

**सिपेट : पेट्रोकेमिकल्स तकनीकी
संस्थान (आईपीटी)**

(पूर्व में सेंट्रल इंस्टिट्यूट ऑफ प्लास्टिक्स इंजीनियरिंग एण्ड टेक्नोलॉजी)
रसायन एवं पेट्रोसायन विभाग
रसायन एवं उर्वरक मंत्रालय, भारत सरकार
गिण्डी, चेन्नै - 600 032.
फोन : 91-44-2225 4701 (6 लाइन)
फैक्स : 91-44-22254707
ई-मेल : chennai@cipet.gov.in
वेबसाइट : www.cipet.gov.in



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**CIPET : INSTITUTE OF PETROCHEMICALS
TECHNOLOGY (IPT)**

(Formerly Central Institute of Plastics Engineering & Technology)

Department of Chemicals & Petrochemicals

Ministry of Chemicals & Fertilizers, Govt. of India

Guindy, Chennai - 600 032.

Phone : 91-44-2225 4701 (6 Lines)

Fax : 91 - 44 - 22254707

E-mail : chennai@cipet.gov.in

Website : www.cipet.gov.in

संदर्भ/Ref: परीक्षण

दिनांक/Date: 14-08-2023

प्रति /To,

Alpha Carbonless Paper Mfg. Co. Pvt. Ltd.,
Plot No. C-101, TTC Industrial Area, Pawane, M.I.D.C. Navi
Mumbai - 400 705

विषय/Sub : Testing of samples-reg.

संदर्भ/Ref : Your letter no. ACPL C-101/PUR/CIPET/02/2022-2023

Dated: 04-01-2023

महोदय,

कृपया हमारी परीक्षण रिपोर्ट क्रमांक प्राप्त करें। Please find enclosed herewith our Test Report no.	73767	दिनांक dated	14-08-2023
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धन्यवाद,

भुवदीय
अधिकृत हस्ताक्षरकर्ता

संलग्न : उपर्युक्तानुसार
ERH:mk

मुख्यालय : सिपेट, गिण्डी, चेन्नै - 600 032. Head Office : CIPET, Guindy, Chennai - 600 032.

केन्द्र : अहमदाबाद, अमृतसर, औरंगाबाद, अगरतला, बदी, बालासोर, बेंगलुरु, भोपाल, भुवनेश्वर, चन्द्रपुर, चेन्नई, देहरादून, गुरुग्राम, गुवाहाटी, ग्वालियर, हैदराबाद, हाजीपुर, हल्दिया, इम्फाल, जयपुर, कोच्ची, कोरबा, लखनऊ, मदुरै, मुरथल, मैसूर, रायपुर, राँची, बलसाड, वाराणसी एवं विजयवाड़ा
Centres : Ahmedabad, Amritsar, Aurangabad, Agartala, Baddi, Balasore, Bengaluru, Bhopal, Bhubaneswar, Chandrapur, Chennai, Dehradun, Gurugram, Guwahati, Gwalior, Hyderabad, Hajipur, Haldia, Imphal, Jaipur, Kochi, Korba, Lucknow, Madurai, Murthal, Mysuru, Raipur, Ranchi, Valsad, Varanasi & Vijayawada

केंद्रीय पेट्रोसायन अभियांत्रिकी एवं
प्रौद्योगिकी संस्थान
पेट्रोकेमिकल्स तकनीकी संस्थान

रसायन एवं पेट्रोसायन विभाग
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गिण्डी, चेन्नै - 600 032.
फोन : 91-44-2225 4701-6 फैक्स : 91-44-22254707
ई-मेल : chennai@cipet.gov.in वेबसाइट : www.cipet.gov.in



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ENGINEERING & TECHNOLOGY
INSTITUTE OF PETROCHEMICALS TECHNOLOGY

Department of Chemicals & Petrochemicals
Ministry of Chemicals & Fertilizers, Govt. of India
Guindy, Chennai - 600 032.
Tel : 91-44-2225 4701-6 Fax : 91 - 44 - 22254707
E-mail : chennai@cipet.gov.in Website : www.cipet.gov.in

का जारी /
Issued to :

Alpha Carbonless Paper Mfg. Co. Pvt. Ltd.,
Plot No. C-101, TTC Industrial Area, Pawane, M.I.D.C.
Navi Mumbai - 400 705

परीक्षण रिपोर्ट / TEST REPORT

क्र.सं. / Sl. No.

