

PHYTO+ Certificate of Analysis:

Organic Hemp CO2 Extract

Cannabinoid Profile

Sunshine Trading | PHYTO Plus
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The Netherlands

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Responsible Supervisor: Martin V.
Responsible Technician: Paul K.
Sample Batch #1501
Date samples received: 10-May 2017
Date analysis began: 10-May 2017
Date sample report produced: 10-May 2017
ID Number when available:
Sample Mass 1 g

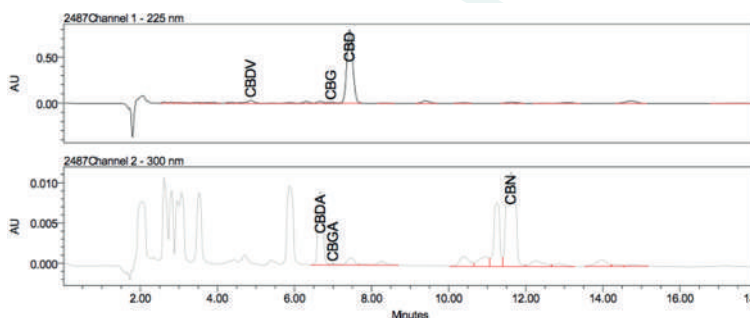


SKAL:100364, ISO 14001: 2004 certified; ISO 9001: 2008 certified, Organic certified: NL-BIO-01, HACCP certified; GMP certified

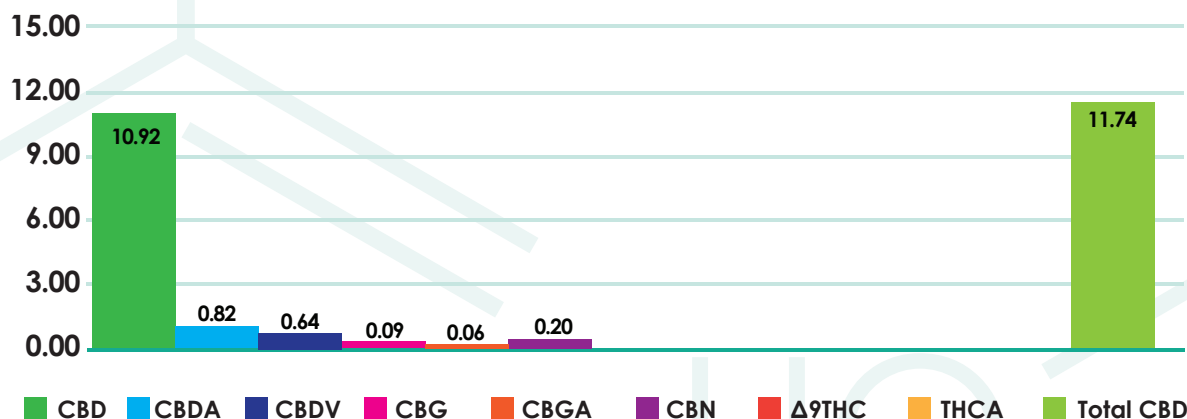
PHYTO Plus 11.74% Total CBD+CBDA: Cannabinoid Profile

Component	Mass (%)	Amount (mg/g)	Limit
CBD	10.92	109.20	N/A
CBDA	0.82	8.20	N/A
CBDV	0.64	6.40	N/A
CBG	0.09	0.90	N/A
CBGA	0.06	0.60	N/A
CBN	0.20	2.00	N/A
Δ9THC	<0.01	<0.10	N/A
THCA	<0.01	<0.10	N/A
Total CBD	11.74	117.40	N/A

HPLC Chromatograph Raw Data



Cannabinoids as Percent of Total Mass



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PHYTO+ Certificate of Analysis:

