Souvik Kusari, Expert Opin Environ Biol 2014, 3:1
http://dx.doi.org/10.4172/2325-9655.C1.003

OMICS International
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3rd International Conference on
Biodiversity & Sustainable Energy Development
June 24-26, 2014 Valencia Conference Centre, Valencia, Spain

Endophytes, the central 'power brokers' within the mesh of plant microbe multipartite interactions

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Fungal endophytes constitute a remarkably multifarious group of polyphyletic fungi ubiquitous in plants, and maintain an imperceptible dynamic association with their hosts for at least a part of their life cycle. Their enormous biological diversity coupled with their capability to biosynthesize bioactive secondary metabolites has provided the impetus for a number of investigations on endophytes. The potential of novel endophytes capable of biosynthesizing bioactive target and non-target metabolites has undoubtedly been recognized. It is imperious to scrutinize the diverse interactions that endophytes have with coexisting endophytes, host plants, pests, and feeders. The precise chemistry behind these associations inducing the endophytic production of functionally important compounds, including those mimetic to associated host plants, should be elucidated to apprehend the 'triggers' of such interaction. It is important to elucidate the biosynthetic pathways in endophytes correlating to associated organisms on a case-by-case basis to understand how the biogenetic gene clusters are regulated and their expression is affected in planta and ex planta. This will then afford a comprehensive elucidation of plant-endophyte crosstalk and the necessary fitness-benefits provided by endophytes to the host plants in specific ecological niches.The above mentioned issues will be highlighted with several examples from our group.

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