रिपोर्ट सं. / REPORT NO.

दिनांक / Date : 14-08-2023

Pages.....09.....Nos. Part A,B,C & D

संदर्भ / Customer Let. Ref : ACPL C-101/PUR/CIPET/

04-01-2023

परीक्षण मानक स्तर के अनुसार परीक्षण रिपोर्ट / TEST REPORT AS PER TEST STANDARD : Refer Part C

भाग - क / PART - A

प्रस्तुत सैपल का विवरण / PARTICULARS OF SAMPLE SUBMITTED

- अ) सैपल का नाम / a) Name of the Sample : Plastic Free Papers and Paper Boards - as stated by the party
- आ) सैपल प्राप्त होने की तारीख / b) Date of Receipt of sample : 06-01-2023
- इ) ग्रेड/प्रकार/आकार/वर्ग / c) Grade / variety / type / size / class : Nil
- ई) घोषित मूल्य / d) Declared value, If any : Nil
- उ) कोड सं. / e) Code No. : Nil
- ऊ) बैच सं. एवं निर्माण तारीख / f) Batch No. and Date of Manufacture: Nil
- ऋ) मात्रा / g) Quantity : 2 kg
- ए) पैकिंग की रीति / h) Mode of Packing : Packed in envelope
- ऐ) मोहर बंद या नहीं / i) Sealed or not : Sealed
- ओ) कोई अन्य सूचना / j) Any other information : --

23012944

भाग - ख / PART - B

अनुपूरक सूचनाएँ / SUPPLEMENTARY INFORMATIONS

- अ) सैपलिंग कार्यवाहियों हेतु संदर्भ / a) Reference to sampling procedure : Sampling not done by this lab
- ब) माप करने हेतु लिए गए सहायक दस्तावेज एवं प्राप्त परिणाम / b) Supporting documents for the measurement taken and result derived : As given in Part C
- इ) संबंधित कार्य अनुदेशों में निर्धारित के अनुसार परीक्षण रीति से कोई परिवर्तन / c) Deviation from the test method as prescribed in relevant work instructions, if any : No deviation from the standard

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प्रौद्योगिकी संस्थान
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Guindy, Chennai - 600 032.
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E-mail : chennai@cipet.gov.in Website : www.cipet.gov.in

परीक्षण रिपोर्ट / TEST REPORT

रिपोर्ट सं / REPORT NO. :

14-08-2023

दिनांक / Date :

क्र.सं / SI. No.



भाग - ग / PART - C

परीक्षण परिणाम / TEST RESULTS

Test Duration: 18.01.2023 to 14.08.2023

Sl.No	Name of the Test	Test Method/ Standard	Unit	Results Obtained	Specified Requirements
1	Material Identification	FTIR & DSC	-	Cellulose paper sheet one side coated with styrene based aqueous solution	-
2	Disintegration (Dry mass remains in 2 mm sieve after 84 days)	ISO 17088:2021	%	6.8	No more than 10%
3	Ultimate aerobic Biodegradation (with reference to 100% degradation of positive reference)	ISO 17088:2021	%	91.2 (at the end of 140 days)	> 90 (at the end of the test period not more than 180 days.)
4	Plant Growth study				
	Monocotyledon (Rice) % Seed emergence	ISO 17088:2021 Cl.6.4.3	%	97	> 90
	Dicotyledon (Fenugreek) % Seed Emergence		%	91	> 90
5	Acute Ecotoxic effects to earthworm				
a	Survival of adult earthworm at the end of 7 days	ISO:17088:2021 Cl.6.4.4	%	100	> 90
b	Survival of adult earthworm at the end of 14 days			98	> 90
c	Biomass end of the 14 days			99	> 90
6	Chronic Ecotoxic effects to earthworm				
a	Survival of adult earthworm at the end of 28 days	ISO:17088:2021 Cl.6.4.5	%	95	> 90
b	Survival of adult earthworm at the end of 56 days			95	> 90
c	Offspring at the end of 56 days			95	> 90
d	Biomass end of the 56 days			96	> 90

