CLAIMS

1. A brazzein variant comprising a circular permutation brazzein.

2. The brazzein variant of claim 1, wherein the circular permutation comprises a coupling of the N-terminus and the C-terminus of a wild type brazzein sequence.

3. The brazzein variant of claim 2, wherein the coupling covalently linked the N-terminus and the C-terminus of a brazzein sequence with a linker.

4. The brazzein variant of any one of the preceding claims, wherein the variant comprises N-terminus and C-terminus positions that differ from the wild type brazzein.

5. The brazzein variant of any one of the preceding claims, wherein the variant has substantially similar tertiary structure to wild type brazzein.

6. The brazzein variant of any one of the preceding claims, wherein the variant comprises different intramolecular forces as compared to wild type brazzein.

7. The brazzein variant of claim 3, wherein the linker is 2 to 500 amino acid residues in length, optionally the linker comprises small non-polar and/or polar amino acids, optionally the linker is a globular protein.

8. The brazzein variant of any one of the preceding claims, wherein the circular permutation brazzein comprises a GGGS linker to bridge the N- and C-termini of the brazzein variant.

9. The brazzein variant of any one of the preceding claims, comprising a circular permutation at the amino acid position 7 to 55, or 7 to 30, or 53 to 55.

10. The brazzein variant of any one of the preceding claims, comprising one or more circular permutation at any one of the amino acid positions 2, 3, 5, 7, 8, 9, 23, 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 49, 50, 53, 54, and 55, optionally comprising one or more circular permutation at any one of the amino acid positions 30, 31, 32, 33, 34, 35, 36, 53, 54, and 55.

11. The brazzein variant of any one of the preceding claims, comprising a circular permutation at any one of the amino acid positions selected from the group consisting of K30, H31, A32, R33, S34, G35, E36, E53, and Y54.

12. The brazzein variant of any one of the preceding claims, wherein the brazzein variant comprises any one of the following sequences:

ID	Description	**Sequence for Patent**
CP	**S14CP**	SKCQLANQCNYDCKLDKHARSGECFYDEKRNLQCICDYCEYPQDKCKKVYENYPV (SEQ ID NO: 13)
CPGS	**S14CP/GS linker**	SKCQLANQCNYDCKLDKHARSGECFYDEKRNLQCICDYCEYPGSQDKCKKVYENYPV (SEQ ID NO: 14)
CPGGGS	**S14CP/GGGS linker**	SKCQLANQCNYDCKLDKHARSGECFYDEKRNLQCICDYCEYPGGGSQDKCKKVYENYPV (SEQ ID NO: 15)
K3CP		KCKKVYENYPVSKCQLANQCNYDCKLDKHARSGECFYDEKRNLQCICDYCEYPGGGSQ(SEQ ID NO: 2)
V7CP		VYENYPVSKCQLANQCNYDCKLDKHARSGECFYDEKRNLQCICDYCEYPGGGSQDKCKK (SEQ ID NO: 3)
K30CP		KHARSGECFYDEKRNLQCICDYCEYPGGGSQDKCKKVYENYPVSKCQLANQCNYDCKLD (SEQ ID NO: 4)
H31CP		HARSGECFYDEKRNLQCICDYCEYPGGGSQDKCKKVYENYPVSKCQLANQCNYDCKLDK (SEQ ID NO: 16)

A32 CP		ARSGECFYDEKRNLQCICDYCEYPGGGSQDKCKKVYENYPVSKCQLANQCNYDCKLDK(SEQ ID NO: 5)
R33 CP		RSGECFYDEKRNLQCICDYCEYPGGGSQDKCKKVYENYPVSKCQLANQCNYDCKLDKHA (SEQ ID NO: 6)
S34 CP		SGECFYDEKRNLQCICDYCEYPGGGSQDKCKKVYENYPVSKCQLANQCNYDCKLDKHAR (SEQ ID NO: 7)
G35 CP		GECFYDEKRNLQCICDYCEYPGGGSQDKCKKVYENYPVSKCQLANQCNYDCKLDKHARS(SEQ ID NO: 17)
E36 CP		ECFYDEKRNLQCICDYCEYPGGGSQDKCKKVYENYPVSKCQLANQCNYDCKLDKHARSG (SEQ ID NO: 8)
E53 CP		EYPGGGSQDKCKKVYENYPVSKCQLANQCNYDCKLDKHARSGECFYDEKRNLQCICDYC(SEQ ID NO: 9)
Y54 CP		YPGGGSQDKCKKVYENYPVSKCQLANQCNYDCKLDKHARSGECFYDEKRNLQCICDYCE (SEQ ID NO: 10)
P55 CP		PGGGSQDKCKKVYENYPVSKCQLANQCNYDCKLDKHARSGECFYDEKRNLQCICDYCEY (SEQ ID NO: 11)

13. The brazzein variant of any one of the preceding claims, further comprising one or more modifications that improve protein stability and/or ability to confer sweeter taste,
further comprising one or more mutation/substitution selected from the group consisting of H31R, E36D, E41A, H31R/E36D, H31R/E41A, E36D/E41A, H31R/E36D/E41A, D29A, D29K, D29N, E41K, D2A, D2I, D2N, Q17A, Y54, and replacement of tyrosine residue at C-terminus, insertion of residues before the N-terminus.

14. A polynucleotide encoding the brazzein variant of any one of the preceding claims.

15. A vector comprising the polynucleotide of claim 14.

16. A host cell comprising the vector of claim 15, optionally the host cell is capable of facilitating (or facilitates) the formation of S-S bonds.

17. A method of producing a brazzein variant, comprising
performing concatemerization of a brazzein, and/or
providing overlapping-fragments of a brazzein polynucleotide, and/or
providing the polynucleotide of claim 14.

18. The method of claim 17, wherein the method comprises modifying the expressed brazzein to incorporate 4 S-S bonds.

19. A method of increasing the sweetness of a food product, comprising
providing the brazzein variant of any one of claims 1 to 13,
wherein the food product that undergoes harsh bioprocessing and production conditions, and wherein the brazzein variant comprises circular permutation at amino acid positions K3, V7, Y8, E9, N23, Y24, K30, H31, A32, R33, S34, G35, E36, C37, C49, D50, E53, Y54 and P55.

20. A method of producing a food product,
providing the brazzein variant of any one of claims 1 to 13, optionally bioprocessing the food product.