

## CERTIFICATE OF ANALYSIS

### PRODUCT DETAILS




<b>Product name</b>	: Ginger rhizome TBC (Organic+Fair for Life)	<b>QC reference no.</b>	: SBP2403004
<b>Botanical name</b>	: <i>Zingiber officinale</i> Roscoe	<b>Date of receipt</b>	: 03.20.2024
<b>Common name</b>	: Ginger	<b>Date of report</b>	: 03.30.2024
<b>Plant part used</b>	: Dried rhizome	<b>Date of Mfg.</b>	: March 2024
<b>Batch no.</b>	: F2403ZO001	<b>Retest date</b>	: 2 years from date of mfg.
<b>Batch quantity</b>	: 4000 kg	<b>No. of pages</b>	: 6
<b>Treatment</b>	: Steam treated for microbe reduction	<b>Specification no.</b>	: HA/TBC/SPC/OMP/ZO/002
<b>Country of origin</b>	: India		

### TEST RESULTS

S No.	Tests	Limits	Results	Method used
<b>Botanical identity</b>				
1.	Macroscopic	The rhizome is irregularly compressed and branched; the branches part is slightly curved ovoid or oblong-ovoid, 2-4 cm in length and 1-2 cm in diameter.	Complies	As per JP XVIII
	Microscopic	Powdered Ginger reveals mainly starch grains and parenchyma cells; these cells contain resinous substances or single crystals of calcium oxalate; fragments of fibers, cork tissue, spiral, and ring and reticulate vessels; starch grains composed of simple, compound, spherical, ovoid or globular.	Complies	As per JP XVIII <5.01>
	TLC	The chromatographic profile of the sample should match with that of BRS with respect to major bands.	Complies Refer Annexure I	As per JP XVIII <2.03>
<b>Organoleptic Analysis</b>				
2.	Appearance	Free flowing rhizome particles, mold-free	Free flowing rhizome particles, mold-free	Quality control methods for medicinal plant materials, WHO, Geneva, 2002, Pg.10-11
	Color (herb)	Yellow tan	Yellow tan	
	Color (infusion)	Cloudy golden	Cloudy golden	As per in-house method
	Odor (infusion)	Characteristic, pungent	Characteristic, pungent	As per in-house method
	Taste (infusion)	Pungent	Pungent	As per in-house method
<b>Physicochemical Analysis</b>				
3.	Foreign organic matter (% w/w)	Not more than 2.0	Complies	As per Ph. Eur. 2.8.2
	Loss on drying (% w/w)	Not more than 12.0	8.8	As per JP XVIII <5.01>
	Total ash content (% w/w)	Not more than 8.0	7.6	As per JP XVIII <5.01>
	Essential oil (% v/w)	To be reported	1.0	As per JP XVIII <5.01>
	Bulk density (g/cc)	Between 0.3 - 0.6 (untapped)	0.34	As per USP <616> Method I

