JHG ANALYTICAL SERVICES LIMITED

Unit 3 Section 1

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TEST REPORT **REPORT NO.: 23-11-31405**

CHEMICAL/MICROBIOLOGICAL ANALYTICAL REPORT

Date of Report: 29th. November 2023.

Nature of Product: HM Labs.

Sample Reference: THHG Inc.

Sample Volume: 1 x 100 grams.

THHG INC
2665 Bayshore Dr suite 220
Coconut Grove Florida
33133
Email: thhglmr@gmail.com

For the attention of : THHG INC

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Heavy Metals Analysis

Parameter/Test	Method of Analysis	Units of Measurement	Reported Results
Arsenic (Total)	ICP/IC-OES	mg/kg.	12.600
Cadmium as Cd.	ICP/IC-OES	mg/kg.	0.0021
Mercury as Hg.	Cold Vapour A.A.S.	mg/kg.	0.00009
Lead as Pb.	ICP-OES	mg/kg.	< 0.00002
Chromium as Cr.	ICP/IC-OES	mg/kg.	< 0.00002
Nickel as Ni.	ICP-OES	mg/kg.	< 0.00002
Silver as Ag.	ICP-OES	mg/kg.	< 0.000001
Aluminium as Al.	ICP-OES	mg/kg.	4.446
Antimony as Sb.	ICP-OES	mg/kg.	< 0.00005
Molybdenum as Mo.	ICP-OES	mg/kg.	< 0.00003
Vanadium as V.	ICP-OES	mg/kg.	< 0.0004
Tin as Sn.	ICP-OES	mg/kg.	< 0.0005

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Microbiological Profile Analysis

Parameter/Determinand	Type of Analysis	Units of Measurement	Reported Levels
Staph. aureus	Pour Plate Method	CFU/g.	< 10 CFU/g.
Salmonella spp.	Pour Plate Method	CFU/25g.	Absent/25g.
Yeasts/Moulds	Pour Plate Method	CFU/g.	< 100 CFU/g.
Bacillus cereus	Pour Plate Method	CFU/25g.	Absent/25g.
Total Viable Count TVC @ 20oC.	Pour Plate Method	CFU/g.	2,045 CFU/g.
Total Viable Count TVC @ 37oC.	Pour Plate Method	CFU/g.	2,690 CFU/g.
Camphylobacter spp.	Pour Plate Method	CFU/g.	Absent/g.
Clostridium perfringens	Pour Plate Method	CFU/g.	Absent/g.
Enterobactericeae	Pour Plate Method	CFU/g.	Absent/g.
Eschericia Coli	Pour Plate Method	CFU/g.	Absent/g.
Listeria Monocytogenes	PCR-Immunoassay Method	CFU/g.	Absent/g.
Total Coliforms	Pour Plate Method	CFU/g.	Absent/g.
Pseudomonas aeruginosa	PCR-Immunoassay Method	CFU/g.	Absent/g.

Saponins Profile Analysis

Saponin	Method of Analysis	Units	Reported Results
Triterpene Glycosides	RP-HPLC-MS-MS	g/100g.	0.600g.
Alkaloid Glycosides	RP-HPLC-MS-MS	g/100g.	0.125g.
Holothurin A.	RP-HPLC-MS-MS	g/100g.	0.700g.
Echinoside A.	RP-HPLC-MS-MS	g/100g.	0.148g.
Quinones	RP-HPLC-MS-MS	g/100g.	0.225g.
Oleonanes	RP-HPLC-MS-MS	g/100g.	0.245g.
Lanostanes	RP-HPLC-MS-MS	g/100g.	0.915g.

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Nutritional Analysis

Test	Units	Methodology	Method Ref.	Result per 100grams.	Result per gram.
Protein Content	g/100grams.	Kjeldahl Distil/Digestion	ISO 20483	11.200g.	0.112
Fat Content	g/100grams.	Soxhlet Distillation	ISO 659	1.280g.	0.013
Saturates Monunsaturates Polyunsaturates	g/100grams.	HPLC-PDA HPLC-PDA HPLC-PDA	ISO 5508 ISO 5508 ISO 5508	0.250g. 0.030g. 1.000g.	0.003 0.0003 0.010
Omega-3	g/100grams.	LC-MS-MS	Internal Lab.	0.350g.	0.0035
Omega-6	g/100grams.	LC-MS-MS	Internal Lab.	0.650g.	0.007
Omega-9	g/100grams.	LC-MS-MS	Internal Lab.	-	-
Carbohydrates Sugars	g/100grams.	HPLC-PDA HPLC-PDA	ISO 11292 ISO 11292	41.600g. 26.500g.	0.4160 0.265
Ash Content	g/100grams.	Muffle Furnace	ISO 735	12.400g.	0.1240
Fibre Content	g/100grams.	Digestion/Distillation	ISO 5498	4.900g.	0.0490
Salt Content	g/100grams.	ICP-OES	Internal Lab.	2.875	0.0288
Energy Kcal. Energy KJ.	Kcal/100g. KJ/100g.	Bomb Calorimetry. Bomb Calorimetry.	Internal Lab. Internal Lab.	276 Kcal. 1.210 KJ.	- -

