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RESEARCH ARTICLE

AN INTEGRATIVE AND NOVEL APPROACH TO COMBAT SARS-COV-2: APPLICATION OF FAR INFRARED RADIATION, ALTERNATIVE SYSTEM OF MEDICINES AND NUTRACEUTICALS

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ABSTRACT

CORONA-19 cases in the world are approximately 20 lacs till April 17, 2020, while deaths reported so far is around 1.25 lacs; and there is no vaccine/no exact medicine. In India, the total cases till 17th April, are about 14000; and deaths reported are about 450. The humanity is facing a tough time in the whole globe; more than 200 countries are in the grip of the pandemic CORONA -19. Then, what's to be done! The doctors are trying drugs like Hydroxychloroquine, HIV drugs, and so; but there is no respite. Then why not to use some other drugs/methods which are less expensive, easy to administer and having no side effect. Therefore, it becomes important to combat the tenacity of the SARS-CoV-2, by adopting alternative system of medicines and nutritional approaches. Earlier, some of the authors of the paper have discussed the concept of 'Biogeogens', to deal with any health issues, taking into account all the concerned factors holistically. Therefore, on the basis of extensive research and earlier evidences, an integrative and novel approach of utilizing the far infrared radiation, homeopathic medicine and nutraceuticals, has been suggested to prevent the spread and viral infectivity of SARS- CoV-2.

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INTRODUCTION

Several viral pneumonia cases of unknown origin emerged in Wuhan, Hubei Province of China in December 2019, which attracted attention of the World Health Organization (WHO), which declared the outbreak a Public Health Emergency of International Concern (PHEIC). To identify the causative agent, joint efforts were undertaken by multidisciplinary task forces under the organization of the National Health Commission of the People's Republic of China, and a novel coronavirus, named 2019-nCoV by the WHO, was identified for this contagious epidemic (Jian-Wei Wang, 2020). Ren *et al.* (2020) from the Chinese Academy of Medical Sciences, reported that the metagenomic analysis of respiratory tract specimens obtained from five patients suffering from the pneumonia, showed that the virus belongs to the genus *Betacoronavirus*, which differs from that of previously known human coronaviruses.

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Their data showed that the 2019-nCoV viral genomes have about 79% homology to the genome of severe acute respiratory syndrome coronavirus (SARS-CoV), about 52% homology to that of Middle East respiratory syndrome coronavirus (MERS-CoV), and about 87% homology to the genomes of two strains of bat-derived SARS-like coronavirus identified in Zhoushan in 2015. This evidence suggested that the isolated virus was a novel coronavirus; recently, the ICTV suggested that the new coronavirus be named SARS-CoV-2. Further, updates are also available in the article by Guo et al. (2020). Earlier studies have shown that the novel virus shares the angiotensin-converting enzyme 2(ACE2) receptor with SARS-CoV (Imai, 2007); pathogenesis of SARS, ACE2 contributes to lung injury and increases vascular permeability (Wan, 2020). The SARS-CoV-2 is an RNA virus, prone to mutations; distinct viral subspecies have been identified within the hosts. Therefore, it is vital to investigate the biological characteristics and mutation trends of SARS-CoV-2 to assess viral transmissibility and pathogenesis; which is under study in the laboratories of several countries. The development of exact vaccine and medicine, to prevent the spread of COVID-19, and treat the

patients is still in process/progress, therefore, the WHO has suggested several measures to prevent the spread of the disease. The American Association of Naturopathic Physicians has also issued 'Naturopathic Recommendations' for adopting necessary measures (https://naturopathic.org/ page/ Covid19 Resources). Not only that several other countries including India, have released circulars/notices/orders for following necessary guidelines to avoid the spread of SARS-CoV-2. Therefore, it becomes important to combat the tenacity of the SARS-CoV-2, by adopting alternative system of medicines and nutritional approaches also, to protect ourselves by adopting other than allopathic remedies as well as enhancing immunity as the safe guard. The immune system is precisely a system, not a single entity; it is an intricate mechanism which follows the dogma of 'Biogeogens (NirajKumar, 2013). Therefore, it is necessary to correlate the intricacies and interconnectedness of the immune response, which be seen with holistic outlook, to recommend the strategy to counteract the SARS-CoV-2. An integrative approach of utilizing far infrared radiation, homeopathic medicine and nutraceuticals (developed by the authors), has been suggested to prevent spread and viral infectivity ofSARS-CoV-2.

