Journal of Bioremediation & Biodegradation

Commentary Open Access

Mass Production of Arbuscular Mycorrhizal Fungus

Robert Duran*

Environment and Microbiology, University of Pau and Pays de l'Adour, France

Commentary

Arbuscular mycorrhizal (AM) mutuality could be a dependent interaction between fungi and land plants and promotes world phosphate athletics in terrestrial ecosystems. AM fungi area unit recognized as obligate symbionts that need root formation to complete a life cycle involving the assembly of propagules, vegetative spores. Recently, it's been shown that Rhizophagus irregulars will manufacture infection-competent secondary spores a symbiotically by adding a carboxylic acid, palmitoleic acid. What is more, asymbiotic growth is supported victimization myristate as a carbon and energy supply for his or her asymbiotic growth to extend plant biomass [1]. However, the reproductive structure production and therefore the ability of those spores to colonise host roots were still restricted compared to the co-culture of the flora with plant roots. Here we tend to show that a mix of 2 plant hormones, strigolactone and jasmonate induces the assembly of an outsized variety of infection-competent spores in asymbiotic cultures of Rhizophagus clarus HR1 within the presence of myristate and organic element. Immunisation of symbiotically-generated spores promoted the expansion of host plants, as ascertained for spores made by dependent culture system. Our findings offer a foundation for the elucidation of secretion management of the plant life cycle and therefore the development of inoculant production schemes [2]. Arbuscular mycorrhizal (AM) fungi area unit present symbionts of the bulk of terrestrial plant species and may facilitate plant mineral acquisition. AM fungi area unit obligate biotrophic fungi, reckoning on host-derived carbohydrates, like sugars and lipids. Ordering analyses of AM fungi have incontestable that the dearth of key metabolic enzymes is concerned within the obligate biotrophy. AM fungi have long been thought of unculturable while not the host. However, co-culture of the AM flora Rhizophagus irregularis and mycorrhiza-helper microorganism Paenibacillus validus incontestable that AM fungi will complete their life cycle within the absence of host plants [3]. Recently, it's been showed that fatty acids boost AM plant growth and asexual reproduction below asymbiotic conditions. Further, myristate initiated the asymbiotic growth of AM fungi and might additionally function a carbon and energy supply. These findings would result in the event of recent analysis tools for AM studies and novel production systems of AM flora inoculants. At present, the in vitro monoxenic culture with carrot bushy roots is one in all the rife AM flora culture strategies, during which a median a median. Irregularis spores may be obtained from 10–15 parent spores. However, reproductive structure production within the asymbiotic culture systems remains not up to those in dependent co-cultures. Moreover, spores generated with activity palmitoleic acid or myristate were smaller than those generated symbiotically, and their performance as substance is basically unsure. Traditionally, it's been thought of that AM fungi area unit solely capable of taking over inorganic nutrients [4]. Recent studies have challenged this notion by demonstrating that AM fungi promote hyphal growth in patches of organic material and acquire atomic number free throughout degradation of organic material, freelance of the host plants. It's additionally been shown that AM fungi directly take up recalcitrant and labile types of organic atomic number. Not only nutrients but signaling molecules from host plants may be crucial for AM fungal growth and reproduction. Some phytohormones show positive effects on interactions between AM fungi and hosts. For example, strigolactones are a major plant-derived signal that induces hyphal branching and elongation and stimulates their mitochondrial activity in the pre-symbiotic stage. Methyl jasmonate (MeJA) was increased during AM fungal colonization in the roots, concurrent with the up-regulation of jasmonic acid biosynthesis genes in plant cortical cells containing arbuscules that are highly branched fungal structures for nutrient exchange [5]. The knowledge on the roles of phytohormones in the interactions between AM fungi and plants has been accumulated recently, but there is only limited information about the direct effect of phytohormones on AM fungal growth and reproduction.

References

1. Bonfante P, Genre A (2008) Plants and arbuscular mycorrhizal fungi: an evolutionary-developmental perspective. Trends Plant Sci 13: 492-498.
2. Jiang Y (2017) Plants transfer lipids to sustain colonization by mutualistic mycorrhizal and parasitic fungi. Sci 356: 1172-1175.
3. Sun X (2019) Genome and evolution of the arbuscular mycorrhizal fungus Diversispora epigaea (formerly Glomus versiforme) and its bacterial endosymbionts. New Phytol 221:1556-1573.
4. Tang N (2016) A survey of the gene repertoire of Gigaspora rosea unravels conserved features among Glomeromycota for obligate biotrophy. Front Microbiol 7: 233.
5. Umehara M (2015) Structural requirements of strigolactones for shoot branching inhibition in rice and Arabidopsis. Plant Cell Physiol 56: 1059-1072.

***Corresponding author:** Robert Duran, Environment and Microbiology, University of Pau and Pays de l'Adour, France, E-mail: robert.duran@univ.pau.fr

Received: 21-Jan-2022, Manuscript No. JBRBD-17-52022; **Editor assigned:** 24-Jan-2022, PreQC No. JBRBD-22-52022 (PQ); **Reviewed:** 07-Feb-2022, QC No. JBRBD-22-52022; **Revised:** 09-Feb-2022, Manuscript No. JBRBD-22-52022 (R); **Published:** 16-Feb-2022, DOI: 10.4172/2155-6199.1000492

Citation: Duran R (2022) Mass Production of Arbuscular Mycorrhizal Fungus. J Bioremediat Biodegrad, 13: 492.

Copyright: © 2022 Duran R. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.