Notice

DESCRIPTION CN214961678U

An intensive duckweed cultivation device

一种集约化浮萍培养装置

[0001]

Technical Field

技术领域

[n0001]

This utility model relates to the field of plant cultivation technology, and in particular to an intensive duckweed cultivation device.

本实用新型涉及植物培养技术领域，尤其涉及一种集约化浮萍培养装置。

[0003]

Background Technology

背景技术

[n0002]

Duckweed is a general term for plants in the family Lemnaceae. It is the smallest flowering plant in the world, comprising 5 genera and 36 species. It grows rapidly, reproducing a generation in 16 hours under ideal conditions, and its biomass accumulation is 28 times that of corn. Duckweed has a high starch content; some varieties can reach 75% starch content under specific conditions. Duckweed starch is easily converted into ethanol, and some literature reports that the ethanol yield of duckweed can reach 6.42%.

浮萍(Duckweed)是浮萍科(Lemnaceae)植物的统称，是世界上最小的开花植物，共有5个属36个种，其生长速度快，在理想条件下16小时就可以繁殖一代，其生物量积累是玉米的28倍；浮萍淀粉含量高，有些浮萍品种在特定条件下其淀粉含量可达到75%，浮萍淀粉很容易转化为乙醇，有文献报道浮萍的乙醇产率可达到6.42?

With a yield of 103 liters per hectare, its ethanol production is 50% higher than that of corn; in addition, duckweed has a lower content of cellulose (~10%) and lignin (~2%), making its pretreatment process simpler in the production of bioethanol.

103升/公顷，其乙醇产量较玉米高出50%；另外浮萍纤维素(～10%)和木质素(～2%)含量较低，生产生物乙醇过程中其前期预处理更为简单。

Based on the above advantages, duckweed is considered one of the most promising strategic raw materials for future biomass liquid fuels.

基于以上有点，浮萍被认为是未来生物质液体燃料最具发展潜力的战略性原料之一。

Duckweed is rich in protein, with a content of 24-41%, and has broad application prospects in feed and functional protein powder. At the same time, duckweed has a strong ability to accumulate nitrogen, phosphorus, organic molecules and heavy metals, which can effectively absorb environmental pollutants.

浮萍富含蛋白质，含量可达24-41%，在饲料和功能蛋白粉方面有广阔应用前景；同时，浮萍具有极强的氮、磷、有机分子以及重金属等的富集能力，可以有效消纳环境污染物质。

[n0003]

Currently, duckweed cultivation mainly relies on shallow ponds, either naturally or artificially constructed. Since the duckweed floats above the water surface, it cannot fully utilize the space, which not only limits its application in biomass, energy, and feed, but also restricts its application in pollutant disposal.

目前浮萍培养都是以自然或者人工修建的浅池为主，浮萍漂浮在水面以上，导致不能充分的利用空间，不仅限制了浮萍在生物质、能源、饲料等方面的应用，还限制了其在污染物消纳方面的应用。

[0006]

Utility Model Content

实用新型内容

[n0004]

To address the aforementioned problems, a simple and flexible intensive duckweed cultivation device is provided.

针对上述问题，现提供一种结构简单且使用灵活的集约化浮萍培养装置。

[n0005]

The specific technical solution is as follows:

具体技术方案如下：

[n0006]

An intensive duckweed cultivation device, characterized by the following features:

一种集约化浮萍培养装置，具有这样的特征，包括：

[n0007]

Two first culture tanks with open tops are arranged opposite each other, and the first culture tanks are made of light-transmitting material;

两个顶部呈开口状的第一培养槽，第一培养槽呈上、下相对设置，且第一培养槽由透光材料制成；

[n0008]

Multiple second culture tanks with open tops are spaced apart between two first culture tanks, and adjacent second culture tanks are connected by connecting cylinders. Both the second culture tanks and the connecting cylinders are made of translucent material.

多个顶部呈开口状的第二培养槽，第二培养槽上、下间隔设于两个第一培养槽之间，且上、下相邻第二培养槽间及相邻第二培养槽和第一培养槽间均通过连接筒连通，第二培养槽及连接筒均由透光材料制成；以及

[n0009]

Multiple culture lamps are spaced around the first culture tank, with the bottom of each culture lamp resting on the ground.

多个间隔设于第一培养槽周围的培养灯，培养灯底部坐设于地面上。

[n0010]

The aforementioned intensive duckweed cultivation device also has the following features: a first insertion interface is provided on one side wall of the first cultivation tank, and a second insertion interface is provided on both the upper and lower side walls of the second cultivation tank; the upper and lower ends of the connecting tube can be inserted into the corresponding insertion interfaces.

上述的集约化浮萍培养装置，还具有这样的特征，第一培养槽的一侧侧壁上设有第一插接口，第二培养槽上、下两侧侧壁上均设有第二插接口，连接筒的上、下两端可插入对应插接口中。

[n0011]

The aforementioned intensive duckweed cultivation device also has the following feature: the cultivation device further includes at least one circulation pump, which is located in the connecting cylinder.

