effective, safe and rapid. Holistic management to be planned as per various stages of infection (quarantine, post quarantine also)and before releasing from lockdown period.

All these suggested protocols are based on evidence reviewed from research papers and modulated by clinical experience.

KEYWORDS : Pranayama, Antiviral herbs, Physical distancing, Ayurveda.

I. INTRODUCTION

Pandemic, well recorded in Charak samhita "Janapadodwamsa"^[11] means mass destruction of population (nations). Acharya Susrutha describes the spread of pandemics (Sankramanthi narannaram^{12]} and how the people suffer due to transmission. With approximately 60% of all infectious diseases being transmitted by zoonoses, and over 70% of these caused by pathogens of wild origin^[3]. it is the need of the hour to find a permanent solution to these pandemics.

Pratishyaya can manifest due to both short and chronic incubation periods. The upper respiratory condition when neglected leads to kasa, swasa, many serious conditions like tuberculosis, wasting and many other disorders. It is well recorded as a condition which needs to be controlled if not leads to many ailments. The microbial infection referred to as Pratishyaya manifests due to khaphaja krumi. (Krumi means; that which attacks, invades, infects, spreads) and microbiologists named in Vedic period were Susrutha has described about nidana parivarjan move away /stop causative factors and it includes close contact, sharing of clothes, cosmetics, breathing air etc. 'Aupasargajanya vyadhi' due to transmission . Droplet infection due to all above reasons. Do not share masks or any clothing / aprons / instruments / equipment / any hospital materials which can carry viruses. Sneezing, a major symptom which is recognised as having short or chronic incubation, has been known to have ailments culminating in diseases of lungs, heart and digestive system also. Prevention of seasonal ailments which spreads to the whole community and more drastic symptoms in people with compromised immunity.

It is well known that this pandemic is not just common cold⁴⁰Ayurveda recognises that common cold infection when neglected manifests as infectious lower respiratory tract infection and involves the lungs,heart and can manifest as complications. Other Ayurveda classical treatises also describe minute organisms causing contagious conditions⁶⁰⁸⁰⁷⁷

Ayurveda also notes that eating rotten, unhealthy meat (which is not suitable for human consumption)can cause the same type infections in the whole of respiratory system⁽⁶⁾

Viral conditions like herpes, hepatitis, influenza, chikungunya, mumps, measles, avian flu,chicken pox, HIV, SARS, rubella, dengue etc have not been managed by antibiotics but by antivirals which have recorded more hazards than benefits and people are advised no medicines or alternative medicines and change in lifestyle to get better, rid of symptoms.

When management is not proved totally effective the human tendency tries any home remedy or astrology or prayer or a combination of anything to get well. An integrated approach of TCM and Western management was being tried in many viral conditions and only TCM is non emergency conditions and success rate was high.⁽⁹⁾

HOLISTIC MANAGEMENT:-PREVENTION, QUARANTINE TREATMENT OF POSITIVE CASES, POST LOCKDOWN TIME Prevention to stop transmission, lockdown period-termed as "Nidana parivarjan".Prophylaxis is to keep people healthy during lockdown involves regular set of daily routine. Physical, mental and spiritual wellbeing needs to be considered by Yoga including omkar, pranyama, meditation, simple activities if possible gardening, cooking, painting etc keeping away from others. Continuing accustomed food habits to maintain health should include more seasonal species, adequate liquids , regular timings of food intake, avoid snacking and junk food, Daily routine suggested by the government needs to be followed.

Management of people in quarantine.

