

REPUBLIC OF SOUTH AFRICA



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PATENTS ACT, 1978

# CERTIFICATE

In accordance with section 44 (1) of the Patents Act, No. 57 of 1978, it is hereby certified that:

**UNAN REED INDUSTRY AGRICULTURAL ECOLOGICAL TECHNOLOGY CO., LTD;  
INSTITUTE OF SUBTROPICAL AGRICULTURE, CHINESE ACADEMY OF SCIENCES**

Has been granted a patent in respect of an invention described and claimed in complete specification deposited at the Patent Office under the number

**2022/05767**

A copy of the complete specification is annexed, together with the relevant Form P2.

In testimony whereof, the seal of the Patent Office has been affixed at Pretoria with effect from the 31<sup>st</sup> day of August 2022



A handwritten signature in black ink, consisting of stylized initials, positioned above a dotted line.

Registrar of Patents

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PATENTS ACT, 1978  
REGISTER OF PATENTS**

FORM P2

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71	Full name(s) of applicant(s)/Patentee(s):				
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71	Applicant(s) substituted:			Date registrered	
71	Assignee(s):			Date registrered	
72	Full name(s) of inventor(s):				
(1) Wang Wei; (2) Wang Liyan; (3) Xie Yonghong; (4) Mao Tao; (5) Liu Cheng					
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54	Title of invention				
Pleurotus ostreatus cultivation substrate and preparation method thereof					
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Sibanda and Zantwijk, Oaktree Corner, 9 Kruger Street, Oaklands (PO Box 1615 Houghton 2041), Johannesburg, 2192, SOUTH AFRICA Reference no.: PT_CP_ZA00004559 ([InsID: ])					
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**REPUBLIC OF SOUTH AFRICA**  
**PATENTS ACT, 1978**  
**COMPLETE SPECIFICATION**  
[Section 30(1) - Regulation 28]

FORM P7

OFFICIAL APPLICATION NO.

21	01	2022/05767
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22	25 May 2022
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INTERNATIONAL CLASSIFICATION

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FULL NAME(S) OF APPLICANT(S)

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FULL NAME(S) OF INVENTORS(S)

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TITLE OF INVENTION

54	Pleurotus ostreatus cultivation substrate and preparation method thereof
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## **TECHNICAL FIELD**

The invention belongs to the field of edible fungi cultivation, particularly  
5 related to *Pleurotus ostreatus* cultivation substrate and preparation method  
thereof.

## **BACKGROUND**

The most commonly used cultivation materials of *Pleurotus ostreatus* are  
cottonseed hull, sawdust, corncob, crop straw, etc. Because *Pleurotus*  
10 *ostreatus* cultivation areas are usually far away from cotton planting areas,  
cottonseed hulls in most edible fungi cultivation areas are expensive, and most  
crop straws have pesticide residues. The use of sawdust consumes a lot of  
wood resources, which is not conducive to ecological environment protection.

Reed was mainly used in paper making in the past, but was gradually  
15 banned due to serious environmental pollution. Therefore, it is urgent to open  
up new ways to utilize reed resources, and it is also an important measure to  
comply with the trend of ecological civilization construction.

In order to broaden the source of *Pleurotus ostreatus* cultivation raw  
materials and promote the utilization of reed resources, the invention provides a  
20 *Pleurotus ostreatus* cultivation substrate with reed as the main cultivation raw  
material, which can replace or reduce the consumption of sawdust, cottonseed  
hull and corncob, and is beneficial to promoting sustainable and healthy  
development of the edible fungi industry.

## **SUMMARY**

25 This invention provides *Pleurotus ostreatus* cultivation substrate with reed  
as main raw material, which can replace or reduce the consumption of sawdust,  
cottonseed hulls and corncobs, the preparation method is simple and can meet  
the growth needs of *Pleurotus ostreatus*.

