



Coastal Plain Soil Fertility Degradation And Natural Forest Ecosystem Regeneration

J. C. CASAGRANDE (1), C. A. SATO (2), R. M. REIS-DUARTE (2), M. R. SOARES (1), and M. S. GALVÃO BUENO (3)

(1) Federal University of São Carlos, Natural Resources and Environmental Protection, Araras - São Paulo, Brazil (bighouse@power.ufscar.br), (2) Biology Institute, Department of Vegetal Biology, Paulista Estadual University, Rio Claro, São Paulo, Brazil (rostringa@terra.com.br), (3) Universidade São Judas Tadeu University, Taquari, Mooca, São Paulo, Brazil (mariosgb@terra.com.br)

The sand coastal plain vegetation (Restinga Forest) has been described as an ecosystem associated with the Atlantic Forest, constituted of mosaics, which occur in areas of great ecological diversity, particularly the features of the soil which mostly influence the forest, therefore assigned as edaphic community. The Restinga forest is one of the most fragile, showing low resilience to human damage. This work was carried out in several points (14) of Restinga Forest (six low - trees from 3 to 10 m high - and eight high forest - trees from 10 to 15 m high) in the litoral coast of the state of São Paulo. Each sample was made of 15 subsamples of each area collected in each depth (one in 0 - 5, 5 - 10, 10 - 15, 15 - 20, and another in 0 - 20, 20 - 40, 40 and 60 cm). Soil characteristics analyzed were pH, P, Na, K, Ca, Mg, S, H + Al, Al, B, Cu, Fe, Mn, Zn contents and base saturation, cation exchange capacity and aluminum saturation. The vegetation physiognomies of Restinga forest (low and high) were associated with soil results and with the history of human occupation. The soils are sandy (2 to 4% of clay), resulting in a low capacity of nutrient retention. Soil fertility analysis to low and high Restinga forest were similar and showed very low contents of phosphorous, calcium and magnesium in all areas investigated. The base saturation was low due to low amounts of Na, K, Ca and Mg. Base saturation presents low level in all cases, less than 10, indicating low nutritional reserve in the soil. The aluminum saturation values varied from 58 to 69%. The level of calcium and magnesium were low in the subsurface soil layer mainly, associate with high aluminum saturation, representing an limiting factor for the root system development in depth. If soil fertility parameters do not show any significant difference between low and high Restinga physiognomy, what make distinction is the recuperation time. In the areas of high Forest can be note a too long time of recuperation. Considering the regeneration medium time, it was necessary approximately 15 years more to reach high forest them to low forest. As the Restinga forest have similar soil fertility parameters, independently of the forest stage development; the time of natural regeneration was determinant to differentiate low and high Restinga forest.