Need counselling for them to understand the importance of quarantine. A short film which shows what to follow ;45 minutes of two sessions of prescribed yoga inclusive of pranayama, omkar,mantra,yoga asana.agnihotra whatever possible. Effect of Bhramari pranayama and OM chanting on pulmonary function in healthy individuals;. ⁽¹⁰⁾⁽¹¹⁾⁽¹²⁾⁽¹³⁾ Many research conducted on these show the utility of maintaining immunity against all diseases especially enhances the capacity of the respiratory tract. Effect of short-term pranayama and meditation on cardiovascular functions in healthy individuals. The set of all aspects of yoga which has ample evidence to prove the benefits needs to be adopted not only during quarantine but also after lock down is withdrawn⁽¹⁴⁾⁽¹⁵⁾⁽¹⁶⁾⁽¹⁷⁾⁽¹⁸⁾⁽¹⁹⁾⁽²⁰⁾⁽²¹⁾

VOLUME-9, ISSUE-4, APRIL -2020 • PRINT ISSN No. 2277 - 8160 • DOI : 10.36106/gjra

Consuming Chyawanprash manufactured as per classical texts boost immunity ^{.15}Consuming liquorice as per Ayurveda is beneficial^{.(22)(23)}

Many herbs prescribed for healthy and several other conditions have been recommended for not only enhancing immunity but also to act against viruses. Glycyrrhiza glabra or Licorice known as Yastimadhu has been proven beneficial against many.DNA viruses such as Varicella zoster virus, Kaposi sarcoma-associated erpesvirus, Herpes Simplex Virus-1, Epstein Barr virus, Human Cytomegalovirus, etc and RNA viruses such as as Influenza A virus (IAV), H5N1 virus, H1N1 virus, Hepatitis C virus, Newcastle disease virus, Rotavirus, SARS-associated coronavirus, Human Immunodeficiency Virus Ayurveda has Yastimadhu Licorice in as many as 1250 formulations and more than 160 research papers showcasing its antiviral activity⁽²⁴⁾⁽²⁵⁾⁽²⁶⁾ Antiviral herbs & Formulations for positive viral cases with evidence of safety study.

Evidence to adopt Balachaturbhadra rasa for management ()()()()(safety in infants have been proved as since decades it has been advised. Ingredients 1,Cyperus Rotundus .2. Piper Longum 3.Aconitum Heterophyllum 4.Pistacia Integerrima

This formulation has been under scientific understanding time tested since llcentury AD to the present day.Each herb and the formulation has been clinically evaluated as safe,cost effective and the formulation of choice as it has been evaluated in kids also.The ingredients ⁽²⁷⁾⁽²⁸⁾⁽²³⁾⁽³⁰⁾⁽³¹⁾have been proved to be antiviral and known to enhance immunity.

Initial stage with fever –amrutha satwa repeatedly with ginger juice, tulsi juice and honey to mitigate fever and immunity enhanced.

Fever associated with upper respiratory tract infection can be controlled by balachaturbadra rasa in powder form mixed with honey and tulsi juice in repeated doses. This formulation has been time tested since 11century AD to present day and has been advised safely to hildren⁽³²⁾⁽³³⁾⁽³⁴⁾⁽³⁵⁾⁽³⁶⁾

The research papers on Balachaturbadhar rasa, its safety profile are all published $^{\rm (37)(GB)(39)(40)}$

When cough and breathlessness increases, the same can be given with Pushkaramoolasava. $^{\scriptscriptstyle (41)(42)(43).}$ This can be substantiated by adding along with Tulsi –taken repeatedly mixed with honey $^{\scriptscriptstyle (44)(45)(46)}$

Fumigation was always a part of Ayurveda management. Few evidence based are noted here $^{\scriptscriptstyle (47)(48)(49)}$ When lockdown is gradually withdrawn

People still need to keep immunity in tact and keep social distance. The management to enhance immunity like --daily routine, seasonal routine, rasayana to maintain immunity needs to be continued. Its safe to continue- turmeric, amrutha, tulsi, neem, yashtimadhu, etc are advocated along with all aspects of Yoga.

What are other traditional systems of medicine doing in this situation?

WHAT ARE OTHER TRADITIONAL SYSTEMS DOING

Most of the nations have adopted herbal medicine and what has been in the traditional systems and is timetested. Here are few research papers from various nations.

