

## How important are lipoxygenases and proteinase inhibitors in the interaction between *Mahanarva spectabilis* (Hemiptera: Cercopidae) and tropical forage grasses?

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The spittlebug *Mahanarva spectabilis* (Distant, 1909) (Hemiptera: Cercopidae) impacts forage production. Tropical forage grasses show different levels of antibiosis resistance (measured by nymphal survival tests) where *Brachiaria brizantha* (cv. Marandu) is resistant and *B. decumbens* (cv. Basiliski) is sensitive. Also, elephant grass cv. Pioneiro shows higher nymphal mortality than cv. Roxo de Botucatu. However, the biochemical bases for the different levels of resistance are unknown. Here, the interaction between *M. spectabilis* and *B. brizantha*, *B. decumbens* and elephant grass (cv. Pioneiro and cv. Roxo de Botucatu) was evaluated regarding lipoxygenase activity, protease inhibitors, and phytohormones. The experiments were conducted in a glasshouse where 40-day-old plants were not-infested (control) and infested with *M. spectabilis* adults for 48 h. Leaves of the plants were collected in four biological replicates. Lipoxygenase and protease inhibitors were measured through specific enzymatic assays, while phytohormones were measured by LC-MS/MS (liquid chromatography with tandem mass spectrometry). The *M. spectabilis*-infested grasses increased lipoxygenases activity, except for elephant grass cv. Pioneiro. The levels of the phytohormones jasmonic and abscisic acids were similarly low in all genotypes and increased under herbivory, but the increase of jasmonic acid in elephant grass cv. Roxo de Botucatu was lower. The salicylic acid concentration was constitutively higher in both species of brachiaria, increasing only in spittlebug-infested *B. decumbens*. The attack of *M. spectabilis* did not increase the activity of protease inhibitors in any of the forage grasses. Our findings revealed that most of the tropical forage grasses exposed to spittlebugs activate the lipoxygenase pathway, resulting in increased abscisic and jasmonic acids. However, greater amounts of these hormones do not induce protease inhibitory activity in response to spittlebug attack.

**Keywords:** hormones, insect, protease, resistance.

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