MATERIALS AND METHODS

As stated above, firstly, it is necessary to follow the guidelines issued by the WHO (https://globalhandwashing.org/wp-content/uploads/2020/03/WHO- 2019-NcOV-IPC_WASH-2020.1-eng-5.pdf) and the American Association of Naturopathic Physicians (https://naturopathic.org /page/ Covid19 Resources; Naturopathic Recommendations Regarding the 2019 Novel Coronavirus (2019-nCoV).) to protect ourselves from SARS-CoV-2. Further, three pronged strategy of exposure/administration to the following procedures/medicine could be adopted as the recent approach to combat the disease –Exposure to Far Infrared (FIR) Radiation: SARS-CoV-2 do not replicate outside living cell but may persist on contaminated environmental surfaces and the duration of persistence is affected by temperature and humidity. Contaminated surfaces are known to be significant vectors in the transmission of infections in the hospital setting as well as the community (Chan, 2011). Several other environmental dimensions/factors including daily sunlight, wind velocity and air pressure, has been shown to be associated with SARS epidemic (Yuan, 2006; Cai, 2007).

The dynamics of SARS epidemic involves multiple factors including physical property of virus, outdoor and indoor environments, hygiene, special distribution, social distancing and genetic predisposition of a particular population (Lin, 2006; Chan, 2006); such dimensions play vital role in determining the pathogencity of a said disease, has also been discussed by the authors (Niraj Kumar, K P Sigh and Prasanna K. Ghosh) in the dogma of Biogeogens (Niraj Kumar, 2013). Therefore, understanding the stability of viruses in different temperature and humidity conditions is important in understanding transmission of novel infectious agent; therefore, further literature search enabled authors to propose the novel method of exposure to FIR, based on the methodology developed by En-Jing, Lia, Wei-Hong Huang (En-Jing, 2020). FIR heating fans are commonly used to warm homes in India also, which generate FIR radiation (type of electromagnetic radiation) having heating effect. The FIR wavelength ranges from 5.6 – 1000 μm, which is above those of microwaves and longer than those of visible light (Shui et al., 2015).

FIR is invisible to the human eye (Li et al., 2017). From Planck Distribution curve, the wavelength emitted or absorbed radiations can be calculated at particular temperature. The penetration capacity of any electromagnet wave is determined by skin depth. Formula for skin depth is as given below:

$$\delta = \sqrt{(\pi/\rho f \mu_r \mu_o)}$$

Where ρ = Resistivity of the material**;** f = Test frequency
μ_r = Relative permeability
μ_O = Permeability constant

Further, the relation between power of FIR fan (Watt) and Room size has already been studied (Ali Ahmed Hamza, 2010). Thus, applying the techniques discussed by the earlier authors in aforesaid references (as cited), it was calculated by one of the authors (Pavitra Tandon) that 900 Watt (220-240 V at 50 Hz)fan is sufficient to heat the room of dimension 5x5x4.6 m^3. Therefore, from Planck Distribution curve calculation; and the studies of Ali Ahmed et al. (2010) and Beever, R. et al. (2010) it is established that FIR can penetrate up to about 4 centimeters beneath human skin, to proliferate the human cells and tissues, which makes FIR a promising treatment for cardiovascular malfunction, pain, inflammation, skin itches and some chronic health problems.

