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Differential attraction of root-knot nematodes towards different host plants and the role of those plant derived chemicals on nematode behavior

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Plant parasitic nematodes are gaining considerable importance worldwide due to their devastating effects on crops leading to major economic downturn. Nematodes are attracted to plant roots via soluble and gaseous attractants produced by root itself or by attendant rhizosphere microorganisms. Just how nematodes move through soil to locate plant roots is poorly understood but is of considerable importance to predict the important role nematode play in soil ecosystems. Investigation was conducted to compare and contrast the differences in host recognition of root-knot nematodes, Meloidogyne graminicola and M. incognita on rice and tomato in pluronic gel medium resembling natural three dimensional soil environment. A significant preference of M. incognita for tomato and M. graminicola for rice was observed in attraction bioassay reassured by penetration and development study in different host plants. Thus, either the blend of attractants and repellents are different in good and poor hosts; or, relatively long range attractants along with shorter range repellents might affect nematode movement patterns. Therefore, plant volatiles like small lipophilic molecules emitted by root exudates of tomato and rice were isolated through solid phase extraction to investigate their effect on root-knot nematodes. The semiochemicals present in those molecules negatively influenced the behavior of M. incognita and M. graminicola in stylet thrusting, motility and mortality bioassay. Therefore, it is proposed that lipophilic molecules present in both tomato and rice root exudates play important roles during the interaction of Meloidogyne spp. with their host plants and that they might exert a repellent, or allellopathic effect on these nematodes.

Biography

Tushar Kanti Dutta has completed Ph.D under the joint venture of Rothamsted Research, UK and Indian Agricultural Research Institute, New Delhi. He is currently working as a scientist at IARI working on molecular basis of plant nematode interaction. Published few paper on plant nematode interactions in reputed journals.

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