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Terpenoid Profile

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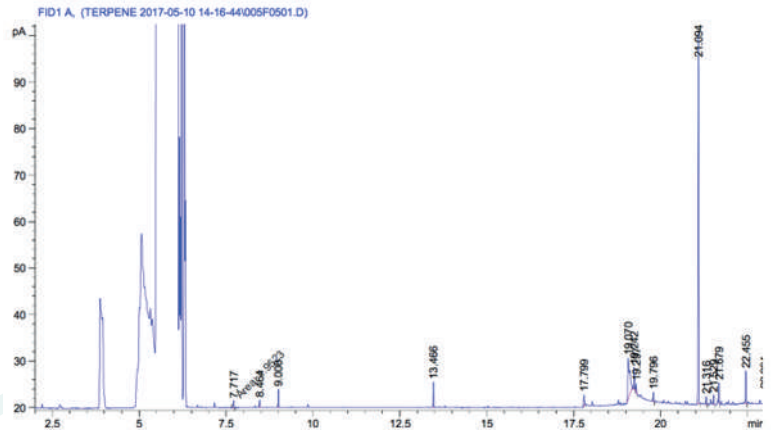
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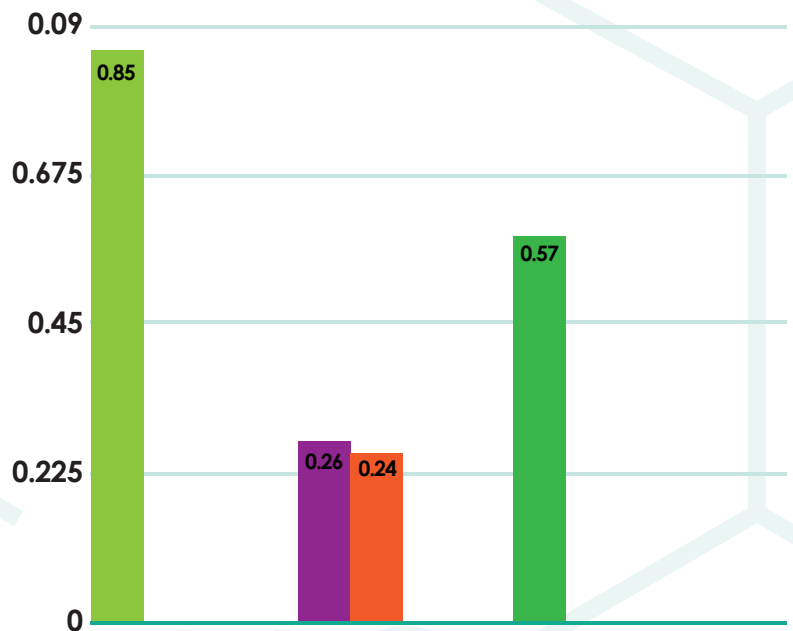
PHYTO Plus 11.74% Total CBD+CBDA: Terpenoid Profile

Component	Amount (%)
β-Caryophyllene	0.85
α-Humulene	<0.01
Caryophyllene oxide	<0.01
Myrcene	0.26
α-Pinene	0.24
Terpinolene	<0.01
Humulene epoxide II	<0.01
Limonene	0.57
β-Pinene	<0.01
E-β-Ocimene	<0.01
Sabinene	<0.01
Linalool	<0.01



Terpenoid Distribution

- β-Caryophyllene
- α-Humulene
- Caryophyllene oxide
- Myrcene
- α-Pinene
- Terpinolene
- Humulene epoxide II
- Limonene
- β-Pinene
- E-β-Ocimene
- Sabinene
- Linalool



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PHYTO+ Certificate of Analysis:

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Microbial Profile

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PHYTO Plus 11.74% Total CBD+CBDa: Microbial Profile

Component	Amount (mg/g)	Result
Listeria / Monocytogenes	1 g	Not Detected
Escherichia c.	1 g	Not Detected
Salmonella	25 g	Not Detected
Yeast	1 g	<1 x 10 ²
Mold	1 g	<1 x 10 ²

All Mycotoxins at Non Detectable (ND) levels



Conclusions:

All microbial residues including Listeria, Monocytogenes, E-Coli, Fungi, Salmonella and Molds are all below detectable thresholds.

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PHYTO+ Certificate of Analysis:

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Heavy Metals Profile

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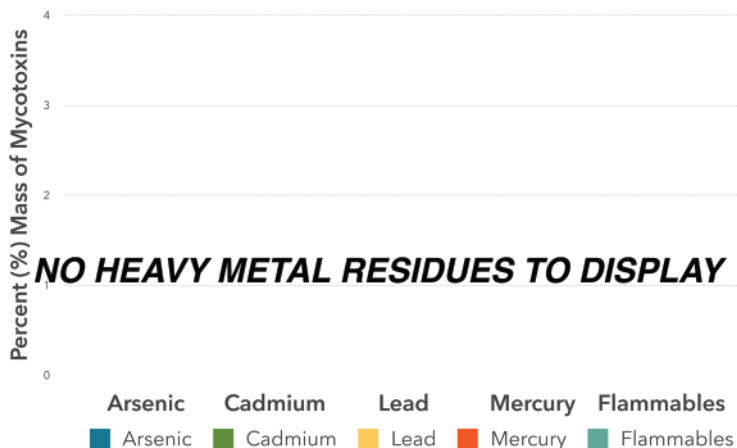


