ISSN: 2634-9221
European Journal of Applied Sciences; Vol. 14 No. 04 (2026) (182-191)
https://doi.org/10.14738/aivp.1404.12045

Impact of the Blessing Energy Treatment on Morphological and Yield Attributes of Sponge Gourd (*Luffa cylindrica*)

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Abstract: **Background:** Sponge gourd (*Luffa cylindrica*) is an economically vital cucurbitaceous vegetable crop valued globally for its nutritional profile, dietary fiber, and traditional medicinal properties. However, fluctuating environmental factors and rising chemical input costs present persistent challenges to maximizing crop productivity. Consequently, exploring non-chemical, sustainable agricultural technologies capable of altering plant biophysical properties has gained momentum. **Objective:** This study aimed to systematically evaluate the response of *L. cylindrica* morphological and yield-related attributes to a non-contact, intention-based Spiritual Blessing Energy Treatment (SBET). **Methodology:** The field experiment was executed utilising a Randomised Complete Block Design (RCBD) with two distinct experimental cohorts: an untreated control sponge gourd group (CONSPGG) and a blessing/biofield energy-treated sponge gourd group (BTSPGG). High-purity *L. cylindrica* seeds and experimental land plot soils within the treated group were subjected to the SBET, while the control group remained entirely unexposed. **Results:** The vegetative growth traits such as vine length (40.63%, $p \leq 0.001$), number of primary branches (47.66%, $p \leq 0.001$), number of nodes (38.68%, $p \leq 0.001$), internode length (38.40%, ($p \leq 0.001$), and stem diameter (37.50%, $p \leq 0.001$) were significantly increased in the BTSPGG compared to the CONSPGG. The leaf morphological trait like number of leaves per plant was significantly increased by (53.29%, $p \leq 0.001$) in the BTSPGG compared to the CONSPGG. Reproductive and yield-attributing traits such as number of female flowers (41.46%, $p = 0.002$), peduncle length (33.47%, $p \leq 0.001$), fruit weight (33.43%, $p \leq 0.001$), and seed count per fruit (42.80%, $p \leq 0.001$) were significantly increased in the BTSPGG than CONSPGG. Further, overall yield of sponge gourd in the BTSPGG was increased by 48.76% compared to the CPNSPGG. **Conclusion:** These findings suggest that SBET can positively impact the developmental pathways of sponge gourd, optimizing both growth vigour and reproductive capacity.

Keywords: *Luffa cylindrica*, biofield energy treatment, spiritual blessing, crop morphology, yield optimization, sustainable agriculture.

INTRODUCTION

Sponge gourd (*Luffa cylindrica* L.), a prominent member of the Cucurbitaceae family, is widely recognized as an economically vital vegetable and a sustainable source of natural industrial fibers. The plant thrives predominantly in tropical and subtropical regions, but its cultivation and yield outcomes are heavily contingent upon environmental adaptability, soil edaphoclimatic properties, and specific microclimatic variations. To establish the foundational baseline for direct-sown crop performance, yield parameters such as fruit length, fruit weight, fruit diameter, and seed counts must be rigorously evaluated against cultivation site mechanics. These baseline agro-morphological dynamics and feasibility parameters are thoroughly characterized by Fernández-Lambert 2025 et al. [1]. Beyond broader climate feasibility, the precise phenotypic expression and biometric lifecycle of *Luffa cylindrica* are highly sensitive to specific nutritional inputs and external macro-environmental stimuli. Key vegetative and reproductive indicators such as rapid seedling germination, extended vine height, leaf area expansions, flower counts, and chronological flowering cycles, directly determine the commercial value and structural integrity of the resulting sponge matrix. Maximizing these attributes typically involves adjusting nutritional cultivation frameworks to optimize growth behavior, as comprehensively analyzed by Fridrich et al. 2022 [2]. While conventional soil amendments and chemical fertilizers are traditionally deployed to manage these biometric outcomes, modern agricultural biotechnology increasingly explores alternative, non-chemical biostimulants to improve crop yield and induce favorable morphological alterations. Among these novel methodologies, Blessing Energy Treatments (also known as the Trivedi Effect®) have emerged as non-invasive techniques capable of systematically altering the phenotypic growth rate [3], genetic polymorphism [4], and yield traits of cucurbitaceous crops [5], as historically documented. Building directly upon these established paradigms, this investigation focused on the systematic response of Blessing Energy Treatment on the morphological and yield attributes of Sponge Gourd (*Luffa cylindrica*) and evaluated the structural and yield improvements achieved through this energy intervention.

