Linking lignocellulosic dietary patterns with gut microbial Enterotypes of *Tsaitermes ampliceps* and comparison with *Mironasutitermes shangchengensis*

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**ABSTRACT.** *Tsaitermes ampliceps* (lower termites) and *Mironasutitermes shangchengensis* (higher termites) are highly eusocial insects that thrive on recalcitrant lignocellulosic diets through nutritional symbioses with gut dwelling prokaryotes and eukaryotes. We used denaturing gradient gel electrophoresis and a 16S rRNA clone library to investigate i) how microbial communities adapt to lignocellulosic diets with different cellulose and lignin content, ii) the differences in the dominant gut microbial communities of the 2 types of termites. The results indicated that gut microbiota composition in *T. ampliceps* was profoundly affected by 2-week diet shifts. Comparison of these changes indicated that Bacteroidetes and Spirochaetes act in cellulose degradation, while Firmicutes were responsible for lignin degradation. Additionally, Proteobacteria consistently participated in energy production and balanced the gut environment. Bacteroidetes may
function without hindgut protozoans in higher termites. The diversity of enteric microorganisms in *M. shangchengensis* was higher than that in *T. amplices*, possibly because of the more complicated survival mechanisms of higher termites.

**Key words:** Denaturing gradient gel electrophoresis; Gut microbiota; Lignocellulosic diets; *Mironasutitermes shangchengensis*; *Tsaiitermes amplices*