



Impact of Consciousness Energy Healing Treatment (The Trivedi Effect[®]) on Physical, Spectroscopic, and Thermal Properties of *Withania somnifera* (Ashwagandha) Root Extract

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To cite this article:

Mahendra Kumar Trivedi, Alice Branton, Dahryn Trivedi, Gopal Nayak, Aileen Carol Lee, Aksana Hancharuk, Carola Marina Sand, Debra Jane Schnitzer, Rudina Thanasi, Eileen Mary Meagher, Faith Ann Pyka, Gary Richard Gerber, Johanna Catharina Stromsnas, Judith Marian Shapiro, Laura Nelson Streicher, Lorraine Marie Hachfeld, Matthew Charles Hornung, Patricia M. Rowe, Sally Jean Henderson, Sheila Maureen Benson, Shirley Theresa Holmlund, Stephen P. Salters, Parthasarathi Panda, Snehasis Jana. Impact of Consciousness Energy Healing Treatment (The Trivedi Effect[®]) on Physical, Spectroscopic, and Thermal Properties of *Withania somnifera* (Ashwagandha) Root Extract. *International Journal of Food Science and Biotechnology*. Vol. 2, No. 1, 2017, pp. 6-15. doi: 10.11648/j.ijfsb.20170201.12

Received: February 6, 2017; Accepted: February 18, 2017; Published: March 9, 2017

Abstract: *Withania somnifera* (Ashwagandha) root extract and their active metabolites possess a broad range of pharmacological activities. The current study aimed to explore the impact of The Trivedi Effect[®] - Energy of Consciousness Healing Treatment (Biofield Energy Healing) on the physical, spectroscopic, and thermal properties of ashwagandha root extract using PXRD, PSD, FT-IR, UV-vis spectroscopy, TGA, and DSC analysis. Ashwagandha root extract was divided into two parts – one part was control without any and another part was treated with The Trivedi Effect[®] - Energy of Consciousness Healing Treatment remotely by eighteen renowned Biofield Energy Healers and defined as The Trivedi Effect[®] treated sample. The PXRD analysis exhibited that both the treated and control samples were amorphous in nature. The particle sizes at d₁₀, d₅₀, and d₉₀ values of the treated sample were significantly decreased by 12.23%, 10.97%, and 1.25%, respectively with respect to the control sample. The surface area analysis revealed that the surface area of the treated sample was significantly increased by 14.29% as compared to the control sample. The FT-IR analysis indicated the alteration of the force constant for the functional groups of the treated sample in comparison to the control sample. The UV-vis analysis revealed that the wavelength for the maximum absorbance of the control and treated samples were at 205.8 and 206.0 nm, respectively. The TGA analysis revealed that the total weight loss was decreased by 0.70% in the treated sample as compared to the control sample. This indicated that the treated sample was thermally more stable as compared to the control sample. The DSC analysis indicated that the melting point of the treated sample (190.48°C) was decreased by 4.91% than the control sample (203.45°C). The latent heat of fusion of the treated (4.94 J/g) sample was significantly decreased by 42.96% compared with the control (8.66 J/g) sample. The current findings suggest that The Trivedi Effect[®] - Energy of Consciousness Healing Treatment (Biofield Energy Healing) might have the astounding capacity to enhance the solubility, absorption, dissolution, and finally, bioavailability of ashwagandha root extract in various form of pharmaceutical and nutraceutical formulation by modifying its particle size and surface area. Thus, the treated ashwagandha root extract might provide better therapeutic response against against inflammatory diseases, immunological disorders, stress, arthritis, cancer, diabetes, sexual disorders, aging and other chronic infections.

Keywords: Biofield Energy Healing Treatment, Biofield Energy Healers, Consciousness Energy Healing, The Trivedi Effect[®], *Withania somnifera*, PXR, Particle Size, TGA, DSC

1. Introduction

The importance of the herbal medicines in the prevention and treatment of the various diseases has been increased day-by-day throughout the world due to its impressive therapeutic effects and fewer side effects as compared to the modern medicines [1]. The roots of *Withania somnifera* (L.) Dunal (Family- Solanaceae) - a vital Rasayana herb is traditionally known as 'Ashwagandha' or winter cherry. In Ayurveda, it is called as 'Indian ginseng'. Ashwagandha is widely used in the most of the Indian herbal drugs and nutraceuticals for the treatment of various diseases include nervous and sexual disorders, infectious diseases, diabetes, cancer, ulcer, immunological disorders, stress, arthritis, etc. From the ancient time, it is used as a tonic to arrest the ageing process, rejuvenate the body and boost the defense against infectious disorders and also promote the longevity [2-11]. As ashwagandha root extract contains a wide array of nutrients and phytochemicals, it is used as a dietary supplement for the health restoration [3]. The major active phytoconstituents of ashwagandha root extract are highly oxygenated withanolides. Withanolides have C28 steroidal nucleus with C9 side chain, having a six membered lactone ring (Figure 1). The oxidation at various sites of skeleton is responsible for the structural deviations in different classes of withanolides [11-14].

