

Complementary and Alternative Medicine: Impact of Biofield Energy Treatment on the Physicochemical and Thermal Properties of *Withania somnifera* Root Extract

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Abstract

Withania somnifera (WS) is a popular health supplement, which is used in many nutraceutical and pharmaceutical formulations for the overall good health, improves the quality of life, along with the prevention and treatment of numerous diseases. In this study, the impact of the Consciousness Energy Healing Treatment (the Trivedi Effect®) on the physicochemical and thermal properties of WS root extract was evaluated using modern analytical techniques. The test sample WS root extract was divided and termed as control and Biofield Energy Treated sample. The control sample did not receive the Biofield Energy Treatment; whereas, the treated WS root extract received the Consciousness Energy Healing Treatment by a well-known Biofield Energy Healer, Dahryn Trivedi. The particle size values of the treated WS root extract powder sample were altered by -7.92% (d_{10}), -5.32% (d_{50}), and -0.36% (d_{90}) 1.02% {D(4,3)}; thus, the specific surface area was significantly increased by 5.31% compared with the control sample. The evaporation temperature and latent heat of evaporation of the treated WS root extract were significantly increased by 11.24% and 21.34%, respectively compared with the control sample. The total weight loss in the treated WS root extract was decreased by 4.3%; however, the residue amount was significantly increased by 25.02% compared with the control sample. The experimental results concluded that the Trivedi Effect®-Consciousness Energy Healing Treatment might have altered particle size, surface area, and thermal properties of WS root extract which would show better solubility, dissolution, absorption, bioavailability, and thermal stability compared to the control sample. This new form of WS root extract would be helpful to design more efficacious nutraceutical/pharmaceutical formulations for rejuvenate the body, restricting the aging process, immune busting, neuro-protection, antioxidant, inflammation, memory loss, insomnia, hepatoprotection, hypoglycemia, gastrointestinal issues, constipation, arthritis, cancer, skin conditions, Alzheimer's, Huntington's, and Parkinson's disorders, etc.

Keywords: *Withania somnifera* Root Extract; Complementary and Alternative Medicine; The Trivedi Effect®; Consciousness Energy Healing Treatment; PSA; PXRD; DSC; TGA/DTG

Abbreviations: PSA: Particle Size Analysis; PXRD: Powder X-Ray Diffraction; DSC: Differential Scanning Calorimetry; TGA: Gravimetric Analysis; DTG: Differential Thermo Gravimetric Analysis.

Introduction

Withania somnifera (WS) popularly known as ashwagandha/ Indian ginseng. The WS root extract is a popular ingredient in the nutraceutical/pharmaceutical supplements due to its multiple beneficial effects in the body, i.e., rejuvenate the body, acts as a tonic to arrest the aging process, boost the immune system, improves the overall quality of life, and help in the inhibition and treatment of various diseases [1-3]. WS root extract used for the treatment of sexual disorders, stress-related disorders, nervous and immunological disorders, diabetes, infectious diseases, arthritis, ulcer, cancer, etc. [2-6]. The WS root extract contains number of biologically active Phytoconstituents, i.e., withanolides (withanolide A, withanolide B, withanolide D, withferine, etc.), withanamides, alkaloids, sitoindosides, starch, reducing sugars, peroxidases, withanicil, glycosides, benzyl alcohol, dilcitol, 2-phenyl ethanol, benzoic acid, cinnamic acid, phenyl acetic acid, etc. [7-9]. Withanolides are reported with many important beneficial physiological actions, i.e., immunomodulating, neuroprotective, antioxidant, anti-inflammatory, insomnia, memory loss, hepatoprotective, and hypoglycemic. It is also helpful in gastrointestinal problems, constipation, antiarthritic, antimicrobial, anticancer, skin conditions, Huntington's, Alzheimer's, and Parkinson's disorders, etc. [3-6,10-12].