FIR radiation induced degradation of RNA but not double strand genomic DNA in airborne microorganisms; after FIR radiation, genomic DNA extracted from airborne microorganisms remained intact, while RNA from airborne microorganisms were degraded in terms of treatment period (En-Jing, 2020). Accordingly, a similar FIR Fan (as used by En-Jing et al., (2020) of 900 wattage (220-240 V & 50 Hz) has been suggested for Indian people/clinics (Fig.1 & 2), with total exposure period of about 2 hrs only for the clinics of about 5x5x4.6 m^3 volume, taking into account the discussions in the research articles of Shui et al. (2015) Li et al. (2017) and Ali et al. (2010) In the IR radiations, only FIR transfers energy purely in the form of heat. The absorbed excessive energy can change the energy levels of RNA molecule and thereby destructing the structure of the virus.

Therefore, such FIR radiation exposure could be significant for RNA degradation of SARS-CoV-2. The practicing clinics in India may adopt and verify the results, as it is cheap, easy and effective method of controlling the spread of virus.

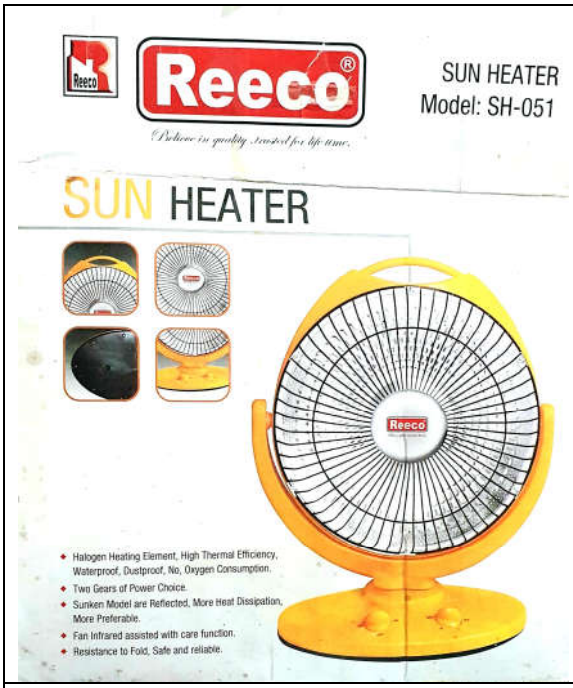
Administration of Homeopathic medicine: It has been discussed by En-Jing *et al.* (2020) that there is a possibility of survival of a few viruses, even after the exposure to FIR radiation; therefore, to ensure complete elimination further, treatment/remedy has been suggested on the basis of extensive research in the field of Homeopathic medicines, and discussion with the local registered practitioners. The exact medicine is Creosote (Beechwood Kreosote; commercial/pharmaceutical/ homeopathic name –Kreosotum 30 CH). Creosote is a category of carbonaceous chemicals formed by the distillation of various tars and pyrolysis of plant-derived material, such as wood or fossil fuel. They are typically used as preservatives or antiseptics (https://en.wikipedia.org/wiki/Creosote.). All types of creosote are composed of phenol derivatives (Fig.3) and share some quantity of monosubstituted phenols (American Pharmaceutical Association, 1985; Allen, Alfred Henry, 1910;

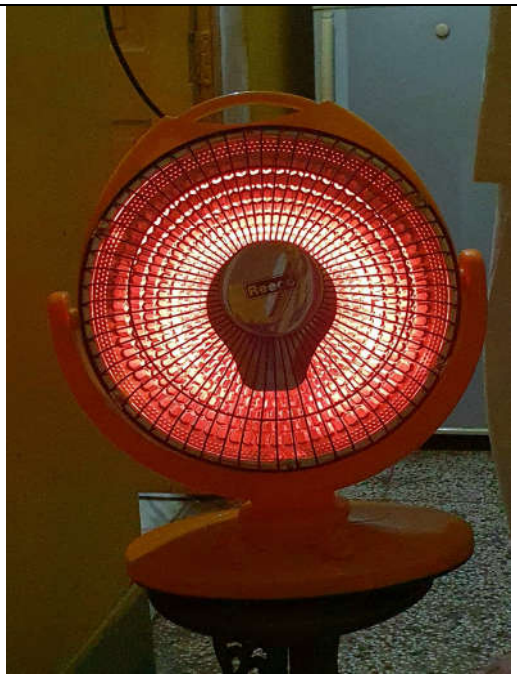
Constituency of distillations of creosote from different woods at different temperatures (https://en.wikipedia.org/wiki/Creosote)