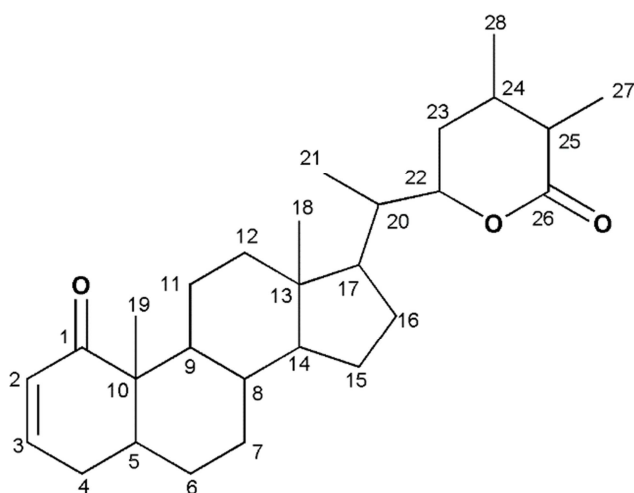


Figure 1. Basic skeleton of withanolide.

Literatures reported that withanolides such as withaferin A, withanolide D, withanolide E, etc. possess various pharmacological activities include antioxidant, anticancer, immunomodulating, neuroprotective, antiepileptic, antibacterial, adaptogenic, spermatogenic, antidepressant, anti-anxiety, hepatoprotective, anti-inflammatory, antiarthritic, antimicrobial, hypoglycaemic, hypolipidemic, aphrodisiac, antiulcer, radiosensitizing, etc. [11, 14-19].

Therefore, a new proprietary herbomineral formulation was formulated that consisted of herbal product like ashwagandha root extract along with minerals such as zinc, magnesium and selenium. This herbomineral formulation is designed as nutraceutical supplement, and can be used for the prevention and treatment of various human disorders.

From the ancient-time, the living force preserved by every living organisms that contributes the 'life' is defined as prana by the Hindus, *qi* or *chi* by the Chinese, and *ki* by the Japanese. This is believed to co-relate with the soul, spirit and mind. This hypothetical vital force is considered now as the Bioenergetics Field. The Biofield Energy Field is a dynamic electromagnetic field existing surround of the human body. The Biofield Energy is infinite and paradigmatic. It can freely flow between the human and environment that leads to the continuous movement or matter of energy [20, 21]. Thus, the human has the ability to harness energy from the earth, the "universal energy field" and transmit it to any living or nonliving object (s) around the globe. The objects always receive the energy and respond in a useful way. This process is known as Biofield Energy Healing Treatment [22, 23]. Biofield (Putative Energy Fields) based Energy Therapies are used worldwide to promote health and healing [24]. The National Center of Complementary and Integrative Health (NCCIH) has been recognized and accepted Biofield Energy Healing as a Complementary and Alternative Medicine (CAM) health care approach in addition to other therapies, medicines and practices such as natural products, deep breathing, yoga, Tai Chi, Qi Gong, chiropractic/osteopathic manipulation, meditation, massage, special diets, homeopathy, progressive relaxation, guided imagery, acupressure, acupuncture, relaxation techniques, hypnotherapy, healing touch, movement therapy, pilates, rolfing structural integration, mindfulness, Ayurvedic medicine, traditional Chinese herbs and medicines, naturopathy, essential oils, aromatherapy, Reiki, cranial sacral therapy and applied prayer (as is common in all religions, like Christianity, Hinduism, Buddhism and Judaism) [25]. The Biofield Energy Treatment (The Trivedi Effect[®]) has been extensively studied with significant outcomes in many scientific fields such as cancer research [26]; altered antimicrobial sensitivity of pathogenic microbes in microbiology [27-29], biotechnology [30, 31], genetics [32, 33]; changing the structure of the atom in relation to the various metals, ceramics, polymers and chemicals materials science [34-36]; altered physical and chemical properties of pharmaceuticals [37, 38], nutraceuticals [39, 40], organic compounds [41-43]; and improved overall growth and yield of plants in agricultural science [44, 45]. Herbal extracts and herbal drugs despite of their outstanding *in vitro* results exhibited poor or negligible *in vivo* activity, because of their reduced lipid solubility or improper molecular size, causing in deprived absorption and

thus poor bioavailability [1]. According to the recent study on the bioavailability of major withanolides of *Withania somnifera*, Devkar *et al.* demonstrated that the nonpolar and low molecular weight withanolides were highly permeable, whereas the high glycosylated and polar withanolides displayed low permeability in their *in vitro* absorption model system [46]. As ashwagandha root extract has the outstanding nutrition and medicinal values, researchers are still working on to find out an optimal dosage range for reproducing the desired effects in human as well as to determine the safe, non-toxic and effective dosage form [47]. The physicochemical properties such as particle size, crystalline structure, crystallite size, surface area, etc. and thermal properties of a drug have a vital role in bioavailability as well as stability of the drug during processing, formulation, storage, and packaging [48, 49]. Biofield Energy Treatment (The Trivedi Effect[®]) has been reported to change the particle size, specific surface area, crystalline, chemical and thermal behavior of an atom/ion through possible mediation of neutrinos [50]. By considering all these aspect, the objective of the current study was to examine whether the Biofield Energy Treatment can change the physical, structural, and thermal properties of ashwagandha root extract in such a way that might be assist in the improvement of the solubility and absorption of ashwagandha root extract and also help in designing of any suitable pharmaceutical formulation. The physical, spectroscopic, and thermal properties of both control and the Biofield Energy Treated ashwagandha root extracts were evaluated using various analytical techniques include Fourier transform infrared (FT-IR) spectrometry, ultraviolet-visible (UV-vis) spectroscopy, Powder X-ray diffraction (PXRD), particle size distribution analysis (PSD), thermogravimetric analysis (TGA), and differential scanning calorimetry (DSC).

