

Abstract template (see example in box):

Isolation and characterization of mimosine, 3, 4 DHP and 2, 3 DHP degrading bacteria from a commercial rumen inoculum

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Abstract

The presence of the toxic amino acid mimosine in *Leucaena leucocephala* restricts its use as a protein source for ruminants. Rumen bacteria degrade mimosine to 3,4- and 2,3-dihydroxypyridine (DHP), which remain toxic. *Synergistes jonesii* is believed to be the main bacterium responsible for degradation of these toxic compounds but other bacteria may also be involved. In this study, a commercial inoculum provided by the Queensland's Department of Agriculture, Fisheries, and Forestry was screened for isolation and characterization of mimosine, 3,4- and 2,3-DHP degrading bacterial strains. A new medium for screening of 2,3-DHP degrading bacteria was developed. Molecular and biochemical approaches used in this study revealed four bacterial isolates – *Streptococcus lutetiensis*, *Clostridium butyricum*, *Lactobacillus vitulinus*, and *Butyrivibrio fibrisolvens* – to be able to completely degrade mimosine within 7 days of incubation. It was also observed that *C. butyricum* and *L. vitulinus* were able to partially degrade 2,3-DHP within 12 days of incubation, while *S. lutetiensis*, was able to fully degrade both 3,4 and 2,3 DHP. Collectively, we concluded that *S. jonesii* is not the sole bacterium responsible for detoxification of *Leucaena*. Comprehensive screening of rumen fluid of cattle grazing on *Leucaena* pastures is needed to identify additional mimosine-detoxifying bacteria and contribute to development of more effective inoculums to be used by farmers against *Leucaena* toxicity.

Keywords: *Leucaena leucocephala*, mimosine, rumen bacteria.