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Estimating Understory Species Diversity of West Timor Tropical Savanna, Indonesia: The Basis for Planning an Integrated Management of Agricultural and Environmental Weeds and Invasive Species

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Abstract : Indonesia is well known as a country covered by lush tropical rain forests, but in fact, the northeastern part of the country, within the areas geologically known as Lesser Sunda, the dominant vegetation is tropical savanna. Lesser Sunda is a chain of islands located closer to Australia than to islands in the other parts of the country. Among those of islands in the chain which is closes to Australia, and thereby most strongly affected by the hot and dry Australian climate, is the island of Timor, the western part of which belongs to Indonesia and the eastern part is a sovereign state East Timor. Regardless of being the most dominant vegetation cover, tropical savanna in West Timor, especially its understory, is rarely investigated. This research was therefore carried out to investigate the structure, composition and diversity of the understory of this tropical savanna as the basis for looking at the possibility of introducing other spesieis for various purposes. For this research, 14 terrestrial communities representing major types of the existing savannas in West Timor was selected with aid of the most recently available satellite imagery. At each community, one stand of the size of 50 m x 50 m most likely representing the community was as the site of observation for the type of savanna under investigation. At each of the 14 communities, 20 plots of 1 m x 1 m in size was placed at random to identify understory species and to count the total number of individuals and to estimate the cover of each species. Based on such counts and estimation, the important value of each species was later calculated. The results of this research indicated that the understory of savanna in West Timor consisted of 73 understory species. Of this number of species, 18 species are grasses and 55 are non-grasses. Although lower than non-grass species, grass species indeed dominated the savanna as indicated by their number of individuals (65.33 vs 34.67%), species cover (57.80 vs 42.20%), and important value (123.15 vs 76.85). Of the 14 communities, the lowest density of grass was 13.50/m2 and the highest was 417.50/m2. Of 18 grass species found, all were commonly found as agricultural weeds, whereas of 55 non-grass, 10 species were commonly found as agricultural weeds, environmental weeds, or invasive species. In terms of better managing the savanna in the region, these findings provided the basis for planning a more integrated approach in managing such agricultural and environmental weeds as well as invasive species by considering the structure, composition, and species diversity of the understory species existing in each site. These findings also provided the basis for better understanding the flora of the region as a whole and for developing a flora database of West Timor in future.

Keywords : tropical savanna, understory species, integrated management, weedy and invasive species
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