74 Responses of rodent reservoirs of zoonotic diseases to anthropogenic land-use change: a meta-analysis

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Rodents are important reservoirs for a large number of zoonotic pathogens. The replacement of native habitats by productive lands (e.g. agricultural crops and forestry plantations) can increase the abundance of rodent reservoirs, which can generate an increase risk of pathogen exposure to humans. In this study, we conducted a meta-analysis concerning the responses of rodents to land-use change, in order to assess the general effect of land-use change on abundance of rodent species in relation to their reservoir status for several pathogens. We collected data from the PREDICTS database and we grouped rodent species into three categories (reservoir, non-reservoir and future reservoir), according to a recently published reservoir status categorization of rodents species. We retrieved 58 case studies dealing with 54 rodent species from several geographical areas. Rodent reservoirs were significantly more abundant in areas with non-native vegetation compared to sites of native vegetation. On the other hand, non-reservoir species were more abundant in sites of native vegetation. Future reservoirs did not show a clear pattern regarding their response to habitat modification. To our knowledge, this is the first study that evaluates globally the effect of land-use change on rodents with implications for disease risks. Our findings are in agreement with the hypothesis that rodent reservoirs tend to respond differently to human disturbances than non-reservoir species. This study may help the assessment of potential risk of rodent-borne diseases when land-use change occurs.
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