上述的集约化浮萍培养装置，还具有这样的特征，培养装置还包括至少一个循环泵，循环泵设于连接筒中。

[n0012]

The aforementioned intensive duckweed cultivation device also has the following feature: a discharge port is provided on the first cultivation tank located at the bottom, and a plug for sealing the discharge port is provided in the discharge port.

上述的集约化浮萍培养装置，还具有这样的特征，相对位于底部的第一培养槽上还设有出料口，其出料口内可插拔式的设有用于封堵出料口的密封塞。

[n0013]

The aforementioned intensive duckweed cultivation device also has the following feature: the first cultivation tank, the second cultivation tank, and the connecting cylinder are made of plexiglass.

上述的集约化浮萍培养装置，还具有这样的特征，第一培养槽、第二培养槽及连接筒由有机玻璃制成。

[n0014]

The aforementioned intensive duckweed cultivation device also has the following feature: the first cultivation tank, the second cultivation tank, and the connecting cylinder are made of glass.

上述的集约化浮萍培养装置，还具有这样的特征，第一培养槽、第二培养槽及连接筒由玻璃制成。

[n0015]

The beneficial effects of the above scheme are:

上述方案的有益效果是：

[n0016]

The intensive duckweed cultivation device provided by this utility model utilizes a first cultivation tank and a second cultivation tank arranged at intervals to achieve three-dimensional and intensive cultivation of duckweed, thereby effectively saving land area while effectively improving light efficiency and material accumulation efficiency.

本实用新型提供的集约化浮萍培养装置中利用间隔设置的第一培养槽及第二培养槽实现浮萍的立体化、集约化培养，以有效节约占地面积的同时并有效提高光效和物质积累效率。

[0020]

Attached Figure Description

附图说明

[n0017]

Figure 1 is a schematic diagram of the structure of the intensive duckweed cultivation device provided in an embodiment of this utility model.

图1为本实用新型的实施例中提供的集约化浮萍培养装置的结构示意图。

[n0018]

In the attached diagram: 1. First culture tank; 2. Second culture tank; 3. Connecting cylinder; 4. Culture lamp.

附图中：1、第一培养槽；2、第二培养槽；3、连接筒；4、培养灯。

[0023]

Detailed Implementation

具体实施方式

[n0019]

The technical solutions of the present utility model will be clearly and completely described below with reference to the embodiments of the present utility model. Obviously, the described embodiments are only some embodiments of the present utility model, and not all embodiments.

下面将结合本实用新型实施例对本实用新型实施例中的技术方案进行清楚、完整地描述，显然，所描述的实施例仅仅是本实用新型一部分实施例，而不是全部的实施例。

Based on the embodiments of this utility model, all other embodiments obtained by those skilled in the art without creative effort are within the scope of protection of this utility model.

基于本实用新型中的实施例，本领域普通技术人员在没有作出创造性劳动的前提下所获得的所有其他实施例，都属于本实用新型保护的范围。

[n0020]

It should be noted that, unless otherwise specified, the embodiments and features described in these embodiments can be combined with each other.

需要说明的是，在不冲突的情况下，本实用新型中的实施例及实施例中的特征可以相互组合。

[n0021]

The present invention will be further described below with reference to specific embodiments, but this is not intended to limit the present invention.

下面结合具体实施例对本实用新型作进一步说明，但不作为本实用新型的限定。

[n0022]

Figure 1 is a schematic diagram of the structure of the intensive duckweed cultivation device provided in an embodiment of this utility model.

图1为本实用新型的实施例中提供的集约化浮萍培养装置的结构示意图。

As shown in Figure 1, an embodiment of this utility model provides an intensive duckweed cultivation device, comprising: two first cultivation tanks 1 with open tops, the first cultivation tanks 1 being arranged opposite each other, and the first cultivation tanks 1 being made of a light-transmitting material (such as plexiglass or glass); a plurality of second cultivation tanks 2 with open tops, the second cultivation tanks 2 being spaced apart between the two first cultivation tanks 1, and the upper and lower adjacent second cultivation tanks 2 and adjacent second cultivation tanks 2 and first cultivation tanks 1 being connected by a connecting tube 3, the second cultivation tanks 2 and the connecting tube 3 being made of a light-transmitting material (such as plexiglass or glass); and a plurality of cultivation lamps 4 spaced apart around the first cultivation tanks 1, the bottom of the cultivation lamps 4 being placed on the ground.