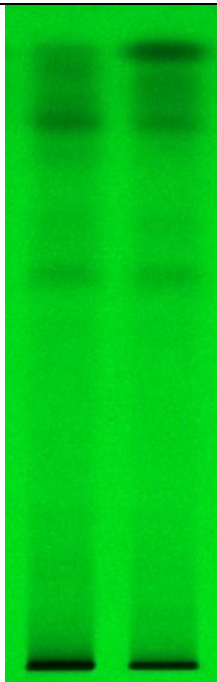


4.	<b>Particle size</b>			
	Material on #12 mesh (% w/w)	Not more than 10.0	0.5	As per AOAC 965.22
	Material on # 60 mesh (% w/w)	Not less than 90.0	97.8	
<b>Phytochemical analysis</b>				
5.	[6]-gingerol, calculated on the basis of dried material (% w/w)	Not less than 0.3	0.8	As per JP XVIII <2.01>
<b>Contaminants</b>				
6.	<b>Heavy metals (ppm)</b>			As per USP <233>, ICP-MS
	Lead (Pb)	Not more than 2.0	0.7	
	Cadmium (Cd)	Not more than 0.5	<0.05	
	Arsenic (As)	Not more than 2.0	<0.05	
	Mercury (Hg)	Not more than 0.2	<0.05	
7.	<b>Pesticide residues (ppm)</b>	To comply with USP	Complies	As per USP <561> Refer Annexure II
8.	<b>Aflatoxins</b>			As per USP <561> Method III
	B1 (ppb)	Not more than 5.0	Complies	
	B1+B2+G1+G2 (ppb)	Not more than 20.0	Complies	
9.	<b>Alkaloids (ppb)</b>			
	Pyrrolizidine alkaloids	Not more than 400	Not detected	As per Ph. Eur. (2.8.26)
	Tropane alkaloids (Sum of Atropine and Scopolamine)	Not more than 25	Not detected	By LC-MS/MS
10.	<b>Microbiological Analysis</b>			
	Total plate count (cfu/g)	Not more than 10,000,000	700000	As per USP <61>
	Yeast and Mold (cfu/g)	Not more than 100,000	10	As per USP <61>
	<i>Escherichia coli</i> (org/g)	Not more than 100	Absent	As per AOAC 991.14
	<i>Salmonella</i> spp. (org/750g)	Absent	Absent	As per USP <62>

**Remarks:** The sample conforms to the specification with reference to the above mentioned tests

<b>Analysed By:</b> 	<b>Checked by:</b> 	<b>Authorised by:</b> 
<b>Name: Maheshwaran. E</b> <b>Designation: Senior officer- QC</b> <b>Date: 04.02.2024</b>	<b>Name: Suresh Duraisamy</b> <b>Designation: Manager- QA</b> <b>Date: 04.02.2024</b>	<b>Name: Arunraja. S</b> <b>Designation: Manager- QC</b> <b>Date: 04.02.2024</b>

### Annexure I

#### TLC profile based identification

A	B	C
 <p style="text-align: center;">L1    L2</p>	 <p style="text-align: center;">L1    L2</p>	 <p style="text-align: center;">L1    L2</p>
<b>Product name</b>	Ginger rhizome TBC (Organic+Fair for Life)	
<b>Botanical name</b>	<i>Zingiber officinale</i> Roscoe	
<b>Common name</b>	Ginger	
<b>Batch number</b>	F2403ZO001	
<b>Sample preparation - BRS / test substance</b>	2.0 g + 50 ml methanol, sonicate / heat at 75°C for 30 minutes, filter and use.	
<b>Stationary phase</b>	Silica gel 60, F254, 10 x 10 cm TLC plates	
<b>Application</b>	Lane L1: <i>Zingiber officinale</i> Rhizome Botanical reference standard solution (10 µl) Lane L2: Ginger rhizome TBC (Organic+Fair for Life) (F2403ZO001) solution (10 µl)	
<b>Mobile phase</b>	Ethyl acetate: Hexane (1:1)	
<b>Spray reagent</b>	Anisaldehyde-Sulphuric acid reagent	
<b>Detection</b>	(A) – UV 254 (B) – UV 365 (C) – Visible after derivatization	
<b>Conclusion</b>	Passes the test. The chromatographic profile of the sample (F2403ZO001) matches with that of BRS with respect to major bands.	

ANNEXURE – II

**PESTICIDE REPORT**

Product name	:	Ginger rhizome TBC (Organic+Fair for Life)
Batch no.	:	F2403ZO001

Residual pesticides by GC-MS/MS

S. No.	Pesticide details	Permissible limits (in mg/kg) as per USP	Detection limit (in mg/kg)	Result (in mg/kg) F2403ZO001
1.	Alachlor	0.05	0.01	Not detected
2.	Aldrin & Dieldrin (sum of)	0.05	0.01	Not detected
3.	Azinphos-ethyl	0.1	0.01	Not detected
4.	Azinphos-methyl	1.0	0.01	Not detected
5.	Bromophos-ethyl	0.05	0.01	Not detected
6.	Bromophos-methyl	0.05	0.01	Not detected
7.	Bromopropylate	3.0	0.01	Not detected
8.	Chlorfenvinphos	0.5	0.01	Not detected
9.	Chlorpyrifos-ethyl	0.2	0.01	<0.01
10.	Chlorpyrifos-methyl	0.1	0.01	Not detected
11.	Chlorthal-dimethyl	0.01	0.01	Not detected
12.	β - Cyfluthrin	0.1	0.01	Not detected
13.	λ-Cyhalothrin	1.0	0.01	Not detected
14.	Cypermethrin and isomers	1.0	0.01	<0.01
15.	Total DDT analogues 2, 4 DDE 4, 4 DDE 2, 4 TDE 4,4 TDE 2, 4 DDT 4, 4 DDT	1.0	0.01	Not detected
16.	Delta methrin	0.5	0.01	Not detected
17.	Diazinon	0.5	0.01	Not detected
18.	Dichlofluanid	0.1	0.01	Not detected
19.	Dichlorvos	1.0	0.01	Not detected
20.	Dieldrin	0.05	0.01	Not detected