	Beech		Oak	Pine
	200–220°C	200–210°C	200–210°C	200–210°C
Monophenols	39.0 %	39.0 %	55.0 %	40.0%
Guaiacol	19.7 %	26.5 %	14.0 %	20.3%
Creosol and homologs	40.0%	32.1%	31.0%	37.5%
Loss	1.3%	2.4%	. . .	2.2%

Active ingredients (Ogata N. 1995) of Kreosotum 30 CH (Fig.4)

Active Ingredient/Active Moiety		
Ingredient Name	Basis of Strength	Strength
WOOD CREOSOTE (UNII: 3JYG22FD73)		30 [hp_C]
(WOOD CREOSOTE - UNII:3JYG22FD73)	WOOD CREOSOTE	in 30 [hp_C]





Figs 1 & 2: The model of the FIR fan available in the local market of Allahabad, as procured by the main author (Niraj Kumar); the company name (REECO) is only suggestive as a model, to utilize either the same or of others also available in the market.

Fig. 3: Creosote- a by product of wood combustion

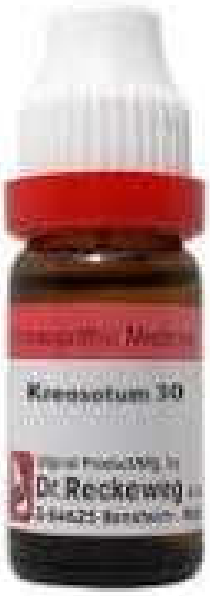
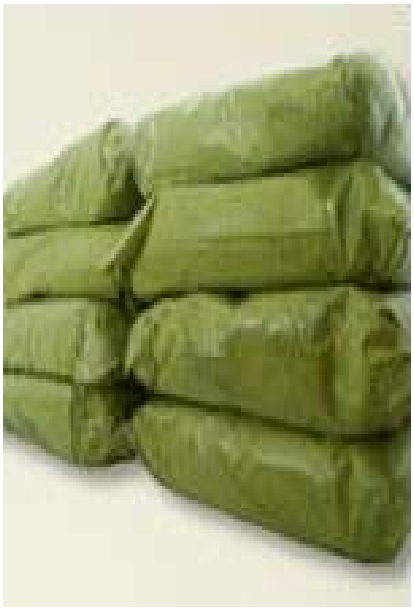


Fig. 4*: Kreosotum Dilution 30 CH

(*Coutesy:https://www.1mg.com/otc/dr.-reckeweg-kreosotum-dilution-30-ch-otc326690)

(The company name (Dr Reckeweg & Co*), is only suggestive as a brand, to utilize either the same or of others also available in the market. The main author (Niraj Kumar) procured the same for display and discussion with the registered practitioners.)

Moringa Powder



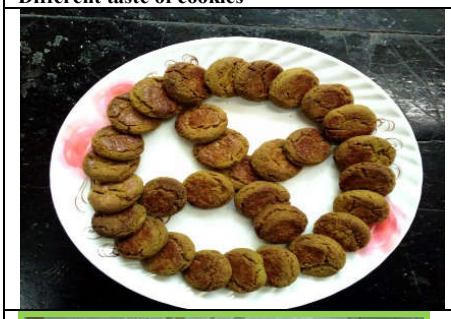
Biochemical analysis of Moringa Leaves powder