2. Materials and Methods

2.1. Chemicals and Reagents

Withania somnifera (Ashwagandha) root hydroalcoholic extract was purchased from Sanat Product Ltd, India. All other chemicals used in the experiment were of analytical grade available in India.

2.2. Energy of Consciousness Treatment Strategies

Ashwagandha root extract powder was one of the components of the new proprietary herbomineral formulation, developed by our research team, and it was used *per se* as the test compound for the current study. The test compound was divided into two parts, one part of the test compound was treated with The Trivedi Effect[®] - Energy of Consciousness Healing Treatment (Biofield Energy Healing) by renowned Biofield Energy Healers and defined as The Trivedi Effect[®] treated sample, while the second part of the test compound did not receive any sort of treatment and defined as untreated or control ashwagandha root extract sample. The Trivedi Effect[®] treatment was provided by the

group of eighteen renowned Biofield Energy Healers who participated in this study and performed the Biofield Energy Treatment (The Trivedi Effect[®]) remotely. Eleven Healers were remotely located in the U. S. A., four in Canada, two in Finland, and one of which was remotely located in Albania, while the test compound was located in the research laboratory of GVK Biosciences Pvt. Ltd., Hyderabad, India. The Trivedi Effect[®] - Energy of Consciousness Healing Treatment was provided for 5 minutes through Healer's Unique Energy Transmission process remotely to the test compound under the laboratory conditions. None of the Biofield Energy Healers in this study visited the laboratory in person, nor had any contact with the compounds. Similarly, the control compound was subjected to "sham" healers for 5 minutes, under the same laboratory conditions. The sham healer did not have any knowledge about The Trivedi Effect[®] - Energy of Consciousness Healing Treatment. After that, the treated and untreated samples were kept in similar sealed conditions and characterized thoroughly by PXRD, PSD, FT-IR, UV-visible spectroscopy, TGA, and DSC analysis.

2.3. Characterization

2.3.1. Powder X-ray Diffraction (PXRD) Analysis

The PXRD analysis was accomplished on PANalytical X'pert Pro powder X-ray diffractometer system. The X-ray of wavelength 1.54056 Å was used. The data was collected in the form of a chart of the Bragg angle (2θ) vs. intensity, and a detailed table containing information on peak intensity counts, d value (Å), relative intensity (%), full width half maximum (FWHM) (θ°). From the XRD results, the crystallite size (G) was calculated using X'pert data collector and X'pert high score plus processing software. A total of 500.18 mg of the control and treated samples individually were used for the analysis and prepared by back loading technique using the sample preparation kit. The sample was spread on the holder ring in sufficient quantity to fill the ring cavity. It was then pressed down using powder press block and scrap the powder that was in surplus using a glass slide to get densely packed specimen. Consequently, the bottom plate was placed onto the holder ring and clamp in position. The sample holder was then removed from the sample preparation table by turning it upside down. A smooth surface of sample was obtained to ensure optimum results.

2.3.2. Particle Size Distribution (PSD) Analysis

The average particle size and particle size distribution were analyzed using Malvern Mastersizer 2000, UK with a detection range between 0.01 μm to 3000 μm. The sample unit was filled with the dispersant medium and operated the stirrer at 2500 rpm. Alignment of the optics was done and the background measurement was taken. After the background measurement, the sample was added in to the sample unit with constant monitoring the obscuration and stopped the addition of sample when the obscuration reached in between 15 and 20%. When the obscuration was stable, the measurement was taken twice and the average was taken of two measurements. The average histogram of the two

measurements was recorded. Along with histogram, the data was presented in table format which include particle size (μm). Also, the values at below 10% level (d_{10}), 50% level (d_{50}), and 90% level (d_{90}) were calculated from the histogram and the calculations such as surface area (m^2/g) were done by using software Mastersizer 2000.

Percent change in particle size (d) for at below 10% level (d_{10}), 50% level (d_{50}), and 90% level (d_{90}) was calculated using following equation 1:

$$\% \text{ change in particle size} = \frac{[d_{\text{Treated}} - d_{\text{Control}}]}{d_{\text{Control}}} \times 100 \quad (1)$$

Where, d_{Control} and d_{Treated} are the particle size (μm) for at below 10% level (d_{10}), 50% level (d_{50}), and 90% level (d_{90}) of the control and treated samples, respectively.