China has adopted TCM and got very promising results and it has saved lives and now plans to export all TCM products to the suffering mankind. Traditional Chinese Medicine has done research on Glycyrrhizic from Licorice roots. (50)(51)(52)(53)(54)(55)(56)(57)(58)(59(60))

Evaluation of direct antiviral activity of the Deva-5 herb formulation and extracts of five Asian plants against influenza A virus H3N8 .*Sirlankan management of Viral conditions from* various other nations⁽⁵⁸⁾⁽⁶⁰⁾

References

- Acharya YT, editor (5th ed.). Charaka Samhita of Agnivesa, Vimana Sthana; Janapadodhwamsaniya Adhyaya: Chapter 3, Verse 3. Varanasi: Chowkhamba Sanskrit Series, 2001;240.
- Acharya YT, Acharya NR, Sushruta Samhita of Sushrutha, Nidana Sthana; Kushtha Nidana: Chapter 5, Verse 33,34. Varanasi: Chowkhamba krishnadas Academy, 2004;289.
 Jones KE, Patel NG, Levy MA, et al. Global trends in emerging infectious
- [3] Jones KE, Patel NG, Levy MA, et al. Global trends in emerging infectious diseases. Nature 2008; 451: 990–93.]
- [4] Coronavirus Infections—More Than Just the Common Cold.[5]Acharya YT, Acharya NR, Sushruta Samhita of Sushrutha, Uttara tantra; Chapter 24 Verse 3. Varanasi: Chowkhamba krishnadas Academy, 2004;651.
 [6] Acharya YT, Acharya NR, Sushruta Samhita of Sushrutha, Uttara tantra;
- [6] Acharya YT, Acharya NR, Sushruta Samhita of Sushrutha, Uttara tantra; Chapter 54 Verse 14. Varanasi: Chowkhamba krishnadas Academy, 2004;773.
- [7] Acharya YT, editor (5th ed.). Charaka Samhita of Agnivesa, Nidana Sthana; Apasmara Nidana: Chapter 8, Verse 19. Varanasi: Chowkhamba Sanskrit Series, 2001;227
- (8) Acharya YT, Acharya NR, Sushruta Samhita of Sushrutha, Sutra Sthana; Chapter 46 Verse 126,127. Varanasi: Chowkhamba krishnadas Academy, 2004;225.
- (9). Traditional Chinese medicine for COVID-19 treatment www.sciencedirect.com/science/article/pii
- [10] Immediate effect of specific nostril manipulating yoga breathing practices on autonomic and respiratory variables.
- www.ncbi.nlm.nih.gov/pubmed/18347974/
 [11] Immediate benefits of "Om" chanting on blood pressure and pulse rate in uncomplicated moderate hypertensive subjects www.njppp.com/fulltext/28-1524139333.pdf
- [12] Effect of Bhramari pranayama and OM chanting on pulmonary function in healthy individuals: A prospective randomized control trial.ncbi.nlm.nih.gov/ pmc/articles
- [13] Controlled breathing and dyspnea in patients with chronic obstructive pulmonary disease (COPD).ncbi.nlm.nih.gov/pubmed
- [14] Effect of yoga breathing exercises (pranayama) on airway reactivity in subjects with asthma.ncbi.nlm.nih.gov/pubmed
- [14] The effects of regular yoga practice on pulmonary function in healthy individuals: a literature review.liebertpub.com/doi/10.1089/acm.
