International Journal of Pharmaceutical Research and Applications
Volume 8, Issue 4 July-Aug 2023, pp: 2070-2084 www.ijprajournal.com ISSN: 2249-7781

Potentiation of Siddha medicine using Muppu (Universal Potentiator)

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Submitted: 15-08-2023 Accepted: 25-08-2023

ABSTRACT: Within every therapeutic system, medicine potentiation research is now dynamic and also an urgent need. At present in allopathic system, medicine potentiation is achieved by synergistics and additives, but these strategies are uneconomical and not without adverse effects. We filled up an atomizer with aqueous form of Muppu which on pressure emits 2-6 µm mid-infrared (mid-IR). This sprayer is called Mid-InfraRed Generating Atomizer (MIRGA). The generated mid-infrared was applied to packaged myrobalan (Terminalia chebula) powder samples. Later, the samples were subjected to clinical trials, which demonstrated the enhanced myrobalan inherent potency and dose reduction. The physico-chemical and configurational changes caused by 2-6µm mid-IR on myrobalan were demonstrated with different modern instrumentations and sensory expert panel tests. This experiment will pave way for the enhancement of Siddha medicines potency using Muppu.

KEYWORDS: 2-6 µm mid-IR, dose, health issues, economy, MIRGA, potentiation, reduction, Terminalia chebula

I. INTRODUCTION

Siddha – an ancient and traditional system of medicine – is still significantly practiced in India. To cope with the increasing virulence of diseases, unlike in allopathy, Siddha system is devoid of improvement to effectively tackle such modern capacitated diseases. This study focuses on a trial to potentiate a Siddha drug – Terminalia chebula (Myrobalan/ King of Medicine/ Wonder herb), which is native to India. It has vast use in Indian traditional medicine systems and has medicinal properties like antimicrobial, anti-inflammatory, antioxidant, antimutagenic, antidiabetic, hepatoprotective, cardioprotective, antiarthritic, and wound healing activity[1]. In recent years the extracts of myrobalan finds its use in nanoparticle assisted therapy [2]. Having said these properties, myrobalan is one among the plants of high commercial demand [3]. The purpose of the study is to potentiate myrobalan using 2-6 µm mid-infrared (mid-IR) – an Aqueous form of Muppu - in order to reduce its dose requirement by which utilization of natural resources with cost reduction, without side effects and with reduced host stress can be achieved.

II. MATERIAL AND METHOD

MIRGA (patent no.: 401387) (Fig 1) is a 20-mL capacity polypropylene plastic atomizer containing an inorganic (molar mass 118.44 g/mole) water-based Muppu solution in which approximately two sextillion cations and three sextillion anions are contained. The sprayer unit has dimensions 86 × 55 × 11 mm, an orifice diameter of 0.375 mm, ejection volume 0.062 $\pm$ 0.005 mL, and ejection time 0.2 s. The average pressure is 3900 Pa, and the cone liquid back pressure is 2000 N/m^2. During spraying, approximately 1-µg weight of water is lost as mist and the non-volatile material in the sprayed liquid has a concentration of 153 mg/mL. Every time spraying emits 0.06ml which contains approximately seven quintillion cations and eleven quintillion anions. The Muppu was prepared as described in Agasthiar Paripooranam 400[4] and Pulippani Vaithiyam-500[5]. Depending on the pressure applied to the plunger, every spraying is designed to generate 2–6 µm as estimated by an FTIR (retro-reflector) interferometer instrument (Detector type D* [cm HZ1/2 - 1] MCT [2-TE cooled]) at Lightwind, Petaluma, CA, USA.

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Volume 8, Issue 4 July-Aug 2023, pp: 2070-2084 www.ijprajournal.com ISSN: 2249-7781

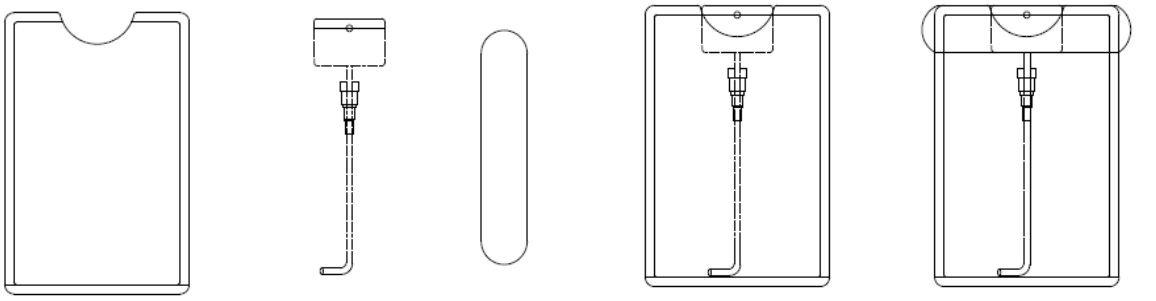

Fig 1: MIRGA spray diagram

Table 1: Clinical and sensory attribute trial details

Batch number	No. Of MIRGA sprayings	Hedonic point (sensory attributes)	Dose (BID) gms	No. of patients employed	No. of completely cured patients within 5 days	Recovery rate within 5 days	Minimum days required for complete cure
Control	Non-sprayed	5	3	10	6	60%	3
1	1	6	2.7	10	6	60%	4
2	2	8	2.43	10	8	80%	2
3	3	8	2.18	10	5	50%	4
4	4	7	1.96	10	6	60%	4
5	5	7	1.76	10	2	20%	5
6	6	4	1.58	10	3	30%	4
7	7	2	1.42	10	3	30%	4
8	8	2	1.27	10	3	30%	5
9	9	2	1.14	10	3	30%	5

Instrumentation results (raw data in Supplementary instrumentations file I1)
Raw data files of instrumentations: https://drive.google.com/open?id=1vyIoDjwrTCG9NKrMWukwSLAHzglxD5mt

GC-MS

Control: Within the detection and noise limits, this sample shows one peak at 16.79 min.