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PHYTO Plus 11.74% Total CBD+CBDA: Heavy Metals Profile

Component	Mass (%)	Amount (mg/g)	Limit
Arsenic	< 0.01	ND	ND
Cadmium	< 0.01	ND	ND
Lead	< 0.01	ND	ND
Mercury	< 0.01	ND	ND
Flammables	< 0.01	ND	ND

All Heavy Metals at Non Detectable (ND) levels



Conclusions:

No heavy metal residues detected. No flammable residues detected.
No chemical residues detected.

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Pesticide Analysis

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Pesticide Analysis: Our tests looked for residue of nearly 300 known pesticides finding no evidence of any over detectable limits.

The Lab tests our products thoroughly. Nearly 300 of the below pesticides concentrations were measured and we are proud to say that all tests measured below our detectable limits. Most tests have a threshold of 0.01 mg/k, while only a handful of tests have a threshold value of <0.05 mg/kg. Not a single test of PHYTO Plus products went over detectable threshold limits.

PESTICIDES MEASURED

Acrinathrin Azoxystrobin Biphenhin Bitertanol Biphenyl Bromopropylate
Bromuconazole Bupirimate Cadusafos Captafol Captan Chlorphenson
Chlorfenapyr Chlorfenvinphos Chlorothalonil Chlorprophame
3,5-Dichloraniline Chlorpyrifos Chlorpyrifos-methyl Chlorthal-dimethyl
Cyfluthrin Cypermethrin Cyproconazole Cyprodinil Clomazone
o,p-DDE P,P-DDE o,p-DDD P,P-DDD o,p-DDT p,p-DDT Deltamethri Diazinon
Diclofop-methyl Dieltrin Dichlobenil Dichlofluaniid Dichlorvos Dicloran Dicofof
Dicrotophos Diethofencarb Diflubenzuron Dimetachlor Diniconazole
Dodemorph Diphenylamine Alpha-Endosulfan Beta-Endosulfan
Endosulfan-sulphate Ethion Etofumesate Ethoprophos Ehtoxyquin
Etoxazole Etridiazole Etrimpfos Famoxadone Fenarimol Fenazaquin
Fenchlorphos Fenhexamid Fenithoate Fenpropidin Fenpropimorph
Fenvalerate Formothion Fipronil Fipronil-sulfone Fludioxonil Flusilazole
Flutriafol Falpet Fuberidazole Furathiocarb Hexaconazole HCB Alpha-HCH
Beta-HCH Delta-HCH Heptachlor Heptachlor-epoxidceis Heptachlor-
epoxidtreas Iprodione Iprovalicarb Lambda- cyhalothrin Lindane Mecarbam
Metalax Metazachlor Methidathion Metribuzin Mevinphos Myclobutanil
Nuairimol Orthophenylphenol Oxadixyl Pacllobutrazol Parathion
Parathion-methyl Paraoxon-methyl Paraoxon-ethyl Penconazole
Pendimethaline Permethrin Phenthoate Phorate Procymidone Profenofos
Propiconazole Propyzamide Pyrazophos Pyrethrins Pyridaben Pyrimethanil
Pyriproxyfen Quinoxifen Quitozene Pentachloraniline Phosphamidon
Pyrifenoxy Prometryn Propanil Propoxur Proquinazid Prothiofos Simazine
Spiroxamine T au-fluvalinate T ebuconazole T ebufenpyrad T ecnazene T
efluthrin T erbutylazine T etraconazole T etradifon T etramethrine
T olclofos-methyl T otyfluaniid Transfluthrin Triadimephon Triadimenol
Trialate Trifloxystrobin Triflumizole Vinclozolin DDT isomersum Heptachlor
(heptachlorand heptachloer poxidsum) Trifluraline Chlorobenzilate 3-Chloraniline
Abamectin (AvermectinBla and AvermectinBlb sum) Acetamiprid Aldicarb
Aldikarbsulphone Aldikarbsulphoxide Azinphos-ethyl Azinphos-methyl
Benalaxyl Benfuracarb Boscalid Buprofezin Carbaryl Carbendazim Carbofuran
3-hydroxycarbofuran Carbosulfan Chloridazone Cymoxanil Clofentezin Clothianidin
Demeton-S-methyl Demeton-S-methylsulfoxid Diafenthion Difenconazole
Dimethoate Dimethomorph Diuron EPN Epoxiconazole Ethirimol Etofenprox
Fenamiprone Fenbuconazole Fenbutatinoxid Fenoxycarb Fenpyroximate
Fenprothion Fenfenthion Fenthion Fenthionsulphone Fenthionsulphoxide
Fluazinam Flufenoxuron Fluquinconazole Fonofos Formetanate Fosthiatate
Hexythiazox Imazalil Imidacloprid Indoxacarb Isofenphos Methacrifos Isofenphos-
methyl Krezoxim-methyl Linuron Lufenuron Malaoxon Malathion Mepanipirim
Meprothion Metamitron Metconazole Methamidophos Methiocarb
Methiocarbsulphone Methiocarbsulfoxide Methomyl Methoxyfenozide
Metobromuron Monocrotophos Monolinuron Omethoate Oxamyl Pencycuron
Phenmedipham Phosalone Phosmet Phosmeot xon Phoxim Pymetrozine
Piperonylbutoxide Pyraclostrobin Pyridaphenthion Pyridate Pyrifenoxy Pirimicarb
Pirimicarbdesmethyl Pirimiphos-methyl Primisulfuron-methyl Prochloraz
Propamocarb Propargite Prothioconazole Prothioconazole-desthio
Quinalphos SpinosynA SpinosynD Sulfotep T ebufenozide T eflubenzuron
Thiabendazole Thiachloprid Thiamethoxam Thiodicar Thiophanate-
methyl Tralkoxydim Triazophos Trichlorfon Triflumuron Triforine Triticonazole
Zoxamide Acephate Amitraz Fenamiphos Fenamiphosulphone
Fenamiphosulfoxid Nifentipram Fenthionoxonsulphone Fenthionoxonsulfoxid
Kumapho Piriphenox Mehibuzine DEET

