



(43) International Publication Date  
4 July 2013 (04.07.2013)

(10) International Publication Number  
**WO 2013/100756 A3**

(51) International Patent Classification:

C12M 1/06 (2006.01) C12P 1/00 (2006.01)  
C12N 1/12 (2006.01) C12Q 3/00 (2006.01)

(21) International Application Number:

PCT/MY2012/000290

(22) International Filing Date:

29 November 2012 (29.11.2012)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

PI 2011700209 29 December 2011 (29.12.2011) MY

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(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY,

BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report (Art. 21(3))

(88) Date of publication of the international search report:

16 October 2014

(54) Title: A METHOD AND A SYSTEM FOR MASS-CULTIVATING MICROALGAE WITH ENHANCED PHOTOSYNTHETIC EFFICIENCY

(57) Abstract: A method for cultivating photosynthetic microorganisms with optimal photosynthetic efficiency, comprising the steps of exposing the microorganisms grown in a culture tank of culture broth to light and carbon source; circulating the culture broth vertically from the bottom of the tank up to the surface of the tank to allow momentary exposure of the microorganisms to the light and carbon source, using one or more circulating means located within the culture tank which are regulated according to a selected cultivation mode; and maintaining the cultured microorganisms at a substantially constant areal density range of 300 to 12,000 g/m<sup>2</sup> to attain the optimal photosynthetic efficiency of the cultivation.



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