2 sprayed sample: Distinct from the GCMS profile of the control sample. In addition to the peak at 16.79 min, the GCMS profile of this sample shows key peaks at these retention times (min): 2.6, 5.1, 4.0, 6.0, 7.9, 14.8, 16.8, 18.3, 19.3, 20.8, and 21.6. These major differences are assigned to the reduced astringency of the 2 sprayed sample relative to the control sample.

8 sprayed sample: Unique compared to the control and to the 2 sprayed samples GCMS data. In addition to the peak at 16.79 min, there are key peaks at 14.8 min, ~18.2 min, ~19.2 min, and 20.8 min. These differences in the 8 sprayed GCMS patter are ascribed to the increased astringency and bitterness of the sample compared to the control sample.

12 sprayed sample: Shows key peaks at ~5.2 min, ~11 min, ~11.2 min, ~11.8 min, 16.79 min, and 18.4 min. This profile is distinct from the control and 2 and 8 sprayed samples which suggests changes in the composition of the sample greatly reduce the astringency and bitterness of the 12 sprayed sample relative to the control.

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The control sample contains mostly the solvent DMSO and 5-Isopropyl-2-methylphenoxy) trimethylsilane. In 2 sprayed sample, there was appearance of Silane Diethyl Octadecyloxy (2-methoxyethoxy) peak while 8 and 12 sprayed samples have shown 6-Nitro-1H-quinazoline-2,4-dione and Acetamide, N-[4-(trimethylsilyl) phenyl] peaks respectively. Additionally, 8 sprayed sample shows 1,4-Bis(trimethylsilyl) benzene and 12 sprayed sample shows the peak of hexamethyl Cyclotrisiloxane which was not present in control and 2 sprayed samples. The transformation of compounds could be responsible for corresponding changes in sensory attributes[9], potentiation and clinical dose. (Fig 2) (Table 2)

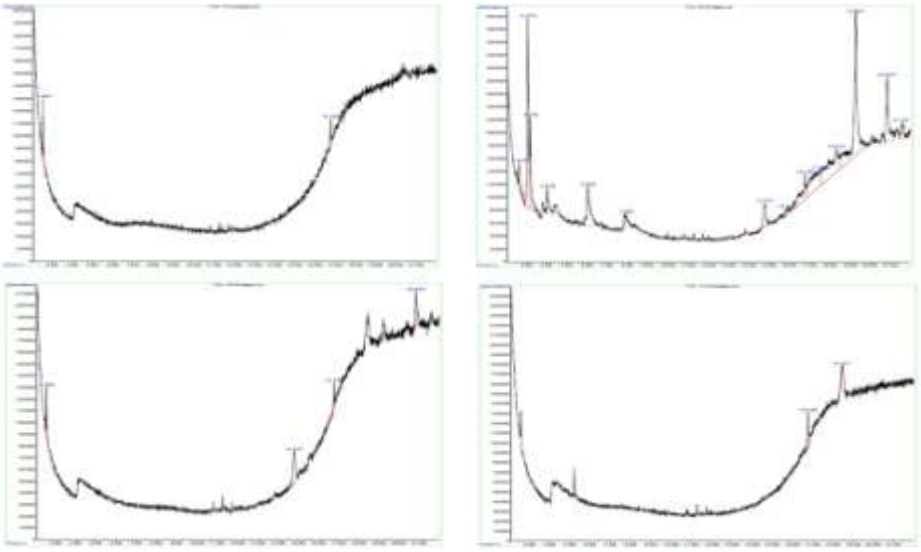

Fig 2: GCMS spectra of Terminalia chebula

Table 2: GC-MS analysis of Terminalia powder samples

R.T. (Min)	Name of Compound	% Area Presence in Sample				
		Control	2 sprayed	8 sprayed	12 sprayed	Remarks
2.569	Dimethyl Sulfoxide	49.15	2.19	12.71	0.0	
3.070	Hydrazine, 2-propenyl-	0.0	13.09	0.0	0.0	
3.193	2,3,1-Benzodiazaborine, 1,2-dihydro-1-methyl-	0.0	6.45	0.0	0.0	
6.039	2-Deoxy-D-galactose	0.0	7.06	0.	0.0	
14.823	6-Nitro-1H-quinazoline-2,4-dione	0.0	0.0	51.06	0.0	Most abundant Peak in 8 sprayed sample
16.790	Acetamide, N-[4-(trimethylsilyl)phenyl]-	0.0	0.0	0.0	94.06	Most abundant peak in 12 sprayed sample