MATERIALS AND METHODS

Study Site

This research was conducted in Bhandarwadi, Sindhudurg, Maharashtra, India (15°37'–16°40' N, 73°19'–74°13' E; 26 m above mean sea level.), situated within the tropical Konkan agro-climatic zone. The region is characterized by a distinct hyper-thermic regime, with mean maximum pre-monsoon temperatures ranging from 39–42°C, alongside pronounced interannual rainfall variability. These erratic precipitation patterns precipitate severe seasonal soil moisture deficits. Consequently, this exacerbates crop vulnerability to drought stress, potentially compromising critical physiological mechanisms across key phenological stages.

Seed Source and Experimental Design

Sponge gourd (*Luffa cylindrica* cv. Desi) seeds with 98% genetic purity (Lot No. NUSP0099; Label: 00218) were obtained from Namdeo Umaji Agritech (India) Pvt. Ltd. The field experiment was laid out in a Randomized Complete Block Design (RCBD) comprising two treatment groups replicated three times: an untreated control (CONSPGG) and a biofield energy treatment (BTSPGG). Both cohorts were cultivated under identical agronomic and environmental conditions, with standardized irrigation, fertilization, and pest management protocols maintained throughout the experimental period.

Field Layout

The experimental site encompassed a total area of 80.0 m^2, partitioned into six individual plots measuring 4.5 m × 2.5 m (11.25 m^2 per plot). Inter-plot and inter-replication buffer zones were maintained at a uniform distance of 0.5 m. Within each plot, a plant spacing grid of 0.5 m × 0.5 m was implemented. Prior to sowing, the experimental area was cleared of debris, and basal fertilizer was uniformly incorporated into the soil of each plot at standard rates of 50, 100, and 50 kg ha^{-1} of N, P, and K, respectively.

Spiritual Blessing (Biofield/Prayer) Energy Treatment (SBET) Strategy

The experimental group, designated as BTSPGG (comprising both *Luffa cylindrica* seeds and soil), was subjected to a single-exposure of spiritual blessing (biofield) energy treatment (SBET) administered by an experienced practitioner (over 17 years of clinical/field experience) Mr. Mahendra Kumar Trivedi. The control group, designated as CONSPGG (untreated seeds and soil), was maintained under identical environmental conditions without intervention. The SBET protocol was standardized using a non-contact, physical-presence modality over a duration of approximately 4 min. A static distance of approximately 0.5 m was strictly maintained between the practitioner and the experimental matrices (seeds and farming land) to prevent physical artifact or confounding tactile variables. To ensure reproducibility, environmental parameters during the exposure period were strictly monitored and regulated at an ambient temperature of (28 ± 2°C) and a relative humidity of (65 ± 5%).

Soil Characterization and Sample Preparation

To establish baseline physicochemical properties, composite soil samples were collected from the topsoil layer (30 cm) of each plot utilizing a systematic five-point sampling design. Collected samples were air-dried at room temperature, passed through a 2-mm sieve to ensure homogenization, and subsequently stored at 4°C prior to analysis. Soil particle size distribution (texture) was determined according to established protocols [6]. Potentiometric pH was measured in a 1:2 (w/v) soil-to-deionized water suspension using a benchtop pH meter calibrated with standard buffer solutions.

Agronomic Management and Plant Protection

Following direct sowing, experimental plots received manual irrigation for a 7-day establishment period before transitioning to a surface drip irrigation system. The irrigation network featured pressure-compensating emitters spaced at 0.5 m intervals with a discharge rate of 3 L h^{-1}. Fertilizer was applied at a baseline rate of 50:100:50 kg ha^{-1} of N, P, and K, respectively. The basal application incorporated the entirety of the specified P [applied as single superphosphate (SSP)] and K [applied as muriate of potash (MOP)] doses, combined with 50% of the total N [applied as urea]. The remaining 50% of N was side-dressed at 21 days after sowing (DAS). To maintain uniform pest pressure across all treatments, insect pests were controlled using a foliar application of a commercial insecticide mixture (50% chlorpyrifos + 5% cypermethrin; Hamla 550, Gharda Chemicals Ltd., Mumbai, India) at a rate of 2 mL L^{-1}.

