Abstract:

Title: COMPOSITION AND METHOD OF PREPARATION OF POTASH MOBILIZING BACTERIAL BASED PRODUCT THAT MOBILIZES POTASH AND MAKES IT AVAILABLE TO PLANT

(57) Abstract: This invention is based upon composition and method of preparing improved potash mobilizing bacterial based product containing Fratureia aurantiar producing plant growth promoting substances which benefit the plant in a multifaceted way. During their growth, they mobilize potash and make it available to crops. It also increases efficiency of chemical fertilizer.


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Declarations under Rule 4.17:

— as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(Hi))
— of inventorship (Rule 4.17(iv))

Published:

— with international search report (Art. 21(3))
Composition and method of preparation of potash mobilizing Bacterial based product that mobilizes Potash and makes it available to plant.

PREAMBLE OF INVENTION - This invention is particularly described the nature of the invention and the manner in which it is to be performed.

FIELD OF INVENTION - The present invention relates generally to a composition and method of making potash mobilizing bacterial based product containing Frateuria aurantia that mobilizes potash and make it available to plant.

PRIOR ART -
In the existing system as given in United States Patent Application No. 6221634 - Granted Patent wherein the invention relates to Xylitol or D-xylulose is produced through direct fermentation from glucose by culturing a microorganism belonging to the genus Gluconobacter, Acetobacter or Frateuria, and having an ability to produce xylitol or D-xylulose in a suitable medium to accumulate xylitol or D-xylulose in the medium, and collecting xylitol or D-xylulose from the medium.

OBJECT OF THE INVENTION - Traditionally, the known potash mobilizing bacterial product has different method of its preparation. The present invention is based upon potash mobilizing bacteria from Frateuria aurantia that makes potash available to plant and thereby produces plant growth promoting substances which benefit the plant in a multifaceted way.
STATEMENT OF INVENTION— The inventor has invented a composition and method of making a bacterial based product that makes potash available to plant.

DETAILED DESCRIPTION OF INVENTION—

Excessive use of chemical fertilizers is not only uneconomical to fanners but also a blame to disturb the natural balance. Green revolution in mid of last century demoted holistic agro-practices and promoted abusing use of chemicals. The modern farmer, for sake of future generations, has re-identified holistic practices and now uses biological fertilizers in integration to chemical fertilizers. This way, he not only improves economy but also reduce the dose of chemicals to preserve soil texture.

Accordingly, in one aspect, this invention provides the composition and method of preparing potash mobilizing bacteria from pure culture of bacteria i.e. Frateuria aurantia. This is rich potash mobilizers. This self-evolving formulation will bring you a new consortium every time.

It mobilizes the immobilize potash and produces plant growth promoting substances which benefit the plant in a multifaceted way.

Material and Method used in preparing potash mobilizing bacteria is as under

**Step-1 Nucleus culture (Maintain culture)**

Pure culture of bacteria (Fraturia aurantia) is inoculated aseptically on plate having 20 ml PAC-010 Agar media; such two to three plates are generally inoculated. Such inoculated plate is maintained in BOD incubator at 27 ± 1 °C for 6 to 7 days with 12/12
hr lighting cycle. (Composition for one liter of PAC-010 agar media is 5 gm Dextrose, 1 gm MgSO₄·7H₂O, 5 gm Yeast extract, 5 gm Peptone, 20 gm Agar agar and 1000 ml distilled water)

**Step-2 Starter culture (In 100 ml flask)**

Culture grown on plate is inoculated aseptically in a flask (250 ml capacity) having 100 ml PAC-010 broth media with the help of inoculating loop, and allow to grow at 27 ± 1 °C for at least 3 to 4 days. For superior growth, flask is put on shaker with agitation of media at 150 RPM. (Composition for one liter of PAC-010 broth media is 5 gm Dextrose, 1 gm MgSO₄·7H₂O, 5 gm Yeast extract, 5 gm Peptone and 1000 ml distilled water)

**Step-3 Growth culture (In 1000 ml flask)**

After sufficient growth in 250 ml flask (step-2), 50 ml culture from this grown culture is inoculated aseptically in 500 ml PAC-010 broth media in a 1000 ml capacity flask for further growth at 27 ± 1 °C for at least 3 to 4 days on shaker with 150 RPM, such two flasks is prepared. (Composition for one liter of PAC-010 broth media is 5 gm Dextrose, 1 gm MgSO₄·7H₂O, 5 gm Yeast extract, 5 gm Peptone and 1000 ml distilled water)

