tolerance. The freeze-thaw awakening method is not limited to plants of a certain family, genus, or species, but can be applied to all plants. To date, more than 230 varieties have been successfully cultivated.

Citation List

Patent Literature

[0008]

Patent Literature 1 JP2006-25632

Patent Literature 2 JP2016-182094

Patent Literature 3 JP2018-183112.

Summary ~~of Invention~~

[0008a]

In a first aspect, the present disclosure refers to a method for producing an extraction liquid, comprising

a freezing step for freezing plant tissue and

an extraction step for obtaining an extraction liquid from the plant tissue that has undergone the freezing step.

[0008b]

In another aspect, the present disclosure refers to the extraction liquid produced by the producing method disclosed herein.

[0008c]

In a further aspect, the present disclosure refers to the extract dried product produced by drying the extraction liquid disclosed herein.

[0008d]

In yet another aspect, the present disclosure refers to a method of enhancing characteristics of a plant tissue, comprising:

a soaking step in which plant tissue from which the characteristics of the plant are to be enhanced is soaked in the extraction liquid,

wherein said extraction liquid is

the extraction liquid disclosed herein, or

the extraction liquid produced by dissolving the extract dried product disclosed herein.

[0008e]

In a further aspect, the present disclosure refers to a method for producing plant tissue with enhanced plant characteristics comprising applying the method of enhancing characteristics of a plant tissue disclosed herein.

[0008f]

In another aspect, the present disclosure refers to a plant tissue with enhanced plant characteristics produced by applying the method disclosed herein.

[0008g]

In yet another aspect, the present disclosure refers to a method for producing a plant with enhanced plant characteristics, comprising the step of growing the plant tissue disclosed herein.

[0008h]

In a further aspect, the present disclosure refers to a method for enhancing plant characteristics, comprising a spraying step for spraying the extraction liquid on the plants for which the plant characteristics are to be enhanced,

wherein said extraction liquid is

the extraction liquid disclosed herein, or

the extraction liquid produced by dissolving the extract dried product disclosed herein.

[0008i]

In another aspect, the present disclosure refers to a method for producing a plant with enhanced plant characteristics, comprising applying the method for enhancing plant characteristics disclosed herein.

[0008j]

In yet another aspect, the present disclosure refers to a plant with enhanced plant characteristics produced by the method for producing disclosed herein.

[0008k]

In a further aspect, the present disclosure refers to a plant

tissue obtained from the plant disclosed herein,and used as a scion for grafting.

[0008l]

In another aspect, the present disclosure refers to a plant grafted with the plant tissue disclosed herein as a scion.

[0008m]

In yet another aspect, the present disclosure refers to a method for producing fruits or seeds of said plant comprising cultivating the plant disclosed herein.

[0008n]

In a further aspect, the present disclosure refers to fruits or seeds produced by the method disclosed herein.

[0008o]

In another aspect, the present disclosure refers to a method for searching for genes involved in enhancing plant characteristics, comprising;

a step of treating plants by the method disclosed herein, and

(i) a step for identifying genes that are highly expressed in the treated plants as compared to plants that have not received said treatment, and/or

(ii) a step for identifying genes that are expressed at lower levels in the treated plants as compared to plants that have not received said treatment.

[0008p]

In yet another aspect, the present disclosure refers to a method for screening for enhancing factors of plant characteristics, comprising

using the following (i) or (ii) genes as screening indicator;

(i) A gene that is highly expressed in treated plants compared to plants that have not been treated by the method disclosed herein; and/or

(ii) A gene that is lower expressed in treated plants compared to plants that have not been treated by the method disclosed herein;

screening the substance as an enhancing factor for a plant characteristic when the expression level of the gene described in (i) in plants treated with the test substance is higher than the expression level of the gene in plants not treated with the test substance and / or

screening the substance as an enhancing factor for a plant characteristic when the expression level of the gene described in (ii) in plants treated with the test substance is lower than the expression level of the gene in plants not treated with the test substance.

[0008q]

In a further aspect, the present disclosure refers to a method for analyzing the extraction liquid comprising

preparing an extraction liquid produced by the method disclosed herein as an analysis object,

preparing, as a comparison object, an extract solution extracted from plant tissue that has not undergone the freezing process described above.

comparing and analyzing the extraction liquid of the analysis object and the extraction liquid of the comparison object, and

identifying a component wherein the component is

a component contained in the extraction liquid of the analysis object, but not in the extraction liquid of the comparison object and / or

a component contained more or less in the extraction liquid of the analysis object compared to the extraction liquid of the comparison object.

[0008r]

In another aspect, the present disclosure refers to a method for searching an enhancing factor for a plant characteristic comprising

preparing an extraction liquid produced by the method disclosed herein as an analysis object,

preparing, as a comparison object, an extract solution extracted from plant tissue that has not undergone the

freezing process described above.

comparing and analyzing the extraction liquid of the analysis object and the extraction liquid of the comparison object, and

identifying a component wherein the component is

a component contained in the extraction liquid of the analysis object, but not in the extraction liquid of the comparison object and / or

a component contained more in the extraction liquid of the analysis object compared to the extraction liquid of the comparison object.

[0008s]

In yet another aspect, the present disclosure refers to a method for producing liquid for enhancing plant characteristics, comprising a step for adding to an aqueous medium a component that has been determined to be an enhancing factor for the plant characteristics by the method for searching disclosed herein.

[0008t]

In a further aspect, the present disclosure refers to a solution comprising the component that has been determined to be an enhancing factor for the plant characteristics by the method for searching disclosed herein.

[0008u]

In another aspect, the present disclosure refers to a method for enhancing characteristics of plant tissue, comprising a soaking step in which plant tissue from which plant characteristics are to be enhanced is soaked in a solution produced by the method disclosed herein.

[0008v]

In yet another aspect, the present disclosure refers to a method for enhancing plant characteristics, comprising a spraying step in which the solution produced by the method disclosed herein is sprayed on plants for which the plant characteristics are to be enhanced.

Technical Problem

[0009]

The problem to be solved is to provide a new technology to enhance plant characteristics without genetic modification.

Solution to Problem

[0010]

In the process of researching further development of the freeze-thaw awakening method, the inventor discovered that by immersing other plant tissues in the extraction liquid of one plant tissue that has undergone the freezing step, the same effect can be given as if the freeze-thaw awakening method were applied to said other plant tissue. Specifically, the present invention provides the following.

[0011]

[1] A method for producing an extraction liquid, comprising

a freezing step for freezing plant tissue and

an extraction step for obtaining an extraction liquid from the plant tissue that has undergone the freezing step.

[2] The method for producing an extraction liquid according to [1], wherein the extraction liquid for enhancing