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16.790	1,4-Bis(trimethylsilyl)benzene	0.0	5.87	0.0	0.0	
16.790	Trimethyl[4-(2-methyl-4-oxo-2-pentyl)phenoxy]silane	0.0	0.0	6.80	0.0	
16.790	(5-Isopropyl-2-methylphenoxy)trimethylsilane	50.85	0.0	0.0	0.0	Most abundant peak in control
17.546	2,4,6-Cycloheptatrien-1-one, 3,5-bis-trimethylsilyl-	0.0	9.27	0.0	0.0	
18.340	1,2-Bis(trimethylsilyl)benzene	0.0	12.70	0.0	0.0	
18.445	Cyclotrisiloxane, hexamethyl-	0.0	0.0	0.0	5.94	
19.295	Silane, diethyloctadecyloxy (2-methoxyethoxy)-	0.0	25.97	0.0	0.0	Most abundant peak in 2 sprayed sample
20.846	Tris(tert-butyldimethylsilyloxy)arsane	0.0	8.85	0.0	0.0	
20.846	1,4-Bis(trimethylsilyl)benzene	0.0	0.00	29.44	0.0	Most abundant Peak in 8 sprayed sample

FTIR

Average Transmission Response in All Samples: The average transmission signal raises by 4.55% as the sample undergoes less number of sprayings, but it drops again by 1.01% and 2.31% in the 8 sprayed and 12 sprayed samples with respect to the control signal. Therefore, the overall absorption by the sprayed samples in the mid-infrared spectrum is a mix and complex behaviour depending on the number of spraying.

Control: The spectral peaks at 2360 cm^{-1} and 3200-3600 cm^{-1}, seen amongst others in the functional group region, are respectively associated with the stretching vibrations of C=C and O-H[10] in terminalia powder.

2 sprayed sample: There is no significant change in the fingerprint region compared to the control sample. In the functional group region however, in addition to a shift in the background signal, the C=C peak at 2360 cm^{-1} raises by about 2.5%. Conversely, the O-H stretching vibration at 3200-3600 cm^{-1}, drops by about 2%.

8 sprayed sample: There is no significant change in the fingerprint region compared to the control and 2 sprayed samples. In the functional group region however, in addition to a shift in the background signal, the C=C peak at 2360 cm^{-1} nearly disappears. On the other hand, the O-H stretching vibration at 3200-3600 cm^{-1} increases such that it is around 4% higher than the control sample.

12 sprayed sample: There is no significant change in the fingerprint region compared to the control, 2 sprayed and 8 sprayed samples. In the functional group region however, in addition to a shift in the background signal, the C=C peak at 2360 cm^{-1} shifts from absorption behavior to transmission behavior, indicating a complex response of the C=C bond to the sample spraying process. Similar to the 2 sprayed sample, the O-H stretching vibration at 3200-3600 cm^{-1} drops again by around 2% compared to the control sample.

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The observed changes in the O-H stretching vibration, as well as the complex behaviour of the C=C bond at 2360 cm^{-1}[17], may be interpreted as to the 2 sprayed sample being more favorable than the control sample, and the 8 sprayed and 12 sprayed samples being less favourable. (Fig 3)

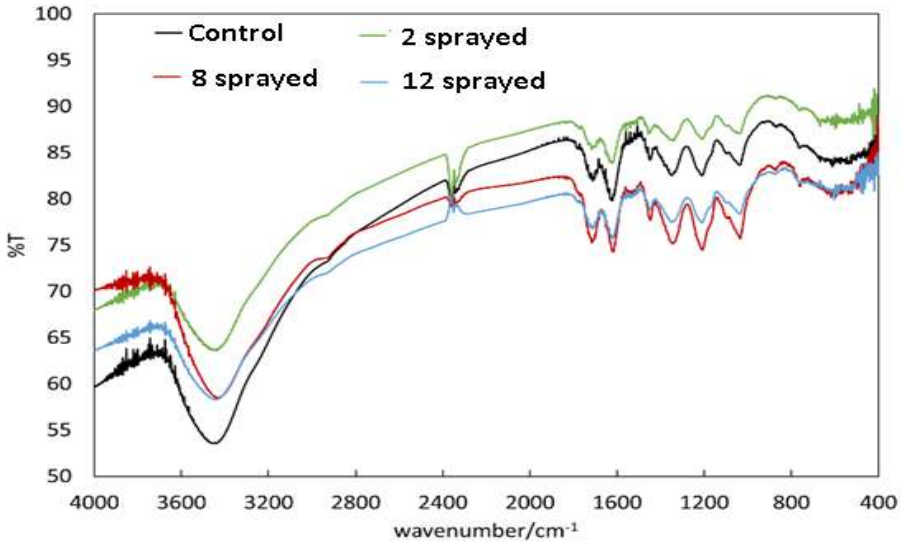

Fig 3: FTIR spectra of Terminalia chebula

PXRD

Patterns of treated samples agree with control sample and correspond to mainly amorphous materials, with smooth and broader diffraction peaks at 2θ: 15.22; 17.15; 22.30 and 36.69.

The areas under the peak in the range of 10^{o} to 38^{o} and the subsequent calculations for the purity of the product are as follows.

