

Stable GFP-tagging of *Bradyrhizobia* Lb8 and Observing its Colonization of Peanut (*Arachis hypogaea* L.) in the Nodulation Process

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Bradyrhizobium is a genus of slow-growing soil bacteria which can infect the roots of some legume species and fix nitrogen through symbiosis. However, *Bradyrhizobium* is recalcitrant to genetic modification due to the lack of endogenous plasmids and quick loss of broad host range plasmids without selection pressure.

In this study, we labeled the *Bradyrhizobium* strain Lb8 stably. Plasmid holding the GFP and the tetracycline resistance genes was transmitted into the *Bradyrhizobium* through tri-parental conjugation, then it was integrated into the bacterial genome through homologous recombination. The successfully transformed *Bradyrhizobium* was selected on the agar YEM plate with tetracycline and chloramphenicol. An infection test of the GFP tagged Lb8 using cultivated peanut Tifrunner further confirmed the success and stability of the GFP tagging. The GFP labeled *Bradyrhizobia* provides a new tool for the plant-microbe studies such as the peanut and the *Bradyrhizobia*, which could help to elucidate the process of crack entry of the symbiosis process.