

Host Induced Gene Silencing of FMRF-amide like Peptide (*flp-14*) in *Meloidogyne incognita* Infecting Brinjal

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Abstract—Globally, root-knot nematodes (*Meloidogyne* spp.) cause severe yield loss in agri and horticultural crops. Present management options are inadequate and a proven strategy is to engineer resistance through RNA interference (RNAi) technique to design nematode resistant transgenic crops. Here, we present results of a study on generation of transgenic brinjal lines expressing dsRNA of FMR Famide like peptide gene *flp-14*. The genetically modified transgenic brinjal events showed stable nematode resistance till four generations. Four independent transformants confirmed through PCR analysis and genomic southern blot analysis were subjected to deliberate challenge against *M.incognita* to study the effect of gene silencing on parasitic lifecycle in terms of galls, females, eggmass, eggs/eggmass and nematode multiplication. A 60-65% reduction in development and multiplication in *M.incognita* was observed due to gene silencing. To substantiate the results, expression analysis using qRT-PCR and T-DNA integration loci were studied. Different in-vitro and in-vivo experiments were also conducted on T4 transgenic seedlings to assess the infectivity in time and space. The results have shown reduction in nematode attraction (50-55%) and penetration (45-50%) compared to wild type. Results indicated that the down regulation of the *mi-flp-14* gene in the pre-parasitic J2s that were in the process of entering the roots. Thus, the results indicated that *mi-flp-14* is involved in chemotaxis, penetration and infection of *M.incognita*. It was observed that disruption of the *flp-14* expression can alleviate nematode damage and also substantiate the potential of RNAi technology for the management of phytonematodes in crop plants.