- [15] Effect of short-term pranayama and meditation on cardiovascular functions in healthy ndividualncbi.nlm.nih.gov
- [16] The effects of regular yoga practice on pulmonary function in healthy individuals: a literature review..ncbi.nlm.nih.gov/pubmed
- [17] Neuro Hemodynamic correlates of 'OM' chanting: A pilot functional magnetic resonance imaging study.ncbi.nlm.nih.gov/pmc/articles
- [18] Breathing exercises for chronic obstructive pulmonary disease. ncbi.nlm.nih.gov/
 [19] Effects of Breathing Exercises in Patients With Chronic Obstructive Pulmonary
- [19] Enects of preduming Exercises in Faterna with Chronic Obstructive Fulmonary Disease: Systematic Review and Meta -Analysis. .ncbi.nlm.nih.gov/ pubmed/31499605
- [20] Effects of acute use of pursed-lips breathing during exercise in patients with COPD: a systematic review and meta-nalysis. https://www.ncbi.nlm.nih.gov/pubmed/28969859
- [21] Pursed-lips breathing reduces dynamic hyperinflation induced by activities of daily living test in patients with chronic obstructive pulmonary disease: A randomized cross-over study.ncbi.nlm.nih.gov/pubmed
- (22) ancientscienceoflife.org/article.asp?issn=0257-7941;year=2017; volume=36;issue=3;spage=141;epage=150;aulast=Gupta Evaluation of Cyavanapr a on health and immunity related parameters in healthy children: A two arm, randomized, open labeled, prospective, multicenter, clinical study.
- (23) ncbi.nlm.nih.gov/pmc/articles/Chyawanprash: A Traditional Indian Bioactive Health Supplement
- (24) Antiviral Activity of Glycyrrhizic Acid Derivatives against SARS Coronavirus https://pubs.acs.org/doi/10.1021/jm0493008
- (25) Scope of Glycyrrhiza glabra (Yashtimadhu) as an Antiviral agent: A Review https://www.researchgate.net/publication/328938275_Scope_of_Glycyrrhiza glabra_Yashtimadhu_as_an_Antiviral_agent_A_Review
- (26) https://www.ncbi.nlm.nih.gov/pubmed/12814717 Glycyrrhizin, an active component of liquorice roots, and replication of SARS-associated coronavirus.
- (27) PHARMACOGNOSTIC AND PHYTOCHEMICAL INVESTIGATION OF THE STEM BARK OF PISTACIA INTEGERRIMA STEW EX BRANDIS JOURNAL OF MEDICINAL PLANT RESEARCH 5(16):3891-3895JOURNAL OF MEDICINAL PLANTS RESEARCH VOL. 5(16), PP. 3891-3895, 18 AUGUST, 2011 ACADEMICJOURNALS.ORG/JMPR
- (28) ABDUR RAÚF. "A MINI REVIEW ON A PISTACIA INTEGERRIMA WELL-KNOWN MEDICINAL PLANT: IT'S ACTIVE PHYTOCHEMICALS WITH EXCITING PHARMACOLOGICAL PROFILE". ACTA SCIENTIFIC NUTRITIONAL HEALTH 3.4 (2019): 45-48.
- (29) ANTIVIRAL ACTIVITIES AND CYTOTOXICITY ASSAY OF SEED EXTRACTS OF PIPER LONGUM AND PIPER NIGRUM ON HUMAN CELL LINES
- (30) ANTIVIRAL ACTIVITIES OF EXTRACTS AND SELECTED PURE CONSTITUENTS OF OCIMUM BASILICUM UTTITUENTS OF OCIMUM BASILICUM
- HTTPS://ONLINELIBRARY.WILEY.COM/DOI/ABS/10.1111/J.1440-1681.2005.04270.X
- (31) WWW.LONGDOM.ORG/OPEN-ACCESS/PHARMACOLOGICAL-