The detailed observation on biodegradability test is enclosed as Annexure

Contd.

Issued to:

M/s. M/s. Alpha Carbonless Paper Mfg. Co. Pvt. Ltd.,
Plot No.C-101, TTC Industrial Area, Pawan M.I.D.C., Navi Mumbai 400 705.

Ref. ACPL C-101/PUR/CIPET/02/2022-2023, dtd. 04-01-2023

2 of 9

AUTHORISED SIGNATORY
Dr. Radhashyam Gini
Technical Officer

AUTHORISED SIGNATORY
S. Udhayamalar,
Sr. Technical Officer

सिपेट : आई पी टी -चेन्नै-32.

CIPET : IPT- Chennai-32.



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रिपोर्ट सं / REPORT NO. :

परीक्षण परिणाम / TEST RESULTS

दिनांक / Date :

14-08-2023

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Plot No.C-101, TTC Industrial Area, Pawan M.I.D.C., Navi Mumbai 400 705.

Customer Letter Ref. No.: ACPL C-101/PUR/CIPET/02/2022-2023, dtd. 04-01-2023

PART C - TEST RESULTS

Sl.No	Name of the Test	Test Method/ Standard	Unit	Results Obtained	Specified Requirements*
7	Heavy metals concentration				
a.	Arsenic (As)			0.075	10
b.	Copper (Cu)			2.303	300
c.	Nickel (Ni)			1.703	50
d.	Zinc (Zn)			5.993	1000
e.	Cobalt (Co)	ISO		1.358	-
f.	Chromium (Cr)	17088:2021	mg/kg	2.595	50
g.	Molybdenum (Mo)			2.558	-
h.	Mercury (Hg)			0.005	0.15
i.	Cadmium (Cd)			0.053	5
j.	Lead (Pb)			1.493	100
k.	Selenium (Se)			0.098	-

* Based on Municipal solid waste (Management and Handling) Rules, 2016 notified on 8th April, 2016 by Ministry of Environment , Forests and climate change, Government of India. Note that concentration of metals like cobalt, molybdenum, and selenium is not mentioned in the notification.

PART D - REMARKS

Note

1. This Test Report / Certificate is issued only for the samples submitted to the laboratory.
2. The results stated above related only to the items tested.
3. The quality of the subsequent production lot has to be ensured by the purchaser.
4. This Test Report shall not be reproduced except in full without the written approval of the laboratory.
5. Any anomaly/discrepancy in this report should be brought to the notice of the laboratory within 30 days from the date of issue.
6. Subcontracted Tests (if any): Nil

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AUTHORISED SIGNATORY
Dr. Radhashyam Giri
Technical Officer


AUTHORISED SIGNATORY
S. Udhavamsingh

सिपेट : आई पी टी -चेन्नै-32.

CIPET : IPT- Chennai-32.