Growth and Morphological Parameters

To evaluate vegetative and reproductive growth parameters, five plants were randomly selected from each plot at 70 DAS. Morphological characterization was divided into qualitative and quantitative traits. Qualitative attributes evaluated included plant growth habit, stem shape, stem pubescence, leaf blade lobing depth, leaf blade color, fruit skin color, fruit shape, seed color, and seediness. Quantitative traits measured included primary vine length (m), number of primary branches, number of nodes per vine, internode length (cm), stem diameter (cm), leaf length and width (cm), days to 50% flowering, fruit weight (g), fruit length and width (cm), cumulative fruit yield (t/ha), seed length and width (cm), and seed count per fruit.

Yield Parameters

Sponge gourd (*Luffa cylindrica*) fruits were harvested at physiological maturity. Fruit dimensions (length and diameter) were measured in centimeters, and fruit mass was determined using a calibrated digital balance. To evaluate yield components, five plants were randomly selected and sampled from each experimental plot. The total fruit yield per net plot (kg) was subsequently extrapolated to tonnes per hectare (t/ha) using standard conversion factors.

Statistical Analysis

Quantitative variables are presented as mean ± standard error of the mean (SEM). Differences between the two independent cohorts were evaluated using a two-tailed Student's *t*-test. All statistical analyses were performed using SigmaPlot (version 14.0). Statistical significance was defined a priori at $p < 0.05$.

RESULTS

Soil Properties

Baseline soil analysis revealed a strongly acidic (pH 5.01) sandy loam with restricted nutrient mobility and low cation exchange capacity (CEC). Post-harvest, SBET application significantly neutralized soil acidity to a pH of 5.86, concurrently elevating exchangeable cations (Ca^{2+}, Mg^{2+}, and Na^{+}) and total K in the BTSPGG cohort compared to the CONSPGG. These findings suggest that this SBET modulated ion exchange dynamics and mineral solubility, presenting an effective mechanism to alleviate the physicochemical constraints of acidic soils.

Phenological Progression and Morphology of *Luffa cylindrica*

Systematic morphological assessments of *Luffa cylindrica* L. were conducted at defined intervals to map its entire ontogenetic development. The study quantified the species' complete phenological timeline, capturing key developmental milestones including germination dynamics, seedling establishment, vegetative growth, anthesis, fruit development, and harvest maturity (**Figure 1**).

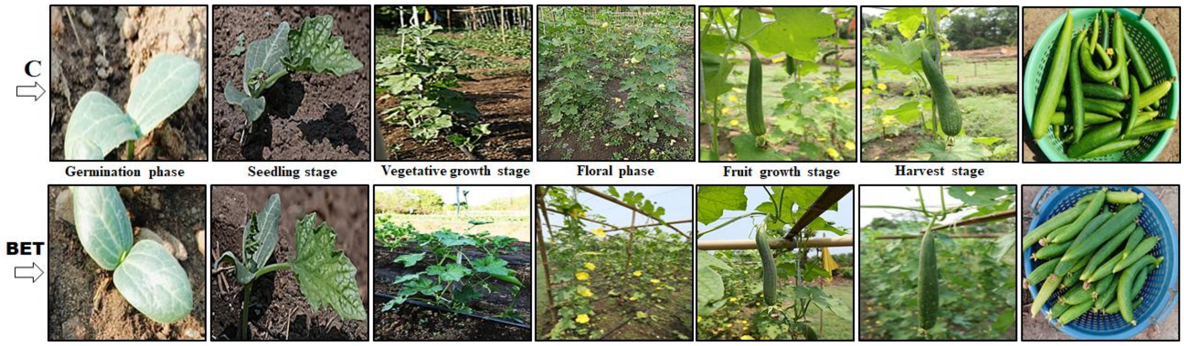

Figure 1: Characterization of sponge gourd (*Luffa cylindrica*) vegetative growth characteristics. Chronological sample images depict the developmental transitions of the control (C) versus blessing/biofield energy-treated (BET) cohorts.

