cultivation of the development material can be carried out in dependence on the development stage, the transport container of the development material takes up as little volume as possible in accordance with the development material, and the development material can develop both inside and outside the transport container until harvesting under aseptic and optimal conditions corresponding to the development material, i.e. different climates. Furthermore, the development material should be provided in such a way that it can be transported in a protected manner, which already uses the transport period for cultivation, which can be stored well and which can be expanded in a modular manner within the framework of farm management. In particular, this task arises the requirements of regulated industries, such as pharmaceuticals, cosmetics and food supplements.

The present invention solves the problem by a storage container having the features of claim 1, as well as by a growth and/or propagation station having the features of claim 11, as well as a maintenance unit of claim 19, and a method of claim 20.

According to a first aspect of the present invention, there is provided a storage container comprising an interior space and a substrate arranged therein, which substrate is stationarily arranged on the wall of the storage container, wherein the storage container further comprises a biological living development material arranged in or on the substrate, wherein the storage container is designed as a sealed capsule for ensuring an aseptic atmosphere, characterized in that the substrate is an absorbent material with a water absorption capacity in the dry state of at least 50 g water/cm3.
and in that the storage container has at least two end segments and a tubular middle segment, the substrate and the development material being arranged in the middle segment, and at least a first of the end segments being arranged opposite the middle segment, characterized has a lower wall thickness and/or has a wall material that is more thermally, physically and/or chemically susceptible to attack and/or has a predetermined separation point.

According to a second aspect of the present invention, there is provided an industrial growth and/or propagation station for the cultivation of development material, characterized in that the growth and/or propagation station is de-signed as a large-capacity container, in particular as an ISO container, the large-capacity container having a device, in particular a sensor-monitored dis-tribution device, for providing and monitoring an aseptic internal atmosphere with simultaneous setting, monitoring and/or maintenance of optimum growth conditions, wherein to ensure these growth conditions the device has at least the parameters: Air pressure, temperature, humidity and gas exchange rate, can be sensed and adjusted by the device.

According to a third aspect of the present invention, there is provided a method for cultivating development material, characterized by the following steps: a) Providing a storage container according to any of the preceding claims, b) Insertion of the storage container into a storage rack of a growth and/or propagation station, in particular according to one of the pre-ceding claims, and preferably after insertion of the storage container into the storage rack, preferably sterilization, in particular preferably according to a CIP process, i.e. a localized cleaning process without dismantling the arrangement of storage rack and storage container, and opening the storage container at least at one end, preferably opening the storage container at both ends; c) Monitoring the growth and/or propagation of the development material in the aseptic internal atmosphere, until the detection of a growth and/or propagation stage for harvesting; d) Use of a maintenance unit and/or process unit while maintaining the aseptic atmosphere while recovering a valuable material, in particular a biological material containing an active substance, from the harvested development material.

A storage container according to the invention comprises an interior space and a substrate arranged therein. The substrate forms the surface that allows growth or propagation of biological living developmental material. In particular, the substrate may allow rooting, i.e., root penetration or attachment. Porous materials, such as porous rock or a sponge material, or gel-like materials, such as hydrogels or gels of biological materials, are particularly well suited for this purpose. Particularly preferably, the development material has a high water absorption capacity. Instead of water, other liquid media, e.g. a nutrient solution, can of course also be absorbed. Nutrients can be contained in the substrate in liquid form, for example, but also in solid form, e.g. as salt.

The substrate can preferably extend over the entire width of the interior space and, according to the invention, is arranged stationarily on the wall of the storage container, e.g. by frictional connection or e.g. by support of the substrate on a net layer arranged perpendicular to the longitudinal axis of the storage container. Alternatively, or additionally, the substrate can also be formed in such a way that, without a support structure, the substrate is stationary by adhesion to the wall of the storage container and by cohesion in the substrate itself.

According to the invention, the substrate is formed as an absorbent material having a water absorption capacity in the dry state of at least 50 g water/cm^3. The water absorption capacity may comprise both unbound water and unbound water, such as is present in the form of hydrogel. This can eliminate the need for additional water accumulation in the end segment of the storage container. Humidification of e.g. plant

ClaimsA storage container (1) comprising an interior space (3) and a substrate (4) arranged therein and stationarily arranged on the wall of the storage container, the storage container (1) further comprising a biological living development material (6) arranged in or on the substrate (4),

wherein the storage container (1) is designed as a sealed capsule for ensuring an aseptic atmosphere,

characterized in that the substrate (4) is an absorbent material having a water absorption capacity in the dry state of at least 50 g water/cm^3

and in that the storage container (1) has at least two end segments (8) and a tubular middle segment (2), the substrate (4) and the development material (6) being arranged in the middle segment (2), and at least a first of the end segments (8) being arranged opposite the middle segment (2), characterized

has a smaller wall thickness and/or

has a wall material that is more thermally, physically and/or chemically susceptible to attack and/or

has a predetermined separation point.

