Anurans – the quadruped soil engineers

Frogs are an integral part of agriculture throughout the world, although not visually appealing to many of us. The sticky legs, popped out eyes and remarkable spit make them unique as well as interesting subjects to study for centuries. Look at the frog inhabited rice fields. You may catch a view on frog preying on insects thus keep their population at check. However, you may not notice their silent, underground activities contributing simultaneously towards the enrichment of soil microbiota, increment in biochemical activities, and promoting plant growth. That's something many of us don't have much idea.

A research study suggests that frog activities in the rice field are far more than traditional pest control services. In this micro-environment of the water-soil-rice plant world, every move of the frog like stirring and burrowing in the rice field, increases soil aeration, thus, enhancing oxygen in soil and water. As we all know, oxygen is a key factor for life, so abundant oxygen stimulates the growth of soil biota like bacteria, fungus, and others. Beyond that, oxygen also facilitates organic compound mineralization i.e. biogeochemical cycle. Likewise, frog excreta is a good resource for organic compounds (e.g., NH4+, AN, and TN) thus, raises soil quality. As a result, frog inhabitation stimulates soil enzyme activity and nutrient status which in turn promotes higher plant growth with greater grain yield.

So in a quiet evening, passing through a grain-laden rice field, one may realize the relentless activities of these quadruped soil engineers who along with the farmers ensure our food availability.

Source: Teng et al., Influences of introducing frogs in the paddy fields on soil properties and rice growth. Journal of Soils and Sediments, DOI 10.1007/s11368-015-1183-6
Image: Rajasri Ray

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