Morphological Characteristics

The qualitative vegetative and reproductive descriptors of sponge gourd are summarized in **Table 1.** Notable phenotypic variations between the control (CONSPGG) and biofield energy-treated (BTSPGG) groups were observed across vine, leaf, fruit, and seed characteristics. The BTSPGG cohort exhibited enhanced vegetative vigor, characterized by longer vine lengths, dense stem pubescence, and large leaf sizes with deep lobing, compared to the medium vine lengths, medium stem pubescence, medium leaf sizes, and medium lobing observed in the CONSPGG group. Additionally, leaf pubescence in the BTSPGG group was distinctly softer than CONSPGG. Foliar and floral pigmentation also intensified following treatment; BTSPGG displayed dark green leaf blades and bright yellow flowers, whereas CONSPGG exhibited green leaf blades and standard yellow flowers. Distinct treatment-induced variations were also evident in fruit and seed morphology. CONSPGG fruits were characterized by green skins, a highly fibrous and spongy internal texture, and a mildly bitter flesh taste. Conversely, BTSPGG fruits developed dark green skins, a softer texture with reduced fibrousness and sponginess, and a slightly sweet flavor profile. Seed traits varied significantly: CONSPGG presented light black seeds with medium seediness (100–200 seeds per fruit), while BTSPGG produced dark black seeds with high seediness (greater than 200 seeds per fruit). Despite these divergences, both groups maintained identical phenotypic patterns for vine stem shape, tendril morphology (including type and branching), leaf shape, leaf margin, and fruit shape (**Table 1**). Many qualitative morphological traits in BTSPGG were better than those in CONSPGG, indicating the superior quality of the treated sponge gourd fruits.

Table 1: Effects of blessings (biofield) energy treatment on qualitative vegetative parameters of sponge gourd at 70 days after sowing (DAS).

Vegetative trait	**Control group (CONSPGG)**	**Treated group (BTSPGG)**
Plant growth habit/vine length	Medium vine (2.5-4 m)	Long vine (>4 m)
Vine stem shape	Angular	Angular
Stem pubescence	Medium	Dense
Tendril	Present	Present
Tendril type	Coiled	Coiled
Tendril branching	Branched	Branched
Leaf shape	Reniform	Reniform

Leaf margin	Dented	Dented
Leaf size	Medium	Large
Leaf pubescence	Soft	Very Soft
Leaf blade colour	Green	Dark green
Depth of lobbing in leaf blade	Medium	Deep
Flower colour	Yellow	Bright yellow
Fruit skin colour	Green	Dark green
Fruit shape	Cylindrical and elongated	Cylindrical and elongated
Fruit texture	Fibrous spongy	Less fibrous, spongy, and soft
Fruit flesh taste	Mild bitter in taste	Mild sweet
Seed colour (mature harvest stage)	Light black	Deep black
Seediness (number of seeds/ fruit)	Medium (100-200)	Large (>200)

Phenology and Yield Traits

Compared to the control (CONSPGG), the BTSPGG treatment elicited significant enhancements across all evaluated growth, physiological, and yield parameters. The germination rate increased by 15.49% ($p \leq 0.001$). Vegetative growth was substantially promoted in the BTSPGG, with significant increases observed in vine length (40.63%, $p \leq 0.001$), number of primary branches (47.66%, $p \leq 0.001$), number of nodes (38.68%, $p \leq 0.001$), internode length (38.40%, $p \leq 0.001$) and stem diameter (37.50%, $p \leq 0.001$) compared to the CONSPGG. Leaf morphological characteristics also improved significantly under BTSPGG treatment, including leaf number per plant (53.29%, $p \leq 0.001$), leaf length (26.07%, ($p \leq 0.001$), and leaf width (25.40%, ($p \leq 0.001$) than CONSPGG. Reproductive phenology and yield components were altered favourably. The number of male and female flowers increased by 34.94% ($p \leq 0.001$) and 41.46% ($p = 0.002$), respectively, while the days to first male and female anthesis were significantly reduced by 11.27% ($p \leq 0.001$) and 10.66% ($p \leq 0.001$). Furthermore, yield-attributing traits such as peduncle length (33.47%, $p \leq 0.001$), fruit weight (33.43%, $p \leq 0.001$), fruit length (27.45%, $p = 0.011$), fruit width (29.33%, ($p \leq 0.001$), and the number of fruits per plant (23.97%, $p = 0.006$) were all significantly enhanced. This culminated in a 48.76% expansion in overall fruit yield per hectare was observed in the BTSPGG compared to the CONSPGG. Seed metrics followed a similar upward trend, with significant increases in seed count per fruit (42.80%, $p \leq 0.001$) seed length (10.11%, $p = 0.013$), and 100-seed weight (16.16%, $p \leq 0.001$) (**Table 2**).