Percent change in surface area (S) was calculated using following equation 2:

$$\% \text{ change in surface area} = \frac{[S_{\text{Treated}} - S_{\text{Control}}]}{S_{\text{Control}}} \times 100 \quad (2)$$

Where, S_{Control} and S_{Treated} are the surface area of the control and treated samples, respectively.

2.3.3. Fourier Transform Infrared (FT-IR) Spectroscopy

FT-IR spectroscopy of ashwagandha root extract was performed on Spectrum two (Perkin Elmer, USA) Fourier transform infrared spectrometer with the frequency array of 400-4000 cm^{-1} by using pressed KBr disk technique.

2.3.4. Ultra Violet-visible Spectroscopy (UV-Vis) Analysis

The UV-Vis spectral analysis was carried out using Shimadzu UV-2450 with UV Probe, Japan. The spectrum was recorded using 1. cm quartz cell that has a slit width of 1.0 nm. The wavelength range chosen for recording the spectra was 190-800 nm. The absorbance spectra (in the range of 0.2 to 0.9) and wavelength of maximum absorbance (λ_{max}) were recorded.

2.3.5. Thermal Gravimetric Analysis (TGA)

TGA analysis was performed using Instrument TGA Q50 (TA Instruments, USA) at a heating rate of 10°C/min from room temperature i.e. 30°C to 900°C under nitrogen atmosphere. A total of 10.31 mg of sample was used for the analysis and was taken on the platinum pan. In TGA, the weight loss for each step was recorded in grams as well as in percent loss with respect to the initial weight. Also, the onset, endset, and peak temperature for each step were recorded in TGA.

Percent change in weight loss (W) was calculated using following equation 3:

$$\% \text{ change in weight loss} = \frac{[W_{\text{Treated}} - W_{\text{Control}}]}{W_{\text{Control}}} \times 100 \quad (3)$$

Where, W_{Control} and W_{Treated} are the weight loss of the control and The Trivedi Effect® treated samples, respectively.

2.3.6. Differential Scanning Calorimetry (DSC)

Analysis was performed using the DSC Q20 (TA Instruments, USA) differential scanning calorimeter. A total of 8.40 mg

sample was weighed and sealed in aluminum pan and equilibrated at 25°C and heated up to 450°C at the heating rate of 10°C/min under nitrogen gas as purge atmosphere with flow rate of 50 mL/min. The value for onset, endset, peak temperature, peak height (mJ or mW), peak area, and change in heat (J/g) for each peak were recorded.

Percent change in melting point (T) was calculated using following equation 4:

$$\% \text{ change in melting point} = \frac{[T_{\text{Treated}} - T_{\text{Control}}]}{T_{\text{Control}}} \times 100 \quad (4)$$

Where, T_{Control} and T_{Treated} are the melting point of the control and treated samples, respectively.

Percent change in latent heat of fusion (ΔH) was calculated using following equation 5:

$$\% \text{ change in latent heat of fusion} = \frac{[\Delta H_{\text{Treated}} - \Delta H_{\text{Control}}]}{\Delta H_{\text{Control}}} \times 100 \quad (5)$$

Where, $\Delta H_{\text{Control}}$ and $\Delta H_{\text{Treated}}$ are the latent heat of fusion of the control and treated samples, respectively.

3. Results and Discussion

3.1. Powder X-ray Diffraction (PXRD) Analysis

Powder X-ray diffraction study was conducted to examine the crystalline pattern of the control and treated ashwagandha root extract. The XRD diffractograms of the both control and treated ashwagandha root extracts as shown in Figure 2, did not contribute any diffraction peak and it was concluded that both the samples were amorphous in nature.

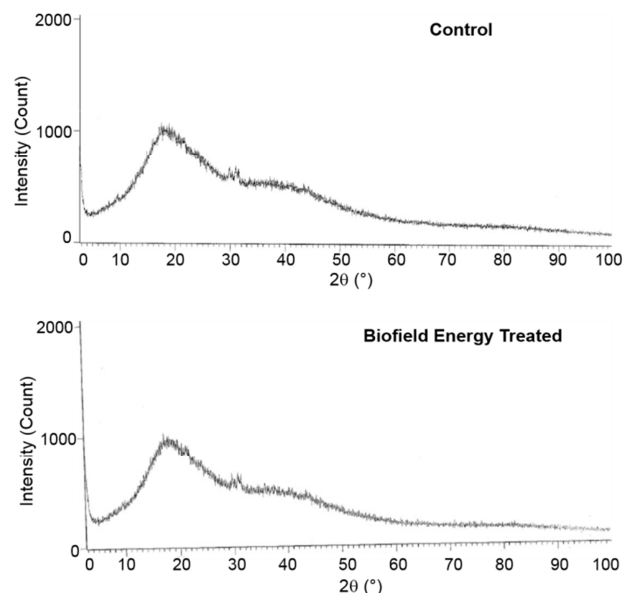


Figure 2. PXRD diffractograms of the control and Biofield Energy Treated *W. somnifera* (Ashwagandha) root extract.