S. No.	Pesticide details	Permissible limits (in mg/kg) as per USP	Detection limit (in mg/kg)	Result (in mg/kg) F2403ZO001
21.	$\alpha$ -Endosulfan	3.0	0.01	<0.01
22.	$\beta$ -Endosulfan			
23.	Endosulfan sulphate			
24.	Endrin	0.05	0.01	Not detected
25.	Ethion	2.0	0.01	Not detected
26.	Fenchlorophos	0.1	0.01	Not detected
27.	Fenitrothion	0.5	0.01	Not detected
28.	Fenpropathrin	0.03	0.01	Not detected
29.	Fenvalerate	1.5	0.01	Not detected
30.	T-fluvalinate	0.05	0.01	Not detected
31.	Fonofos	0.05	0.01	Not detected
32.	Heptachlor (sum of Heptachlor, and Heptachlor epoxide)	0.05	0.01	Not detected
33.	Hexachlorobenzene	0.1	0.01	Not detected
34.	Hexachlorocyclohexane (other than gamma)	0.3	0.01	Not detected
35.	Lindane ( $\gamma$ -hexachlorocyclohexane)	0.6	0.01	Not detected
36.	Malathion and Malaoxon (Sum of)	1.0	0.01	Not detected
37.	Mecarbam	0.05	0.01	Not detected
38.	Methacriphos	0.05	0.01	Not detected
39.	Methidathion	0.2	0.01	Not detected
40.	Methoxychlor	0.05	0.01	Not detected
41.	Mirex	0.01	0.01	Not detected
42.	Parathion	0.5	0.01	Not detected
43.	Methyl parathion	0.2	0.01	Not detected
44.	Paraoxon-ethyl	0.5	0.01	Not detected
45.	Paraoxon-methyl	0.2	0.01	Not detected
46.	Pendimethalin	0.1	0.01	Not detected
47.	Pentachloranisol	0.01	0.01	Not detected
48.	Permethrin	1.0	0.01	Not detected
49.	Phosalone	0.1	0.01	Not detected
50.	Phosmet	0.05	0.01	Not detected
51.	Pyrethrum	3.0	0.01	Not detected
52.	Quintozene	1.0	0.01	Not detected
53.	S-421	0.02	0.01	Not detected
54.	Tecnazene	0.05	0.01	Not detected
55.	Tetradifon	0.3	0.01	Not detected
56.	Vinclozolin	0.4	0.01	Not detected

The following 18 pesticides are analyzed by LC-MS/MS

S. No.	Pesticide details	Permissible limits (in mg/kg) as per USP	Detection limit (in mg/kg)	Result (in mg/kg) F2403ZO001
1.	Acephate	0.1	0.01	Not detected
2.	Chlordane	0.05	0.01	Not detected
3.	Dicofol	0.5	0.01	Not detected
4.	Dimethoate & omethoate (sum of)	0.1	0.01	Not detected
5.	Dithiocarbamates	2	0.01	Not detected
6.	Etrimphos	0.05	0.01	Not detected
7.	Fensulfothion (sum of fensulfothion, fensulfothion-oxon, fensulfothion- oxonsulfon, and fensulfothion-sulfon)	0.05	0.01	Not detected
8.	Fenthion	0.05	0.01	Not detected
9.	Flucythrinate	0.05	0.01	Not detected
10.	Methamidophos	0.05	0.01	Not detected
11.	Monocrotophos	0.1	0.01	Not detected
12.	Piperonyl butoxide	3	0.01	Not detected
13.	Pirimiphos-ethyl	0.05	0.01	Not detected
14.	Pirimiphos-methyl	4	0.01	Not detected
15.	Procymidone	0.1	0.01	Not detected
16.	Profenophos	0.1	0.01	Not detected
17.	Prothiophos	0.05	0.01	Not detected
18.	Quinalphos	0.05	0.01	<0.01



AUTHORISED SIGNATORY