**Step-4 Seed Fermentor (In small fermentor of 10 lit capacities)**

One (1) lit grown culture in step-3 is inoculated aseptically in small fermenter having 10 litter PAC-010 broth media, and allow for further growth at 27 ± 1 °C for at least 3 to 4 days with agitation by motor at 100 RPM. (Composition for one liter of PAC-010 broth media is 5 gm Dextrose, 1 gm MgSO₄·7H₂O, 5 gm Yeast extract, 5 gm Peptone and 1000 ml distilled water)
Step-5 Production Fermentor (In Big fermentor of 200 lit capacities)

Ten (10) lit culture grown in step-4 is inoculated aseptically in Big fermenter having 200 litter PAC-010 media (Composition for one liter of PAC-010 broth media is 5 gm Dextrose, 1 gm MgSO₄·7H₂O, 5 gm Yeast extract, 5 gm Peptone and 1000 ml distilled water), and allow for further growth at 27 ± 1 °C for at least 3 to 4 days with agitation by motor at 100 RPM.

Step-6

Final output from big fermentor mix with starch @ 4 to 5 % which act as a stabilizer and melto dextrin @ 1 to 2 % which act as a drying agent or with 5 % skim milk powder and agitate continuously by using agitator.

Step-7

Mix culture prepared as per step-6, is than Spray dry at definite 160 °C in let and 70 to 72 °C out let temp in spray dryer unit.

Step-7 Collecting dry bacterial powder

Material dry in spray dryer unit is than collected in clean stainless steel vassals and store at 5 °C up to further use.

Step-8 Mix with suitable carrier

At the time of formulation material previously dry is mix with dextrose @ 10 % (10 gm bacterial powder with 90 gm dextrose powder)

Step-9 Packaging

Material prepared as above is than pack in 100 gm, 250 gm and 500 gm packing by using pouch packing machine.
Step-10 Distribution to farmer, retailer, distributor etc

The final material prepared has to be used in following form:

Dose in one Acre: In case of Seed treatment add 100 gm per seed required per hectar

For soil application add 100 gm to 250 gm per hectar
I claim,

1. A composition and method of preparing an improved potash mobilizing bacterial based product containing *Frateuria aurantia*, thereby producing plant growth promoting substances which benefit the plant in a multifaceted way and increasing the efficiency of fertilizer, the method comprising steps of nucleus culture, starter culture, growth culture, seed fermentor, production fermentor, mixing of final output, drying, collecting, mixing with dextrose and packing the final output.

2. A composition and method of preparing improved potash mobilizing bacterial product according to claim 1, by inoculating aseptically pure culture of bacteria namely *Frateuria aurantia* on two to three plate having 20 ml PAC-010 Agar media and maintained in BOD incubator at 27 ± 1 °C for 6 to 7 days with 12/12 hr lighting cycle, wherein composition for one liter of PAC-010 agar media contains 5 gm Dextrose, 1 gm MgSO$_4$$\cdot$7H$_2$O, 5 gm Yeast extract, 5 gm Peptone, 20 gm Agar agar and 1000 ml distilled water.

3. A composition and method of preparing improved potash mobilizing bacterial product according to claim 1, where in culture grown on plate as per method cited in claim 2 is inoculated aseptically in a flask of 250 ml capacity having 100 ml PAC-010 broth media with the help of inoculating loop, and allowing to grow at 27 ± 1 °C for at least 3 to 4 days, wherein for superior growth, flask is put on shaker with agitation of media at 150 RPM and wherein composition for one liter of PAC-010 broth media is 5 gm Dextrose, 1 gm MgSO$_4$$\cdot$7H$_2$O, 5 gm Yeast extract, 5 gm Peptone and 1000 ml distilled water.
4. A composition and method of preparing improved potash mobilizing bacterial product according to claim 1, wherein after sufficient growth in 250 ml flask as per method cited in claim 3, 50 ml culture from this grown culture is inoculated aseptically in 500 ml PAC-010 broth media in a 1000 ml capacity flask for further growth at 27 ± 1 °C for at least 3 to 4 days on shaker with 150 RPM, such two flasks is prepared, wherein composition for one liter of PAC-010 broth media is 5 gm Dextrose, 1 gm MgSO₄·7H₂O, 5 gm Yeast extract, 5 gm Peptone and 1000 ml distilled water.