The result shows a slight increase in crystallinity of the sprayed powders. 2 sprayed and 12 sprayed samples increased crystallinity by 8%. 8 sprayed sample has a increase by 6%. (Fig 4) (Table 3)

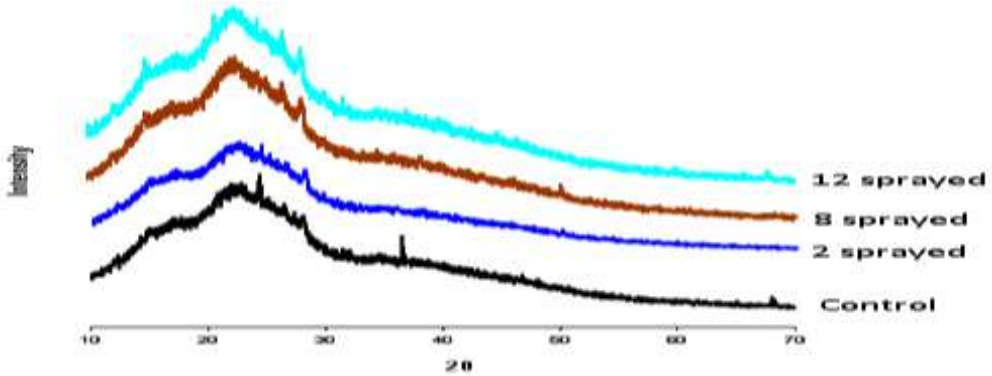

Fig 4: PXRD of Terminalia chebula

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Table 3: PXRD analysis of Terminalia chebula powder

Percentage analysis of the change in Terminalia powder				
	Control	**2 sprayed**	**8 sprayed**	**12 sprayed**
Peak at	10.0 -38.0	10.0 -38.0	10.0 -38.0	10.0 -38.0
Area	6918819	7449248	7303245	7464181
Change in area	0	530429,7	384426,5	545363
Fraction change in area	0	0,076665	0,055562	0,078823
Percentage change	0	7,7	5,6	7,9

HR-TEM

Diffraction patterns: Crystalline structure is only showed by control sample; the pattern shows bright dots overlapped to diffuse concentric areas. This type of pattern indicates that crystallites are in small number and have random orientation, suggesting thus a polycrystalline arrangement. Minimum three different phases are identified. From measurements in reciprocal unit of lattice distance (1/nm), the corresponding interplanar lattice distances are (in real space), roughly: 0.17, 0.21 and 0.34 nm. Differently from the control, both the 2 and 8 sprayed samples do not show point diffraction diagrams, indicating that the crystalline structure is lost. Thus MIRGA sprayings has affected the atomic arrangement of the original sample.

Bright-field images of control sample amorphous-shaped aggregates ranging 1 – 2 µm and semi-spherical nanoparticles ranging 10 – 50 nm. Crystallites appear random oriented. Bands of lattice fringes are visible due to phase contrast. Interplanar distances obtained by the bands of fringes (measured by Plot Profiles data obtained by Image J – FiJ software) are 0.74 and 1.1 nm. These distances are not in agreement with those measured on the diffraction pattern of control sample.

In 2 sprayed sample, spherical particles are numerous of diameter ranging 0.5 – 5 µm; these particles are not observed in the control. Small spherical particles are observed either individually, or in cluster. Materials forming these particles are distributed asymmetrically within particles, being more concentrated in the peripheral portion. Similarly to control, dark nanoparticles are observed within comparable size interval (30 – 50 nm). Nanoparticles are included in the structure of aggregates that, differently from control, show larger sizes (5 – 10 µm).

In 8 sprayed sample, spherical particles like those observed in the 2 sprayed sample are still visible. Similarly to control, dark nanoparticles are observed with comparable size interval (30–50 nm). Nanoparticles are included in the structure of aggregates that show larger sizes (50 – 100 µm) than both control and 2 sprayed samples. However, clusters of smaller nanoparticles ranging 10–100 nm are also observed. Internal structures (mass distribution) of large aggregates appear less compact (more fragmented) than in control and 2 sprayed samples.

In 12 sprayed sample, spherical particles are still visible but show smaller size (diameter 100–500 nm) than in 2 and 8 sprayed samples. Differently from control, dark nanoparticles are not observed. Bright fiber-like particles are observed. Length of these particles is below 1 µm. Amorphous-shaped aggregates ranging 0.1 – 1 µm are present; however their size is far lower than in other samples. Their structure appears internally 'broken' and fragmented by the presence of a large number of holes – a peculiar consequence of 12 times sprayings.

