

Project Title: Saprophytic growth of Frankia populations in soil
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Project summary: Dot blot and in situ hybridization were used as tools to quantify growth of two Frankia strains inoculated alone or together into non-sterile soil microcosms with ground leaf litter of *Alnus glutinosa* as sole carbon (C) source. A significant increase in rRNA content per microcosm was observed during the first 6 weeks after inoculation for strain Ag45/Mut15, both alone and in mixed culture with strain ArI3, followed by a decrease until the end of the study after 12 weeks. In contrast, the rRNA content of strain ArI3 was reduced significantly during the first 2 weeks and undetectable for the remainder of the study. These results were comparable to those obtained in sterile liquid culture with leaf litter of *A. glutinosa* as sole C-source, although reductions in rRNA content were less pronounced than in soil microcosms. In concomitant control studies for both experimental setups, i.e., without leaf litter amendments, rRNA of both strains could only be detected at the time immediately after inoculation. Comparable results were obtained by image analysis after in situ hybridization. While controls did not result in any detection except directly after inoculation, treatments with leaf litter allowed us to determine biomass indices, i.e., the development of fragment number, length of filaments and of cell numbers in time. Profiles for both indices confirmed those of rRNA contents. These results demonstrate that Frankia strains can grow saprophytically in soil with leaf litter as sole C-source, and indicate different effects of inoculation into soil on the fate of individual strains.