hydroponic bed, and the hydroponics was performed in the greenhouse. In the hydroponics, a hydroponic solution including the nutrient for the hydroponics was used.

A borne fruit was harvested from the plant cultivated above, and the amounts of free amino acids and the sugar content were measured with respect to the edible part of the tomato fruit (Comparative Example 1C-1). The results are shown in Table 4 and Table 5.

[0202]

[Table 4]

		Example 2C			Comparative Example 1C
		2C-1	2C-2	2C-3	1 C - 1
Nutrient solution		Salt water (NaCl 1% by mass)	Salt water (NaCl 2% by mass)	Sea water (NaCl 3% by mass)	Fresh water
Standard amino acid [mg / 100 g]	Arginine	4	6.3	12	5.9
	Lysine	4.4	7	10	3.6
	Histidine	7.6	12.1	28	4.6
	Phenylalanine	6.4	5.9	14	5.9
	Tyrosine	1.7	1.6	4	1.8
	Leucine	3.4	4.1	6	3.2
	Isoleucine	6.8	8.3	14	2.9
	Methionine	1	1.3	2	1.2
	Valine	4.1	3.8	10	2.8
	Alanine	9.1	22.9	12	3.6
	Glycine	2	2.9	3	1.1
	Proline	33.9	88.3	134	1.2
	Glutamic acid	321.9	650.1	607	185.9
	Serine	32.3	66	72	8.6
	Threonine	12.3	18	29	5.4
	Aspartic acid	47.9	87.3	124	34.6
	Tryptophan	1.3	1.5	3	1.6
	Cysteine	0.1	0.3	<1	0.04
Total amount [mg / 100 g]		500.2	987.7	1084	273.94
Sugar content (Brix)		10.7	13.4	-	4.0

[0203]

[Table 5]

		Example 2C			Comparative Example 1C
		2C-1	2C-2	2C-3	1 C - 1
Nutrient solution		Salt water (NaCl 1% by mass)	Salt water (NaCl 2% by mass)	Sea water (NaCl 3% by mass)	Fresh water
Non standard Amino acid [mg / 100 g]	Phosphoserine	1.4	1.9	-	0.8
	β-Alanine	3.6	4.4	-	0.7
	γ-aminobutyric acid (GABA)	185.8	173.3	-	36.2

[0204]

The above results revealed that the fruits of the tomatoes obtained in Example 2C contained proteogenic amino acids in larger amounts per gram than the fruit of the tomato obtained in Comparative Example 1C.

Further, the above results also revealed that the fruits of the tomatoes obtained in Example 2C contained nonproteogenic amino acids such as phosphoserine, β-alanine and γ-amino acid in larger amounts per gram than the fruit of the tomato obtained in Comparative Example 1C. The fruit of tomato cultivated with a nutrient solution with high sodium chloride concentration tended to have a larger total amount of proteogenic amino acids and a larger amount of amino acids in general.

INDUSTRIAL APPLICABILITY

[0205]

The present invention can provide a plant with improved shelf life as compared to the conventional plant of the same species.

The tolerance imparting method of the present invention can impart tolerance to plants against diseases and pests.

A fruit of the tomato of the present invention has free amino acid contents

CLAIMS

1. A tomato having a mass content of sodium which is at least 50 times a mass content of sodium of the item described in the Standard Tables of Food Composition in Japan 2015 (Seventh Revised Version), the mass content of sodium being measured per unit mass of edible portion of the plant.

2. The tomato according to claim 1, which has a sodium content of 0.15 % by mass or more as measured with respect to edible portion of a fruit of the tomato.

3. The tomato according to claim 1 or 2, which has a water content of 90 % by mass or less as measured with respect to edible portion of a fruit of the tomato.

4. The tomato according to any one of claims 1 to 3, which has a sugar content (Brix) of 8 or more as measured with respect to edible portion of a fruit of the tomato.

