



ID der Kurzfassung : 478

Zoonotic virus dynamics in megadiverse regions: insights from wildlife across land-use gradients in Colombia

Inhalt

Land-use (LU) change in highly biodiverse regions is increasingly recognized as a key driver of zoonotic disease emergence. Such transformations reshape wildlife communities, alter vector dynamics, and create new interfaces among wildlife, domestic animals, and humans. The SIMPEL project aims to evaluate pathogen diversity and prevalence across a land-use gradient in the Colombian Amazon (Objective 4). Fieldwork was conducted at two sites (Calamar and San José) representing different disturbance levels. Bats and rodents were sampled in dry and wet seasons using swabs and blood samples. Screening targeted coronaviruses and arenaviruses using pan-PCR, complemented by viral enrichment and high-throughput sequencing. Preliminary results show widespread circulation of both viral families, with patterns varying by site and taxon. Coronavirus prevalence in bats showed contrasting trends, decreasing with disturbance in Calamar but increasing in San José, without significant differences across LU categories. In rodents, prevalence remained high (85–100%) regardless of LU. Arenavirus showed site specific dynamics, remaining low in Calamar bats but increasing in transformed areas in San José ($p < 0.05$), while remaining low in rodents ($<10\%$). These results suggest that pathogen responses to LU change vary across host virus systems and local contexts, and highlights the need to integrate ecological and epidemiological data to better anticipate zoonotic spillover risk.

Keywords

Amazon, Colombia, Coronavirus, Arenaviruses, SIMPEL, Land-use change, Wildlife

Registration ID

OHS26-162

Professional Status of the Speaker

Senior Scientist

Junior Scientist Status

No, I am not a Junior Scientist.

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Track Klassifizierung: Climate Change, Ecosystems, Environmental Pollution

Typ des Beitrags: Both options possible

Eingereicht von **TRUJILLO, Natalia** <ntrujillo@humboldt.org.co> am **Montag, 22. Juni 2026**