3.2. Particle Size Distribution (PSD) Analysis

Particle size data (d_{10} , d_{50} , and d_{90}) of both the control and

treated ashwagandha root extract was investigated and the results are presented in Table 1. The particle sizes d_{10} , d_{50} , and d_{90} values of the treated ashwagandha root extract ($d_{10} = 36.80 \mu\text{m}$, $d_{50} = 144.15 \mu\text{m}$, and $d_{90} = 298.68 \mu\text{m}$) were reduced by 12.23%, 10.97%, and 1.25%, respectively with respect to the control sample ($d_{10} = 41.93 \mu\text{m}$, $d_{50} = 161.92 \mu\text{m}$, and $d_{90} = 302.47 \mu\text{m}$).

Table 1. Particle size (d_{10} , d_{50} , and d_{90}) and surface area of the control and Biofield Energy Treated *W. somnifera* (Ashwagandha) root extract.

Parameter	d_{10} (μm)	d_{50} (μm)	d_{90} (μm)	Surface area (m^2/g)
Control	41.93	161.92	302.47	0.14
Treated	36.80	144.15	298.68	0.16
Percent change* (%)	-12.23	-10.97	-1.25	14.29

*denotes the percentage change in the particle size data (d_{10} , d_{50} , and d_{90}) and surface area of Biofield Energy Treated sample with respect to the control sample.

The results revealed that there may be an effect of high energy milling induced through the treatment to the ashwagandha root extract. The surface area analysis of both the control and treated ashwagandha root extract revealed that the surface area of the treated ashwagandha root extract ($0.16 \text{ m}^2/\text{g}$) was enhanced by 14.29% from the control sample ($0.14 \text{ m}^2/\text{g}$). Numerous literatures have mentioned that particle size, shape and surface area of the pharmaceuticals/nutraceuticals have an important impact on solubility, dissolution, *in vivo* bioavailability, dose uniformity and therapeutic efficacy as well as assist in the design of the new drug delivery systems [51]. Decrease in particle size and higher surface area increase the solubility of the solid particles as well as enhance the dissolution rate and bioavailability [52]. Thus, it is anticipated that The Trivedi Effect[®] treated ashwagandha root extract might be absorbed in faster rate and thus, can provide better bioavailability than the untreated sample.

3.3. Fourier Transform Infrared (FT-IR) Spectroscopy

The FT-IR spectra of both the control and Biofield Energy Treated samples of ashwagandha root extract are presented in

Table 2. FT-IR data of the control and Biofield Energy Treated *W. somnifera* (Ashwagandha) root extracts.

Entry No.	Mode of vibration	Characteristic absorption (s) of ashwagandha root extract (cm^{-1})	
		Control	The Trivedi Effect [®] Treated
1	O-H stretching	3420	3426
2	C-H, alkanes stretching	2927, 2856	2926, 2856
3	C=O stretching (α , β -unsaturated ketone)	1682	1676
4	C-H, alkanes bending	1459	1450
5	C-O in epoxide	1266	1237
6	C-O in alkoxy	1128	1121
		1075	1077
		1033	1034
7	C-H aromatic bending	842	848
		611	616

Figure 3.

The wavenumber of the absorbance ν of a diatomic can be calculated from the following equation derived from the Hooke's law equation (6):

$$\nu = \frac{1}{2\pi c} \sqrt{\frac{f(m_1+m_2)}{m_1 m_2}} \tag{6}$$

Where, ν = vibrational frequency (cm^{-1}), c = the velocity of light (cm/s), m_1 and m_2 = the mass of atoms 1 and 2, respectively, in g, f = the force constant of the bond (dyne/cm).

From the above equation (6), it has been shown that if other factors remain constant, the vibrational frequency (wavenumber) is directly proportional to the force constant *i.e.* for a certain functional group (for *e.g.* -C=O), changes in the vibrational frequency (wavenumber) indicate the alteration of the force constant. A lot of literatures reported that various factors such as hybridization, resonance, bond strength, conjugation etc. can affect the force constant [53, 54].

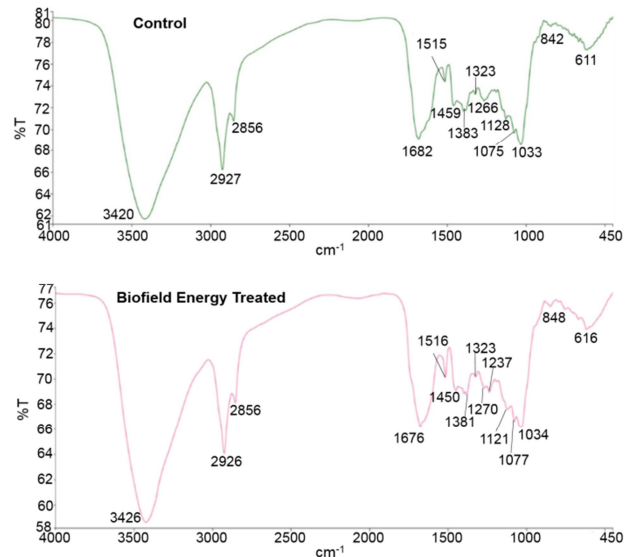


Figure 3. FT-IR spectra of the control and Biofield Energy Treated ashwagandha root extract.

