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[54] **ISOLATION OF SU1, A STARCH DEBRANCHING ENZYME, THE PRODUCT OF THE MAIZE GENE SUGARY1**

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[52] **U.S. Cl.** **800/205**; 435/69.1; 435/172.3; 435/320.1; 435/419; 536/236; 536/24.1

[58] **Field of Search** 800/205; 435/69.1, 435/172.3, 320.1, 419; 536/23.6, 24.1

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[57] **ABSTRACT**

SU1, a starch debranching enzyme active in maize endosperm (*Zea mays*), and the cDNA and gene sequences encoding SU1 are disclosed. The amino acid sequence is significantly similar to that of bacterial isoamylases, enzymes that hydrolyze α -(1 \rightarrow 6) glycosidic bonds. Amino acid sequence similarity establishes SU1 as a member of the α -amylase superfamily of starch hydrolytic enzymes. Also disclosed are antibodies reactive with the SU1 protein, methods of producing antibodies to the SU1 protein, methods of producing fusion proteins including SU1 and methods of producing transgenic plants with a modified su1 gene. The expressed SU1 protein can serve as a replacement for the bacterial and fungal enzymes currently used in the starch processing industry.

27 Claims, 17 Drawing Sheets