Table 2: Evaluation of the phenological and yield characteristics of sponge gourd following spiritual (biofield/prayer) blessing energy treatment (SBET).

Vegetative trait	**Control group (CONSPGG)**	**Treated group (BTSPGG)**	**P Value**
Days to germination	7-9	6-7	-
Germination percentage	85.22 ± 0.06	98.42 ± 0.08	$p \leq 0.001$
Plant vine length (m)	3.47 ± 0.16	4.88 ± 0.12	$p \leq 0.001$
Number of primary branches/vines	6.42 ± 0.11	9.48 ± 0.17	$p \leq 0.001$
Number of nodes/vines	46.74 ± 1.47	64.82 ± 1.58	$p \leq 0.001$
Internode length (cm)	16.77 ± 0.37	23.21 ± 0.15	$p \leq 0.001$
Stem diameter (cm)	1.20 ± 0.03	1.65 ± 0.02	$p \leq 0.001$

Number of leaves per plant	83.26 ± 2.37	127.63 ± 3.84	$p \leq 0.001$
Leaf length (cm)	13.73 ± 0.35	17.31 ± 0.14	$p \leq 0.001$
Leaf width (cm)	12.64 ± 0.12	15.85 ± 0.20	$p \leq 0.001$
Days to first male (staminate) flower appearance	36.72 ± 0.20	32.58 ± 0.42	$p \leq 0.001$
Days to first female (pistillate) flower appearance	42.69 ± 0.27	38.14 ± 0.31	$p \leq 0.001$
Days to 50% flowering	55.37 ± 1.46	52.20 ± 1.25	$p = 0.138$
Number of male flowers	84.27 ± 2.74	113.71 ± 3.60	$p \leq 0.001$
Number of female flowers	16.69 ± 1.02	23.61 ± 1.07	$p = 0.002$
Days to first harvest	57.74 ± 1.24	55.41 ± 1.32	$p = 0.234$
Peduncle length (cm)	12.52 ± 0.17	16.71 ± 0.22	$p \leq 0.001$
Fruit weight (g)	114.53 ± 1.58	152.82 ± 1.26	$p \leq 0.001$
Crop duration (days)	105.36 ± 1.34	104.62 ± 1.72	$p = 0.743$
Fruit length (cm)	21.64 ± 1.25	27.58 ± 1.32	$p = 0.011$
Fruit width (cm)	3.75 ± 0.12	4.85 ± 0.16	$p \leq 0.001$
100-seed weight (g)	11.82 ± 0.07	13.73 ± 0.05	$p \leq 0.001$
Seed length (cm)	0.89 ± 0.02	0.98 ± 0.02	$p = 0.013$
Seed width (cm)	0.63 ± 0.01	0.67 ± 0.02	$p = 0.111$
Seed count/fruit	162.75 ± 4.62	232.41 ± 4.52	$p \leq 0.001$
Number of fruits per plant	32.58 ± 1.59	40.39 ± 1.35	$p = 0.006$
Fruit yield (kg) per plant	3.73	6.17	-
Fruit yield (kg)	40.89	60.85	-
Fruit yield/sq. m plot (kg/sq. m)	1.21	1.80	-
Fruit yield/hectare (ton/ha)	12.12	18.03	-

Data represented as mean ± SEM (n = 5); $p \leq 0.05$ *vs.* control sponge gourd group (CONSPGG) using Student's *t*-test

DISCUSSION

The significant boost in early development following the BTSPGG treatment was initial evidence of enhanced vegetative vigor. The observed increase in seed germination directly aligns with observations that optimized pre-sowing and environmental inputs stimulate physiological reserves within the hard seed coats of *Luffa* species. This dynamic was corroborated by Sidhu and Kaur, 2021, reported that targeted breeding and physiological conditioning significantly optimize early seedling vigor and germination rates [7]. Furthermore, the extensive enhancement of structural elements such as vine length, number of primary branches, and stem diameter demonstrates that the treatment actively promotes cell division and elongation in the main and lateral meristems. These findings map consistently with the growth patterns recorded by the researcher Shah et al. 2020 [8], where localized nutrient optimization drove major increases in structural vine lengths and node density. The expansion of leaf morphological traits, including leaf number, leaf length, and leaf width, reveals a larger overall canopy surface area. This increased area directly improves solar energy capture and photosynthetic capacity. According to Fernández-Lambert described that managing leaf dimensions and canopy spacing creates an optimal microclimate that prevents premature leaf drop and maximizes vegetative-to-reproductive carbohydrate distribution [1].