The above comparative data confirms that the sprayings has altered the sample structure with respect to the control. (Fig 5) [12]

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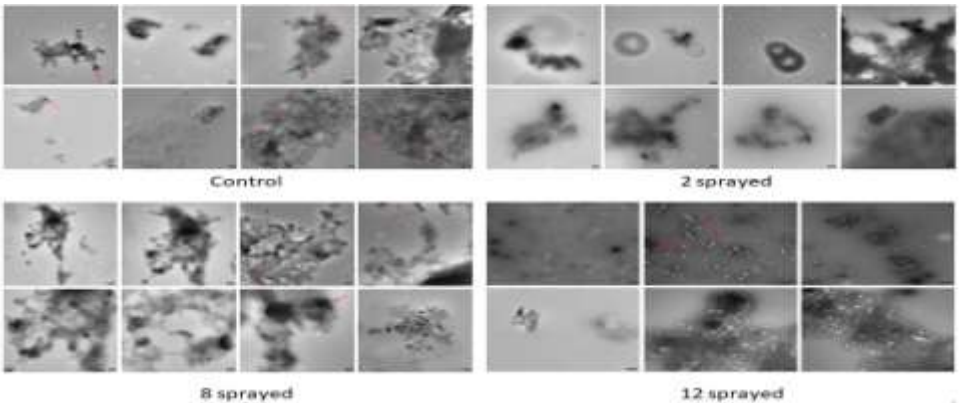

Fig 5: TEM Bright field images of Terminalia chebula

Proton NMR

The monosubstituted alkane–phenyl at 1.254 ppm is well isolated and has the same integral value in (control) and (2 sprayed) and (8 sprayed) and (12 sprayed), this peak is used as a reference to normalize the integral values in all the four data sets. The monosubstituted alkane –OH (1.566 ppm),the substituted alkanes –O–C (2.040 ppm),the monosubstituted alkane –CH2 (2.095 ppm), the monosubstituted alkane –COCH3 (2.171 ppm) and the substituted ethylene (5.348 ppm) have their lowest peak integral value in 8 sprayed sample compared to the control, 2 sprayed and 12 sprayed samples. These behaviors may be interpreted as to the 2 sprayed sample being more favorable than the control, the 8 sprayed and the 12 sprayed samples. Thus the 2 times sprayed myrobalan powder was made more effective through 2-6 µm mid-IR. (Fig 6; supplementary figures F2, F3) (Table 4)

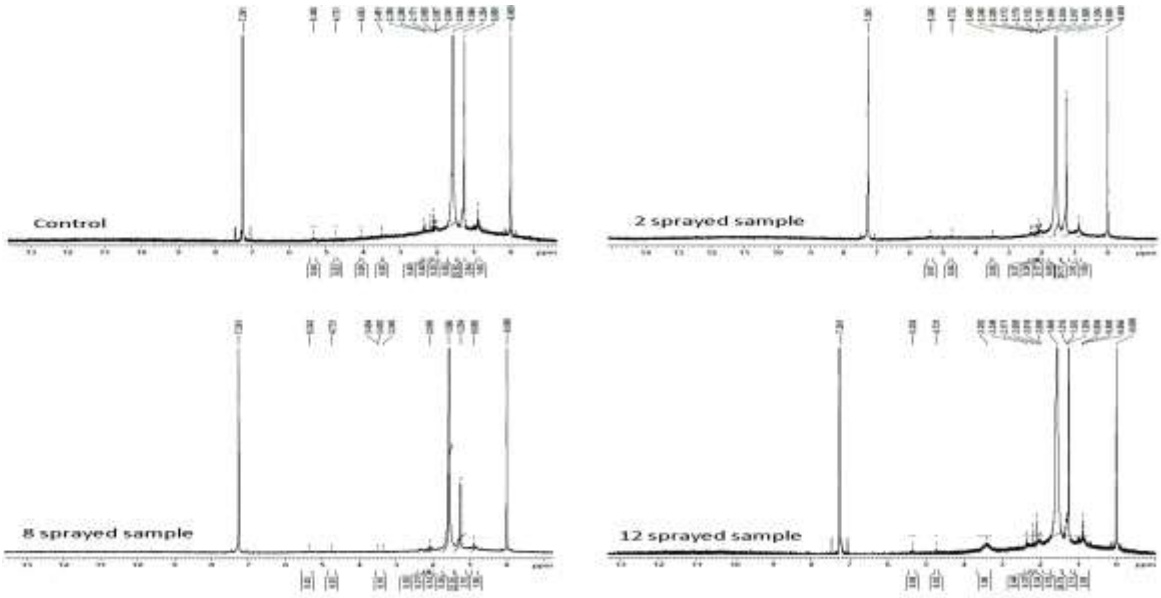

Fig 6: Proton NMR of Terminalia chebula

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Table 4: H-NMR spectra analysis of Terminalia chebula

Chemical Description		Shift	Control			2 sprayed sample			8 sprayed sample			12 sprayed sample		
			CS	PI	NPI	CS	PI	NPI	CS	PI	NPI	CS	PI	NPI
Fatty acid	CH3	Alkyl group - Ethyl	0.880	1	0.35	0.880	1	0.26	0.880	1	0.27	0.880	2.05	0.66
Monosubstituted Alkanes	– phenyl	Alkyl group - 2-Propyl	1.254	2.84	1.00	1.254	3.91	1.00	1.254	3.75	1.00	1.254	3.11	1.00
Monosubstituted Alkanes	–OH	Alkyl group - n-Butyl	1.566	25.55	9.00	1.568	29.77	7.61	1.566	22.38	5.97	1.565	24.78	7.97
Substituted Alkanes	–O–C	Alkenes	2.040	0.55	0.19	2.034	0.65	0.17	2.034	0.36	0.10	2.018	0.78	0.25
Monosubstituted Alkanes	–CH2	Alkyl group - Ethyl	2.095	0.38	0.13	2.095	0.17	0.04	2.095	0.14	0.04	2.095	0.34	0.11
Monosubstituted Alkanes	– COCH3	Alkyl group - Methyl	2.171	0.48	0.17	2.173	0.24	0.06	2.173	0.21	0.06	2.171	0.33	0.11
Monosubstituted Alkanes	– COOH	Alkyl group - 2-Propyl	2.350	0.4	0.14	2.348	0.37	0.09	2.348	0.36	0.10	2.349	0.44	0.14
Monosubstituted Alkanes	–OH	Alkyl group - Methyl	3.491	0.08	0.03	3.495	0.05	0.01	3.494	0.18	0.05	3.392	1	0.32
Monosubstituted Ethylenes	–O– phenyl	Alkenes	4.731	0.03	0.01	4.732	0.04	0.01	4.731	0.03	0.01	4.731	0.03	0.01
Substituted Ethylenes		Alkenes	5.348	0.04	0.01	5.348	0.07	0.02	5.342	0.03	0.01	5.352	0.05	0.02

