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Title of the Application	Anaerobic Germination-Tolerant Plants and Related Materials and Methods
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Application Number	PCT/IB2014/066818
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Publication Link in the WIPO Website

<https://patentscope.wipo.int/search/en/detail.jsf?docId=WO2015087282&recNum=2&office=&queryString=FP%3A%28Anaerobic+Germination%29+AND+PA%3A%28International+Rice+Research+Institute%29&prevFilter=&sortOption=Pub+Date+Desc&maxRec=2>

Status of the Application National Phase applications filed in Brazil and USA discontinued in 2017 and 2018, respectively

BRIEF BACKGROUND

Global socio-economic developments are creating strong incentives for rice farmers to shift from transplanting to direct-seeding as a means of sustainable intensification. Anaerobic germination (“AG”) tolerance, which enables uniform germination and seedling establishment under complete submergence, is an important trait for the development of direct-seeded rice varieties for tropical regions. Morphologically, AG tolerance is characterized by rapid and extensive coleoptile elongation under submergence, eventually enabling allocation of surface oxygen towards the developing embryo.

IRRI identified a key gene responsible for AG tolerance, AG1, coding for a trehalose-6-phosphate phosphatase, which regulates energy starvation responses under hypoxic stress and links sugar signaling to starch utilization during germination. Initial results provide valuable tools for the development of AG-tolerant elite lines, which could facilitate a progression from transplanting to direct seeding in tropical environments.

AG1 near isogenic lines (NILs) in popular *Indica* varieties and high quality AG1 diagnostic DNA markers are available to facilitate introgression of the AG tolerance trait. Allelic diversity of AG1 and corresponding haplotypes has been characterized allowing to genotypically assess new germplasm by haplotype profiling, and design optimal introgression strategies. There are no yield or grain quality penalties associated with AG1.

On the basis of those technical results, IRRI applied for patents on the AG1 trait, and developed proposals for partnership with 3rd parties which would help establish a proof of concept in various agro-climatic environments, and which would help in the development and dissemination of AG1 elite varieties. A regular milestone review of IRRI’s patent portfolio concluded that the proposals on AG1 did not yield the expected partnerships.

In this context, IRRI decided to discontinue the patent applications. IRRI actively continues research and breeding on the AG1 trait, autonomously and in the context of public-public partnerships. Furthermore, IRRI, as a non-profit international organization, promotes responsible technology transfer and intellectual property management. Management of future research projects shall be in accordance with its Intellectual Property and Commercialization Policy (IP&C Policy)¹ and with the CGIAR Principles on the Management of Intellectual Assets (“IA Principles”)².

CURRENT STATUS

In 2014, a PCT application was filed relating to this invention. From there, two (2) National Phase patents were derived and filed in USA and Brazil.

Filing Date	Filing Place	Application Number	Publication Date	Publication Number	Link in the WIPO website	Status
07/06/ 2016	USA	15102311	08/12/2016	US 2016/0355838 A1	https://patentscope.wipo.int/search/en/detail.jsf?docId=US185208326&recNum=1&office=&queryString=FP%3A%28Anaerobic+Germination%29+AND+PA%3A%28International+Rice+Research+Institute%29&prevFilter=&sortOption=Pub+Date+Desc&maxRec=2	Discontinued on 11 June 2018
10/06/2016	Brazil	BR 11 2016 013491 5	N/A	N/A	N/A	Discontinued on 08 November 2017

¹Available at <http://books.irri.org/Approved-IPC-Policy-291017.pdf>

²Available at <https://cgspace.cgiar.org/bitstream/handle/10947/4486/CGIAR%20IA%20Principles.pdf?sequence=5>