From the Table 2, it has been observed that the wavenumber for the O-H, C-H groups of The Trivedi Effect[®] - Biofield Energy Treated ashwagandha (Table 2, entry 1, 6, and 7) was increased from the control sample. It indicated that the force constant of the O-H, C-H groups was improved. On the other hand, the wavenumber for C-H (alkene), C=O, C-O groups (Table 2, entry 2, 3, 4, 5, and 6) was reduced as compared to the control sample. Interestingly, the wavenumber for C-O in epoxide group in the treated sample was reduced more than other functional groups with respect to the control sample. This results revealed that the force constant for the C-H (alkene), C=O, C-O groups was diminished as compared to the control sample. It is assumed that the alteration of the force constant for the functional groups might be due to the change in the bond strength of the functional groups of the treated sample as compared to the control sample. The presence of epoxide, unsaturated lactone, 1-keto-2-ene functions play a vital role to elicit the pharmacological activities of withanolides [14, 55-57]. From the Table 2, it has been found that these type of functional groups were altered in the treated ashwagandha in comparison to the control sample. Hence, it is assumed that The Trivedi Effect[®] treatment might be responsible for changing the structural features of the ashwagandha root powder extract.

3.4. Ultraviolet-Visible Spectroscopy (UV-Vis) Analysis

The UV-visible spectra of both the control and treated ashwagandha root extracts are shown in Figure 4. The wavelength for the maximum absorbance (λ_{\max}) of the both the control and treated ashwagandha root extracts were at 205.8 and 206.0 nm, respectively and there was a minor shift of absorbance maxima from the control sample (1.9907) to the treated sample (2.3103). It has been reported that the wavelength for the maximum absorbance for the ashwagandha root extract was at 208.50 nm [58]. However, no significant change in the λ_{\max} of the treated sample was observed as compared to the control sample. The UV absorbance occurs due to the different type of energy transitions from the singlet to the singlet excited state such as $\sigma \rightarrow \sigma^*$, $n \rightarrow \pi^*$, and $\pi \rightarrow \pi^*$. These type of electronic transitions are happened when the difference in energy between the lowest unoccupied molecular orbital (LUMO)

and the highest occupied molecular orbital (HOMO) is significantly higher than the activation energy of the compound [59].

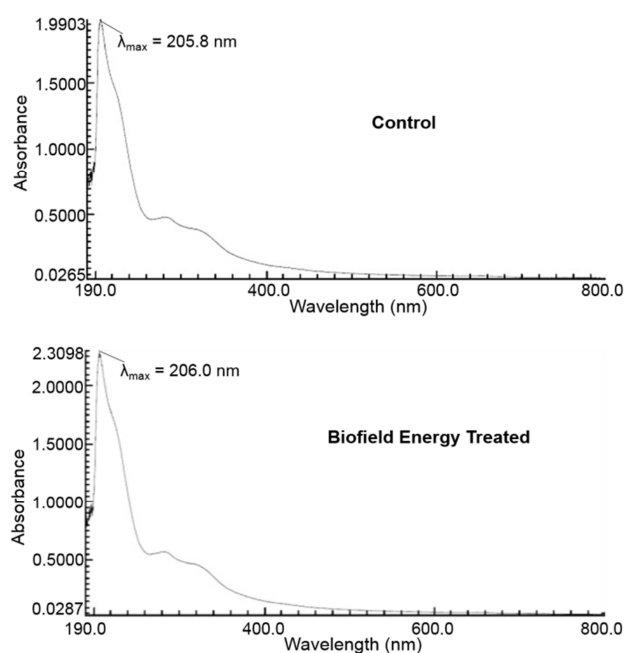


Figure 4. UV-vis spectra of the control and Biofield Energy Treated *W. somnifera* (Ashwagandha) root extracts.

Hence, it is anticipated that the structure of the phytoconstituents in the treated sample was remained unaffected as compared to the control sample.

3.5. Thermal Gravimetric Analysis (TGA)

TGA was applied to investigate the thermal stability of the both control and treated ashwagandha root extracts. The TGA analysis exhibited three steps of thermal degradation as mentioned in Table 3 and Figure 5. In the 1st and 2nd step thermal degradation, the weight loss of the treated ashwagandha root extract (1st step = 10.04% and 2nd step = 56.78%) were reduced by 2.05 and 3.47%, respectively compared with the control sample (1st step = 10.25% and 2nd step = 58.82%).

Table 3. Thermal degradation steps of the control and Biofield Energy Treated *W. somnifera* (Ashwagandha) root extract.

Step	Temperature (°C)		% Weight loss		% Change*
	Control	Treated	Control	Treated	
1 st step of degradation	209.57	205.23	10.25	10.04	-2.05
2 nd step of degradation	442.46	438.66	58.82	56.78	-3.47
3 rd step of degradation	895.84	895.95	14.60	16.26	11.37
Total	-	-	83.67	83.08	-0.70

*denotes the percentage change in the weight loss of the Biofield Energy Treated sample with respect to the control sample.

