

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
27 September 2007 (27.09.2007)

PCT

(10) International Publication Number
WO 2007/109802 A3

(51) International Patent Classification:

A61K 36/82 (2006.01)

(21) International Application Number:

PCT/US2007/064830

(22) International Filing Date: 23 March 2007 (23.03.2007)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

60/785,178

23 March 2006 (23.03.2006)

US

(71) Applicant (for all designated States except US):

HERBALSCIENCE SINGAPORE PTE. LTD.

[US/US]; 1004 Collier Center Way, Suite 200, Naples, FL 34110 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **GOW, Robert, T.**

[US/US]; 13631 Pondview Circle, Naples, FL 34119 (US).

SYPERT, George, W. [US/US]; 6th Street South, Naples,

FL 34102 (US). **LI, Dan** [CN/CN]; No. 1 Science Park

Road, #01-07/08 The Capricorn, Singapore 117528 (CN).

ALBERTE, Randall, S. [US/US]; 20221 Estero Gardens

Circle, #203, Estero, FL 33928 (US).

(74) Agents: **DIVERDI, Michael, J.** et al.; Foley Hoag LLP,

Patent Group, 155 Seaport Boulevard, Boston, MA 02210-

2600 (US).

(81) Designated States (unless otherwise indicated, for every

kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, 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, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, 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, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report

— before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

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

22 November 2007

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: EXTRACTS AND METHODS COMPRISING GREEN TEA SPECIES

(57) Abstract: The present invention relates to extracts of green tea species plant material prepared by supercritical CO₂ extractions methods.



WO 2007/109802 A3

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 07/64830

A. CLASSIFICATION OF SUBJECT MATTER IPC(8) - A61K 36/00; G01N 24/00 (2007.01) USPC - 424/725; 436/173 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) USPC - 424/725; 436/173 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 practicable, search terms used) PubWEST(USPT, PGPB, EPAB, JPAB), Google Scholar: polysaccharide, green tea, water, alcohol, precipitate, affinity, adsorbent, phenolic, purify, l-tyrosine, theanine, carnosic acid, myricetin, myricitin, theanine, treatment, cinnamic, cinnamide, shikimic, coumaric, gallic acid, catechin quinone, pyrogallol														
C. DOCUMENTS CONSIDERED TO BE RELEVANT														
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.												
Y	CHANG et al. Separation of Catechins from Green Tea Using Carbon Dioxide Extraction. Food Chemistry. 2000. Vol. 68. pg. 109-113, pg. 109, para 1-3, pg. 112, para 2, and Table 2	1-55												
Y	CODY et al. Versatile New Ion Source for the Analysis of Materials in Open Air Under Ambient Conditions. Anal. Chem. 2005. Vol. 77. pg 2297-2302, pg. 2297, para 2	1-22												
Y	SUGIYAMA et al. Teas and Other Beverages Suppress D-Galactosamine-Induced Liver Injury in Rats J. Nutrition. 1999. Vol. 129. pg. 1361-1367, pg. 1362, para 3, pg. 1363, para 2, pg. 1365, para 1	2-47												
Y	US 2002/0034568 A1 (BLYTH et al.) 21 March 2002 (21.03.2002), claim 4	3												
Y	US 6,036,991 A (HUMPHREY et al.) 14 March 2000 (14.03.2000), col 1, ln 48-54	6-7 and 51-55												
Y	US 2005/0287278 A1 (QUAN et al.) 29 December 2005 (29.12.2005), para [0004], [0010]	21 and 49-55												
Y	STAHL et al. Extraction of Seed Oils with Liquid and Super Critical Carbon Dioxide. J. Agric. Food Chem. 1980. Vol. 28. pg. 1153-1157, pg. 1153, para 5	23-47												
Y	US 2002/0055471 A1 (BAILEY et al.) 09 May 2002 (09.05.2002), para [0056]-[0058]	25 and 32-39												
Y	US 2003/0185918 A1 (ROSENBLOOM et al.) 02 October 2003 (02.10.2003), para [0087]	48-51 and 53												
Y	SANDERSON et al. 5-Dehydroshikimate Reductase in the Tea Plant (Camellia sinensis L.) Biochem. J. 1966. Vol. 98. pg248-252, pg. 248, para 1	48												
☒ Further documents are listed in the continuation of Box C. ☐														
<table border="0"> <tr> <td>* Special categories of cited documents:</td> <td>"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</td> </tr> <tr> <td>"A" document defining the general state of the art which is not considered to be of particular relevance</td> <td>"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</td> </tr> <tr> <td>"E" earlier application or patent but published on or after the international filing date</td> <td>"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</td> </tr> <tr> <td>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</td> <td>"&" document member of the same patent family</td> </tr> <tr> <td>"O" document referring to an oral disclosure, use, exhibition or other means</td> <td></td> </tr> <tr> <td>"P" document published prior to the international filing date but later than the priority date claimed</td> <td></td> </tr> </table>			* Special categories of cited documents:	"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	"A" document defining the general state of the art which is not considered to be of particular relevance	"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	"E" earlier application or patent but published on or after the international filing date	"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	"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&" document member of the same patent family	"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	
* Special categories of cited documents:	"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													
"A" document defining the general state of the art which is not considered to be of particular relevance	"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													
"E" earlier application or patent but published on or after the international filing date	"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													
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&" document member of the same patent family													
"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														
Date of the actual completion of the international search 08 August 2007 (08.08.2007)		Date of mailing of the international search report 25 SEP 2007												
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201		Authorized officer: Lee W. Young PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774												

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 07/64830

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	HARBORNE et al. Plant Polyphenols. Biochem. J. 1961. Vol. 81. pg. 242-250, pg. 242, para 1, pg. 244, para 3.	48-50 and 52-55
Y	GORDON et al. Circadian Rhythmicity in the Activities of Phenylalanine Ammonia-Lyase from Lemna perpusilla and Spirodela polyrhiza. Plant Physiol. 1978. Vol. 62 pg. 612-615, pg 612, para 3.	48-55
Y	MARTIN et al. Regulation of Heme Oxygenase-1 Expression Through the Phosphatidylinositol 3-Kinase/Akt Pathway and the Nrf2 Transcription Factor in Response to the Antioxidant Phytochemical Carnosol. J. Biol. Chem. March 2004. pg. 8919-8929, pg. 8919, para 1.	50
Y	PIETTA et al. Catechin Metabolites After Intake of Green Tea Infusions. BioFactors 1998. Vol. 8. pg. 111-118, abstract.	51-55