5. A method for producing the tomato of any one of claims 1 to 4, comprising:

a salt tolerance imparting step of performing a salt resistance imparting treatment by bringing a salt tolerance imparting agent into contact with at least a part of a root of a tomato, thereby obtaining a salt tolerance imparted tomato; and

a cultivation step of hydroponically cultivating the salt tolerance imparted tomato obtained in the salt tolerance imparting step with a nutrient solution having a sodium chloride concentration of 1 % by mass or more for a period ranging from a period of 1/2 of an entire cultivation period from immediately after the salt tolerance imparting treatment to the entire cultivation period.

6. A tolerance imparting method for imparting tolerance to a tomato against diseases and pests, comprising:

a salt tolerance imparting step of performing a salt resistance imparting treatment by bringing a salt tolerance imparting agent into contact with at least a part of a root of a tomato, thereby obtaining a salt tolerance imparted tomato; and

a cultivation step of hydroponically cultivating the salt tolerance imparted tomato obtained in the salt tolerance imparting step with a nutrient solution having a sodium chloride concentration of 1 % by mass or more for a period ranging from a period of 1/2 of an entire cultivation period from immediately after the salt tolerance imparting treatment to the entire cultivation period.

7. The tolerance imparting method according to claim 6, which further comprises, as a step to be performed prior to the salt tolerance imparting step, an initial growth step of allowing a seed or a bulb of the tomato to bud and root under an environment with a sodium chloride concentration of less than 1 % by mass.

8. The tolerance imparting method according to claim 7, wherein the seed or the bulb is allowed to bud or root in the initial growth step under an environment with a sodium chloride concentration of 0.5 % by mass or less.

9. The tolerance imparting method according to any one of claims 6 to 8, wherein the salt tolerance imparting treatment is a treatment of putting at least a part of the root of the tomato into a treatment solution which contains the salt tolerance imparting agent, and has a sodium chloride concentration of 1 % by mass or more.

10. The tolerance imparting method according to claim 9, wherein at least a part of the root of the tomato is held in the treatment solution for 1 hour or more.

11. The tolerance imparting method according to claim 9 or 10, wherein the salt tolerance imparting agent is a microorganism that imparts the salt tolerance to the tomato by adhering to the root, and

the concentration of the microorganism in the treatment solution is 10^3 CFU/mL or more.

12. The tolerance imparting method according to any one of claims 6 to 11, wherein the nutrient solution further contains a magnesium chloride in an amount of 0.5 % by mass or less.

13. The tolerance imparting method according to any one of claims 6 to 12, wherein the salt tolerance imparting agent comprises at least one species of the microorganism.

14. The tolerance imparting method according to any one of claims 6 to 13, wherein the tolerance is viral disease tolerance.

15. The tolerance imparting method according to any one of claims 6 to 13, wherein the tolerance is fungal disease tolerance.

16. A tomato satisfying at least one of the following (1) to (6), which respectively represent amounts of free amino acids contained per 100 g of edible portion of a fruit of the tomato:

(1) free glutamic acid : 500 mg or more,
(2) free aspartic acid : 100 mg or more,
(3) free arginine : 10 mg or more,
(4) free isoleucine : 10 mg or more,
(5) free alanine : 10 mg or more, and
(6) free serine : 70 mg or more.

17. The tomato according to claim 16, which has a sodium content of 0.15 % by mass or more as measured with respect to edible portion of a fruit of the tomato.

18. The tomato according to claim 16 or 17, which has a water content of 90 % by mass or less as measured with respect to edible portion of a fruit of the tomato.

19. The tomato according to any one of claims 16 to 18, which has a sugar content (Brix) of 8 or more as measured with respect to edible portion of a fruit of the tomato.

20. A method for producing the tomato of any one of claims 16 to 19, comprising:

a salt tolerance imparting step of performing a salt resistance imparting treatment by bringing a salt tolerance imparting agent into contact with at least a part of a root of a tomato, thereby obtaining a salt tolerance imparted tomato; and

a cultivation step of hydroponically cultivating the salt tolerance imparted tomato obtained in the salt tolerance imparting step with a nutrient solution having a sodium chloride concentration of 1 % by mass or more for a period ranging from a period of 1/2 of an entire cultivation period from immediately after the salt tolerance imparting treatment to the entire cultivation period.