

CLAIMS

1. A mutant tobacco plant cell comprising:

(i) a polynucleotide comprising, consisting or consisting essentially of a sequence encoding a member of the CLC family of chloride channels and having at least 85% sequence identity to SEQ ID NO:4;

(ii) a polypeptide encoded by the polynucleotide set forth in (i); or

(iii) a polypeptide comprising, consisting or consisting essentially of a sequence encoding a member of the CLC family of chloride channels and having at least 85% sequence identity to SEQ ID NO:13;

and wherein the expression or activity of the polynucleotide or the polypeptide is increased or reduced as compared to a control tobacco plant containing a control tobacco plant cell and wherein said mutant tobacco plant cell comprises one or more mutations that increase the level of biomass in a mutant tobacco plant containing the mutant tobacco plant cell as compared to the control plant containing the control plant cell, and wherein the one or more mutations comprise a substitution mutation at position P86 of SEQ ID NO:13.

2. The mutant tobacco plant cell according to claim 1, wherein the substitution mutation is P86S.

3. The mutant tobacco plant cell according to any of claims 1 to 2, wherein the mutation is heterozygous.

4. The mutant tobacco plant cell according to any of claims 1 to 2, wherein the mutation is homozygous.

5. A mutant tobacco plant or component thereof comprising the mutant tobacco plant cell according to any of claims 1 to 4.

6. The mutant tobacco plant, tobacco plant component or tobacco plant cell according to any of claims 1 to 5, wherein additionally the nitrate content is increased or reduced.

7. The mutant tobacco plant, tobacco plant component, or tobacco plant cell according to any of claims 1 to 6, wherein additionally, the 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanone (NNK) content is increased or reduced.

8. The mutant tobacco plant, tobacco plant component, or tobacco plant cell according to claim 6 or 7, wherein the mutation(s) further comprise a substitution mutation at position P143 of SEQ ID NO:13.

9. The mutant tobacco plant, tobacco plant component, or tobacco plant cell according to claim 8, wherein the mutation at position P143 of SEQ ID NO:13 is substitution mutation P143L.

10. A method for increasing at least the biomass content of a tobacco plant or a component thereof, comprising the steps of:

(a) introducing into the genome of the tobacco plant one or more mutations within at least one allele of a member of the CLC family of chloride channels comprising:

(i) a polynucleotide comprising, consisting or consisting essentially of a sequence having at least 85% sequence identity SEQ ID NO:4;

(ii) a polypeptide encoded by the polynucleotide set forth in (i); or

(iii) a polypeptide comprising, consisting or consisting essentially of a sequence having at least 85% sequence identity to SEQ ID NO:13;

and wherein the one or more mutations in items (i) to (iii) comprise a substitution mutation at position P86 of SEQ ID NO: 13;

(b) measuring the biomass yield of the mutant tobacco plant obtained in step (a);

(c) optionally measuring at least the nitrate content in at least a part of the mutant tobacco plant obtained in step (a); and

(d) identifying a mutant tobacco plant in which at least the biomass has changed in comparison to a control tobacco plant in which the expression or activity of the polynucleotide or the polypeptide set forth in (a) has not been increased or reduced.

11. The method according to claim 10, wherein additionally the nitrate content in the mutant tobacco plant is increased or reduced.
12. The method according to claim 10 or claim 11, wherein additionally the 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanone (NNK) content is increased or reduced in the mutant tobacco plant.
13. The method according to any of claims 10 to 12, wherein additionally the nicotine content in the mutant tobacco plant is increased or reduced or the same as the control tobacco plant.
14. The method according to any of claims 10 to 13, wherein at least the N-nitrosonicotine (NNN) content is the same as the tobacco control plant.
15. The method according to any of claims 10 to 14, wherein the component of the plant is a leaf, suitably, a cured leaf.
16. Plant material including biomass, seed, stem or leaves from the mutant tobacco plant of claim 5.
17. A tobacco product comprising the mutant tobacco plant cell of claim 1, at least a part of the mutant tobacco plant of claim 5, plant material according to claim 16, or suitably processed plant material according to claim 16.
18. An isolated polynucleotide comprising, consisting, or consisting essentially of a sequence encoding a member of the CLC family of chloride channels and having at least 85% sequence identity to SEQ ID NO:4 comprising a substitution mutation at position P86 of SEQ ID NO:13.
19. A polynucleotide construct, vector, or expression vector comprising a polynucleotide according to claim 18.
20. An isolated polypeptide encoded by a polynucleotide according to claim 18.
21. An isolated polypeptide comprising, consisting or consisting essentially of a sequence having at least 85% sequence identity to SEQ ID NO:13 comprising a substitution mutation at position P86.