CS - Chemical Shift (ppm); **PI** - Peak Integral; **NPI** - Normalized Peak Integral

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Volume 8, Issue 4 July-Aug 2023, pp: 2070-2084 www.ijprajournal.com ISSN: 2249-7781

Compared with control data, all the instrumentation data illustrated that, MIRGA depending on number of sprayings has altered the chemical bonds, thereby structure, which influenced the inherent characters of myrobalan.

III. DISCUSSION

Invention background, definition, technique of mid-IR generation from MIRGA, toxicological study on MIRGA, safety of the MIRGA sprayed usables and primeval and future scope of MIRGA have been also described by Umakanthan et al., 2022a[13].

Invention background

The four observable states of matter (solid, liquid, gas, and plasma) are composed of intermolecular and intramolecular bonds. The inherent characteristics of neutrons, protons and electrons are unique, however, differences in their numbers are what constitute different atoms, and how these atoms bind together develops into different molecules with unique characteristics. In the electromagnetic wave (EMW) spectrum, the mid-IR region is vital and interesting for many applications since this region coincides with the internal vibration of most molecule[14]. Almost all thermal radiation on the surface of the Earth lies in the mid-IR region, indeed, 66% of the Sun's energy we receive is infrared[15] and is absorbed and radiated by all particles on the Earth. At the molecular level, the interaction of mid-IR wavelength energy elicits rotational and vibrational modes (from about 4500–500 cm^{-1}, roughly 2.2 to 20 microns) through a change in the dipole movement, leading to chemical bond alterations[16].

During our research we observed: **(A)** In all objects, even though atoms always remain as atoms their chemical bond parameters are continuously prone to alteration by cosmic and physical energies (eg: EMW, heat, pressure, humidity) causing the bonds compression/stretching/bending[17-20], breaking[21,22] and new bond formation[23]. These alterations ultimately lead to the change in the physicochemical characters of the objects. **(B)** The dynamic, constant, mutual influences of EMW among earth, celestials and living bodies are continuously causing alterations in the inherent physiochemical characters of earthly objects, like enhancement due to optimum dose of energy or decrease/ destruction due to more dose of energy (detailed below). Thus based on these concepts, the MIRGA was developed to alter bond parameters thereby potentiate any usables' natural characters.

MIRGA definition

We define MIRGA as 'a harmless, economical atomizer containing an imbalanced ratio of ions suspended in water, which influence the natural potency of target substances by generating mid-IR while spraying'.

Technique of mid-IR generation from MIRGA

We designed MIRGA as to accommodate an imbalanced ratio of ions suspended in water in their fundamental state and can move as free particles. The solution has very little background frequency of detectable disintegration which is less than that of cosmic events whereas even humans have more radioactivity (around 10 microns)[24,25]. We designed MIRGA to generate energy based on various below given processes like, **(A)** spraying leads to ionization (electron getting separated from atom) and the pathway for electron re-absorption are also many, due to these two oscillatory processes energy generated. **(B)** while spraying, water-based ionic solution gets excited/charged, which in turn leads to oscillation among the imbalanced ions[26] in their excited state, resulting in the emission of photons[27,28]. **(C)** Though low electromagnetic field exists between charged particles of the MIRGA's ionic solution, during spraying the induced oscillation between these charged particles produces energy[29-32]. **(D)** Also, in the natural rainfall process, more energy is required to break water bonds for creating smaller water droplets from the clouds[33]. Therefore, these droplets should have more stored energy and then travels down at a velocity from a specific distance thus gaining also a kinetic energy. When the rain hits the earth's surface, it forms a very thin film of mid-IR (nearly 6 micron), hence there is a net heat gain[33,34]. We simulated this rainfall's energy gaining process also in MIRGA i.e., when imbalanced ions in liquid media are atomized, the ejected smaller droplets should have higher internal energy as well as an acquired kinetic energy and the energy emitted by breaking the surface tension. From trial and experience, we calibrated an ejection pressure to obtain a desired fine mist, and minimized the evaporation rate by altering the pH and density of the

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Volume 8, Issue 4 July-Aug 2023, pp: 2070-2084 www.ijprajournal.com ISSN: 2249-7781