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Bioactives Profile

Parameter	LOD	Method Type	Units	Results
Alginic acid	0.002%	HPLC-PDA	g/100g.	11.150
β-D-mannuronic acid				8.150
α-L-guluronic acid				3.000
Laminarin	0.002%	HPLC-PDA	g/100g.	2.250
1,3-β-D-glucopyranose				1.250
1,3-β-D-galactopyranose				1.000
Fucoidan	0.002%	HPLC-PDA	g/100g.	1.360
Sulphated Fucans				1.010
Sulphated Mannans				0.350
Mannitol	0.002%	HPLC-PDA	g/100g.	1.880

Sugars Analysis

Parameter	Method of Analysis	Method Reference	Units	Reported Levels
Carbohydrate	HPLC-PDA	ISO 11292	g/100g.	41.600
Sucrose				26.500
α-Glucose				5.100
β-Glucose				2.750
Fructose				2.750
Glucopyranose				1.500
Galactofuranose				1.400
Raffinose				1.100
Inositol				0.500

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Chemical Compositional

Parameter	Method of Analysis	Method Reference	Units	Reported Levels
Potassium as K.	ICP-OES	APHA 3500	g/100g.	1.975
Phosphorus as P.	ICP-OES	APHA 3500	g/100g.	0.275
Nitrogen as N. Organic (Ureic) Inorganic (Anionic)	Kjeldahl Distillation	APHA 3500	g/100g.	0.770 0.750 0.020
Iron as Fe.	ICP-OES	APHA 3500	mg/kg.	255
Elemental Sulphur S.	Elemental Analyser	In-House Method	mg/kg.	5.660
pH Value	Electrometric	In-House Method	pH Units	5.77
Organic Matter	Elemental Analyser	In-House Method	g/100g.	85.170
Specific Gravity	Densitometry	In-House Method	-	-
Fulvic acid Content	RP-HPLC-PDA	In-House Method	g/100g.	0.165

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Trace Minerals Analysis

Parameter	Method of Analysis	Method Reference	Units	Reported Levels
Magnesium as Mg.	ICP-OES	APHA 3500	grams/kg.	2.590
Calcium as Ca.	ICP-OES	APHA 3500	grams/kg.	4.865
Sodium as Na.	ICP-OES	APHA 3500	grams/kg.	6.000
Manganese as Mn.	ICP-OES	APHA 3500	mg/kg.	13.200
Zinc as Zn.	ICP-OES	APHA 3500	mg/kg.	17.765
Copper as Cu	ICP-OES	APHA 3500	mg/kg.	4.370
Iodine as I2	IC/ICP-OES	APHA 3500	mg/kg.	321
Selenium as Se	ICP-OES	APHA 3500	mg/kg.	4.900
Chromium as Cr	ICP-OES	APHA 3500	mg/kg.	< 0.002
Molybdenum as Mo.	ICP-OES	APHA 3500	mg/kg.	< 0.002
Boron as B.	ICP-OES	APHA 3500	mg/kg.	< 0.002

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Amino Acids Profile

Parameter	Method of Analysis	Method Reference	Units	Reported Levels
Glutamic acid	LC-MS	JHG-097	mg/100grams.	3,155
Aspartic acid	LC-MS	JHG-097	mg/100grams.	2,940
Arginine	LC-MS	JHG-097	mg/100grams.	1,225
Glycine	LC-MS	JHG-097	mg/100grams.	1,188
Alanine	LC-MS	JHG-097	mg/100grams.	1,948
Serine	LC-MS	JHG-097	mg/100grams.	555
Proline	LC-MS	JHG-097	mg/100grams.	408
Leucine	LC-MS	JHG-097	mg/100grams.	561
Tyrosine	LC-MS	JHG-097	mg/100grams.	391
Valine	LC-MS	JHG-097	mg/100grams.	178
Methionine	LC-MS	JHG-097	mg/100grams.	352
Histidine	LC-MS	JHG-097	mg/100grams.	425
Iso-Leucine	LC-MS	JHG-097	mg/100grams.	509
Cystine	LC-MS	JHG-097	mg/100grams.	665
Phenylalanine	LC-MS	JHG-097	mg/100grams.	491
Tryptophan	LC-MS	JHG-097	mg/100grams.	212
L-Taurine	LC-MS	JHG-097	mg/100g	230
L-Lysine	LC-MS	JHG-097	mg/100g	176
L-Anserine	LC-MS	JHG-097	mg/100g	123
L-Asparagine	LC-MS	JHG-097	mg/100g	145
Hydroxyproline	LC-MS	JHG-097	mg/100g	131
L-Ornithine	LC-MS	JHG-097	mg/100g	130