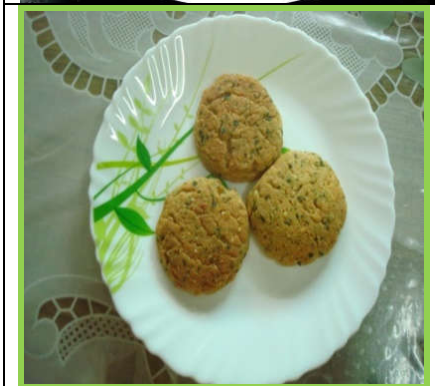
S.No.	Test parameters	Results	Unit
1	Moisture	5.80	g/100g
2	Protein	16.49	g/100g
3	Fat	1.43	g/100g
4	Carbohydrate	49.00	g/100g
5	Energy	270.83	Kcal/100g
6	Crude Fibre	18.56	g/100g
7	Total Phenolic Content	596.72	mgGAE/100g
8	Total Flavond Content	1.23	mg QE/g
9	Antioxidant test	84.66	µmol/g
10	Calcium	1975.31	mg/100g
11	Phosphorus	197.58	mg/100g
12	Iron	10.75	mg/100g
13	Total Ash	9.72	g/100g
14	Vitamin C	88.41	Mg/100g

Fig. 5. Preparation and biochemical properties of Moringa Leaves, as developed in IASc, by Rizvi et.al.

Fig. 6. Development of cookies with Moringa Leaves powder

Different taste of cookies





Biochemical analysis of Biscuit fortified by Moringa Leaves powder

S.No.	Test parameters	Results	Unit
1	Total ash	1.72	g/100g
2	Protein	2.57	g/100g
3	Fat	24.12	g/100g
4	Carbohydrate	63.59	g/100g
5	Energy	481.72	Kcal/100g
6	Crude Fibre	3.75	g/100g
7	Total Phenolic Content	264.162	mgGAE/100g
8	Total Flavond Content	0.27	mg QE/g
9	Antioxidant test	29.78	µmol/g
10	Calcium	800	mg/100g
11	Phosphorus	230	mg/100g
12	Iron	4.25	mg/100g
13	Vitamin C	9.36	g/100g

*Rizvi et.al. 2018

Fig.7: Moringa food products

Moringa Guava Jelly

Moringa Amla Jelly

Biochemical analysis of Red Guava jelly fortified by Moringa leave powder

S.No.	Test parameters	Results	Unit
1	Moisture	15.43	g/100g
2	Protein	6.81	g/100g
3	Fat	0.45	g/100g
4	Carbohydrate	76.66	g/100g
5	Energy	337.93	Kcal/100g
6	Crude Fibre	0.22	g/100g
7	Total Phenolic Content	175.75	mgGAE/100g
8	Total Flavond Content	0.184	mg QE/g
9	Antioxidant test	35.90	µmol/g
10	Calcium	24.23	mg/100g
11	Phosphorus	35.51	mg/100g
12	Iron	0.22	mg/100g
13	Total Ash	0.43	g/100g
14	Vitamin C	75.78	mg/100g

Renard, Adolphe, 1895) as – O-cresol: (CH3)C6H4(OH) M- and p-cresols: (CH3)C6H4(OH) Creosol and homologs: C6H3(CH3)(OH)(OCH3)— Various phenols: C6H5OH— Phenol: C6H5OH Guaiacol: C6H4(OH)(OCH3) . Traditionally, Kreosote was used to treat infertility, kidney and gallbladder stones, rheumatism, arthritis, pain and inflammation. It was also used to reduce the complications of diabetes; and also taken as nutritional supplement. In 1950s creosote bush was used as disinfectant or antiseptic to preserve food and natural fibers (Pankaj, **G**.; Partha, 2001; Satti, 2005). Kreosote and their constituents are being also used for their bactericidal power and expectorant activity (Shifa shaffique, 2018). It's ingredient guaiacol is effectively used in other form (Potassium Guaiacolsulfonate) as allopathic medicine for relieving symptoms of cough and mucus in the chest due to respiratory infections, asthma, colds, or hay fever (https://www.webmd.com/ drugs/2/drug-7958/potassium-guaiacolsulfonate-oral/details). Therefore, on the basis of the above, and discussion with the registered practitioners, it could be recommended that Kreosote is very effective to negate the effect of the virus on respiratory system. If taken regularly (10 drops of mother tincture of Kreosotum 30 CH, twice daily), for a week, along with FIR radiation (at least once daily), the virus would be eliminated completely.