如图1所示，本实用新型的实施例中提供集约化浮萍培养装置，包括：两个顶部呈开口状的第一培养槽1，第一培养槽1呈上、下相对设置，且第一培养槽1由透光材料(如有机玻璃或玻璃)制成；多个顶部呈开口状的第二培养槽2，第二培养槽2上、下间隔设于两个第一培养槽1之间，且上、下相邻第二

培养槽2间及相邻第二培养槽2和第一培养槽1间均通过连接筒3连通，第二培养槽2及连接筒3均由透光材料(如有机玻璃或玻璃)制成；以及多个间隔设于第一培养槽1周围的培养灯4，培养灯4底部坐设于地面上。

[n0023]

The intensive duckweed cultivation device provided by this utility model utilizes a first cultivation tank 1 and a second cultivation tank 3 arranged at intervals to achieve three-dimensional and intensive cultivation of duckweed, thereby effectively saving land area while effectively improving light efficiency and material accumulation efficiency.

本实用新型提供的集约化浮萍培养装置中利用间隔设置的第一培养槽1及第二培养槽3实现浮萍的立体化、集约化培养，以有效节约占地面积的同时并有效提高光效和物质积累效率。

In this invention, the first culture tank 1 located at the bottom can be directly placed on the ground to support the upper culture tank.

本实用新型中相对位于底部的第一培养槽1可直接坐设于地面上，从而支撑上部的培养槽。

[n0024]

In this invention, a cultivation lamp 4 is used to provide a light source for the growth of duckweed.

本实用新型中利用培养灯4为浮萍生长提供光源。

[n0025]

Based on the above technical solution, in order to allow users to flexibly increase the number of culture tanks according to the culture needs, a first insertion interface (not shown in the figure) can be opened on one side wall of the first culture tank 1, and a second insertion interface (not shown in the figure) can be opened on the upper and lower side walls of the second culture tank 2. In this utility model, when it is necessary to adjust the number of culture tank layers, the user can insert the upper and lower ends of the connecting tube 3 into the corresponding insertion interfaces to increase or decrease the number of culture tanks.

于上述技术方案基础上，进一步的，本实施例提供的培养装置中为使得使用者可根据培养需要灵活增加培养槽，故可在第一培养槽1的一侧侧壁上开设第一插接口(图中未显示)，且在第二培养槽2上、下两侧侧壁上开设第二插接口(图中未显示)，本实用新型中当需要调整培养槽层数时使用者可将连接筒3的上、下两端插入对应插接口中，以实现培养槽的增加或减少。

[n0026]

Based on the above technical solution, the cultivation device provided in this embodiment further includes at least one circulation pump (not shown in the figure). In this utility model,

the circulation pump is located in the connecting cylinder 3, so that the user can use the circulation pump to circulate the water and nutrients in the cultivation device (as shown by the arrow in the figure), which is beneficial to the growth of duckweed.

于上述技术方案基础上，更进一步的，本实施例提供的培养装置中还包括至少一个循环泵(图中未显示)，本实用新型中循环泵设于连接筒3中，这样即可使得使用者借助循环泵实现培养装置内水体及营养物质的循环(如图中箭头所示)，以有利于浮萍生长。

[n0027]

Based on the above technical solution, the first culture tank 1 located at the bottom of the culture device provided in this embodiment is further provided with a discharge port (not shown in the figure), and a plug for sealing the discharge port is provided in the discharge port in a pluggable manner. In this utility model, the plug can be pulled out after the culture is completed, thereby releasing the culture liquid and the cultured duckweed.

于上述技术方案基础上，更进一步的，本实施例提供的培养装置中相对位于底部的第一培养槽1上还设有出料口(图中未显示)，且出料口内可插拔式的设有用于封堵出料口的密封塞，本实用新型中当培养完毕后即可拔出密封塞，从而放出培养液及所培养的浮萍。

In this invention, a removable filter screen can also be installed in the discharge port (the filter screen can be blocked in the discharge port through the rubber mesh edge structure around

it). In this way, when the sealing plug is pulled out and the culture medium is released, the filter screen can be used to block the duckweed in the culture medium. After the culture medium is completely released, the user can pull out the filter screen to clean the duckweed.

本实用新型中还可考虑在出料口内可插拔式的设置滤网(滤网可通过其周边的由橡胶制成的网边结构使得滤网堵塞于出料口内)，这样当拔出密封塞并放出培养液后即可利用滤网阻隔培养液内浮萍，当培养液完全放出后使用者可再拔出滤网，以清理浮萍。

[n0028]

The above are merely preferred embodiments of the present utility model and are not intended to limit the implementation methods and protection scope of the present utility model. Those skilled in the art should realize that any equivalent substitutions and obvious changes made based on the content of the present utility model specification should be included within the protection scope of the present utility model.

以上仅为本实用新型较佳的实施例，并非因此限制本实用新型的实施方式及保护范围，对于本领域技术人员而言，应当能够意识到凡运用本实用新型说明书内容所作出的等同替换和显而易见的变化所得到的方案，均应当包含在本实用新型的保护范围内。