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दिनांक / Date :

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Customer Letter Ref. No.: ACPL C-101/PUR/CIPET/02/2022-2023, dtd. 04-01-2023

OBSERVATION FOR BIODEGRADABILITY TEST AS PER ISO 17088:2021

- 1 Sample Details (As stated by Party): Plastic Free Papers and Paper Boards
- 2 Material Identification by FTIR : Cellulose Paper Sheet one side coated with styrene based aqueous solution

BIODEGRADABILITY TEST AS PER ISO:14855-1

3 Observation

(i) Conditions of reaction mixtures

Origin of Compost: Livestock excrement, municipal and vegetable waste

Reaction Temperature (°C)

: 58

Dry Solid (%)

: 54.8

Volatile content (%)

: 13.7

CO₂ evolved during first 10days in blank

: 52.37 mg/g

Test duration (days)

: 140 days

Reference material

: Cellulose

Volume of reaction vessel (mL)

: 3000 ml

(ii) pH of test medium

S.No.	Compost Vessel	pH (Before)	pH (After)
1	Blank 1	7.1	7.1
2	Blank 2	7.2	7.2
3	Blank 3	7.2	7.3
4	Cellulose 1	7.1	7.1
5	Cellulose 2	7.4	7.2
6	Cellulose 3	7.4	7.3
7	Negative 1	7.3	7.3
8	Negative 2	7.3	7.2
9	Negative 3	7.3	7.2
10	Sample 1	7.2	7.1
11	Sample 2	7.2	7
12	Sample 3	7.3	7.3

Contd.,

409
AUTHORISED SIGNATORY
Technical Officer

409
AUTHORISED SIGNATORY
S. Udhayamalar,
Sr. Technician

सिपेट : आई पी टी -चेन्नै-32.

CIPET : IPT- Chennai-32.



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परीक्षण परिणाम / TEST RESULTS

दिनांक / Date :

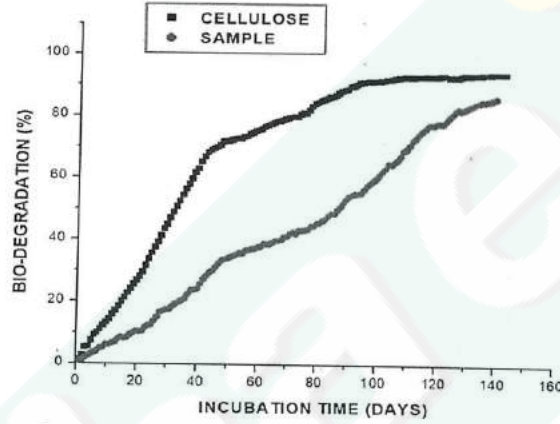
14-08-2023

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Plot No.C-101, TTC Industrial Area, Pawan M.I.D.C., Navi Mumbai 400 705.

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- 4 Result: Percentage biodegradation relative to positive reference
Sample (Mean) : 91.2 % at the end of 140 days
The reference Material - cellulose : ~ 100%



5 Visual Observation of Sample

Description	Week 1-3	Week 4-6	Week 7-9
Structure	Cut pieces	Cut pieces	Fragmented pieces
Moisture	Adequate moisture Level	Adequate moisture Level	Adequate moisture Level
Colour	White	Dirty	Dirty
Fungal Development	None	None	None
Smell	Organic/dirt like	Organic/dirt like	Organic/dirt like

Description	Week 10-13	Week 14-16	week 17-20
Structure	Fragmented pieces	Fragmented pieces	Fragmented pieces
Moisture	Adequate moisture Level	Adequate moisture Level	Adequate moisture Level
Colour	Dirty	Dirty	Dirty
Fungal Development	None	None	None
Smell	Organic/dirt like	Organic/dirt like	Organic/dirt like

Contd..

5 of 9

AUTHORISED SIGNATORY
Dr. Radhashyam Giri
Technical Officer

AUTHORISED SIGNATORY
S. Udhayamalar

CIPET : IPT- Chennai-32.



