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# The role of fire in tropical dry forest regeneration

Anghy Gutiérrez-Rincón<sup>1</sup>, Alejandro Hernández-Cobos<sup>1</sup>, and Angela Parrado-Rosselli\*<sup>1</sup>

<sup>1</sup>Use and Conservation of Forest Diversity Research Group, Faculty of Environment and Natural Resources, Universidad Distrital Francisco Jose de Caldas – Colombia

## Abstract

In fire-influenced ecosystems some plant species have the ability to recover, germinate and establish after a fire; however, their proportion and dominance varies between sites. Currently, there is a debate on the influence of fire in Colombian tropical dry forests and if the vegetation has the capacity to regenerate after fire. In that way, in a tropical dry forest of the Upper Magdalena River Valley in Colombia, we characterized natural regeneration following a fire as well as we evaluated the effect of heat shock on seed germination of five dominant legume species. All seedlings and saplings of woody species were recorded 1.5 years after a fire in 75 2x2m plots installed in burned and unburned sites. Additionally, we exposed 810 seeds per species to nine experimental heat shock treatments (*i.e.* 80 °C, 100 °C and 140 °C for 1, 3 and 5 minutes) and then, seeds were incubated in an acclimatized germination chamber. Regarding natural regeneration following fire, species richness was lower in burned sites, but the number of individual per species was higher than in unburned areas. *Machaerium capote*, *Cordia alliodora* and *Casearia corymbosa* were highly abundant in the burned plots, while poorly represented or absent in the unburned ones. On the other hand, germination of legume species was stimulated by heat; however, germination percentages of *Albizia niopoides*, *Pseudosamanea guachapele* and *Piptadenia* sp were higher under less-intense heat treatments. In contrast, *Enterolobium cyclocarpum* and *Chloroleucon manguense* exhibited a better germination response under high temperatures (100 and 140 °C for 3 and 5 minutes). Our findings indicate that some tropical dry forest species might have fire-tolerant traits that should be considered in restoration programs in light of future and more frequent forest fires due to climate change.

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\*Speaker