



IBS. 2019
Humboldt
250 **2do Congreso**
Latinoamericano de Biogeografía

5 – 9 AUGUST 2019
UNIVERSIDAD SAN FRANCISCO DE QUITO
QUITO – ECUADOR

ABSTRACT BOOK

Concurrent Session 25: Climate Change Biogeography

CS25-1

Geographical history of stoneflies (Insecta: Plecoptera): review and extremes of adaptations in environmentally sensitive species.

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Plecoptera are aquatic insects that live in clean, well-oxygenated fresh water as immatures. They are generally more prevalent in temperate streams and lakes than in tropical ones. But numerous exceptions and radiations exist. They have a clear fossil history that extends to the Permian. They are used as bioindicators of desirable water quality by managers and ecologists around the world. The phylogeny of the group is largely stable, with notable exceptions. In this talk I will summarize the rather odd distributional history of the order and highlight research into their use of extreme habitats of glaciers, oligotrophic lakes, hyporheic zones, and life history adjustments to alpine and arctic regions. I will also address some current conservation and extinction issues with respect to local and global change.

CS25-2

Applying fuzzy logic to assess the biogeographical risk of dengue in South America

Raimundo Real, University of Malaga; David Romero Pacheco, Universidad de la República-Facultad de Ciencias-Uruguay; Jesús Olivero, Universidad de Málaga; José Guerrero, Instituto de Ecología y Ciencias Ambientales, Facultad de Ciencias, Universidad de la Republica

Over the last decade, reports about dengue cases have increase worldwide, which is particularly worrisome in South America due to the historic record of dengue outbreaks from the seventeenth century until the first half of the twentieth century. Dengue is a viral disease that involves insect vectors, namely *Aedes aegypti* and *Ae. albopictus*, which implies that, to prevent and combat outbreaks, it is necessary to understand the set of ecological and biogeographical factors affecting both the vector species and the virus. We here contribute with a methodology based on fuzzy logic that is helpful to disentangle the main factors that determine favorable environmental conditions for vectors and diseases. Using favorability functions as fuzzy logic modelling technique and the fuzzy intersection, union and inclusion as fuzzy operators, we were able to specify the territories at biogeographical risk of dengue outbreaks in South America. Our results indicate that the distribution of *Ae. aegypti* mostly encompasses the biogeographic framework of dengue in South America, which suggests that this species is the principal vector responsible for the geographic extent of dengue cases in the continent. Nevertheless, the intersection between the favorability for dengue cases and the union of the favorability for any of the vector species provided a comprehensive map of the biogeographical risk for dengue. In the current South America epidemiological framework, understanding the vector-illness biogeographic interaction may be useful in decision-making by the public health authorities to prevent, control and mitigate such diseases.

CS25-3

A model for plant growth and application to understand the impact of regional scale warming on the distribution of biomass in Ecuador (BIOc Model)

Paulina Rosero, FLACSO

The accounting of biomass has become relevant as the report of carbon emissions by deforestation and forest degradation (EDD) are important indicators for climate change mitigation. The purpose of the BIOc model is the quantification of biomass in a national-scale basis, considering the diversity of bioclimates in Andean regions such as Ecuador, thus the variation in the altitudinal distribution of biomass. BIOc is structured in three sub-models, the first which estimates biomass as a function of climate; the second which estimates the change in maximum productivity of biomass as a function of changes in temperature and CO₂ concentration and the third which estimates the carbon emissions by deforestation.

Ecuadorian Ecosystems produce from 187 to 2969 g DM m⁻² yr⁻¹. The Evergreen forest of the Amazon and the northern coast are the most productive, followed by the western and oriental slopes of the Andes. The Deciduous