# Scientists seek to establish community-driven metadata standards for microbiomes research

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"We are living through an explosion in the availability of microbiome data," according to JP Dundore-Arias, assistant professor of plant pathology at California State University, Monterey Bay. "In agricultural systems, the proliferation of research on plant and soil microbiomes has been coupled with excitement for the potential that microbiome data may have for the development of novel, sustainable, and effective crop management strategies."

While this is an exciting development, as the collective body of microbiome data for diverse crops grows, the lack of consistency in recording data makes it harder for the data to be utilized across research projects. In a recent article published in *Phytobiomes Journal*, Dundore-Arias and others in his field discuss the need for agriculture-specific metadata standards for microbiome research.

"Metadata is known as 'data about other data,' or in other words, the what, where, when, and how of the data or sample. This can include, for example, the crop, the sample location, the time of sampling, crop management factors, the method of DNA extraction, and many other factors," explains Dundore-Arias. "Developing a shared consensus of what needs to be reported about a microbiome sample is critical to advancing our field."

Consistent metadata allows researchers to determine whether data from other studies can be integrated for analysis into their own research. Standard recording and sharing practices will also provide a rigorous foundation for building understanding and increase the long-term value of microbiome data within the plant health community.

Through a workshop sponsored by the National Science Foundation-funded Agricultural Microbiomes Research Coordination Network, Dundore-Arias, Emiley Eloe-Fadrosh (LBNL, DOE-JGI), Lynn Schriml (University of Maryland School of Medicine) and Linda Kinkel (University of Minnesota) began the process of engaging the research community in an open process for developing consensus on Agricultural Microbiomes Metadata Standards.

They proposed a checklist of required and desirable metadata standards, which is meant to stimulate discussion and move the community toward standardized reporting of metadata, sampling, processing, and analytical pipelines in agricultural microbiome research. After gathering feedback, the next step, according to Dundore-Arias, "is to develop, along with members of the Genomic Standards Consortium (GSC), a MIxS-Ag metadata standard and ontology that will be incorporated into the GSC MIxS collection and released to other commonly used data management platforms and repositories."

During the process of developing this proposed list of metadata standards categories, and in the next step, developing the official metadata standards checklist for describing agricultural microbiome studies (MIxS-Ag), Dundore-Arias and colleagues have and will continue to seek feedback and endorsement from agricultural microbiome researchers representing diverse public and private sectors. Feedback can be given in the comments at the bottom of the article, found here.

**More information:** J. P. Dundore-Arias et al, Community-Driven Metadata Standards for Agricultural Microbiome Research, *Phytobiomes Journal* (2020). DOI: 10.1094/PBIOMES-09-19-0051-P

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