5. A composition and method of preparing improved potash mobilizing bacterial product according to claim 1. One (1) lit grown culture according to method cited in claim 4 is inoculated aseptically in small fermenter having 10 litter PAC-010 broth media, and allow for further growth at 27 ± 1 °C for at least 3 to 4 days with agitation by motor at 100 RPM, wherein composition for one liter of PAC-010 broth media contains 5 gm Dextrose, 1 gm MgSO₄·7H₂O, 5 gm Yeast extract, 5 gm Peptone and 1000 ml distilled water.

6. A composition and method of preparing improved potash mobilizing bacterial product according to claim 1, wherein ten (10) lit culture grown in step-4 is inoculated aseptically in Big fermenter having 200 litter PAC-010 media, wherein composition for one liter of PAC-010 broth media contains 5 gm Dextrose, 1 gm MgSO₄·7H₂O, 5 gm Yeast extract, 5 gm Peptone and 1000 ml distilled water, and allow for further growth at 27 ± 1 °C for at least 3 to 4 days with agitation by motor at 100 RPM.

7. A composition and method of preparing improved potash mobilizing bacterial product according to claim 1, final out put from big fermentor mix with starch @ 4 to 5 % which act as a stabilizer and melto dextrin @ 1 to 2 % which act as a
drying agent or with 5% skim milk powder and agitate continuously by using agitator.

8. A composition and method of preparing improved potash mobilizing bacterial product according to claim 1, wherein mix culture prepared as per claim 7, is then sprayed dry at definite 160°C in let and 70 to 72°C out let temp in spray dryer unit

9. A composition and method of preparing improved potash mobilizing bacterial product according to claim 1, material dried in spray dryer unit is then collected in clean stainless steel vessel and store at 5°C up to further use.

10. A composition and method of preparing improved potash mobilizing bacterial product according to claim 1, wherein at the time of formulation material previously dried is mix with dextrose @ 10% at 10:90 ratio and the final output is ready as potash mobilizing bacterial product.
INTERNATIONAL SEARCH REPORT

International application No.
PCT/IN 10/00181

A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - A01 N 63/02 (201 0.01)
USPC - 424/780

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC(8): A01N 63/02 (2010.01)
USPC: 424/780

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
USPC: 424/780;71/6,71/9;504/1

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
PubWest, DialogPRO-Chemical Engineering and Biotechnology Abstracts, INSPEC, NTIS (National Technical Information Service), PASCAL, Current Contents Search, MEDLINE search terms: Frateuria aurantia, potash, potassium, mobilizing, culture, peptone, dextrose, agar

C. DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
<thead>
<tr>
<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
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<tbody>
<tr>
<td>Y</td>
<td>HBL - Potash, Hindustan Bioenergy Products, 2009, [retrieved on 2010-12-06]. Retrieved from the internet. &lt;URL: <a href="http://hindustanbioenergy.net/biofertilizer-hbl-pnb.php%3E">http://hindustanbioenergy.net/biofertilizer-hbl-pnb.php&gt;</a>, para 1, 2.</td>
<td>1-10</td>
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<tr>
<td>Y</td>
<td>WO 2008/126669 A2 (Kishimoto) 23 October 2008 (23.10.2008), pg 15, In 15-16; Pg 16, In 26-pg 17-In 1; Pg 17, In 12-13; Pg 17, In 19-20; Pg 27, In 7-19.</td>
<td>1-10</td>
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<td>Y</td>
<td>WO 2009/1 551 15 A2 (McDaniel) 23 December 2009 (23.12.2009), para [0395], [0407], [0412], [0904]. This document can be viewed by entering the doc number at the following url: <a href="http://ep.es">http://ep.es</a> pacenet.com/number rSearch?locale=en_EP</td>
<td>1-10</td>
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Further documents are listed in the continuation of Box C.

Date of the actual completion of the international search
12 December 2010 (12.12.2010)

Date of mailing of the international search report
21 DEC 2010

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Form PCT/ISA/2 10 (second sheet) (July 2009)