VOLUME-9, ISSUE-4, APRIL -2020 • PRINT ISSN No. 2277 - 8160 • DOI : 10.36106/gjra

EVALUATION-OF-OCIMUM-SANCTUM-JBB-1000330.PDF

- (32) HTTP://WWW.IOSRPHR.ORG/PAPERS/V617V2/E06723248.PDF A REVIEW ON CYPERUS ROTUNDUS A POTENTIAL MEDICINAL PLANT
- (33) GLOBALRESEARCHONLINE.NET/JOURNALCONTENTS/V44-1/42.PDFUSHA PATIL. STUDIES ON ANTIVIRAL ACTIVITY OF TULSI (OCIMUM SANCTUM) CRUDE EXTRACTS ON SELECTED VIRUSES OF VETERINARY IMPORTANCE (34)EVALUATION OF ANTIVIRAL ACTIVITY OF OCIMUM SANCTUM AND ACACIA ARABICA LEAVES EXTRACTS AGAINST H9N2 VIRUS USING EMBRYONATED CHICKEN EGG MODEL HTTPS://BMCCOMPLEMENTMEDTHERAPIES.BIOMEDCENTRAL.COM/ARTI
- CLES/10.1186/S12906-018-2238-1 (35) EVALUATION OF ANTIVIRAL ACTIVITY OF OCIMUM SANCTUM AND ACACIA
- (3) EVALUATION OF ANTIVITAL ACTIVITY OF OCIMUM SANCTUM AND ACACIA ARABICA LEAVES EXTRACTS AGAINST H9N2 VIRUS USING EMBRYONATED CHICKEN EGG MODELHINDAWI.COM/JOURALS/ECAM/2017/9217567/(36)ASSESSMENT OF IN VITRO ANTIVIRAL ACTIVITY OF OCIMUM SANCTUM (TULSI) AGAINST PANDEMIC SWINE FLU H1N1 VIRUS INFECTION WORLD RESEARCH JOURNAL OF ANTIMICROBIAL AGENTS 3.1 (2014):62-67. https://www.researchgate.net/publication/304395043_Drug_Dosage_Modifi cation_and_Standardization_of_Balachaturbhadra_Syrup
- (37) Drug Dosage Modification and Standardization of Balachaturbhadra Syrup https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3131776/Toxicological study of Balacaturbhadrika churna
- (38) https://media.neliti.com/media/publications/280218-a-critical-review-onbalachaturbhadra-ch-d1690d03.pdf
- (39) A CRITICAL REVIEW ON BALACHATURBHADRA CHURNA: AN EFFECTIVE AYURVEDA FORMULATION FOR THE PEDIATRIC AGE http://oqii.net/articles/2017/1791-1533918767.pdf
- (40) Pharmaccgnostical and Pharmacceutical Evaluation of Balachaturbrbhadra Vetti - A Well-Known Drug for Paediatric disorders. Safety toxicity study done Rohit Gokarn et al. Drug dose modification of Balachaturbhadra syrup, 2016, joinsysmed.ol 4(1), 15-19
- (41) Sharma R (2019) Viral Diseases and Antiviral Activity of Some Medicinal Plants with Special Reference to Ajmer. J Antivir Antiretrovir. 11:186. DOI: 10.35248/1948-5964.19.11.186.chavya as antiviral, Umar Muzaffer, V. I. Paul. (2018)
- (42) Sun, Yuanyuan & Gong, Xuepeng & Tan, Justin & Kang, Lifeng & Li, Dongyan & VIKASH, & Yang, Jihong & Du, Guang. (2016). In Vitro Antiviral Activity of Rubia Cordifolia Aerial Part Extract Against Rotavirus. Frontiers in Pharmacology. 7. 10.3389/fphar.2016.00308.
- (43) ossan, Md Shahadat & Fatima, Ayesha & Rahmatullah, Mohammed & Khoo, Teng & Nissapatorn, Veeranoot & Galochkina, Anastasia & Slita, Alexander & Shtro, Anna & Nikolaeva, Yulia & Wiart, Christophe. (2018). Antiviral activity of Embelia ribes Burm. f. against influenza virus in vitro. Archives of Virology. 163.2121–2131. 10.1007/s00705-018-3842-6.Honey antiviral for VZV
- (44) Shahzad, Aamir & Cohrs, Randall. (2012). In vitro antiviral activity of honey against varicella zoster virus (VZV): A translational medicine study for potential remedy for shingles. Translational biomedicine. 3. 10.3823/434.
- (45) Honey and Health: A Review of Recent Clinical Research