The popularity of WS in the formulations is very high, but solubility, dissolution, absorption, and bioavailability of the nutraceutical compounds are very important to achieve better therapeutic efficacy [13, 14]. The Consciousness Energy Healing Treatment (the Trivedi Effect®) has the significant impact on the crystallite size, particle size, surface area, thermal properties, bioavailability, etc. of the nutraceutical and pharmaceutical compounds [15-19]. The Trivedi Effect® is a natural and only scientifically proven phenomenon in which a skilled person can harness this inherently intelligent energy from the "Universe" and can transmit it anywhere on the planet through the possible mediation of neutrinos [20]. The "Biofield" is a unique para-dimensional electromagnetic field generated from the continuous movement of the electrically charged particles (ions, cells, etc.) in the body. The "Biofield" based Energy Healing Therapies have been accepted all over the world, which claimed to have significant outcomes against

various disease conditions [21,22]. The National Institutes of Health (NIH) and National Centre for Complementary and Alternative Medicine (NCCAM) has recommended and included the Energy therapy under Complementary and Alternative Medicine (CAM) category that has been accepted by most of the USA population [23, 24]. Moreover, the Trivedi Effect®-Consciousness Energy Healing Treatment also have outstanding outcomes in different object (s), i.e., metals, ceramic, and polymer, organic compounds, crops, microorganisms, and cancer cells [25-34]. Seeing the significant results, this study was designed to evaluate the influence of the Trivedi Effect®-Consciousness Energy Healing Treatment on WS root extract using particle size analysis (PSA), powder X-ray diffraction (PXRD), differential scanning calorimetry (DSC) analytical techniques, and thermo gravimetric analysis (TGA)/ Differential thermo gravimetric analysis (DTG).

Materials and Methods

Chemicals and Reagents

Withania somnifera root extract was purchased from Sanat Product Ltd., India and the other chemicals used during the experiment were purchased from India.

Consciousness Energy Healing Treatment Strategies

The test sample WS root extract powder was divided into two parts. One part of the WS root extract was received the Trivedi Effect®-Consciousness Energy Healing Treatment by a well-known Biofield Energy Healer, Dahryn Trivedi (USA) remotely for 3 minutes through the Unique Energy Transmission process termed as the Biofield Energy Treated sample. While the other part of the test sample did not receive the Biofield Energy Treatment called control sample. But, the control WS root extract was subjected to a "sham" healer under the similar laboratory conditions, who did not have any knowledge about the Biofield Energy Healing Treatment. Both the samples were kept in sealed conditions and further characterized by using modern analytical techniques.

Characterization

The PSA, PXRD, DSC, and TGA analysis of WS root extract was performed. The PSA was carried out using Malvern Mastersizer 2000 (the UK) with the help of the wet method [35,36]. The PXRD analysis of WS root extract was performed with the help of Rigaku MiniFlex-II Desktop X-ray diffractometer (Japan) [37,38]. The average size of the crystallite was calculated from PXRD data using the Scherrer's formula (1)

$$G = k\lambda/\beta\cos\theta \quad (1)$$

Where G is the crystallite size in nm, k is the equipment constant, λ is the radiation wavelength, β is the full-width at half maximum, and θ is the Bragg angle [39]. Similarly, the DSC analysis of WS root extract was performed with the help of DSC Q200, TA instruments. The TGA/DTG thermograms of WS root extract were obtained with the help of TGA Q50 TA instruments [35,36].

The % change in particle size, specific surface area, melting point, latent heat, weight loss, and the maximum thermal degradation temperature of the Biofield Energy Treated WS root extract sample was calculated compared with the control sample using the following equation 2:

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

Results and Discussion

Particle Size Analysis (PSA)

The comparative particle size analysis results of the control and the Biofield Energy Treated WS powder

Parameter	d_{10} (μm)	d_{50} (μm)	d_{90} (μm)	D (4,3) (μm)	SSA (m^2/g)
Control	20.34	58.43	119.86	65.21	0.245
Biofield Energy Treated	18.73	55.32	119.43	65.87	0.258
Percent change (%)	-7.92	-5.32	-0.36	1.02	5.31

Table 1: Particle Size Data of the Control and Biofield Energy Treated WS Root Extract.

d_{10} , d_{50} , and d_{90} : particle diameter corresponding to 10%, 50%, and 90% of the cumulative distribution, D (4,3): the average mass-volume diameter, and SSA: the specific surface area.