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परीक्षण परिणाम / TEST RESULTS

दिनांक / Date :

14-08-2023

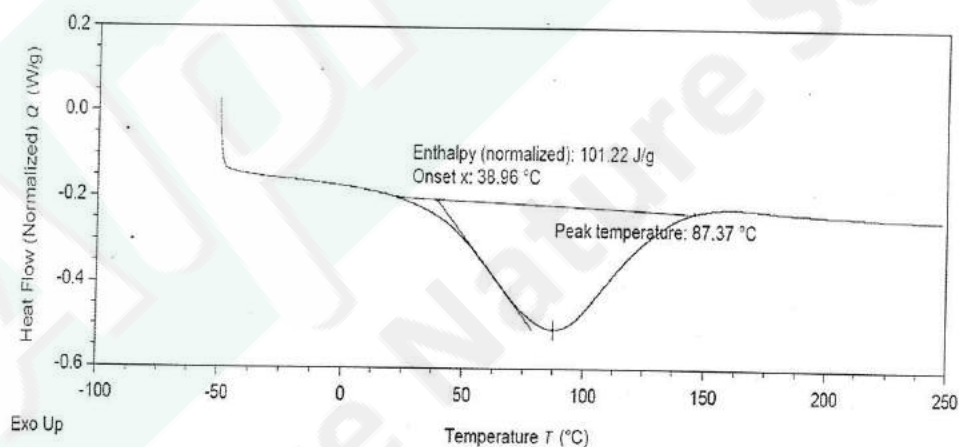
Issued to: M/s. Alpha Carbonless Paper Mfg. Co. Pvt. Ltd.,
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6 Visual Observation of Compost

Description	Week 1-3	Week 4-6	Week 7-9
Structure	Fine Particles	Fine Particles	Fine Particles
Moisture	Adequate moisture Level	Adequate moisture Level	Adequate moisture Level
Colour	Dark Brown	Dark Brown	Dark Brown
Fungal Development	Nil	Nil	Nil
Smell	Organic/dirt like	Organic/dirt like	Organic/dirt like

Description	Week 10-13	Week 14-16	week 17-20
Structure	Fine Particles	Fine Particles	Fine Particles
Moisture	Adequate moisture Level	Adequate moisture Level	Adequate moisture Level
Colour	Dark Brown	Dark Brown	
Fungal Development	Nil	Nil	Nil
Smell	Organic/dirt like	Organic/dirt like	Organic/dirt like

7 DSC Analysis



Contd.,

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AUTHORISED SIGNATORY
Dr. Radhashyam Giri
Technical Officer

AUTHORISED SIGNATORY
S. Odhayanagar
Sr Technical Officer

सिपेट : आई पी टी -चेन्नै-32.
CIPET : IPT- Chennai-32.



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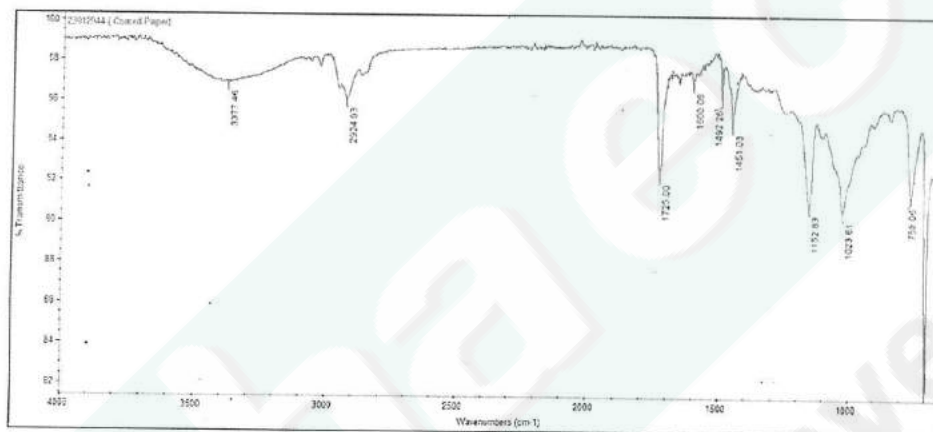
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FTIR Analysis