Storage container according to claim 1, **characterized in that** the material of the substrate comprises at least one porous material, in particular porous rock, and/or at least one sponge material, and/or at least one gel-like material, in particular a hydrogel or a gel of biological materials, in which water is present in stored form.

Storage container according to claim 1 or 2, **characterized in that** the storage container has a space below the substrate a gas-filled or vacuumed cavity, preferably for containing roots, and which is bounded by wall portions of the storage container and by the substrate.

A storage container according to any one of the preceding claims, characterized in **that** the first of the end segments (8) is a bottom end segment with respect to the biological living development material (6).

Storage container according to any one of the preceding claims, **characterized in that** at least a second of said end segments (8), in particular a lid-side end segment, is formed of a gas-selective semi-permeable material, preferably CO2, O2, N2 and/or CH4-selective.

Storage container according to one of the preceding claims, **characterized in that** a wall (7) of the storage container (1), in particular of the middle segment (2), consists at least in regions or completely of a transparent material and particularly preferably

~~of a transparent, UV-impermeable, thermally insulating material which is at least partially gas-tight towards the outside.~~

~~Storage container according to one of the preceding claims, **characterized in that** the middle segment (2) has at least one circumferentially distributed limiting stop (13) or a plurality of circumferentially distributed limiting stops or a conical shape and/or has a locking device in order to fix the storage container in a stationary and vibration-resistant manner.~~

~~Storage container according to any one of the preceding claims, **characterized in that** the limiting stop(s) and/or the locking device is/are attached to the lower half of the middle segment.~~

~~Storage container according to one of the preceding claims, **characterized in that** the substrate (4) is arranged as the only water reservoir within the storage container (1) and is positioned with a water content of 30 g water/cm^3 , preferably as a shaped body, in the middle segment of the storage container.~~

~~Storage container according to one of the preceding claims, characterized in that the storage container (1) has a, preferably all-embracing, sterilizable surface of a peroxide- and/or radical-stable material, in particular an ozone-, peracetic acid- and/or hydrogen peroxide-stable material, preferably a coating or a wall based on metals, such as aluminum, iron, a thermoplastic, such as e.g. polyamide, polycarbonate, polyolefin, polyacryl, polymethacryl, halogenated ethylenes and/or an elastomer, such as rubber, halogenated elastomers, silicones.~~

~~Industrial growth and/or propagation station (100) for cultivating development material (6), **characterized in that** the growth and/or propagation station (100) is designed as a large-capacity container, in particular as an ISO container, wherein the large-capacity container has a device, in particular a sensor-monitored distribution device, for providing and monitoring an aseptic internal atmosphere while simultaneously setting, monitoring and/or maintaining optimum growth conditions, wherein, in order to ensure these growth conditions, the device has at least the parameters: Air pressure, temperature, humidity and gas exchange rate, can be sensed and adjusted by the device.~~

~~Industrial growth and/or propagation station (100) according to claim 11, **characterized in that by** the device additionally, individually or in combination, the parameters SAL level, partial gas pressure, fertilizer temperature, wind strength, wind direction,~~

sound level and/or sound frequency sequence can be determined and/or adjusted by sensors.

Industrial growth and/or propagation station (100) according to claim 11 or 12, **characterized in that by** the device additionally, individually or in combination, the parameters light intensity, fertilizer quantity, fertilizer composition, pH value and/or conductance can be sensory determined and/or adjusted by the device.

Industrial growth and/or propagation station (100) according to claim 12, **characterized in that it is** the partial gas pressure of single or in combination of the following gases: CO2, O2, N2, He, Ar, O3, CO, CH4, ethane, ethene, ethyne, and/or terpenes.

The industrial growth and/or propagation station (100) of claim 14, characterized in **that the** terpenes are single or in combination hemiterpenes, monoterpenes, sesquiterpenes, diterpenes, sesterterpenes, triterpenes, tetraterpenes, polyterpenes, and terpenoids,

Industrial growth and/or propagation station (100) according to any one of the preceding claims, **characterized in that** the growth and/or propagation station (100) comprises a grow room with a supply and/or outlet of a CIP medium, in particular ozone.

Industrial growth and/or propagation station (100) according to any one of the preceding claims, **characterized in that** the growth and/or propagation station (100) comprises a grow room with an inlet and/or outlet of a cleaning medium for CIP cleaning, in particular ozone.

