POSTGRADUATE INSTITUTE OF SCIENCE

UNIVERSITY OF PERADENIYA

SRI LANKA

PGIS RESEARCH CONGRESS 2021

PROCEEDINGS

29th – 31st October 2021

Abstract No: 117 ***Life Sciences***

BIOFILM BIOFERTILISER ENHANCES THE COMPOSITION AND CAPACITY OF ANTIOXIDANTS IN RICE GRAINS

A.T.D. Rathnathilaka[1], M. Premarathna[1], H.M.S.P. Madawala[2] and G. Seneviratne[1*]

[1]Microbial Biotechnology Unit, National Institute of Fundamental Studies, Kandy, Sri Lanka
[2]Deparment of Botany, Faculty of Science, University of Peradeniya, Peradeniya, Sri Lanka
[*]gamini.se@nifs.ac.lk

Rice (*Oryza sativa* L.) is the staple food in Sri Lanka, and it is an important source of vitamins, minerals, fibres and antioxidants. Rice antioxidants influence the cellular redox status of human plasma, which could offer protection against chronic diseases such as cancers and diabetes, those known to be associated with oxidative stress. However, there is a dearth of information about the effects of biofertilisers on antioxidant composition and capacity in rice grains. The available evidence suggests a higher prevalence of antioxidants in organic rice than in rice grown with chemical fertiliser. Therefore, this study investigated the effect of Biofilm biofertiliser (BFBF) on antioxidants and antioxidant capacity of rice grains. Rice seed samples (n = 90) were collected at the harvest from 18 farmer-managed paddy fields that were under two different fertiliser applications; 100% chemical fertiliser (CF) practice (425 kg NPK/ha) and 50% CF practice + BFBF (2.5 L/ha) in the Ampara District. The samples were analysed for total phenolic content (TPC), total flavonoid content (TFC) and total antioxidant capacity (TAC). The data were statistically analysed using a *t*-test following the confirmation of normal distribution. Pearson correlation coefficients (r) were calculated to determine the relationships among TPC, TFC and TAC using Minitab 17 version. The results revealed that the application of 50% of CF practice + BFBF significantly increased ($p < 0.05$) the production of TPC by 67%, TFC by 45%, and TAC by 80% in rice grains over 100% CF practice. Furthermore, TAC was found to be positively correlated with TPC ($r = 0.871$; $p > 0.0001$) and TFC ($r = 0.868$; $p < 0.0001$). Thus, the results confirmed that the application of BFBFs increased the content and the capacity of antioxidants in rice grains.

Keywords: Antioxidants, Biofilm biofertiliser, *Oryza sativa*