Sponge gourd is naturally monoecious (bearing separate male and female flowers on the same vine), meaning its overall fruit yield is fundamentally restricted by its male-to-female sex ratio and flowering schedule. The treatment group (BTSPGG) significantly modified these reproductive traits by increasing the number of female flowers than male flowers. This targeted increase in female floral nodes effectively balances the plant's sex ratio toward high-yield potential. This reproductive shift mirrors the physiological trends documented by Davis JM, 1994, who reported that modifying early lateral branches and optimizing nutrient allocation can trigger a higher density of pistillate (female) flowers [9]. Additionally, the SBET treatment significantly accelerated reproductive maturity, cutting down the days to first male anthesis and female anthesis. Minimizing these pre-flowering days enables earlier crop establishment and extends the seasonal harvest window. This accelerated development pattern strongly agrees with the baseline behavior outlined by Gantayat et al. 2025, highlighted that early flowering timelines were vital indicators of adaptive resource partition efficiency in *Luffa* cultivation [10].

The phenotypic improvements in reproductive traits directly translated into better yield architecture. Significant expansions in peduncle length, individual fruit weight, fruit length, and fruit width collectively demonstrate that the SBET-treatment group (BTSPGG) ensures a steady, powerful sink-strength during fruit filling. The boost in the total number of fruits per plant, combined with increased individual fruit mass, culminated in a substantial expansion in overall fruit yield per hectare compared to the control group. This massive productivity jump underlines the efficacy of the treatment. These results are highly consistent with the field dynamics published by Shah et al. 2020 [8], who established that maximizing fruit dimensions and fruit count per vine was the primary way to achieve top-tier tonnage per hectare in intensive gourd farming.

Finally, seed quality indicators also followed a clear upward trend under the SBET-treatment group, BTSPGG. The significant increases in seed count per fruit, seed length, and 100-seed weight showed that the treatment improves fertilization efficiency and embryonic embryo-sac development. These enhanced seed characteristics match the structural outcomes seen in high-vigor *Luffa* populations analyzed by Fernández-Lambert et al. 2025 [1], where superior seed counts and single-seed mass directly reflected strong reproductive health and exceptional post-harvest seed viability. Collectively, these integrated results were strongly supported by the macro-level agricultural models, which showed that applying non-traditional biostimulants and blessing energy treatment can fundamentally optimize cell metabolism, leading to significant increases in overall agricultural yield, biomass production, and crop resilience.

CONCLUSION

In conclusion, the application of the SBET demonstrated a profound, holistic stimulatory effect on crop production, significantly outperforming the treatment group (BTSPGG) across all stages of plant ontogeny from initial establishment to final reproductive output. Taken together, these findings demonstrate that BTSPGG acts as a highly effective growth and yield biostimulant. By systematically improving early germination, vegetative biomass, photosynthetic source capacity, and reproductive efficiency, BTSPGG offers a powerful, statistically robust intervention to maximize crop productivity and agricultural output per hectare.

Abbreviations

SBET: spiritual blessing energy treatment; CONSPGG: control sponge gourd group; BTSPGG: biofield energy-treated sponge gourd group; SSP: single super phosphate; MOP: muriate of potash

Acknowledgement

The authors are grateful to Divine Connection Foundation for the assistance and support during the work.

Conflict of Interests

Author MKT was employed by Trivedi Global, Inc. VDK, NRP, and TBG were employed by Shree Angarsiddha Shikshan Prasarak Mandal's College of Agriculture, Sangulwadi, Mohitewadi, Maharashtra, India. Authors SM and SJ were employed by Trivedi Science Research Laboratory Pvt. Ltd.

Funding

The authors declare that no funds, grants, or other support were received during the preparation of this manuscript.

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