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Declarations under Rule 4.17:

— of inventorship (Rule 4.17(iv))

Published:

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

— before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))

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

14 March 2013

(54) Title: EXTRACTION OF VITAMIN E FROM PLANT MATTER

(57) Abstract: A process for the extraction of Vitamin E from annatto plant matter is disclosed wherein annatto seed matter is subjected, before extraction, to acidification using amla fruit matter. After the acidification, the mixture of the two plant matters is extracted by water. The acidification converts the vitamin E compounds in the plant matter into more water-soluble forms thus enhancing the vitamin yield: More of the vitamin is obtained in the ester form than in the form of vitamin alcohols. Processing time is reduced.



INTERNATIONAL SEARCH REPORT

International application No.

PCT/IN12/00529

A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - C07D 311/72; A61K 31/355, 36/185 (2013.01)

USPC - 549/412, 413; 424/776; 514/458

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(8): C07D 311/00, 311/72; A61K 31/22, 31/355, 36/185 (2013.01)

USPC: 549/412, 413, 408, 398, 396, 381, 356, 200; 585/833, 800; 424/776, 725; 514/458, 1; 203/34, 28, 29

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)

MicroPatent (US-G, US-A, EP-A, EP-B, WO, JP-bib, DE-C,B, DE-A, DE-T, DE-U, GB-A, FR-A), extract, vitamin E, tocopherol, tocotrienol, annatto, roucou, achiote, amla, aamla, indian gooseberry, phyllanthus emblica, emblica officinalis, esterification, acidification, ascorbic plant, seed, fruit; Google/Google Scholar; DialogPro; ACS

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2009/0041870 A1 (TAN, B et al.) February 12, 2009; abstract; figures 1, 2; paragraphs [0089]-[0093]	1-4
A	US 6124268 A (GHOSAL, S) September 26, 2000; abstract; column 4, lines 13-27	1-4
A	US 6350453 B1 (TAN, B et al.) February 26, 2002; abstract; column 3, lines 8-65	1-4
A	US 5157132 A (TAN, B et al.) October 20, 1992; abstract; figure 1; column 18, lines 59-67 to column 19, lines 1-13; column 19, lines 34-49	1-4
A	MEENA, AK et al. Evaluation Of Physicochemical And Preliminary Phytochemical Studies On The Fruit Of Emblica Officinalis Geartn. Asian Journal Of Pharmaceutical And Clinical Research. 2010, Vol. 3, No. 3, pp 242-243; ISSN - 0974-2441; abstract; page 242, column 2, paragraph 5 to page 243, column 1, paragraph 1; table 2.	1-4

☐ Further documents are listed in the continuation of Box C.

* 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 another 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

28 January 2013 (28.01.2013)

Date of mailing of the international search report

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Name and mailing address of the ISA/US

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/IN12/00529

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☒ Claims Nos.: 7
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

The scope of Claim 7 is unclear. Claim 7 is an 'omnibus-type claim' which recites, a process for extracting vitamin E from annato plant matters substantially as hereindescribed. The scope of 'substantially as hereindescribed' is unclear, as that no meaningful opinion could be formed.

3. ☒ Claims Nos.: 5, 6, 8
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of additional fees.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.