- https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5424551/ (46) ASSESSMENT OF IN VITRO ANTIVIRAL ACTIVITY OF OCIMUM SANCTUM (TULSI) AGAINST PANDEMIC SWINE FLU H1N1 VIRUS INFECTION .* WORLD RESEARCH JOURNAL OF ANTIMICROBIAL AGENTS 3.1 (2014):62-67.(47)MICROBIAL GROWTH INHIBITION BY APARAJITHA DHOOMA CHOORNAM
- https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3330879/pdf/ASL-26-4.pdf (48) A Review on Antibacterial, Antiviral, and Antifungal Activity of Curcumin
- https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4022204/
 https://www.jetir.org/papers/JETIR1907F31.pdf
 HARIDRADIDHOOMA VARTHI; REVIEW AND METHOD OF PREPARATION
 https://www.researchgate.net/publication/330654735_The_Quality_Control_ Assessment_of_Guduchi_Sattwa'_A_Traditional_Herbal_Formulation
 https://www.hindawi.com/journals/jir/2017/1787803/
- https://www.initdaw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.daw.init.da
- https://pubs.acs.org/doi/10.1021/jm0493008 (51) Antiviral Activity of Glycyrrhizic Acid Derivatives against SARS – Coronavirus
- https://www.ncbi.nlm.nih.gov/pubmed/24520776
 (53) Preliminary Phytochemical Analysis and Invitro Antiviral Activity of Ethanolic extract of Whole plant of Tinospora cordifolia (Thunh.) Miers against Hepatitis-A Virus Ramaiah Maddi, Venkata Lakshmi Kandula, Bhagyavathi Vallepu, Hymavathi Navuluri, Harshavardhan Kollu, "Preliminary Phytochemical Analysis and Invitro Anti-viral Activity of Ethanolic extract of Whole plant of Tinospora cordifolia (Thunh.) Miers against Hepatitis-A Virus," International Journal of Scientific Research in Biological Sciences, Vol.5, Issue.3, pp.51-55, 2018. (54)Immunomodulatory Potential of Tinospora cordifolia and CpG ODN (TLR21 Aganist) against the Very Virulent, Infectious Bursal Disease Virus in SPF Chicks Swati Sachan https://www.ijcmas.com/5-6-2016/S.K.%20Dwivedi%20and%20Enespa.pdf
- (55) Antiviral activity of glycyrthizic acid derivatives against SARScoronavirus.https://www.ncbi.nlm.nih.gov/pubmed/15715493
- (56) Extraction of Glycyrrhizic Acid and Glabridin from Licorice. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2635700/ The antiviral and antimicrobial activities of licorice, a widely-used Chinese herb.
- https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4629407/
- (57) A Review on Antibacterial, Antiviral, and Antifungal Activity of Curcumin https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4022204/
- (58) https://www.thailandmedical.news/news/further-research-into-thephytochemicals-contained-in-licorice-root-might-yield-a-treatment-for-thenew-coronavirus-strain-in-china Further-research-into-the-phytochemicalscontained-in-licorice-root-might-yield-a-treatment-for -the-new-coronavirusstrain-in-china
- (59) https://bmccomplementmedtherapies.biomedcentral.com/articles/ 10.1186/1472-6882-14-235

- MULATIONS FOUND_IN_SRI_LANKAN_AYURVED
 (60) N. Zhu, D. Zhang, W. Wang, X. Li, B. Yang, J. Song, X. Zhao, B. Huang, W. Shi, R. Lu, P. Niu, F. Zhan, X. Ma, D. Wang, W. Xu, G. Wu, G.F. Gao, W. TanChina novel coronavirus investigating and research team. A novel coronavirus from patients with pneumonic in China, 2019