



INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶ : A01H 4/00, C12N 15/82	A3	(11) International Publication Number: WO 98/36636 (43) International Publication Date: 27 August 1998 (27.08.98)
(21) International Application Number: PCT/EP98/01125 (22) International Filing Date: 23 February 1998 (23.02.98) (30) Priority Data: 97200514.4 21 February 1997 (21.02.97) EP (34) <i>Countries for which the regional or international application was filed:</i> NL et al. (71) Applicant (for all designated States except US): K.U. LEUVEN RESEARCH & DEVELOPMENT [BE/BE]; Groot Begijnhof, Benedenstraat 59, B-3000 Leuven (BE). (72) Inventors; and (75) Inventors/Applicants (for US only): SCHOOFS, Hilde, Maria, Emmy [BE/BE]; Mechelsesteenweg 301, B-3020 Herent (BE). SAGI, Laszlo [HU/BE]; Waversebaan 27/12, B-3001 Heverlee (BE). PANIS, Bartholomeus, Jozefus [BE/BE]; Franz Schollaertstraat 18, B-3010 Kessel-Lo (BE). REMY, Serge [BE/BE]; Stationstraat 4, B-3910 Neerpelt (BE). SWENNEN, Rony, Leon [BE/BE]; Banhagestraat 73, B-3052 Blanden (BE). (74) Agent: VAN SOMEREN, Petronella, Francisca, Hendrika, Maria; Arnold & Siedsma, Sweelinckplein 1, NL-2517 GK The Hague (NL).		(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, GW, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG). Published <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i> (88) Date of publication of the international search report: 3 December 1998 (03.12.98)
(54) Title: METHOD FOR GENERATING EMBRYOGENIC CELL CULTURES FOR THE PRODUCTION OF BANANAS (MUSA SPP.) (57) Abstract The present invention relates to a plant regeneration method, comprising the provision of a starting material for regeneration and the regeneration of plants from the starting material, wherein the provision of a starting material preferably comprises the combination of rigorous selection for highly meristematic tissue with proliferating <i>in vitro</i> meristems in the presence of cytokinins in a concentration of at least 50 μ M, preferably at least 100 μ M to obtain cells in suspension. The step of the regeneration of plants in this method is preferably initiated by induction of somatic embryogenesis of cells in suspension on semi-solid medium. The induction step can also be used with other cell suspension preparation methods.		

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INTERNATIONAL SEARCH REPORT

International Application No
PCT/EP 98/01125

A. CLASSIFICATION OF SUBJECT MATTER

IPC 6 A01H4/00 C12N15/82

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)

IPC 6 A01H C12N

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

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DHED'A, D.: "Culture de suspensions cellulaires embryogéniques et régénération en plantules par embryogénèse somatique chez le bananier" TROPICULTURA, vol. 10, no. 4, 1992, pages 152-154, XP002041686 cited in the application	1-5, 9-15, 17
Y	see page 152, right-hand column, paragraph 3	7, 8, 16, 18
A	see page 153, last line, paragraph 1; figure 1; table 1	19-22
Y	KRIKORIAN: "Section VI: Tropical and Subtropical Fruits - Chapter 12: Banana" HANDBOOK OF PLANT CELL CULTURE, 1984, pages 327-348, XP000618226 see page 342, paragraph 1-2; table 1	7, 8, 16, 18
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☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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Date of the actual completion of the international search

28 September 1998

Date of mailing of the international search report

12/10/1998

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International Application No
PCT/EP 98/01125

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	TEISSON: "In vitro culture of tropical crops in CIRAD" AGRITROP, vol. 13, no. 2, 1989, pages 1-4, XP002041687 see page 1, left-hand column, last paragraph - right-hand column, paragraph 1 ---	6
A	SAGI, L. ET AL: "Transient gene expression in electroporated banana" PLANT CELL REPORTS, no. 13, 1994, pages 262-266, XP000617868 cited in the application see page 263, left-hand column, paragraph 1 ---	5,6
A	DATABASE CABA - AN 97:78278 Fruits 1996 Vol 51 No 4 "Mitotic instability in banana varieties BAP concentrations and effects of number of subcultures" Shepherd, K et al. XP002078780 see abstract ---	1-5
A	DATABASE CABA - AN 89:99212 Tropical Agriculture 1988 Vol. 65 No. 4 "Micropropagation of Musa" Mateille, T. XP002078781 see abstract ---	1-5
A	EP 0 400 553 A (SCHWEIZERISCHE EIGENOSSENSCHAFT EIDGENÖSSISCHE TECHNISCHE HOCHSCHULE) 5 December 1990 see page 9, line 26 ---	1-5
A	EP 0 424 047 A (PIONEER HI-BRED INTERNATIONAL) 24 April 1991 see page 2, line 48 - line 49; claim 7 -----	1-5

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/EP 98/01125

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 400553 A	05-12-1990	AU 5602190 A	29-11-1990
		CA 2017544 A	29-11-1990
		JP 3039091 A	20-02-1991
		PT 94177 A	08-01-1991
EP 424047 A	24-04-1991	US 5322783 A	21-06-1994
		AT 124995 T	15-07-1995
		DE 69020850 D	17-08-1995
		DE 69020850 T	07-12-1995
		DK 424047 T	20-11-1995
		ES 2077034 T	16-11-1995
		GR 3017310 T	31-12-1995