

Vegetation dynamics of campos under grazing/fire regimes in southern Brazil

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Introduction Natural grassland vegetation in Southern Brazil, known as campos, has most likely evolved under a disturbance regime that included fire and grazing (Pillar *et al.*, 1997). Nowadays, the composition of the vegetation of campos is grazing- and fire-dependent (Boldrini *et al.*, 1997). Its importance can be evaluated by the fact that it represents 37 % of the state's area and provides 77 % of the slaughtered cattle at Rio Grande do Sul (Barcellos *et al.*, 2002). The objective of this experiment was to evaluate the vegetation dynamics of campos under grazing/fire regimes in order to explore the resilience of the vegetation under the regimes studied.

Materials and methods The effect of fire and grazing regimes on vegetation dynamics was evaluated during eight years on campos vegetation (Pillar *et al.* 1997). The experimental area is located in Santa Maria, in the southern-most Brazilian state. The experiment consisted of eight plots subjected to combinations of two grazing and fire regimes (presence/absence) on two relief positions (convex, concave slope). The annual evaluation started in August 1995 and finished in January 2002. Data on visual estimates of species above-ground biomass, using field procedures of BOTANAL (Tothill *et al.*, 1992), were subjected to ordination analysis.

Results Treatments ungrazed (Figure 1) showed a resilient behaviour tending to a dominance of *Andropogon lateralis*, except on the burning treatment in the concave position. After 8 years under grazing management, typical species were *A. lateralis*, *Desmodium incanum*, *Paspalum notatum* and *Eragrostis angustifolius*. During this time interval, campos vegetation changed from a dominance of the first species to include the others cited above. This could be due to the plasticity observed in plants of *A. lateralis*, which changed from a tall tussock grass to a sward of decumbent plants.

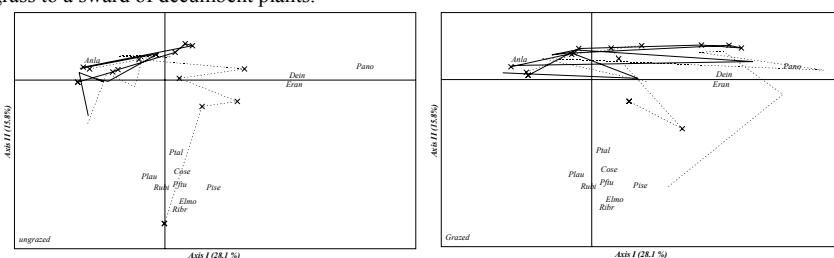


Figure 1 Principal Coordinate Analysis of 64 experimental plots under grazing/fire regimes in eight evaluation years. The lines indicate the campos dynamic and the grazing/fire regimes at two relief positions (lines with X for burned treatments and continuous line for convex slope) for grazed and ungrazed treatments. Characters indicate species most correlated with the axes ($r > 0.50$): *Anla* (*Andropogon lateralis*), *Pano* (*Paspalum notatum*), *Dein* (*Desmodium incanum*), *Ptal* (*Pterocaulon alopecuroides*), *Cose* (*Coelorhachis selloana*), *Pftu* (*Pfaffia tuberosa*), *Eran* (*Eragrostis angustifolius*), *Plau* (*Plantago australis*), *Elmo* (*Elephantopus mollis*), *Ribi* (*Richardia brasiliensis*), *Rubi* (Undetermined (Rubiaceae)) and *Pise* (*Piriqueta selloi*).

Conclusion Disturbance factors like grazing and fire are important in maintaining and enhancing diversity on campos vegetation. Both maintain open spaces allowing the development of species dependent on light and soil resources.

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