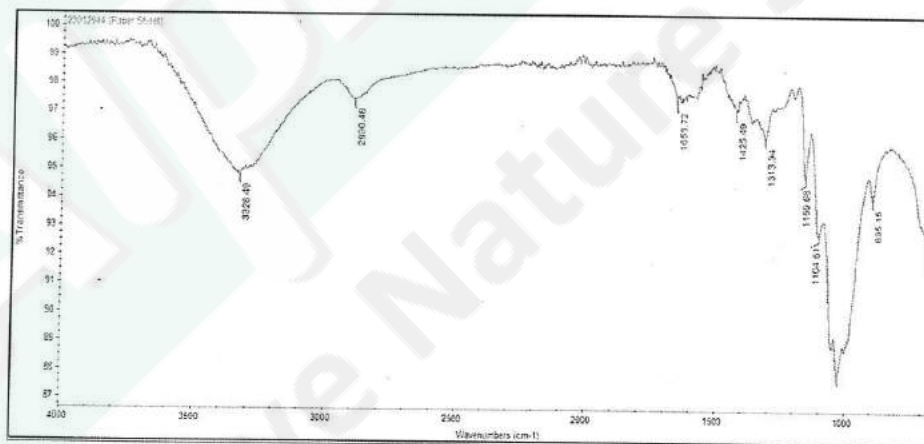
Sample Details (as stated by party):

Plastic Free Papers and Paper Boards

Coated Side



Paper Side



contd.,

7/9

AUTHORISED SIGNATORY
Dr. Radhasanyam Gini
Technical Officer

AUTHORISED SIGNATORY
S. Udhayamalar,
Sr. Technical Officer

सिपेट : आई पी टी -चेन्नै-32.

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FTIR Interpretation

Coated Side

Wave number (cm ⁻¹)	Nature of Bond
3377	O-H stretching
2924	C-H stretch
1725	C=O stretch
1600	C=C stretch
1451	CH ₂ bend
1152	C-C stretch
1023	C-O stretch
758	C-H bend

Paper Side

Wave number (cm ⁻¹)	Nature of Bond
3328	O-H stretching
2890	C-H stretch
1653	C=H stretch
1425	CH ₂ bend
1313	C-H in Plane bend
1159	C-C stretch
1027	C-O stretch
895	C-H bend

Comment: The above DSC & FTIR analysis indicates the above sample is Cellulose Paper Sheet one side coated with styrene based aqueous solution

Contd.,

8 4 9


AUTHORISED SIGNATORY
Dr. Radhashyam Giri
Technical Officer


AUTHORISED SIGNATORY
Sr. Technical Officer

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9 Disintegration After 12 Weeks



Before Disintegration



After Disintegration

The disintegration of the supplied sample by passing through 2 mm sieve after 12 week in composting condition as per ISO 17088-2021 was found not more than 10% of original dry mass remain.

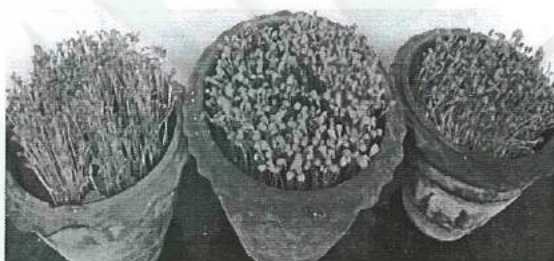
10 Plant growth study



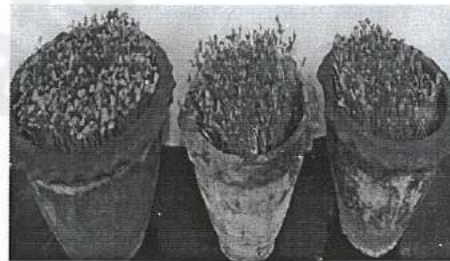
REP-1 REP-2 REP-3
Fresh compost with Rice seeds



REP-1 REP-2 REP-3
Bio-degradation tested compost with Rice seeds



REP-1 REP-2 REP-3
Fresh compost with Fenugreek seeds



REP-1 REP-2 REP-3
Bio-degradation tested compost with Fenugreek seeds

The percentage of seed germination rate is found to be greater than 90% for both Rice and Fenugreek

999