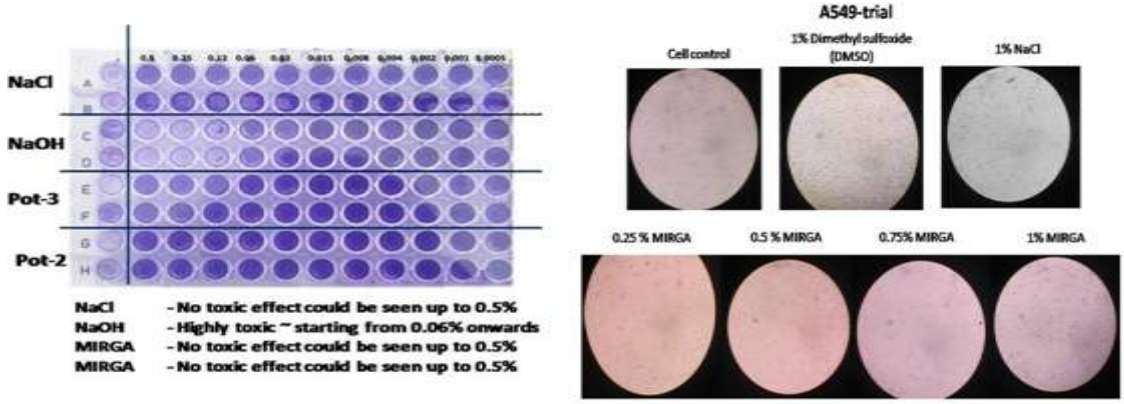
solution. Also considering other facts like, the accelerated ions in the sprayed ionic clouds collide among them and generate energy[35], we incorporated those phenomena in our atomizer and designed in such a way to emit energy in the 2-6 µm mid-IR range.

Action of MIRGA emitted 2-6 µm mid IR on Myrobalan

The MIRGA's effect on Myrobalan was found to be O-H and C=C stretching/ disappearance and also chemical transformation which lead to the potentiation. The thermal mid-infrared wavelength is a range in infrared spectrum which elicits its action on chemical bonds[36,37]. Naturally, the radiant of sun contains 66% of infrared[12]. Thus mid-IR is a safe and able to penetrate natural and anthropogenic intervening media[38,39]. All biomolecules continuously vibrate and generate electromagnetic wave and active in mid-IR region[40]. The photon influence the vibrational modes through dipole movement, thereby bond's stretching, disappearing and formation of new molecules occurrence[41-44]. These changes effect many process causing myrobalan's physicochemical character alterations[45,46] in favour to us, depending on the quantity of mid-IR applied, which move the vibration from lower ground state to higher state[16]. The inorganic compounds used in the generation of MIR are a perspective for biomedical applications[47,48]. It is also a new synthesis method for preparation of functional material (2-6 µm mid-IR) [49,50]. It is well known that the combination of different compounds, which have excellent electronic properties, leads to new composite materials, which have earned great technological interest in recent years[51,52].
Depending on number of MIRGA spraying (energy given), a receptor's chemical bond configurations and subsequent physical and chemical characters can be altered to our desire. This has been achieved in coffee, tea, cocoa and edible salts using MIRGA spraying by Umakanthan 2022a, 2022b, 2023[13,53,54].

Toxicological study on MIRGA

Even though, MIRGA generates the safe 2-6 µm mid-IR energy, and moreover spraying is done 0.25–0.50 meter externally right away to packaged consumables, we also wanted to study the MIRGA's toxicity effect by cytotoxicity assay. In-vitro Vero, A549 and Human dermal fibroblast cells study proved that MIRGA sprayed mist was non-toxic in any way (Fig 7).



a) Trial with Toxicity assay of MIRGA at various concentrations

b) Trial with A549 cells

Fig 7: MIRGA's toxicological studies

Field studies also showed that, MIRGA spray is eco-friendly, non-toxic, non-irritant to soft tissues such as cornea, safe to infants even if sprayed directly, needs no skill but easy to handle (like perfume body spray), and highly economical (USD 0.30 per MIRGA unit which emits 300 sprayings)

Safety of MIRGA-sprayed products

In our nearly two-decades of research, we observed MIRGA induced bond altered target substances had not shown any adverse reaction upon consumption/use. As a comparison, to assure the

International Journal of Pharmaceutical Research and Applications
Volume 8, Issue 4 July-Aug 2023, pp: 2070-2084 www.ijprajournal.com ISSN: 2249-7781

safety of the bond altered targets' millennium long consumption by human/ living kinds; we submit that in nature, **(A)** Stereochemical configuration has great influence on taste[55] e.g. variety of mango, grapes, rice, etc., **(B)** Cooking and digestive enzymes break chemical bonds thereby soften our edibles. And, as an example; raw rice on water-boiling to boiled rice; rice on raw heat to puffed rice; rice on boiling and drying to flat rice; rice on pressure to rice flour[56,57], each by-product has its unique aroma, taste, texture and shelf life but with same molecular formula $C_6H_{10}O_5$), **(C)** In food industry, sensory attributes and shelf-life are enhanced by altering the food's chemical bonds using various irradiation processes like, radappertization, radicidation, raduriaztion[58], **(D)** On heating, ice to water to steam manifestations are due to changes in the hydrogen bonding, where steam has negligible hydrogen bonding[59] but chemical composition (H_2O) remains the same[60].

