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(54) Title: PLANTS WITH ALTERED GLUCURONOXYLAN METHYL TRANSFERASE ACTIVITY AND METHODS OF USE

(57) Abstract: Provided herein are plants having altered glucuronoxylan methyl transferase (GXMT) activity, including reduced GXMT activity. In one embodiment the plant is a transgenic plant. Also provided herein are methods for using such plants, including methods for processing a part of a plant to result in a pulp, methods for hydrolyzing a pulp, and methods for producing a metabolic product. Further provided herein is plant material from a plant having altered GXMT activity, and pulp from a plant having altered GXMT activity.



A. CLASSIFICATION OF SUBJECT MATTER

AOIH 5/00(2006.01)i, C12N 15/82(2006.01)I, C12N 15/29(2006.01)I, C07K 14/415(2006.01)I, D21H 11/00(2006.01)I, C12S 3/08(2006.01)n

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

AOIH 5/00; C12N 15/82; C12N 9/14

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean utility models and applications for utility models
Japanese utility models and applications for utility models

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKOMPASS(KIPO internal) & Keywords: transgenic plant, pulp, decreased GXMT, recalcitrance, hydrolysis, saccharification, fermentation, metabolic product, microbe

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
PA	WO 2011-130666 A2 (UNIVERSITY OF GEORGIA RESEARCH FOUNDATION, INC. et al.) 20 October 2011 See claims 1-46.	1--120
A	FU, C. et al. "Genetic manipulation of lignin reduces recalcitrance and improves ethanol production from switchgrass", PNAS, 1 March 2011, Vol. 108, No. 9, pp. 3803-3808. See the whole document.	1--120
A	BROWN, D. et al. "Arabidopsis genes IRREGULAR XYLEM(IRX15) and IRX15L encode DUF579-containing proteins that are essential for normal xylan deposition in the secondary cell wall", The Plant Journal, 24 February 2011, Vol. 66, pp. 401-413. See the whole document.	1--120
A	PENA, M. J. et al. "Arabidopsis irregular xylem8 and irregular xylem9: Implications for the Complexity of Glucuronoxylan Biosynthesis", The Plant Cell, 23 February 2007, Vol. 19, pp. 549-563. See the whole document.	1--120

Further documents are listed in the continuation of Box C.

See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2012/050166

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2010-0017916 A1 (PAPPAN, K. et al.) 21 January 2010 See paragraphs [0187]-[0189] , [0203]-[0206] , [0209]-[0210] , [0213H0216] .	1-120

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2012/050166

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2011130666 A2	20. 10.2011	None	
US 20100017916 A 1	21.01.2010	CN 102046283 A	04.05.2011
		US 2009-0293720 A 1	03. 12.2009
		US 7875106 B2	25.01.2011
		WO 2009-146464 A2	03. 12.2009
		WO 2009-146464 A3	18. 11.2010
		WO 2009-146464 A9	01.04.2010
		WO 2009-148872 A2	10. 12.2009