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(54) Title: ENZYMES

(57) Abstract: The present invention relates to enzymes and processes. In particular, there is described a host cell transformed or transfected with a nucleic acid encoding a bacterial phytase enzyme and variants thereof.



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INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER

INV. C12N9/16 C12N15/55 C12N15/11 C12P21/02 C12N1/20
A23K1/165

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)

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)

EPO-Internal, BIOSIS, FSTA, WPI Data, PAJ, Sequence Search, EMBASE

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DATABASE UniProt [Online] 5 July 2004 (2004-07-05), "Phytase" XP002391879 retrieved from EBI accession no. UNIPROT:Q6U677 Database accession no. Q6U677 the whole document	1-41
X	& ZININ NICKOLAY V ET AL: "Gene cloning, expression and characterization of novel phytase from Obesumbacterium proteus" FEMS MICROBIOLOGY LETTERS, vol. 236, no. 2, 15 July 2004 (2004-07-15), pages 283-290, XP002391867 ISSN: 0378-1097 cited in the application the whole document ----- -/--	1-41

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

☒ See patent family annex.

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

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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)

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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

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Date of the actual completion of the international search

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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2004/015084 A (GENENCOR INTERNATIONAL, INC; BLATTMANN, BEAT, O; DARZINS, ALDIS; DAVIS) 19 February 2004 (2004-02-19)	1-4, 6-22, 24-41
Y	the whole document	5,23
X	WO 2004/085638 A (REPUBLIC OF NATIONAL FISHERIES RESEARCH AND DEVELOPMENT INSTITUTE; KIM) 7 October 2004 (2004-10-07)	1-4, 6-22, 24-41
Y	the whole document	5,23
Y	DATABASE BIOSIS [Online] BIOSCIENCES INFORMATION SERVICE, PHILADELPHIA, PA, US; 2003, ZININ N V ET AL: "Phytase activity of several bacteria groups." XP002392194 Database accession no. PREV200300308051 abstract & ZININ N V ET AL: "PHYTASE ACTIVITY OF SEVERAL BACTERIA GROUPS" BIOTEHNOLOGIÂ, GLAVNOE UPRAVLENIE MIKROBIOLOGICESKOJ PROMY LENNOSTI PRI, SU, no. 2, 2003, pages 3-10, XP008045468 ISSN: 0234-2758	5,23
A	VATS PURVA ET AL: "Production studies and catalytic properties of phytases (myo-inositolhexakisphosphate phosphohydrolases): an overview" ENZYME AND MICROBIAL TECHNOLOGY, vol. 35, no. 1, 6 July 2004 (2004-07-06), pages 3-14, XP002391868 ISSN: 0141-0229	

INTERNATIONAL SEARCH REPORT

Information on patent family members

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2004015084 A	19-02-2004	AU 2003258157 A1	25-02-2004
		CA 2495660 A1	19-02-2004
		CN 1688690 A	26-10-2005
		EP 1546316 A2	29-06-2005
WO 2004085638 A	07-10-2004	NONE	