Use of Nutraceuticals: Methodologically, it is important to take into account the interaction of various Population factors, Environmental factors and Cultural factors with each other for determining the pattern and pathogenicity of the disease and its spread in a particular geo-social condition. The two such recent examples of the spread of COVID-19 disease in India is the i) migration of the labours/workers from one state to the other in India (in other parts of the world also), which made them unknown carriers, and ii) distribution of Tablighi fellows in different parts of India carrying the CORONA virus to almost all over India (https://www.nytimes.com/ 2020/04/10/ world/asia/coronavirus- migrants.html; https://www. aljazeera.com/ news/2020/04/tablighi-jamaat-event- india-worst-coronavirus-vector-200407052957511.html). The Tablighi fellows (*Tablighi Jamaat is an Islamic missionary movement that focuses to exhort Muslims and encourage fellow members to return to practicing their religion as it was practised during the lifetime of the Islamic prophet Muhammad*) and migrant workers have not only become the victims of Covid-19, but spreaders, too, creating a new world of risk for a vulnerable population. The majority of both the groups are malnourished, i.e. some are obese (several Tablighi), while others are undernourished or suffering from hidden hunger (migrating workers). To fight the virus, they must be provided balanced and nutritious diet; as a healthy immune system can only defeat invading pathogens. For a developing country like India with so much of population pressure, it is not an easy task. The Institute of Applied Sciences, Allahabad has done extensive research for developing such nutritious but cheap functional food, which could be an ideal food supplement for such malnourished and infected population. These products are tested and verified by the governmental and non-governmental agencies. The method of preparation of such nutraceuticals/functional food has been described in detail, by Rizvi et al (2018). These are mainly developed from the Moringa leaves, amalgamating with seasonal fruits, as guava, amla etc., the pictographic details are given in Fig. 5, 6 & 7. If right dose of such nutraceuticals is given daily to the population, there will be less chance of infection; and better recovery in the infected patients. For an adult male weighing 60 kg or an adult female weighing 55 kg, the prescribed dose is 100 g of these products daily along with the balanced diet for better result (Anees F. Rizvi, 2018).

DISCUSSION

The whole world is badly in the grip of the pandemic COVID-19. Several thousand deaths have been reported so far from different developed and developing countries, like USA, China, Italy, Spain, England, India and so. Indian government is very effectively monitoring the situation with minute-to-minute updates (https://www.mygov.in/covid-19). The guidelines given by the Ministry of AYUSH, Government of India (https://pib.gov.in/ Press Release Page.aspx?PRID=1600895) may also be adopted to ensure better health. The supplements like zinc, selenium, iron, copper, folic acid, and vitamins A, B6, C, D and E, are also beneficial (https://naturopathic. org/page/Covid19Resources), as also confirmed by one of the authors, who is allopathic medical practitioner (B P Agarwal). On the basis of ethno-botanical medicinal evidences, one of the authors (D K Chauhan) has also suggested that boiling water with a pinch (about .005 g) of clove, turmeric, black pepper, garlic, ginger, and a drop of coriander oil, may be taken as morning tea, as it could be protective and preventive against the viruses. But unfortunately, as no exact medicine or vaccine has been developed so far, therefore, in the light of such precarious situation and rapidly spreading pandemic, it is the need of hour to adopt an integrative and innovative approach to combat this dreaded disease, therefore, the above methods/strategies could be adopted, as it is cheap, easy to adopt and could be effective on the ground of the research done as well as the references cited in the aforesaid text.

Conclusion

WHO is also regularly updating the whole world, as well as trying its best to evolve some concrete strategy/medicine/vaccine, therefore, it would be nice if the aforesaid methods, as described in this paper could be tried, as these are totally harmless with no side effect, if administered cautiously and carefully.

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