

JHG ANALYTICAL SERVICES LIMITED

Unit 9 Airside

Boeing Avenue

Airport Business Park

Killowen

Waterford X91 FX50

Republic of Ireland.

Tel: +353 51 364103

Mob: +353 85 1379 880

Fax: +353 51 364039



ANALYSIS REPORT REFERENCE: 21-08-21664

**CHEMICAL/BIOCHEMICAL  
ANALYTICAL REPORT**

**Nature of Product: Liquid Seaweed Extract Fertilizer Sample.**

**Date of Report: 12<sup>th</sup>. September 2021.**

**Sample Reference: GroGreen Feed & Shine Frugt**

**Sample Ref.: as Dated.**

**E.Marker A/S  
Okslundvej 8  
BOV DK-6330  
Padborg  
Denmark.**

**For the Attention of: Mr. Carsten Marker.**

**Contact No. +46 74670808**

**Email: Carsten@marker.DK.**

**Date of Sample: 30<sup>th</sup>. July 2021.**

ANALYSIS REPORT REFERENCE: 21-08-21664

## Bioactives Profile

Parameter	LOD	Method Type	Units	Results
<b>Alginic acid</b>	0.002%	HPLC-PDA	% mass.	6.900%
β-D-mannuronic acid				4.750%
α-L-guluronic acid				2.150%
<b>Laminarin</b>	0.002%	HPLC-PDA	% mass.	1.800%
1,3-β-D-glucopyranose				1.625%
1,3-β-D-galactopyranose				0.175%
<b>Fucoidan</b>	0.002%	HPLC-PDA	% mass.	1.300%
Sulphated Fucans				0.800%
Sulphated Mannans				0.500%
<b>Mannitol</b>	0.002%	HPLC-PDA	% mass.	0.705%

## Sugars Analysis

Parameter	Method of Analysis	Method Reference	Units	Reported Levels
Carbohydrate	HPLC-PDA	ISO 11292	% mass	10.700%
Sucrose				7.900%
α-Glucose				0.700%
β-Glucose				0.300%
Fructose				0.400%
Glucopyranose				0.680%
Galactofuranose				0.215%
Raffinose				0.269%
Inositol				0.248%

ANALYSIS REPORT REFERENCE: 21-08-21664

## Chemical Compositional

Parameter	Method of Analysis	Method Reference	Units	Reported Levels
Potassium as K.	ICP-OES	APHA 3500	% weight	0.090%
Phosphorus as P.	ICP-OES	APHA 3500	% weight	0.004%
Nitrogen as N.	Kjeldahl Distillation	APHA 3500	% weight	5.775%
Organic (Ureic)				5.665%
Inorganic (Anionic)				0.110%
Iron as Fe.	ICP-OES	APHA 3500	% weight	0.925%
Elemental Sulphur S.	Elemental Analyser	In-House Method	% weight	0.424%
pH Value	Electrometric	In-House Method	pH Units	4.86
Organic Matter	Elemental Analyser	In-House Method	% weight	1.235%
Specific Gravity	Densitometry	In-House Method	g/L <sup>-1</sup> .	1.166

ANALYSIS REPORT REFERENCE: 21-08-21664

## Trace Minerals Analysis

Parameter	Method of Analysis	Method Reference	Units	Reported Levels
Magnesium as Mg.	ICP-OES	APHA 3500	% weight	0.390%
Calcium as Ca.	ICP-OES	APHA 3500	% weight	0.218%
Sodium as Na.	ICP-OES	APHA 3500	% weight	0.155%
Manganese as Mn.	ICP-OES	APHA 3500	% weight	0.196%
Zinc as Zn.	ICP-OES	APHA 3500	% weight	0.212%
Copper as Cu	ICP-OES	APHA 3500	% weight	0.245%
Iodine as I <sub>2</sub>	IC/ICP-OES	APHA 3500	% weight	0.017%
Selenium as Se	ICP-OES	APHA 3500	% weight	0.004%
Chromium as Cr	ICP-OES	APHA 3500	% weight	< 0.0002%
Molybdenum as Mo.	ICP-OES	APHA 3500	% weight	< 0.0001%
Boron as B.	ICP-OES	APHA 3500	% weight	< 0.0002%

## ANALYSIS REPORT REFERENCE: 21-08-21664

## Amino Acids Profile

Parameter	Method of Analysis	Method Reference	Units	Reported Levels
Glutamic acid	LC-MS	JHG-097	mg/100mls.	341
Aspartic acid	LC-MS	JHG-097	mg/100mls.	148
Arginine	LC-MS	JHG-097	mg/100mls.	109
Glycine	LC-MS	JHG-097	mg/100mls.	88
Alanine	LC-MS	JHG-097	mg/100mls.	117
Serine	LC-MS	JHG-097	mg/100mls.	90
Proline	LC-MS	JHG-097	mg/100mls.	45
Leucine	LC-MS	JHG-097	mg/100mls.	69
Tyrosine	LC-MS	JHG-097	mg/100mls.	108
Valine	LC-MS	JHG-097	mg/100mls.	123
Methionine	LC-MS	JHG-097	mg/100mls.	137
Histidine	LC-MS	JHG-097	mg/100mls.	44
Iso-Leucine	LC-MS	JHG-097	mg/100mls.	58
Cystine	LC-MS	JHG-097	mg/100mls.	71
Phenylalanine	LC-MS	JHG-097	mg/100mls.	82
Tryptophan	LC-MS	JHG-097	mg/100mls.	39