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Vitamin Profile

Parameter	Method of Analysis	Method Reference	Units	Reported Levels
Vitamin E	HPLC-PDA	JHG-088	mg/100g.	4.005
Vitamin B1	HPLC-PDA	JHG-088	mg/100g.	1.860
Vitamin B2 (Riboflavin)	HPLC-PDA	JHG-088	mg/100g.	14.445
Vitamin B3 (Niacin)	HPLC-PDA	JHG-088	mg/100g.	6.065
Vitamin B5 (Pantothenic acid)	HPLC-PDA	JHG-088	mg/100g.	0.700
Vitamin B6 (Pyridoxine)	HPLC-PDA	JHG-088	mg/100g.	0.830
Vitamin B12 (Cobalamine)	HPLC-PDA	JHG-088	µg/100grams.	0.465
Vitamin C	HPLC-PDA	JHG-088	mg/100grams.	151
Vitamin D	HPLC-PDA	JHG-088	IU/100grams.	332
Vitamin K	HPLC-PDA	JHG-088	µg/100grams.	207
Choline	HPLC-PDA	JHG-088	mg/100grams.	126

Plant Hormones Profile

Parameter	Method of Analysis	Method Reference	Units	Reported Levels
Betaines Content	HPLC-PDA	JHG-088	mg/kg.	141
Auxins Content	HPLC-PDA	JHG-088	mg/kg.	25
Gibberellins Content	HPLC-PDA	JHG-088	mg/kg.	16.500
Cytokinins Content	HPLC-PDA	JHG-088	mg/kg.	15.825
Strigolactones Content	HPLC-PDA	JHG-088	mg/kg.	0.033
Brassinosteroids Content	HPLC-PDA	JHG-088	mg/kg.	< 0.002

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Flavonoids Analysis

Parameter	Method of Analysis	Method Reference	Units	Reported Levels
Quercetin	SPME-HPLC	In-House Method	mg/kg.	17.775
Apigenin	SPME-HPLC	In-House Method	mg/kg.	22.125
Flavanone	SPME-HPLC	In-House Method	mg/kg.	9.675
Caffeic acid	SPME-HPLC	In-House Method	mg/kg.	5.102
Catechin	SPME-HPLC	In-House Method	mg/kg.	9.090
Gallic acid	SPME-HPLC	In-House Method	mg/kg.	4.480

Phlorotannins Analysis1

Parameter	Method of Analysis	Method Reference	Units	Reported Levels
Phloroglucinol	SPME-HPLC	In-House Method	mg/kg.	17
Eckol	SPME-HPLC	In-House Method	mg/kg.	10
Dieckol	SPME-HPLC	In-House Method	mg/kg.	3.345
Phlorofucofuroeckol	SPME-HPLC	In-House Method	mg/kg.	9

All test methods were performed in accordance with the requirements of ISO: IEC 17025.

The test results relate only to the product listed in this report.

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SHELF-LIFE TESTING PROGRAMME

Shelf-Life Testing was performed to test the Bacterial and Chemical integrity of the finished product. Demonstrating both the absence of Pathogenic bacteria and undesirable Chemical agents in the product are the safest ways of avoiding consumer cases of illness. The finished report may be used as an excellent sales tool as it indicates that the product is shelf stable and free of Pathogenic bacteria for the estimated time.

TESTING REGIME

An initial sample was tested for the following Microbiological Series when the samples were first received. After Microbiological Analysis, the sample was dispatched to the Chemistry Laboratory, where it underwent a series of Chemical contaminant tests, as well as a suite of Physical and Sensory assessments. The remaining samples underwent the same testing regime at agreed time points and the testing programme continued until the product reached the end of its Shelf-Life.

Microbiological	Chemical	Physical	Sensory
Total Aerobic Count @ 22o C	*Hydroxyl Value*	*Water Activity*	*Smell*
Total Aerobic Count @ 37o C	*Peroxide Value*	*pH Value*	*Taste*
Esch. Coli	*Free Fatty Acid*	*Conductivity*	*Texture*
Salmonella spp.	*TBA Rancidity*		*Colour*
Enterobacteriaceae	*TOTOX Value*		
Coagulase (+) Staphylococcus			
Listeria Monocytogenes			
Clostridium Perfringens			
Campylobacter spp.			
Pseudomonas spp.			

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STABILITY TEST CONDITIONS

METHODOLOGY:	ACCELERATED SHELF-LIFE (Ambient)
DATE OF COMMENCEMENT OF TESTING:	11th. November 2023
DATE OF CONCLUSION OF TESTING:	24 th. November 2023
DATE OF REPORT:	29th. November 2023
DATA ANALYSIS:	EXCEL 2007 Spreadsheet
TEMPERATURE OF TESTING:	Ambient Temperature.
SAMPLE PREPARATION:	No Preparation.
STABILITY METHOD:	Micro/Rancidity/Chemical
DATE OF SAMPLE:	11th. November 2023
PRODUCT CODE:	THHG INC

SHELF-LIFE CERTIFICATE FOR

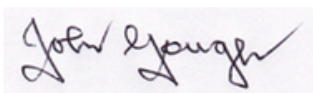
THHG inc

HM Labs

This is to certify that the product

'HM'

when stored under recommended Ambient conditions and, if the packaging is unopened and undamaged, is guaranteed to have a Shelf-Life of 18 months from Date of Production.

Signed: __  _____ Technical Director

JHG Analytical Services Limited

Riverstown Business Park, Tramore

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Republic of Ireland.

Dated: 29th. November 2023