ORIGINAL ARTICLE

Moderately acidophilic mesorhizobia isolated from chickpea

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KEYWORDS

chickpea (*Cicer arietinum* L. • moderately acidophilic • pH • rhizobia • symbiotic effectiveness

Abstract

Aims: Our aim was to evaluate the effect of acid and alkaline pH on chickpea rhizobia, and on chickpea–rhizobia symbiosis.

Methods and Results: Forty-seven rhizobia isolates obtained from 12 Portuguese soils were grown at pH 5, 7 and 9. Among these, 26 grew more at pH 5 than at 7, suggesting the existence of acidophiles. All isolates were identified as mesorhizobia by 16S rDNA partial sequence analysis. Molecular phylogeny of isolates based on partial 16S rDNA sequences suggests that pH tolerance might be species related. Further studies were conducted with six isolates, which were able to grow at acid pH. Isolates PT-35 and 64b grow optimally at pH 6–5–7, with a minimal pH range from 5 to 3, and may thus be considered as moderately acidophilic. Both isolates belong to a previously identified putative new *Mesorhizobium* species, based on 16S rDNA sequence.

Conclusions: Two moderately acidophilic mesorhizobia isolated from chickpea were identified (PT-35 and 64b). A positive correlation was found between the symbiotic effectiveness at low pH and the acid tolerance of rhizobia isolates.

Significance and Impact of the Study: This is the first report on moderately acidophilic mesorhizobia, and is an important contribution for the development of highly effective inoculants for chickpea in acid soils.

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