



Anabena sp. Mediated Modulation of Arsenic Accumulation Enhances Tolerance Responses in *Oryza sativa* L.

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ABSTRACT: Arsenic (As) is a non threshold carcinogen, present in ground water and agricultural fields of Indian subcontinent. Arsenic affects human health through consuming As contaminated food. Minimization of As uptake through cyanobacteria could be a feasible and environmental friendly techniques. Arsenic biotransformation by cyanobacteria may play a critical role in the fate and toxicity iAs (inorganic As) to relatively less toxic methylated oAs (organic As). Presented results showed that As tolerant *Anabaena* sp. not only grow at high concentration 1000 μ M of arsenate [As(V)], but also have the ability to accumulate the high (3556.1 μ g g⁻¹ DW) concentration of As(V) (500 μ M). Experiment was carried out (i) to indentify the tolerant *Anabaena* sp. towards Arsenic [As(V) and As(III)] and (ii) quantify the reduction of As toxicity in rice cv. saryoo-52 seedlings co-cultured with 10% *Anabaena* sp. which was treated with As(V) and As(III) (30-60 μ M), under hydroponic growth conditions using Hewitt media. The As uptake was found to reduce in rice when grown with *Anabaena* sp. by 48.79 % and 33.25 % against 60 μ m As(III) and 60 μ m As(V), respectively. The rice seedlings co-cultured with *Anabaena* sp. also showed significant decreased in the level of TBARS and H₂O₂ under As stress. Similarly, activity of antioxidant enzymes such as SOD, GR, CAT and GPX were also decreased with As and co-cultured *Anabaena* sp.. The results provide initial evidence that *Anabaena* sp. inhibits As accumulation and modulates tolerance responses towards As. © 2016 iGlobal Research and Publishing Foundation. All rights reserved.

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