Furthermore, the weight loss of the third step degradation of the treated ashwagandha root extract (16.26%) was increased by 11.37% with respect to the control sample (14.60%). However, the total weight loss of the treated

sample (83.08%) was reduced by 0.70% from the control sample (83.67%). It is then anticipated that The Trivedi Effect[®] treatment might slightly enhance the thermal stability of the ashwagandha root extract.

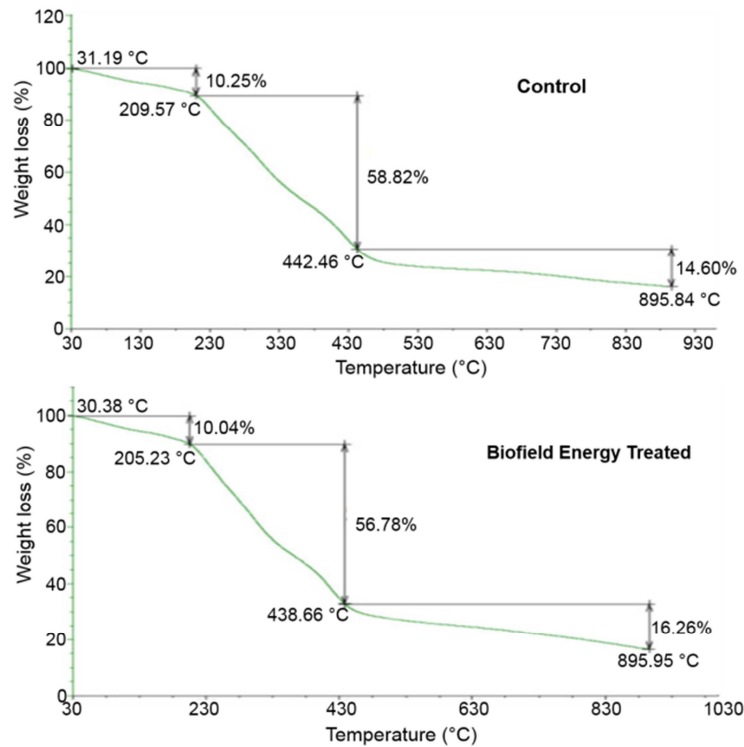


Figure 5. TGA thermograms of the control and Biofield Energy Treated *W. somnifera* (Ashwagandha) root extract.

3.6. Differential Scanning Calorimetry (DSC) Analysis

The DSC thermograms of both the control and treated ashwagandha root extract are presented in Figure 6 and Table 4.

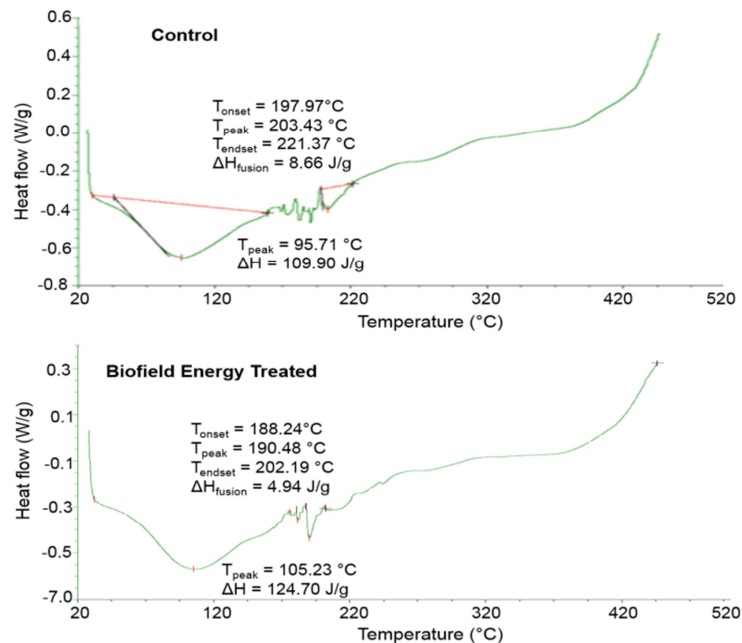


Figure 6. DSC thermograms of the control and Biofield Energy Treated *W. somnifera* (Ashwagandha) root extract.

The DSC thermogram of the control and treated samples indicated the presence of a broad endothermic inflection at 95.71 and 105.23°C, respectively which is not the true melting point of the treated ashwagandha root extract. It may

be the evaporation of the bound water present in the sample. Around 180-225°C, several small endothermic peaks were observed which indicated that the melting and decomposition of the compounds present in sample occurred concurrently.

The Table 4 showed that the melting point of the treated sample (190.48°C) was lower by 4.91% than the control sample (203.45°C). The control and treated samples exhibited a latent heat of fusion of 8.66 J/g and 4.94 J/g, respectively. The latent heat of fusion (Table 4) was decreased in the treated sample by 42.96% as compared to the control. Hence, the treated sample required less energy in the form of latent heat of fusion to undergo the process of the

melting point. It is assumed that The Trivedi Effect[®] treatment might reduce the intermolecular force in the treated sample, which probably drop the heat change. Literature demonstrated that decreased particle size depress the latent heat of fusion [60]. As The Trivedi Effect[®] Treated sample has reduced particle size, it has lower latent heat of fusion as compared to the control sample.