Powder X-ray Diffraction (PXRD) Analysis

The PXRD diffractograms of both the control and Biofield Energy Treated WS root extract samples did not show any sharp and intense peaks (Figure 1), which

samples were presented in Table 1. The particle size values of the control WS powder sample were 20.34 μm , 58.43 μm , 119.86 μm , and 65.21 μm at d_{10} , d_{50} , d_{90} , and D(4,3), respectively. Similarly, the particle sizes of the Biofield Energy Treated WS root extract powder were 18.73 μm , 55.32 μm , 119.43 μm , and 65.87 μm at d_{10} , d_{50} , d_{90} , and D(4,3), respectively. The particle size values in the Biofield Energy Treated WS root extract was decreased by 7.92%, 5.32%, and 0.36% at d_{10} , d_{50} , d_{90} , respectively whereas 1.02% increase at D (4,3) compared to the control sample (Table 1). The specific surface area (SSA) of the treated WS root extract powder (0.258 m^2/g) was significantly increased by 5.31% compared with the control sample (0.245 m^2/g). The results indicated that the Trivedi Effect®-Consciousness Energy Healing Treatment might be acting like an external force to break down the larger WS root extract powder particles to the smaller particle hence increased the surface area. Therefore, due to reduced particle size and increased surface area, the solubility, dissolution rate, absorption, bioavailability, and even the therapeutic efficacy of the Biofield Energy Treated WS root extract would be very high [37-39].

indicated that both samples were amorphous in nature and the Biofield Energy Treatment did not alter the crystallinity pattern of the WS root extract compared to the control sample.

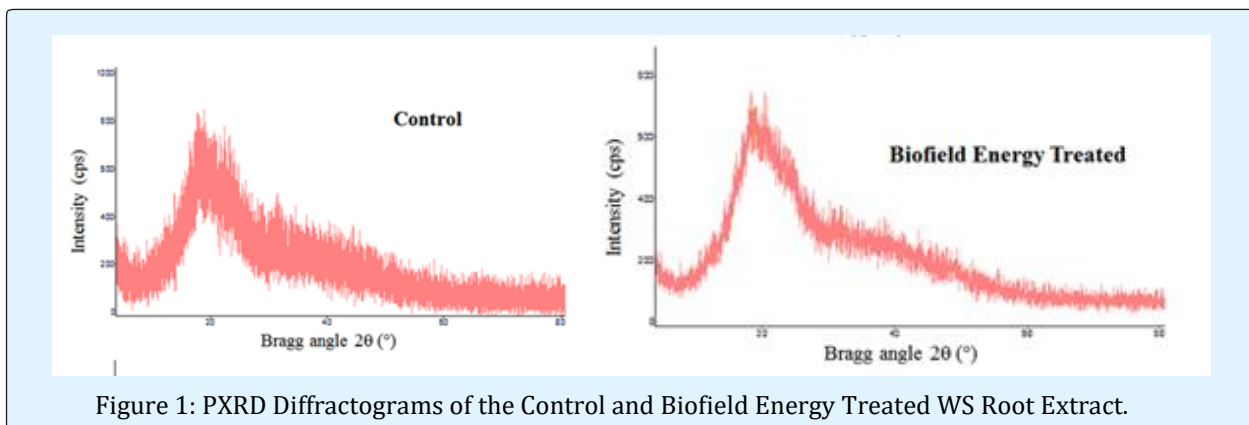


Figure 1: PXRD Diffractograms of the Control and Biofield Energy Treated WS Root Extract.

Differential Scanning Calorimetry (DSC) Analysis

The DSC thermograms of the control and Biofield Energy Treated WS root extract samples showed an endothermic peak at 105.65°C and 117.52°C (Figure 2). Such an endothermic peak was due to the evaporation of the trapped water molecule from the samples. The evaporation temperature and latent heat of evaporation ($\Delta H_{\text{evaporation}}$) of the Biofield Energy Treated WS root extract were significantly increased by 11.24% and 21.34%, respectively compared with the control sample (Table 2). As per the literature, any alteration in the molecular chains and the crystal structure has the direct connection to the latent heat of fusion [40]. Hence, Dahryn's Biofield Energy Treatment could have disrupted the molecular chains and crystal structure of WS root extract which lead to the increase of the melting point of the treated sample compared to the control sample.

