Sukid Rueangruea 2009: Vegetation Structure of Montane Forests in Thailand. Master of Science (Forestry), Major Field: Forest Biology, Department of Forest Biology. Thesis Advisor: Mr. Sarayudh Bunyavejchewin, Ph.D. 158 pages.

Structure and composition of montane forests in Thailand and its relation to topographic features and soil properties were determined. A total of 150 of 40m x 50m sample plots were established, all trees with diameters at breast height 4.5 cm and over were measured and identified into species. A set of soil sample, 0-10, 10-20 and 20-30 cm depth, were collected for each plot. Elevation, slope and aspect representing the topographic features of the sample plots were also recorded.

The 150 sample plots included 29, 9 I 4 trees (1,000 trees/ha) of 841 species, 315 genera and 90 families, Which the average basal area was 43.75 m^2/ha Fagaceae, an oak family, contained the highest density (275 trees/ha) and basal area (14.35 m^2/ha). Lauraceae was the highest species richness family, 97 species. Correlation between basal area of sample plots and environmental feature were analyzed by using Stepwise multiple regression method, showed the basal area equation was Basal area (m^2/ha) = 79.96 – 10.67 (pH) – 0.35 (slope) + 0.01 (elevation) ค่า R^2 = 0.34 Mixed Oak-Laurel type was the most diverse comparing to the other types, both alpha diversity (2.96) and beta diversity (14.17). Elevation, pH, silt and Ca were correlated to all type. Fisher's Linear Discriminant Function models were created to classify dominance-type as follow, An cluster analysis of Sorensen Ward's method can be divided the montane forests into 6 types as, 1) *Castanopsis* type, 2) *Castanopsis acuminatissima* type, 3) Mixed Oak-Laurel type, 4) Quercus-Lithocarpus type, 5) Oak-Pine type and 6) *Castanopsis argyrophylla* type. While the Discriminant Analysis by used the variables form function 1 of canonical to make the Fisher's Liner Discriminant function form that the coefficient variable in each cluster was

Castanopsis type = -60.655 + 0.009(Elevation) + 20.061 (pH) + 0.459(Silt) - 1.459(Ca)

Castanopsis acuminatissima type = -44. 115 + 0.007(Elevation) + 17.452(pH) + 0.326(Silt) - 1.272(Ca)

Mixed Oak-Laurel type = -53.364 + 0.011(Elevation) + 18.06(pH) + 0.442(Silt) - 1.263 (Ca)

Quercus-Lithocarpus type = -77.588 + 0.012(Elevation) + 21.406(pH) + 0.553(Silt) - 0.783(Ca)

Oak-Pine type = -58.666 + 0.009(Elevation) + 19.636(pH) + 0.479(Silt) - 1.3l5(Ca)

Castanopsis argyrophylla type = -61.164 + 0.01(Elevation) + 19.775(pH) + 0.5 11 (Silt) - 1.255(Ca)

Those equation can be used to predict the subtypes of montane forests with 48% Correctly.

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