Industrial growth and/or propagation station (100) according to any one of the preceding claims, characterized in **that** the large capacity container comprises at least one storage rack (14) for arranging one or preferably a plurality of storage containers (1) according to any one of the preceding claims.

Industrial growth and/or propagation station (100) according to any one of the preceding claims, characterized in **that** the large capacity container comprises at least one or preferably all of the following devices:
a light source (23) for irradiating the development material;
an actuator, such as a pump (29) for transporting media, including a nutrient-containing medium and/or a sterilization medium;
a sensor (33) for monitoring the health status of the development item (6);

a control and/or evaluation unit (32) for controlling a control loop for adapting the interior atmosphere to the changes detected by the sensor (33) to at least one predetermined setpoint;
a water supply (26) and/or treatment unit (27);
an air conditioner (24);
a nutrient container (30);
a power supply and/or management unit (20);
a mixing chamber (31) and/or
a communication module (21) for data exchange with an external device.

A cultivation system comprising a growth and/or propagation station (100) according to any one of the preceding claims, and a maintenance unit (300) and/or a process unit (500), in particular a harvesting unit, wherein the maintenance unit is connected to the growth and/or propagation unit for transferring development material or machinery between the two units (100 and 300 or 500), and wherein the maintenance unit (300) or process unit (500), at least in combination with the growth and/or propagation station (100), is equipped for maintaining an aseptic internal atmosphere.

Method for cultivating development material (6), characterized by the following steps
Providing a storage container (1) according to any one of the preceding claims,
Insertion of the storage container (1) into a storage rack (14) of a growth and/or propagation station (100), in particular according to one of the preceding claims, and opening of the storage container (1) at least at one end, preferably opening of the storage container (1) at both ends
Monitoring the growth and/or propagation of the development material (6) in the aseptic internal atmosphere, until the detection of a growth and/or propagation stage for harvesting;
Use of a maintenance unit (300) and/or process unit (500) while maintaining the aseptic atmosphere while recovering a valuable material, in particular a biological material containing an active substance, from the harvested development material.

The method according to claim 21, **characterized in that in** step b), preferably after insertion of the storage container (1) into the storage rack (14), sterilization is carried out, preferably according to a CIP method, i.e., a stationary cleaning method without disassembly of the arrangement of storage rack (14) and storage container (1).

Method according to claim 21 or 22, **characterized in that**
the method in step c) to ensure an atmosphere for growth and/or propagation at least the parameters: Air pressure, temperature, humidity, light intensity, gas exchange

~~rate, fertilizer amount, fertilizer composition, pH and conductance are determined, monitored and/or adjusted.~~

~~Method according to any one of the preceding claims, **characterized in that** the method in step c) for ensuring an atmosphere for growth and/or propagation parameters SAL level, partial gas pressure, fertilizer temperature, wind strength, wind direction, sound level and/or sound frequency sequence are determined, monitored and/or adjusted.~~

Claims

1) Storage container comprising an interior space and a substrate arranged therein, which substrate is stationarily arranged on the wall of the storage container, wherein the storage container further comprises a biological living development material arranged in or on the substrate, wherein the storage container is designed as a sealed capsule for ensuring an aseptic atmosphere, **characterized in that the substrate** is an absorbent material with a water absorption capacity in the dry state of at least 50 g water/cm3.
and in that the storage container has at least two end segments and a tubular middle segment, the substrate and the development material being arranged in the middle segment, and at least a first of the end segments being arranged opposite the middle segment, characterized

- has a lower wall thickness and/or
- has a wall material that is more thermally, physically and/or chemically susceptible to attack and/or
- has a predetermined separation point.

2) Storage container according to claim 1, **characterized in that** the material of the substrate comprises at least one porous material, in particular porous rock, and/or at least one sponge material, and/or at least one gel-like material, in particular a hydrogel or a gel of biological materials, in which water is present in stored form.

3) Storage container according to claim 1 or 2, **characterized in that** the storage container has a space below the substrate a gas-filled or vacuumed cavity, preferably for holding roots, and which is bounded by wall sections of the storage container and by the substrate, and/or **that** the substrate is arranged as the only water reservoir within the storage container and is positioned with a water content of 30 g water/cm3, preferably as a shaped body, in the middle segment of the storage container.

4) A storage container according to any one of the preceding claims, **characterized in that** the first of the end segments is a bottom end segment with respect to the biological living development material.

5) A storage container according to any one of the preceding claims, **characterized in that** at least a second of said end segments, in particular a lid-side end segment, is formed of a gas-selective semi-permeable material, preferably CO2, 02, N2 and/or CH4-selective.

