INFLUENCE OF EUCALYPT PLANTATIONS ON THE DIVERSITY OF MOLLUSKS AND CRUSTACEANS OF BRAZILIAN MANGROVE FORESTS

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INTRODUÇÃO

The prosaic description of mangrove forests as "cradles of the sea" symbolizes their great importance for marine ecosystems (Bosire *et al.*, 2008) by housing a rich and diverse invertebrate fauna (Nagelkerken *et al.*, 2008). As they are situated on the interface between lacustrine, terrestrial and marine ecosystems, anthropogenic impacts of all three ecosystems might influence intactness, diversity and species richness of mangrove forests. Influences of marine or lacustrine pollution by oil, wastewater or shrimp farms are well examined (Bruns *et al.*, 1993), but impacts of agricultural or forestry activities on the diversity of mangrove forest communities are not described completely (Lovelock *et al.*, 2009).

OBJETIVOS

The aim of this article is to analyze the influence of Eucalypt plantations on nearby mangrove forests by using mollusks and crustaceans as indicators (Macintosh *et al.*, 2002).

MATERIAL E MÉTODOS

The studies were realized in two mangrove forests in Caravelas, Bahia, Brasil. The first one (EP), situated at 17°41'08"S and 39°18'58"W, is immediately attached to a Eucalypt plantation; the second study sites (NV) is buffered against the nearest Eucalypt plantation by a 800m wide stripe of natural vegetation at 17°40'14"S and 39°18'33"W. In each study site, six plots of 10 x 10 m aligned parallel to the watercourse were marked, distance between plots was 10 m. Collections were realized during low tide: Crustaceans have been caught by two researchers during 30 minutes along transects within these plots. All mollusks were collected from five quadrats of 1m^2 at random distributed within the plots. All individuals have been stored in alcohol until their identification. The species assemblage, the diversity calculated by Shannon - Wiener (H') and Fisher´s as well as the regression of the species - sampling curves (power and logarithmic models) of both sites have been compared. For linearization, data have been log - (power model) or semilog - transformed (logarithmic model). Fitted by the power model, the intercept of the species - sampling curves (SSC) is a measure for point diversity, while inclination corresponds spatial turnover.

RESULTADOS

In each study site, the same six species of crustaceans decapods (crabs) have been collected. Abundance in EP is higher (150 individuals) than in NV (75). Most abundant species in EP is *Aratus pisonii* (65 individuals), followed by *Uca sp1* (53), *Panopeus lacustris* (18), *Goniopsis cruentata* (7), *Eratium limosum* (4) and *Uca sp2* (3). In NV, *Uca sp1* and *P. lacustris* are the most dominant species with 39 and 14 individuals, followed by *A. pisonii* (9), *Uca sp2* (6), G. *cruentata* (5) , and *E. limosum* (2). Even if less individuals are collected in NV, its diversity is little higher: Fisher´s amounts 1.53 ±0.35 (1.25 ±0.24 in EP), H' is 1.39 (1.30 in EP), but differences are not significant. The evenness differs slightly between study sites (0.78 in NV and 0.73 in EP). The Crustacean SSC from EP is better fitted than the SSC from NV. The logarithmic model fits both SSCs better (EP: R^2 = 0.971, $F_{1;4}$ = 136.6, p ¡ 0.001; NV: R^2 = 0.889, $F_{1;14}$ = 32.3, p ¡ 0.01) than the power model (EP: R^2 = 0.951, $F_{1;4}$ = 77.1, p ¡ 0.001; NV: R^2 = 0.870, $F_{1;4}$ =26.6, p ¡ 0.01). Differences between crustaceans point diversity (EP: 0.313 $\pm$0.047; NV: 0.464 $\pm$0.055) are significant (p ¡ 0.05), but between spatial turnover are not (EP: 0.219 $\pm$0.024; NV: 0.178 $\pm$0.034). Like crustaceans, the mollusks species richness does not differ between both study sites. The same four species from the Gastropoda class have been collected in EP and NV. *Melampus caffeus* L. is the most abundant species in both study sites. Due to a more homogenous distribution, the mollusk diversity measured by H' of EP (1.04) is higher than of NV (0.44). Due to the high dominance of *M. caffeus*, evenness in NV is less than the half in NV (0.32) than in EP (0.75). On the other hand, Fisher´s does not show differences between both areas (EP: 0.84 $\pm$0.2; NV: 0.86 $\pm$0.21). The mollusks´ SSC of EP is fitted better by the power model (R^2 = 0.9917, $F_{1;4}$= 480.4, p ¡ 0.001) than by the logarithmic model (R^2 = 0.9828, $F_{1;4}$ = 228.8, p ¡ 0.001). For the second study site, NV, the logarithmic model (R^2 = 0.9978, $F_{1;4}$ = 1848.4, p ¡ 0,001) fits the species - sampling curve better than the power model (R^2 = 0.9885, $F_{1;4}$ = 3.42.4, p ¡ 0.001). Point diversity differs significantly (p ¡ 0.05) between EP (0.287 $\pm$0.012) and NV (- 0.441 $\pm$0.049), as well as spatial turnover (EP: 0.156 $\pm$0.007; NV: 0.539 $\pm$0.029).

Compared to other surveys from Brazilian mangroves (Almeida *et al.*, 2006; Barroso & Matthews - Cascon, 2006), mollusks and crabs species richness is considered low in both study sites. As gradients of salinity, time of inundation and soil aeration work perpendicular to the watercourse, the parallel arrangement reduces the number of different habitats. This explains the low species richness of both groups due to zonation, a phenomenon which has been observed for other groups in mangrove forests (Clay & Anderson, 1996). Higher crab abundance in EP might be due to higher primary production as a result of fertilizers entrance in the ecosystem increasing the biomass on following trophic levels.

CONCLUSÃO

Eucalypt plantations in the neighborhood of mangrove forests do not influence the species assemblages of mollusks or crabs in serious ways. Little alterations observed in species abundance distribution might be neglected. Significant differences in mollusks lower point diversity is evened by higher spatial turnover.

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