Our laboratory analysis is standardized after following protocols:

LST EN ISO 6579:2003 / AC:2006 / P:2007
LST EN ISO 11290-1:2003 / A1:2004 / P:2005
LST ISO 16649-2:2002 / P:2009
LST ISO 21527-2:2008
Method PLM 486G

Note on Cannabinoid Testing:

All cannabinoids in their acid forms (ending in "-A") are convertible to their non-acid forms via a decarboxylation process (heating). The components lose mass through this process. To find the total theoretical active cannabinoids, one multiplies the acid forms by 87.7%. For example, THC-A can be converted to active THC using the formula: $\text{THC-A} \times 0.877 = \text{THC}$. In this case, the Max THC for the sample is: $\text{Max THC} = (\text{THC-A} \times 0.877) + \text{THC}$. This method has been validated according to the principles of the International Conference on Harmonisation.

Chromatographic Analysis:

Analysis of cannabinoids content was performed using Waters 2695 (Milford, MA, USA) separation module equipped with auto injector, sample cooler, vacuum degasser and column heater units. Separation of all cannabinoids was accomplished on YMC PRO C18 (150 x 4 mm I.D., 5-µm) RP column coupled with C18 precolumn maintained at 30 °C by a CTO-20AC column oven. Isocratic elution consisted of acetonitrile:water (FA 0.5%) (4:1) was done in 30min. The flow rate was maintained at 0.8 ml/min. The cannabinoids CBD, CBG, CBN and THC were monitored at 225 and CBDA, CBGA were monitored at 306 nm respectively using dual absorbance detector Waters 2487 (Milford, MA, USA). The injection volume of 0.1 mg/ml sample was 10 µl. Data evaluation was performed using Clarity software.

Quantification of cannabinoids was obtained from linear regression equation of calibration curve of individual reference standard by plotting concentration versus the area ratio.

The calibration range for CBD, CBG-A, CBG, CBD-A and CBN was linear from 5 to 500 µg/ml. The calibration range for THC was linear from 5 to 100 µg/ml. Elution order CBD-A (RT 6.9 min), CBG-A (RT 7.3 min), CBG (RT 7.3 min) CBD (RT 7.8 min), CBN (RT 12.1), THC (RT 15.5 min).

Sample preparation for HPLC analysis

0.01 g (± 0.0001) of homogeneous cannabis extract was diluted with 1 ml of methanol (HPLC grade). Solution was sonicated for 5 min and vortexing for 10 sec. Samples before HPLC analysis were centrifuged at 4800 rpm and further diluted with methanol to the final concentration of 1 mg/ml.

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