Table 4. The melting point (°C) and latent heat of fusion (J/G) values of the control and Biofield Energy Treated *W. somnifera* (Ashwagandha) root extract.

Sample	Latent heat of fusion (ΔH_{fusion}) J/g	Onset melting temperature (T_{onset})°C	Peak melting temperature (T_{peak})°C	Endset melting temperature (T_{endset})°C
Control	8.66	197.97	203.45	221.37
Biofield Energy Treated	4.94	188.24	190.48	202.19
% Change*	-42.96	-4.91	-6.38	-8.66

T_{onset} : Onset melting temperature, T_{peak} : Peak melting temperature, T_{endset} : Endset melting temperature, ΔH : Latent heat of fusion, *denotes the percentage change of the Biofield Energy Treated sample with respect to the control sample.

4. Conclusions

The current research work revealed that The Trivedi Effect[®] - Energy of Consciousness Healing Treatment (Biofield Energy Healing) has the outstanding capability for reduction of the particle size of the ashwagandha root extract along with enhanced surface area. The particle size at d_{10} , d_{50} , and d_{90} values of the treated ashwagandha root extract were reduced by 12.23%, 10.97%, and 1.25%, respectively with respect to the control sample. The surface area analysis of both the control and treated samples revealed that the surface area of the treated sample was improved by 14.29% from the control sample. The FT-IR analysis revealed that the Trivedi Effect[®] - Biofield Energy Healing had an effect on the structural properties of the ashwagandha root extract by changing the force constant of its functional groups. TGA analysis demonstrated that there was an improvement in the thermal stability through the reduction of the total weight loss by 0.70% of the treated ashwagandha root extract with respect to the control sample. The DSC analysis indicated that the melting point of the treated sample (190.48°C) was reduced by 4.91% than the control sample (203.45°C). The latent heat of fusion of the treated (4.94 J/g) sample was significantly decreased by 42.96% compared with the control (8.66 J/g) sample. In summary, Trivedi Effect[®] treated ashwagandha root extract could be more soluble, absorbable from the gut and more bioavailable as compared to the untreated compound and be suitable for any oral pharmaceutical and nutraceutical formulation which might be providing better therapeutic response against various diseases such as diabetes mellitus, allergies and septic shock; stress-related disorders like sleep disorder, insomnia, anxiety, depression, Attention Deficit Disorder (ADD), Attention Deficit Hyperactive Disorder (ADHD), mental restlessness (mind chattering), brain fog, low libido, impotency, lack of motivation, mood swings, fear of the future, confusion, migraines, headaches, forgetfulness, overwhelm, loneliness, worthlessness, indecisiveness, frustration, irritability, chronic

fatigue, obsessive/compulsive behavior and panic attacks; inflammatory diseases and immunological disorders like Lupus, Systemic Lupus Erythematosus, Hashimoto Thyroiditis, Type 1. Diabetes, Asthma, Chronic peptic ulcers, Tuberculosis, Hepatitis, Chronic active hepatitis, Celiac Disease (gluten-sensitive enteropathy), Addison Disease, Crohn's disease, Graves' Disease, Pernicious and Aplastic Anemia, Sjogren Syndrome, Irritable Bowel Syndrome (IBS), Multiple Sclerosis, Rheumatoid arthritis, Chronic periodontitis, Ulcerative colitis, Chronic sinusitis, Myasthenia Gravis, Atherosclerosis, Vasculitis, Dermatitis, Diverticulitis, Rheumatoid Arthritis, Reactive Arthritis, Alopecia Areata, Psoriasis, Scleroderma, Fibromyalgia, Chronic Fatigue Syndrome and Vitiligo; aging-related diseases like cardiovascular disease, arthritis, cancer, Alzheimer's disease, dementia, cataracts, osteoporosis, diabetes, hypertension, glaucoma, hearing loss, Parkinson's Disease, Huntington's Disease, Prion Disease, Motor Neurone Disease, Spinocerebellar Ataxia, Spinal muscular atrophy, Amyotrophic lateral sclerosis, Friedreich's Ataxia and Lewy Body Disease, chronic infections and much more.

Abbreviations

DSC: Differential scanning calorimetry, FT-IR: Fourier transform infrared spectroscopy, HOMO: Highest energy occupied molecular orbital, LUMO: Lowest energy unoccupied molecular orbital, TGA: Thermal gravimetric analysis, T_{peak} = Peak melting temperature, ΔH : Latent heat of fusion, UV-vis: Ultraviolet-visible spectroscopy, PSD: Particle size distribution; PXRD: Powder X-ray diffraction.

Acknowledgements

The authors are grateful to GVK Biosciences Pvt. Ltd., Hyderabad, India, Trivedi Science, Trivedi Global, Inc. and Trivedi Master Wellness for their support throughout the work.

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