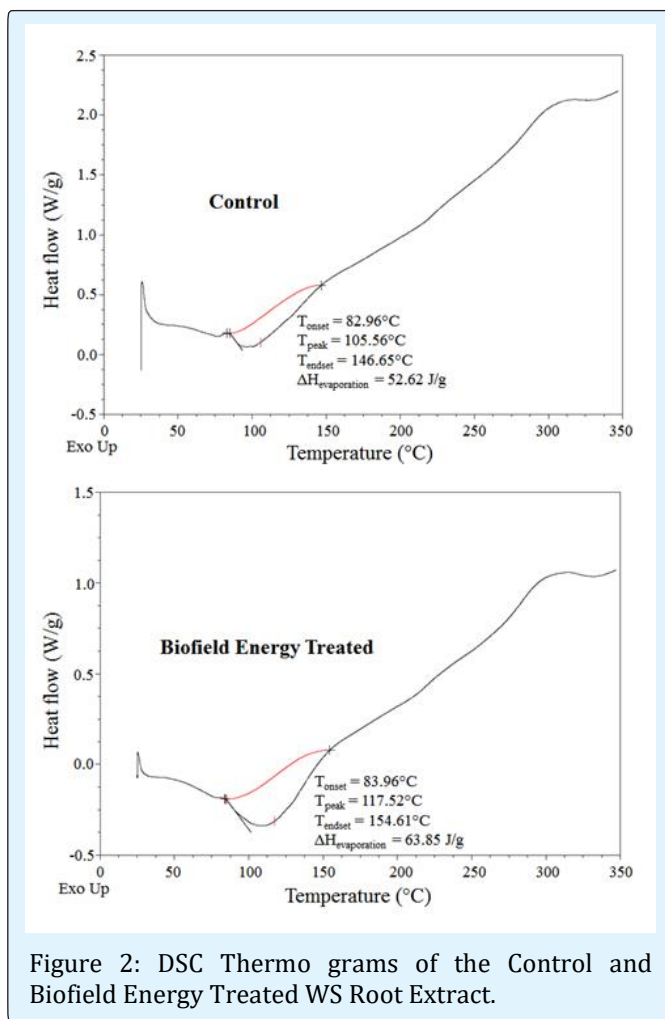


Figure 2: DSC Thermo grams of the Control and Biofield Energy Treated WS Root Extract.

Sample	Evaporation Temperature (°C)	$\Delta H_{\text{evaporation}}$ (J/g)
Control Sample	105.65	52.62
Biofield Energy Treated	117.52	63.85
% Change	11.24	21.34

Table 2: DSC data for both Control and Biofield Energy Treated samples of WS Root Extract.

$\Delta H_{\text{evaporation}}$: Latent heat of evaporation.

Thermal Gravimetric Analysis (TGA) / Differential Thermogravimetric Analysis (DTG)

The control and the Biofield Energy Treated WS root extract showed two steps of the degradation process in the thermograms. The total weight loss of the Biofield Energy Treated WS root extract (81.66%) was decreased by 4.3% compared with the control sample (85.33%). However, the residue quantity was significantly increased by 25.02% in the Biofield Energy Treated sample compared to the control sample (Table 3).

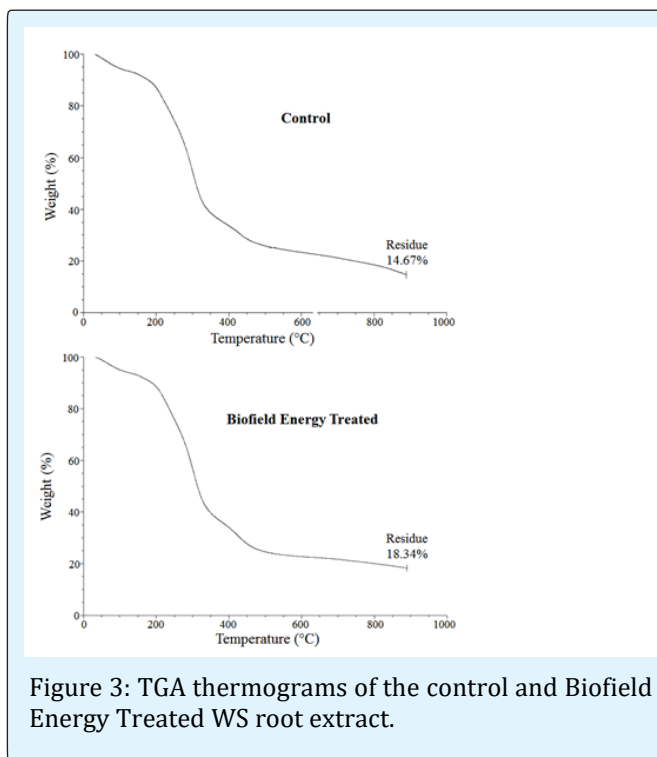


Figure 3: TGA thermograms of the control and Biofield Energy Treated WS root extract.