Past interests

Our in vitro and clinical studies showed that the MIRGA's chemical formulation, therapeutic effect, and outcomes were significantly similar to that of 'The Superior Medicine' of various ancient medicinal systems such as 'Muppu' (Tamil Siddha), 'Al-Kimiya' (Arabic), 'Rasayana' (Indian Ayurveda), 'Rasavatan' (Persian), Materia prima, Philosopher's stone, Tincture (Europe) and Taoist alchemy, Hudan, or Jindan (Chinese). Also, hand healing therapy using body-generated infrared is similar to MIRGA spraying. Moreover, we witnessed, the sages and saints (now living in remote parts of the Indian mountains) used to sprinkle holy water on the patients to cure diseases. This involves the mid-IR radiation generated by their palms and body which is transferred to the patients. The superior medicine of Siddha system – Muppu – found to have acted as the Universal Potentiator.

MIRGA's primeval and future scope

The water-based MIRGA could be the first novel potentiating technology. This type of atomizer technology also seems to be present with the extra-terrestrials for their therapeutic use during visitations[61].

In various products, we have achieved a range from 30% to 173% potentiation. Even the smaller improvement resulted in 30% monetary and resource savings as well as health benefits. However, there is a knowledge gap between potentiation from 30% to at least 100% for all products, which can be filled-up by refining MIRGA's ionic solution, concentration, atomizer pressure, and other parameters and even formulating a better solution.

Using Muppu, we conducted experiments which resulted in resource savings with edible oils, vegetables, fruits, food, coffee, tea, alcohol, tobacco, cocoa, edible salts, sugar, herbal, cement, spices, chemicals, pharmaceuticals, dairy products, liquid and gaseous fuels, and vaccine. Human and veterinary disease therapy and were included in these studies, and the results are promising. The laboratory analysis of these substances revealed the altered chemical bonds, configuration and chemical compound transformation. In foodstuffs, detoxification of agrochemical residues resulted as well as enhancement of sensory attributes and shelflife. These results are being separately submitted for publication. The individual results are about to be published.

Three types of Muppu (Vaithiya, Vadha and Gnana muppu) are available. These have wide range of applications, we believe that this technique will resonate in many scientific fields including biophotonics, therapeutics, health, ecology, and others. We are currently conducting research on Muppu and its applications with various manifestations viz., Muppu salt, Muppu vapor and Muppu plasma[13,53,54].

IV. CONCLUSION

2-6 µm mid-infrared generated by Muppu spraying enhanced the potency of myrobalan medicine, thereby reducing the clinical dose and the course of treatment, in addition to reducing the costs and the resources required for treatment. The increased use of MIRGA will lead to new solutions to various existing medicines and therapeutic problems, especially with respect to dose quantity and potency. Future research by altering MIRGA formulation/ specification will have every chance to enhance potentiation of other Siddha medicines also.

ACKNOWLEDGMENT

Authors thank multi-Faculty scientists of different labs, institutions, universities, etc., around the world for their technical guidance and help; also thank Dr.George Tranter, Chiralabs Ltd., Begbroke Centre for Innovation & Enterprise, Oxfordshire, UK; Dr.Jan IC Vermaak, Manager of Engineering,

Nuclear Science Center - Texas A&M University, USA; Dr.TakashiroAkitsu, Professor, Department of Chemistry, Faculty of Science, Tokyo University of Science, Japan; Dr.Kam-Hung Low, X-ray Facility manager, Department of Chemistry, The University of Hong Kong; Ms. Satitaphorn Sriphuttha, Tokyo University of Science, Japan; Ms.Shiho Murakami, Mr.Kanai and other Spectroscope specialists of Hitachi High-Tech, Japan; Mr. Gary Powell, Lightwind corporation, Petaluma, California, USA; Dr. Senthil Kumar Rajendran, Cell Biology, Biosciences, ÅboAkademi Univesity, Finland; Dr. Ramakrishnan, Head, Indian Veterinary Research Institute, Mukteshwar, India; Dr. R Prabhakaran, Assistant Professor, Department of Chemistry, Bharathiar University, Coimbatore, India; Prof. Dr. HalukYucel, Institute of Nuclear Sciences of Ankara University, Tandogan Yerleskesi, 06100, Ankara, Turkey; Dr.Anuradha Das, NISER, Bhubaneshwar; Mr.Akram Hebaish, Analytical Development Scientist, Australia; Dr. Rajeshkumar Vadgama, Research Scientist, Institute of Chemical Technology, India; Dr.Morteza Erfani, Ray Technology, UK; and other Kolabtree experts; Volunteers, alcohol specialists, Bar owners, medicos, lab technicians of various states of India; All financiers who funded this research for nearly 2 decades; And we would also like to apologize to all scientists and other helpers around the world who are not cited here now.

COMPETING INTEREST

In accordance with the journal's policy and our ethical obligation as researchers, we submit that the authors Dr.Umakanthan and Dr.Madhu Mathi are the inventors and patentee of Indian patent for MIRGA (granted-patent no.: 401387) which is a major material employed in this study.

DATA AND MATERIALS AVAILABILITY

All data is available in the manuscript and supplementary materials.

FUNDING

The authors received no specific funding for this research.

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