*Pleurotus ostreatus* cultivation substrate comprises the following raw  
30 materials in percentage by mass: reed chips 37-43%; cottonseed hulls 37-43%,

rice hulls 7.6%, bran 10%, gypsum 1%, urea 0.4%, lime 1%, the sum of the mass percentages of the raw materials is 100%.

The preparation method of *Pleurotus ostreatus* cultivation substrate comprises the following steps: (1) after harvesting and sun-drying, reed is crushed and screened into fine particles, which are mixed with rice hulls according to mass percentage, then pre-wetted and added with lime and urea, and fermented for 15-30 days to soften the texture; (2) mix cottonseed hull, bran, gypsum and fermented reed chips evenly in proportion to adjust the water content to 62.65%; add lime and adjust pH to 9.3-9.5; (3) bag and sterilize.

Preferably, *Pleurotus ostreatus* cultivation substrate comprises the following material in percentage by mass: reed chips 40%; cottonseed hulls 40%, rice hulls 7.6%, bran 10%, gypsum 1%, urea 0.4%, lime 1%.

The reed chips are prepared by crushing green reed in the growing period.

The effect of each component in the above-mentioned edible fungus cultivation substrate is as follows: reed can be used in different growth periods. Compared with the mature reed, the green reed in the growing period has higher nutrient content and is easier to soften;

Rice hulls can be used as a substrate for mushroom growth, and at the same time can increase the aeration of the substrate. Bran can increase the nutrition of the substrate, and can also be replaced by other similar items according to the economic cost, such as bean cake, soybean meal, corn flour, etc.

Adding urea in the fermentation process can promote fermentation, and transform inorganic nitrogen into organic nitrogen through microbial action, providing organic nitrogen source for edible fungi; Gypsum provides sulfur and calcium for edible fungi, and improves the physical and chemical properties of the substrate. Lime is used to promote softening of reed chips and adjust the pH of the medium.

Compared with the prior art, the invention has the advantages that:

The invention opens up a new way for the utilization of reed resources, and provides a new source of raw materials for the cultivation of edible fungi. By crushing reed into fine particles, and adding urea and lime for fermentation and softening, it is beneficial to the utilization of the substrate by *Pleurotus ostreatus*

and the problem of bundling is solved; the rice hull solves the problem of poor ventilation of the fine particles of the reed. The edible fungus cultivation substrate of the invention can meet the growth requirements of *Pleurotus ostreatus*.

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## **DETAILED DESCRIPTION OF THE INVENTION**

The specific embodiments of the present invention will be described in detail below with reference to the examples.

10 Calculated by mass percentage, the invention includes the following components: Embodiment 1: Ripe reed chips (harvested in December at maturity) 40%, cottonseed hull 40%, rice hull 7.6%, wheat bran 10%, lime 1.0%, gypsum 1.0%, urea 0.4%; Embodiment 2: Green reed chips (harvested in May in the growing season) 40%, cottonseed hulls 40%, rice husks 7.6%, wheat bran 10%, lime 1.0%, gypsum 1.0%, urea 0.4%; Embodiment 3: poplar  
15 shavings 30%, cottonseed hulls 53%, wheat bran 15%, lime 1.0%, gypsum 1.0%; Embodiment 4: corncob 40%, cottonseed husk 58%, lime 1.0%, gypsum 1.0%; among them, Embodiment 1 and Embodiment 2 use reed as one of the main raw materials; Embodiment 3 and Embodiment 4 are the cultivation  
20 preparation method; total weight of each embodiment is 10 kg.

The preparation methods of Embodiment 1 and Embodiment 2 are as follows:

(1) Pretreatment: after harvesting, the reeds are sun-dried, pulverized through a 1 mm mesh screen, mixed with rice husks according to the above  
25 proportions, pre-wetted and then added with lime and urea, composted and fermented for 20 days to soften the texture;

(2) Batching preparation: batching is carried out according to the content of the above-mentioned components, each embodiment is 10 kilograms of dry material, repeated 3 times; the water content is adjusted to about 65% (the  
30 culture material is squeezed by hand to have a watermark without dripping), and the pH is adjusted to around 9.5.