6) Storage container according to one of the preceding claims, **characterized in that** a wall of the storage container, in particular of the middle segment, consists at least in regions or completely of a transparent material and particularly preferably of a transparent, UV-impermeable, thermally insulating and at least partially gas-tight material and/or **in that** the storage container has a sterilizable surface, preferably all-embracing, of a peroxide- and/or radical-stable material, in particular an ozone-, peracetic acid- and/or hydrogen peroxide-stable material, such as polyamide, polycarbonate, polyolefin, polyacrylic, polymethacrylic, halogenated ethylene and/or an elastomer such as rubber, halogenated elastomers, silicones.

7) Storage container according to one of the preceding claims, **characterized in that** the middle segment has at least one circumferentially distributed limiting stop or a plurality of circumferentially distributed limiting stops or a conical shape and/or has a locking device in order to fix the storage container in a stationery and vibration-resistant manner and/or **in that** the limiting stop or stops and/or the locking device is or are attached to the lower half of the middle segment.

8) Industrial growth and/or propagation station for the cultivation of development material, **characterized in that** the growth and/or propagation station is designed as a large-capacity container, in particular as an ISO container, the large-capacity container having a device, in particular a sensor-monitored distribution device, for providing and monitoring an aseptic internal atmosphere with simultaneous setting, monitoring and/or maintenance of optimum growth conditions, wherein to ensure these growth conditions the device has at least the parameters: Air pressure, temperature, humidity and gas exchange rate, can be sensed and adjusted by the device.

9) Industrial growth and/or propagation station according to claim 8 characterized in that by means of the device additionally, individually or in combination, the

parameters SAL level, partial gas pressure of a single or a combination of the following gases: CO2, O2, N2, He, Ar, O3, CO, CH4, ethane, ethene, ethyne, and/or terpenes, and/or fertilizer temperature, wind strength, wind direction, sound level and/or sound frequency sequence can be determined and/or adjusted by sensors and/or that by means of the device additionally, individually or in combination, the parameters light intensity, fertilizer quantity, fertilizer composition, pH value and/or conductance can be determined and/or adjusted by sensors.

10) The industrial growth and/or propagation station of claim 8, **characterized in that** the terpenes are single or in combination hemiterpenes, monoterpenes, sesquiterpenes, diterpenes, sesterterpenes, triterpenes, tetraterpenes, polyterpenes, and terpenoids.

11) Industrial growth and/or propagation station according to any one of claims 8-10, **characterized in that** the growth and/or propagation station comprises a grow room with an inlet and/or outlet of a cleaning medium for CIP cleaning and/or CIP medium, in particular ozone.

12) Industrial growth and/or propagation station according to any one of claims 8-11, **characterized in that** the large capacity container comprises at least one storage rack for arranging one or preferably a plurality of storage containers according to any one of the preceding claims.

13) Cultivation system comprising a growth and/or propagation station according to one of claims 8-12, as well as a maintenance unit and/or a process unit, in particular a harvesting unit, wherein the maintenance unit is connected to the growth and/or propagation unit for transferring development material or machinery between the units and wherein the maintenance unit or process unit at least in combination with the growth and/or propagation station is equipped for maintaining an aseptic internal atmosphere.

14) Method for cultivating development material, characterized by the following steps:

a) Providing a storage container according to any of the preceding claims,

b) Insertion of the storage container into a storage rack of a growth and/or propagation station, in particular according to one of the preceding claims, and preferably after insertion of the storage container into the storage rack, preferably sterilization, in particular preferably

according to a CIP process, i.e. a localized cleaning process without dismantling the arrangement of storage rack and storage container, and opening the storage container at least at one end, preferably opening the storage container at both ends.

c) Monitoring the growth and/or propagation of the development material in the aseptic internal atmosphere, until the detection of a growth and/or propagation stage for harvesting;

d) Use of a maintenance unit and/or process unit while maintaining the aseptic atmosphere while recovering a valuable material, in particular a biological material containing an active substance, from the harvested development material.

15) The method according to claim 14, **characterized in that** the method in step c) for ensuring an atmosphere for growth and/or propagation at least the parameters: Air pressure, temperature, humidity, light intensity, gas exchange rate, fertilizer quantity, fertilizer composition, pH value and conductance are determined, monitored and/or adjusted and/or **that** the method in step c) for ensuring an atmosphere for growth and/or propagation parameters SAL level, partial gas pressure, fertilizer temperature, wind intensity, wind direction, sound level and/or sound frequency sequence are determined, monitored and/or adjusted.