

We Claim:

1. A codon optimized synthetic nucleotide sequence encoding protein having amino acid sequence as set forth in SEQ ID NO: 1, wherein said nucleotide sequence is selected from a group consisting of: (a) the nucleotide sequence as set forth in SEQ ID NO: 2 ; (b) a nucleotide sequence which specifically hybridizes to at least 10 nucleotides of the nucleotide sequence as set forth in SEQ ID NO: 2 from nucleotide position 262 to 402 and/or 1471 to 1631; and (c) a nucleotide sequence complementary to the nucleotide sequence of (a) and (b).
2. A nucleic acid molecule comprising a codon optimized sequence for expression in a plant selected from the group consisting of: (a) the nucleotide sequence as set forth in SEQ ID NO: 2; (b) a nucleotide sequence which specifically hybridizes to at least 10 nucleotides of the nucleotide sequence as set forth in SEQ ID NO: 2 from nucleotide position 262 to 402 and/or 1471 to 1631; and (c) a nucleotide sequence complementary to the nucleotide sequence of (a) and b).
3. The codon optimized synthetic nucleotide sequence as claimed in claim 1 or 2, wherein the nucleotide sequence which specifically hybridizes to the nucleotide sequence as set forth in SEQ ID NO: 2 is selected from the group consisting of SEQ ID NO: 3, SEQ ID NO: 4, SEQ ID NO: 5 and SEQ ID NO: 6.
4. A recombinant DNA comprising the codon optimized synthetic nucleotide sequence as claimed in claim 1, wherein the nucleotide sequence is operably linked to a heterologous regulatory element.
5. The recombinant DNA as claimed in claim 4, wherein said codon optimized synthetic nucleotide sequence optionally comprises a selectable marker gene, a reporter gene or a combination thereof.
6. The recombinant DNA as claimed in claim 4, wherein said codon optimized synthetic nucleotide sequence optionally comprises a DNA sequence encoding a targeting or transit peptide for targeting to the vacuole, mitochondrion, chloroplast, plastid, or for secretion.
7. A DNA construct for expression of an insecticidal protein in plant comprising a 5' non-translated sequence, a coding sequence encoding an insecticidal Cry2Ai protein comprising the amino acid sequence of SEQ ID NO: 1 or an insecticidal portion thereof, and a 3' non-translated region, wherein said 5' non-translated sequence comprises a promoter functional in a plant cell, said coding sequence is a codon optimized synthetic nucleotide sequence as claimed in claim 1, and wherein said 3' non-translated sequence comprises a transcription termination sequence and a polyadenylation signal.
8. A plasmid vector comprising the codon optimized synthetic nucleotide sequence as claimed in claim 1.
9. A host cell comprising the codon optimized synthetic nucleotide sequence as claimed in claim 1.
10. The host cell as claimed in claim 9, wherein said host cell is a plant, bacterial, virus , fungi or a yeast cell.

11. The host cell as claimed in claim 10, wherein said bacterial cell is *Agrobacterium* or *E. coli*.
12. A method for conferring an insect resistance in a plant comprising
- 5 (a) inserting into a plant cell a codon optimized synthetic nucleotide sequence as claimed in claim 1, wherein the nucleotide sequence is operably linked to a (i) promoter functional in a plant cell and (ii) a terminator;
- (b) obtaining a transformed plant cell from the plant cell of step (a), wherein said transformed plant cell comprises the said codon optimized synthetic nucleotide sequence of claim 1; and
- 10 (c) generating a transgenic plant from said transformed plant cell of step (b), wherein said transgenic plant comprises the said codon optimized synthetic nucleotide sequence of claim 1.
13. A transgenic plant obtained by the method as claimed in claim 12.
14. A transgenic plant comprising the codon optimized synthetic nucleotide sequence as
15 claimed in claim 1.
15. The transgenic plant as claimed in claim 13 or 14, wherein said plant is selected from a group consisting of rice, wheat, corn, sorghum, oat, millet, legume, cotton, tomato, eggplant, cabbage, cauliflower, broccoli, Brassica sp., beans, pea, pigeonpea, potato, pepper, cucurbit, lettuce, sweet potato canola, soybean, alfalfa, peanuts, sunflower,
20 safflower, tobacco, sugarcane, cassava, coffee, pineapple, citrus, cocoa, tea, banana and melon.
16. A tissue, seed or a progeny obtained from the transgenic plant as claimed in claim 13 or 14, wherein said seed or progeny comprises the codon optimized synthetic nucleotide sequence as claimed in claim 1.
- 25 17. A biological sample derived from the tissues or seed or progeny as claimed in claim 16, wherein said sample comprising a detectable amount of said codon optimized synthetic nucleotide sequence as claimed in claim 1.
18. A commodity product derived from the transgenic plant as claimed in claim 13 or 14, wherein said product comprises a detectable amount of said codon optimized synthetic
30 nucleotide sequence as claimed in claim 1.
19. A composition comprising *Bacillus thuringiensis* comprising the codon optimized synthetic nucleotide sequence as claimed in claim 1 encoding Cry2Ai protein having amino acid sequence as set forth in SEQ ID NO: 1.
20. The composition as claimed in claim 19, wherein said composition optionally comprises
35 an additional insecticidal agent toxic to same insect pest but exhibiting a different mode of its insecticidal activity from said insecticidal protein.
21. The composition as claimed in claim 20, wherein said insecticidal agent is selected from the group consisting of a *Bacillus* toxin, a *Xenorhabdus* toxin, a *Photorhabdus* toxin, and a dsRNA specific for suppression of one or more essential genes in said insect pest.

22. A method of controlling insect infestation in a crop plant and providing insect resistance management, wherein said method comprising contacting said crop plant with a insecticidally effective amount of the composition as claimed in claim 19.
- 5 23. Use of the codon optimized synthetic nucleotide sequence as claimed in claim 1 for production of insect resistant transgenic plants.
24. Use of the codon optimized synthetic nucleotide sequence as claimed in claim 1 for production of insecticidal composition, wherein the composition comprises *Bacillus thuringiensis* cells comprising the said nucleotide sequences.

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