CLAIMS

[Claim 1]

A cell wall or cell membrane disrupting device comprising a fixed disc, a rotating disc, a rotating shaft for driving of the rotating disc, a pressure reducing means and a housing, wherein

at least one pair of the fixed disc and the rotating disc are disposed facing each other, the center section of the fixed disc has a hollow section that is larger than the outer diameter of the rotating shaft passing through the center section,

shearing force generated between the rotating disc and the fixed disc is applied to a target fluid having a water content of 89% or higher that has been loaded into the device, and

the pressure inside the cell wall or cell membrane disrupting device is reduced from -0.00001 MPa to -0.08 MPa by the pressure reducing means.

[Claim 2]

A cell wall or cell membrane disrupting device comprising a fixed disc, a rotating disc, a rotating shaft for driving of the rotating disc, a pressure reducing means based on suction force from a land pump and/or a submersible pump, and a housing, wherein

at least one pair of the fixed disc and the rotating disc are disposed facing each other, the center section of the fixed disc has a hollow section that is larger than the outer diameter of the rotating shaft passing through the center section,

shearing force generated between the rotating disc and the fixed disc is applied to a target fluid having a water content of 89% or higher that has been loaded into the device, and

when a land pump is used, the land pump is situated after the discharge port of the device, or

when a submersible pump is used, the submersible pump is situated at the discharge port end after the final fixed disc in the device,

the pressure inside the cell wall or cell membrane disrupting device is reduced from -0.00001 MPa to -0.08 MPa by the pressure reducing means.

[Claim 3]

The cell wall or cell membrane disrupting device according to claim 2, wherein the land pump is a one rotor screw pump.

[Claim 4]

The cell wall or cell membrane disrupting device according to any one of claims 1 to 3, wherein the rotating disc rotates at a circumferential speed of 10 m/s or higher.

[Claim 5]

The cell wall or cell membrane disrupting device according to any one of claims 1 to 4,

which comprises two or more of the fixed disc and/or rotating disc.

[Claim 6]

The cell wall or cell membrane disrupting device according to any one of claims 1 to 5, wherein the gap between the fixed disc and rotating disc is 5 mm to 30 mm.

[Claim 7]

The cell wall or cell membrane disrupting device according to any one of claims 1 to 6, wherein the surfaces of the rotating disc and/or fixed disc are mirror surfaces or rough surfaces.

[Claim 8]

The cell wall or cell membrane disrupting device according to any one of claims 1 to 7, wherein the target substance to be loaded into the cell wall or cell membrane disrupting device contains at least one component selected from the group consisting of fungi, microorganisms, algae and plants.

[Claim 9]

The cell wall or cell membrane disrupting device according to any one of claims 1 to 8, wherein the target substance to be loaded into the cell wall or cell membrane disrupting device is sludge.

[Claim 10]

A method of reducing sludge volume, comprising a step of treating sludge by the cell wall or cell membrane disrupting device according to any one of claims 1 to 9.

[Claim 11]

A method of preparing fertilizer from sludge, comprising a step of treating sludge with the cell wall or cell membrane disrupting device according to any one of claims 1 to 9, and a step of converting the treated sludge obtained from the step of treating sludge, to fertilizer.

[Claim 12]

A method of preparing a culture solution from sludge, comprising a step of treating sludge with the cell wall or cell membrane disrupting device according to any one of claims 1 to 9, and a step of collecting the treated separated liquid obtained from the step of treating sludge, as a culture solution.

[Claim 13]

A deodorizing method comprising a step of treating sewage and/or sludge, or an odorous food, with the cell wall or cell membrane disrupting device according to any one of claims 1 to 9.

[Claim 14]

A method of fermenting for obtaining biogas, the method comprising a step of treating sludge with the cell wall or cell membrane disrupting device according to any one of claims 1 to 9, and a step of supplying the treated sludge and/or treated separated liquid obtained from the step of treating sludge, to a biogas fermenter.

[Claim 15]

A method for producing a food, beverage, drug, supplement or cosmetic, comprising a step of treating a target substance of at least one component selected from the group consisting of fungi, microorganisms, algae and plants, with the cell wall or cell membrane disrupting device according to any one of claims 1 to 8.

[Claim 16]

A method for recovering an oil, the method comprising a step of treating a target substance containing at least one kind of oil component selected from the group consisting of fungi, microorganisms, algae and plants, with the cell wall or cell membrane disrupting device according to any one of claims 1 to 9.