

## **SEASONALLY DRY DECIDUOUS FORESTS: DIVERSITY AND SOILS IN ARBOREAL COMMUNITIES**

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### **Summary**

This chapter presents a perspective of the diversity of tree species on the Seasonal Deciduous Forest in Central Brazil and its relation with the edaphic features. Seasonally dry deciduous tropical forests occur worldwide in hot seasonal climates occupying a smaller area than the rain forests. These forests have been intensively converted into pastures and croplands. In Central Brazil these forests grow on fertile soils, on patches of limestone outcrops within a savanna matrix, where mining is an additional threat. In the Cerrado domain they occur on eutrophic and mesotrophic soils but rarely are found on dystrophic soils. The dry forests, composed by valuable timber species are extremely vulnerable and need actions for conservation and sustainable management. The selective extraction of timber species elsewhere and the absence of sustainable management practices are selectively eroding the natural reserves of these species and can compromise the existence and conservation of these populations in these scattered communities in the Central Brazil. A large quantity of low density species is another constraint for conservation leading to the need of a conservation network including many sites.

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## Bibliography

- Andrade-Lima D. A. (1981). The caatingas dominium. *Revista Brasileira de Botânica* 4, 149-153. [This article presents an extensive revision on caatingas of Brazil]
- Baldochi D. D., Hutchison B., Matt D. and Mcmillen R. (1984). Seasonal variations in the radiation regime within an oak-hickory forest. *Agricultural and Forest Meteorology* 33, 177-191. [This article presents issues on the ecology of the canopy of seasonal deciduous forests]
- Borchet R. (1994). Soil and water storage determine phenology and distribution of Tropical Dry Forest trees. *Ecology* 75, 1437-1449. [This work deals the distribution and the phenology related to water availability in dry forests]
- Bullock S.H., Mooney H.A. and Medina E. (1995). *Seasonally dry tropical forests*, 450 pp. Cambridge: Cambridge University Press. [This is a reference book which includes ecology diversity and environments on dry forests of the world]
- Castro-Marín G. (2005). *Stand Dynamics and Regeneration of Tropical Dry Forests in Nicaragua*. Doctoral Thesis. Swedish University of Agricultural Sciences. [This work focuses important aspects on the dynamics and the management of seasonal deciduous forests in neotropics]
- Damasceno Junior G.A. (2007). Matas Secas - Simpósio. *A botânica no Brasil: pesquisa, ensino e políticas públicas ambientais* (orgs. L. M. Barbosa and N. A. Santos Junior), 372-383. São Paulo: Sociedade Botânica do Brasil. [This work approaches tree species and management of tropical dry forest in Central Brazil]
- Embrapa (1999). *Sistema Brasileiro de classificação de solos*, 421 pp. Brasília: Embrapa Produção e Informação. [This book presents the new soils classification of Brazil and it is a reference work]
- Embrapa (1981). *Mapa de solos do Brasil*. Serviço nacional de levantamento e classificação de solos. Empresa Brasileira de Pesquisa Agropecuária/Ministério da Agricultura. [This work presents the main types of soils and its occurrence in Brazil]
- Felfili J.M. (2003). Fragmentos de florestas estacionais do Brasil Central: diagnóstico e proposta de corredores ecológicos. *Fragmentação florestal e alternativas de desenvolvimento rural na Região Centro-Oeste*. (org. R.B. Costa), 139-160. Campo Grande: UCDB [This article approaches the seasonal deciduous forests of Central Brazil and conservation and management at fragmented environments]
- Foster R.B. (1985). Plant seasonality in the forests of Panama. *The botany and natural history of Panama*. (eds. W.G. Darcy and A.M.D. Correa), 255-262. Saint Louis: Missouri Botanical Garden [This work emphasizes the ecological issues of the seasonality and its aspects in the tropical rain forests and dry forests]
- Janzen D.H. (1997). Tropical dry forests the most endangered major tropical ecosystem. *Biodiversity*. (ed. E.O. Wilson), 130-137, Washington DC: National Academic Press [This is an important work which deals dry forests and its importance for conservation of biodiversity]
- Laurence W.F. and Bierreggaard R.O. (1997). *Tropical forest remnants: ecology, management and conservation of fragmented communities*, 589 pp, Chicago: The University of Chicago Press. [This is a reference book which includes experimental work in the tropics on ecology and conservation of populations and communities in fragmented systems]

Mostacedo B. and Fredericksen T.S. (2001). *Regeneración y Silvicultura de Bosques Tropicales en Bolivia*, 124 pp, Santa Cruz, Bolivia: BOLFOR. [This book deals all aspects of ecology and regeneration at tropical deciduous forests].

Murphy P.G. and Lugo A. E. (1986). Ecology of Tropical Dry Forest. *Annual Review of Ecology and Systematics* 17, 67-88. [This work is one of the first concise revisions on the seasonal deciduous forests in the tropics]

Oliveira-Filho A. T. and Ratter J.A. (1995). A study of the origin of Central Brazilian forests by the analysis of plant species distribution patterns. *Edinburgh Journal of Botany* 52, 141-194. [This work treats issues of forests in Central Brazil and its relations with biogeographical and ecological factor determinants].

