Contribution ID: **41** Type: **Poster**

Utilizing Signaling Molecules for Sustainable Crop Management in Agriculture

Tuesday, May 14, 2024 3:45 PM (35 minutes)

Jasmeet Kaur1, Antonia Gibbs2, Tanvi Govil2, and Rajesh K. Sani1,2
1 Department of Chemistry, Biology, and Health Sciences, South Dakota Mines, Rapid City, SD, USA
2 Karen M. Swindler Department of Chemical and Biological Engineering, South Dakota Mines, Rapid City, SD, USA

Sustainable agriculture holds immense promise in meeting the food demands of our ever-expanding global population. The integration of signaling molecules in agriculture represents a promising approach for sustainable and eco-friendly crop management. Identifying these signaling molecules and harnessing them to improve the interaction between beneficial microbes and plant roots can improve resource availability and use efficiency. The introduction of signaling molecules such as flavonoids can stimulate biofilm formation in soil diazotrophic bacteria, promote bacterial colonization of plant tissues, and improve biological nitrogen fixation (BNF) with increased grain yield. Whereas molecules like lectin acid can act as an adhesion molecule between root and nitrogen-fixing bacteria.
Under the NSF EPSCoR RII-T2 BioWRAP project, our research focuses on the biomanufacturing of flavonoids through microbial route. By exploring these compounds as potential agricultural amendments, we aim to stimulate the proliferation of nitrogen-fixing microbiota in agricultural fields, thereby mitigating the reliance on synthetic nitrogen fertilizers. The initial investigation encompasses various methodologies and optimization strategies for flavonoid extraction. This involves investigating both chemical and microbial routes to determine their efficacy and scalability. By utilizing microbial routes, we aim to demonstrate the scalable production of bioactive flavonoids. Furthermore, research extends to evaluating the impact of flavonoids on plant and soil health.
Keywords: Sustainable agriculture, Flavonoids, Biomanufacturing

Primary author: KAUR, Jasmeet (SDSMT)

Presenter: KAUR, Jasmeet (SDSMT)

Session Classification: Poster Session

Track Classification: Biology