

Genomic analysis of three *Bradyrhizobium* geno(species) nodulating Lima bean (*Phaseolus lunatus* L.) in Peru

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The Lima bean (*Phaseolus lunatus*), also known as pallar, ibes, garrofón or butter bean in Peru, México, Spain and USA, respectively, is the second most economically important species of *Phaseolus*. Peru is a centre of origin and domestication of Lima bean. This crop is cultivated mainly in the Central coast of Peru under a subtropical arid climate. In contrast to the common bean (*Phaseolus vulgaris*) which forms nodules with fast growing *Rhizobium* strains, the Lima bean forms nodules with slow growing bacteria of the *Bradyrhizobium* genus (López-López et al. 2013, Ormeño-Orrillo et al. 2006). We found strains of *Bradyrhizobium yuanmingense* and of three novel *Bradyrhizobium* genospecies inside *P. lunatus* nodules in Peru (Ormeño-Orrillo et al. 2006). Strains of the three novel genospecies were characterized by showing an extra-slow growing phenotype (generation time > 10 h⁻¹) and strong alkali production in yeast extract mannitol medium. Two of the novel genospecies were recently named as *Bradyrhizobium paxllaeri* and *Bradyrhizobium icense* (Durán et al. 2014). *B. paxllaeri* strains dominate nodule occupancy followed by those of *B. icense* and then the third and yet-unnamed genospecies. With the aim to gain insights into this differential competitive ability, we sequenced the genome of one representative strain of each species.

Sequencing was performed with the Illumina HiSeq or MiSeq platform and genome assembly with the SPAdes program. Gene prediction and automated annotation was performed with Prokka and RAST. Annotation of genes putatively involved in competitiveness was manually curated. Assemblies had from 55 to 175 contigs, with N50 sizes > 131 kb. Genome sizes of *B. paxllaeri* and *B. icense* were similar (8.2 Mb) and larger than that of the third genospecies (7.8 Mb). Preliminary analysis revealed differences between *B. paxllaeri* and the other two genospecies such as more genes for type IV pilus and two *nodA* genes. A comparative genomic analysis of *P. lunatus* symbionts will be presented at the meeting.

References

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