Prado D. (2000). Seasonally dry forests of tropical South America: from forgotten ecosystems to a new phytogeographic unit. *Edinburg Journal of Botany* 57, 437-461. [This work deals phytogeographical aspects including the forests of central Brazil and suggests that the forests in Central Brazil link the seasonal forests in the Northeastern Brazil].

Sano S.M. and Almeida S.P. (1998). *Cerrado: ambiente e flora*, 556 pp, Planaltina: Embrapa- Cerrados. [This book is a reference work and approaches ecological and environmental aspects of cerrado domain in Brazil].

Scariot A., Sousa-Silva J.C. and Felfili J.M. (2005). *Cerrado: ecologia, biodiversidade e conservação*, 439 pp, Brasília: Ministério do Meio Ambiente. [This represents a comprehensive discussion of structure and diversity of Cerrado vegetation and its environments].

Scolforo J.R. and Carvalho L.M.T. (2006). *Mapeamento e inventário da flora nativa e dos reflorestamentos de Minas Gerais*, 288 pp. Lavras: Editora da Universidade Federal de Lavras [This recent book approaches a detailed review of the main types of vegetation of Minas Gerais, Brazil].

## References of Table 2

Alcoforado-Filho F.G., Sampaio E.V.S.B. and Rodal M.J.N. (2003). Florística e fitossociologia de um remanescente de vegetação caducifólia espinhosa em Caruaru. Pernambuco. *Acta Botanica Brasilica* 17, 287-303. [This paper deals plant communities in the Caatinga domain of Brazil].

Lamprecht H. (1990). *Silvicultura nos trópicos: ecossistemas florestais e respectivas espécies arbóreas-possibilidades e métodos de aproveitamento sustentado*, 343 pp. Eschborn: GTZ. [This book is a reference work and approaches ecology and silviculture of tree species in the tropics].

Linares-Palomino R. and Alvarez S.I.P. (2005). Tree community patterns in seasonally dry forests in the Cerros de Amotape Cordilera, Tumbes, Peru. *Forest Ecology and Management* 209, 261-272. [This work approaches tree species and diversity of tropical dry forest]

Nascimento A.R.T., Felfili J.M. and Fagg C.W. (2007). Canopy openness and lai estimates in two seasonally deciduous forests on limestone outcrops in Central Brazil using hemispherical photographs. *Árvore* 31, 167-176. [This is a case study that addresses the analysis methods in canopy description with special reference to structure of vegetation]

Oliveira-Filho A.T., Mello J.M. and Scolforo J.R. (1997). Effects of past disturbance and edges on tree community structure and dynamics within a fragment of tropical semideciduous forest in south-eastern Brazil over a five-year period (1987-1991). *Plant Ecology* 131, 45-66. [This paper presents the study of tree species dynamics]

Pereira I.M., Andrade L. A., Barbosa M.R.V. and Sampaio E.V.S.B. (2002). Composição florística e análise fitossociológica do componente arbóreo-arbustivo em uma remanescente florestal no Agreste Paraibano. *Acta Botanica Brasilica* 16, 357-369. [This paper presents description of the vegetation in the Caatinga domain]

Scariot A. and Sevilha A.C. (2000). Diversidade, estrutura e manejo de florestas decíduas e as estratégias para conservação. *Tópicos atuais em botânica*. (eds. T.B. Cavalcanti. and B.M.T. Walter) . Brasília: Embrapa Recursos Genéticos e Biotecnologia. [This paper presents description of diversity and structure of the seasonal deciduous forest]

Viana V.M. and Tabanez A.A.J. (1996). Biology and conservation of forest fragments in the Brazilian Atlantic Moist Forest. *Forest Patches in Tropical landscapes* (eds. J. Schellas and R. Greenberg ), 151-167. Washington: Island Press. [This work presents issues related to conservation and management of forest fragments]

### References of Table 3:

Araújo G.M., Rodrigues L.A. and Ivizi L. (1997). Estrutura fitossociológica e fenologia de espécies lenhosas de mata decídua em Uberlândia. MG. *Contribuição ao conhecimento ecológico do cerrado*, (eds. L.L. Leite and C.H. Saito), 22-28. Brasília: Universidade de Brasília. [This work emphasizes the ecological issues of phenology and diversity at seasonal deciduous forest].

Oliveira-Filho A.T., Curi N., Vilela E.A. and Carvalho D.A. (1998). Effects of canopy gaps, topography and soils on the distribution of woody species in a central Brazilian deciduous dry forest. *Biotropica* 30, 362-375. [This work deals with the ecology and distribution of tree species in a seasonal deciduous forest].

Siqueira A.S. (2007). *Florística, fitossociologia e caracteres edáficos de duas florestas estacionais decíduas no Triângulo Mineiro*. Dissertação de Mestrado. Uberlândia: Universidade Federal de Uberlândia. [This is a case study that addresses the study of vegetation and edaphic aspects of seasonal deciduous forest in the Central Brazil].

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