FLORA RESEARCH LABORATORIES, LLC

ANALYTICAL REPORT

February 7, 2020 FRL ID: 200121005, 200121006, & 200121011

DATE: February 7, 2020

REPORT: Phytoforensic Quantification of Cannabidiol (CBD) by High Performance Liquid Chromatography-Ultraviolet Detection (HPLC-UV)

CLIENT: Buddha Teas

JOB: J20-0121-D

FRL Sample ID	Client Sample ID	Client Sample Description
200121005	A5555	CBD Mushroom Blend
200121006	A5556	CBD Tulsi Ashwagandha
200121011	A5557	CBD Sample

INTRODUCTION:

The client contacted FRL to outline and run a multi-step project surrounding the client's Cannabidiol (CBD) water dispersive raw material and two tea blends. In finished product form, each tea blend should contain 5mg of CBD per serving. The three phases of the project are defined below:

1. Analysis of powdered CBD raw material for potency by HPLC-UV
2. Matrix blank analysis of the blends without the CBD ingredient (the teas were provided to FRL without the CBD)
3. Analysis of lab mixed blends of matrix blanks with CBD ingredient spiked in on the bench (prepared at the same relative concentration as would be found in the finished product form)

PHASE 1 RESULTS:

Cannabidiol	Result (%w/w)
200121011 Sample	20.3
200121011 Duplicate	20.9
200121011 Triplicate	20.3
200121011 Mean	20.5

%w/w = Percent by Weight

~CONTINUED ON NEXT PAGE~

PHASE 2 RESULTS:

Cannabidiol (CBD)	Result
200121005 Mushroom Blend	ND
200121006 Tulsi Ashwagandha Blend	ND

ND = No peak detected in blank matrix within the retention window of CBD

PHASE 3 RESULTS: (Average of Triplicate Analyses)

Cannabidiol (CBD)	Results (mg/serving)	% Recovery
200121005 Mushroom Blend	4.47	86.4
200121006 Tulsi Ashwagandha Blend	4.26	83.2

mg/serving = milligrams per serving
Based on a serving size of 2g, per client specification
% Recovery = Percent CBD recovered from spiked matrix

DISCUSSION:

For Phase 1 testing, 100mg of the CBD raw material was first extracted in 3mL of water by vortexing for 30 seconds, shaking for 5 minutes, and sonicating for 15 minutes before a subsequent extraction with an additional 7mL of Methanol (final volume was 10mL). This extraction protocol yielded a triplicate average of 20.5%w/w for the CBD raw material. See Phase 1 Results Table for replicate data. This extraction protocol was used going forward for Phase 2 & 3 testing. For Phase 2 testing, 250mg of non-spiked tea blends were weighed into 50mL centrifuge tubes, extracted, and analyzed by HPLC-UV for any potential peaks within the retention window of CBD. Running the blank, non-spiked tea mixes allowed for FRL to rule out any potential co-eluting peaks, which could interfere with an accurate quantification of CBD in Phase 3 testing. No peaks were observed within the retention window of CBD for any of the blank tea blends. For Phase 3 testing, lab bench mixes were prepared by mixing the CBD raw material and the blank tea blends using the client provided finished product specifications for each of the tea blends. Once mixed and homogenized, 250mg of the lab prepared bench mix was taken and extracted using the protocol defined in Phase 1. All of the spiked tea blends meet allowable percent recovery requirements for data reporting. See Phase 3 Results Table for data.

~CONTINUED ON NEXT PAGE~

CONCLUSION:

Based on the data analyzed from Phase 1, the CBD raw material is consistent with the client specified value of 20.0% (reported value = 20.5%). This value was only achieved by an initial extraction in water before a subsequent extraction in methanol. The chromatographic method used by FRL separates analytes in matrix in such a way that allows for no co-eluting peaks with CBD. This allows for an accurate quantification of CBD by HPLC-UV. The spiking studies performed in Phase 3 suggests that both the extraction and instrument method of analysis used by FRL are sufficient for the analysis of CBD in the matrices submitted by the client. If additional matrices are to be tested for routine CBD potency in the future, it is suggested to submit a blank tea blend in order to determine potential co-eluting compounds, similar to what was done in Phase 2 of this project.

Assayed/Reported By:
Reine Bravo,
Chemical Hygiene & Safety Officer
Scientist I
Date: 2-7-20

QC Approval By:
Pierce Prezy
Assistant Laboratory Manager
Date: 02/07/20