ANALYSIS REPORT REFERENCE: 21-08-21664

### Plant Hormones Profile

Parameter	Method of Analysis	Method Reference	Units	Reported Levels
Betaines Content	HPLC-PDA	JHG-088	% weight	0.007%
Auxins Content	HPLC-PDA	JHG-088	ppm.	12
Gibberellins Content	HPLC-PDA	JHG-088	ppm.	15
Cytokinins Content	HPLC-PDA	JHG-088	ppm.	11
Strigolactones Content	HPLC-PDA	JHG-088	ppm.	< 0.002
Brassinosteroids Content	HPLC-PDA	JHG-088	ppm.	< 0.002

### Heavy Metals Analysis

Heavy Metal	Method of Analysis	Units	Reported Results
Arsenic (Inorganic)	ICP-OES	mg/L. (ppm)	0.006
Arsenosugars (Organic)	ICP/IC-OES	mg/L. (ppm)	1.190
Antimony as Sb.	ICP-OES	mg/L. (ppm)	< 0.002
Cadmium as Cd.	ICP/IC-OES	mg/L. (ppm)	< 0.0005
Mercury as Hg.	Cold Vapour A.A.S.	mg/L. (ppm)	< 0.0005
Lead as Pb.	ICP-OES	mg/L. (ppm)	< 0.002
Chromium as Cr <sup>6+</sup> .	ICP/IC-OES	mg/L. (ppm)	< 0.002
Nickel as Ni.	ICP-OES	mg/L. (ppm)	< 0.002
Silver as Ag.	ICP-OES	mg/L. (ppm)	< 0.002
Vanadium as V.	ICP/IC-OES	mg/L. (ppm)	< 0.002
Tin as Sn.	ICP-OES	mg/L. (ppm)	< 0.002
Aluminium as Al.	ICP/IC-OES	mg/L. (ppm)	< 0.002

## ANALYSIS REPORT REFERENCE: 21-08-21664

## Herbicide Residues Analysis

Parameter	Method of Analysis	Method Reference	Units	Reported Levels
Sulfonyl Ureas/Ureas	UHPLC-MS	APHA 6630	µg/ml.	< 0.004
Imidazolinones/Diphenylethers	UHPLC-MS	APHA 6630	µg/ml.	< 0.005
Phenoxy/Chlorophenoxy	UHPLC-MS	APHA 6630	µg/ml.	< 0.006
Dinitroalinine/Acetamides	UHPLC-MS	APHA 6630	µg/ml.	< 0.002
Bipyridillums/Triketones	UHPLC-MS	APHA 6630	µg/ml.	< 0.004
Thiocarbamates	UHPLC-MS	APHA 6630	µg/ml.	< 0.035
Glyphosate/Glufosinate	UHPLC-MS	APHA 6630	µg/ml.	< 0.002
Atrazine desethyl deisopropyl	UHPLC-MS	APHA 6630	µg/ml.	< 0.001
Atrazine deisopropyl	UHPLC-MS	APHA 6630	µg/ml.	< 0.003
Atrazine desethyl	UHPLC-MS	APHA 6630	µg/ml.	< 0.002
Simazine	UHPLC-MS	APHA 6630	µg/ml.	< 0.005
Terbutylazine desethyl	UHPLC-MS	APHA 6630	µg/ml.	< 0.001
Atrazine	UHPLC-MS	APHA 6630	µg/ml.	< 0.001
Terbutryn	UHPLC-MS	APHA 6630	µg/ml.	< 0.001
Terbutylazine	UHPLC-MS	APHA 6630	µg/ml.	< 0.001
Alachlor	UHPLC-MS	APHA 6630	µg/ml.	< 0.004
Metolachlor	UHPLC-MS	APHA 6630	µg/ml.	< 0.005
Aminopyralid	LS-MS-MS	APHA 6630	µg/ml.	< 0.001
Clopyralid	LS-MS-MS	APHA 6630	µg/ml.	< 0.001
Triclopyr	LS-MS-MS	APHA 6630	µg/ml.	< 0.002

ANALYSIS REPORT REFERENCE: 21-08-21664

## Pesticide Residues Analysis

Parameter	Method of Analysis	Method Reference	Units	Reported Levels
Organochlorine Residues	UHPLC-MS	APHA 6630	µg/ml.	< 0.002
Organophosphorus Residues	UHPLC-MS	APHA 6630	µg/ml.	< 0.002
Organonitrogen Residues	UHPLC-MS	APHA 6630	µg/ml.	< 0.050
Carbamate Pesticides	UHPLC-MS	APHA 6630	µg/ml.	< 0.030
Pyrethroid Residues	UHPLC-MS	APHA 6630	µg/ml.	< 0.001
Organotin Residues	UHPLC-MS	APHA 6630	µg/ml.	< 0.002

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.

**Analytical Assessor****John Gough BSc. MSc.****Assessor Credentials****BSc (Hons) in Analytical Chemistry with Quality Management.****MSc in Environmental Chemistry.****J.W. GOUGH**

\_\_\_\_\_ **Technical Signatory.**

**Dated: 12<sup>th</sup>. September 2021**