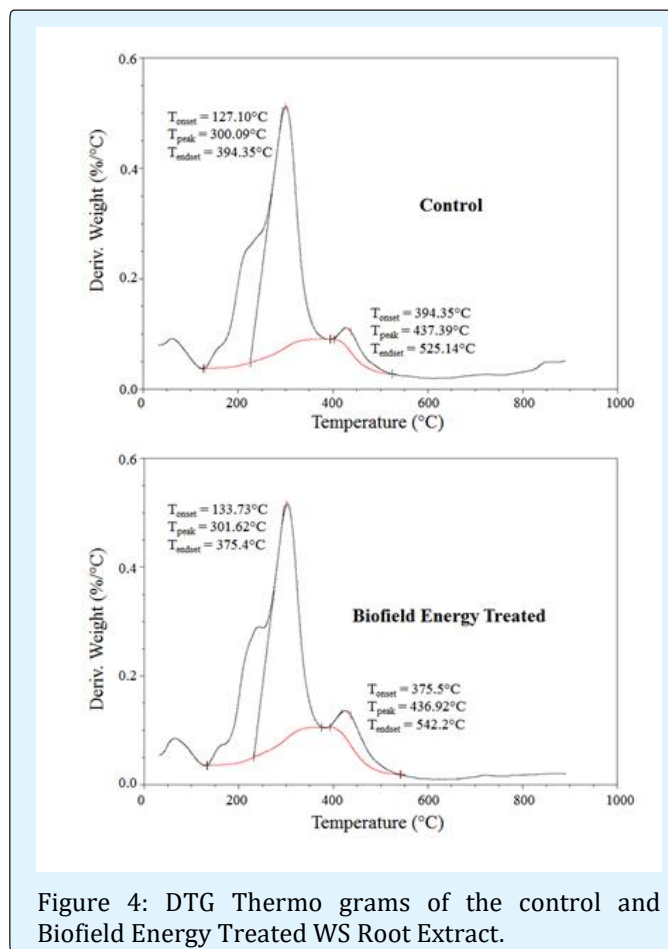


Figure 4: DTG Thermo grams of the control and Biofield Energy Treated WS Root Extract.

Sample	TGA		DTG; T _{max} (°C)	
	Total weight loss (%)	Residue %	Peak 1	Peak 2
Control	85.33	14.67	300.09	437.39
Biofield Energy Treated	81.66	18.34	301.62	436.92
% Change	-4.3	25.02	0.51	-0.11

Table 3: TGA/DTG Data of the Control and Biofield Energy Treated Samples of WS Root Extract.

T_{max} = the temperature at which maximum weight loss takes place in TG or peak temperature in DTG.

Similarly, the control and the Biofield Energy Treated WS root extract also exhibited two peaks in the DTG thermograms (Figures 3 & 4). The maximum thermal degradation temperature (T_{max}) of the Biofield Energy Treated WS root extract was slightly altered by 0.51% and -0.11% in peak 1 and peak 2, respectively compared with the control sample. Overall, TGA/DTG thermal analysis revealed that the thermal stability of the Biofield

Energy Treated WS root extract was increased compared with the control sample.

Conclusion

The experimental results indicated that the Trivedi Effect®-Consciousness Energy Healing Treatment have a significant impact on the particle size, surface area, and thermal behaviors of WS root extract. The particle size values of the Biofield Energy Treated WS root extract powder sample were altered by -7.92% (d₁₀), -5.32% (d₅₀), and -0.36% (d₉₀) 1.02% {D(4,3)}; thus, the specific surface area was significantly increased by 5.31% compared with the control sample. The evaporation temperature and ΔH_{evaporation} of the Biofield Energy Treated WS root extract were significantly increased by 11.24% and 21.34%, respectively compared with the control sample. The total weight loss in the Biofield Energy Treated WS root extract was decreased by 4.3%; however, the residue amount was significantly increased by 25.02% compared with the control sample. The experimental results concluded that the Trivedi Effect®-Consciousness Energy Healing Treatment might have altered particle size, surface area, and thermal properties of WS root extract which would show better solubility, dissolution, absorption, bioavailability, and thermal stability compared to the control sample. This new form of WS root extract would be helpful to design more efficacious nutraceutical/pharmaceutical formulations for rejuvenate the body, restricting the aging process, immune busting, neuro-protection, antioxidant, inflammation, memory loss, insomnia, hepatoprotection, hypoglycemia, gastrointestinal issues, constipation, arthritis, cancer, skin conditions, Alzheimer's, Huntington's, and Parkinson's disorders, etc.

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