

Joint modelling of mean and dispersion in dose-response experiments

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Abstract: *One of the interests of fungus germination data is to assess the Ultraviolet radiation (UV-B) tolerance of reproductive structures (conidia) of entomopathogenic fungi. The ultraviolet radiation (UV-B) component reduces efficacy of fungi and the proportion of germinated conidia. The conidia germination is valued to select the most tolerant fungal isolate that could be used for the development of biopesticides. The proportion of germinated conidia in twelve isolates exposed to UV-B was observed aiming to identify the ones with higher resistance. Germination data are usually overdispersed. This may be due to individual variability of the experimental units, or due to some correlation between these units. We illustrate applications of Quasi-binomial and Beta-binomial models with the dispersion parameter modelled by covariates, using fungal germination data, in order to compare and to select the most suitable model to analyse and to compare the resistance of isolates. The Beta-binomial model with a dispersion parameters modelled using GAMLSS approach provided a good fit to the data and presented better results than Quasi-binomial and the Beta-binomial models.*

Keywords: germination; overdispersion; Quasi-binomial; Beta-binomial; GAMLSS.

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