(3) Sterilization: use 17×33cm polypropylene bags, sterilize by high temperature and high pressure; sterilization temperature is 122°C, and sterilization time is 2.8 hours.

Utilizing the above-mentioned embodiment to carry out the cultivation experiment of oyster mushroom respectively, and the method is as follows:

(1) Inoculation: it is carried out on a sterile operating table; first inoculate one end of the cultivation bag and the sterile operating table with sodium dichloroisocyanurate, fumigate for half an hour, and seal it with a mushroom ring;

(2) Mycelium culture: place the inoculated culture bag into the culture room for dark culture, the ambient temperature is 22-24°C and the humidity is 60-65%;

(3) Fruiting management: after the mycelium is full in the bag, it is placed in a fruiting room with a temperature of 25-30°C and a humidity of 85-95%.

The following table shows the yields of *Pleurotus ostreatus* cultivated by the medium of the above embodiments:

	Embodiment Feature	Yield (kilogram)	Biological Efficiency
Embodiment 1	Ripe reed is the main material (40%)	8.235	82.40%
Embodiment 2	Green reed is the main material (40%)	9.332	93.30%
Embodiment 3	Polar shavings is the main material(40%)	8.534	85.30%
Embodiment 4	Corn cob is the main material(40%)	9.011	90.10%

It can be seen that Embodiment 2 with green reed as the main material has the highest yield, and the biological efficiency (fresh mushroom seed/cultivation material weight × 100%) is 93.3%, which is 8.0 percentage points higher than the conventional embodiment with poplar sawdust as the main material, and 3.2 percentage points higher than the conventional embodiment with corncob as the main ingredient. The yield of Embodiment 1 with mature reed as the main raw material is the lowest, but it is close to the output of the conventional embodiment with poplar sawdust as the main material. When the raw materials

such as wood chips and corncob are insufficient or their prices are high, the mature reed chips can be used as alternative raw materials.

## CLAIMS

5        1. The characteristics of the *Pleurotus ostreatus* cultivation substrate are that the mass percentage of raw materials is as follows: reed chips 37-43%; cottonseed hulls 37-43%, rice hulls 7.6%, bran 10%, gypsum 1%, urea 0.4%, lime 1%, and the sum of the mass percentages of the raw materials is 100%.

10        2. *Pleurotus ostreatus* cultivation substrate, according to claim 1, is characterized in that reed chips 40%; cottonseed hulls 40%, rice hulls 7.6%, bran 10%, gypsum 1%, urea 0.4%, lime 1%.

3. The preparation method of *Pleurotus ostreatus* cultivation substrate is characterized in that the reed chips are prepared by crushing green reed in the growing period.

15        4. The preparation method of *Pleurotus ostreatus* cultivation substrate is characterized in that (1) after harvesting and sun-drying, reed is crushed and screened into fine particles, which are mixed with rice hulls according to the mass percentage, then pre-wetted and added with lime and urea, and fermented for 15-30 days to soften the texture; (2) mix cottonseed hull, bran,  
20        gypsum and fermented reed chips evenly in proportions, and adjust the water content to 62.65%; add lime and adjust the pH to 9.3-9.5; (3) bag and sterilize.



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## **ABSTRACT**

This invention provides a cultivation substrate for *Pleurotus ostreatus* and a preparation method thereof. The medium comprises reed chips, cottonseed  
25 hulls, rice hulls, bran, gypsum, urea and lime. Using reed as the main raw material can replace or reduce the consumption of sawdust, cottonseed hulls and corncobs, and open up a new source of raw materials. The invention provides a simple preparation method, which can not only meet the growth demand of *Pleurotus ostreatus*, but also save forest resources, reduce  
30 pesticide residues, and promote both the development and utilization of reed resources and the sustainable and healthy development of edible fungi industry.