Fluktuasi asimetri dan ekomorfologi pembagian relung (niche partitioning) pada komunitas kelelawar di Taman Nasional Lore Lindu Sulawesi Tengah

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Abstrak

Lore Lindu National Park covers 217,991 ha of Central Sulawesi. The elevation range from 200 m asl in Pakuli to 2,355 m asl at the top of Nokilalaki mountain on the north east of this national park. This wide range of the elevation has become the supporting factor of the high biodiversity in this national park. There were many Sulawesi endemic faunas which have been found in this national park. This national park have at least 5 species of squirrel, 31 of 38 of the rats species are endemic not to mention other big mammals and the species of shrews which are mostly endemic. Approximately there are 55 species of bats inhabit this national park. This group of animals plays important economic and ecological roles including producing fertilizer, pollinating fruit trees, and consuming vast numbers of insects. Bat’s morphology and anatomy are basically like that of any other mammal, the wings are the most obvious distinguishing characteristic. The fundamental similarity in structure of all bats has required the group to expand into new habitat or to partition their niche.

Ecomorphology is a study that relates the morphological structures that construct an organism with ecological and evolutionary consequences of that designs. Some previous study indicate the relationship between morphological characters such as cranial or wing characters with diet and niche partition in bats. Ecomorphological study of bats is very lack in Sulawesi particularly which correlates with its ecological function such as niche partition. The study on ecomorphology has not been comprise the whole area of this national park. There were no reports on this study at the South West Part of Lore Lindu National Park, near Tomado village.

Fluctuating asymmetry (FA) is a pattern of variation in which asymmetry values are normally distributed around a mean of zero. FA has been considered as the product of random errors in development, and thus a measure of developmental stability. The level of FA in a trait may indicate genetic, developmental, or environmental stress. The study of FA can also predict the interspecies relationship between two or more species in one area. The study of FA in bats has never been conducted in Lore Lindu National Park. This study can explain the interspecies relationship among bats species and the level of environmental stress in the national park.

This study focused on two topics: (1) ecomorphological relationship between wing characters and niche partition in bat community, and (2) fluctuating asymmetry pattern in bat community. The study area was located at Lore Lindu National Park, Salupada Mountain, Tomado village, Central Sulawesi. The study was conducted between July to August 2002.

Bats were captured using mist nets and a harp trap. This study is testing the hypothesis that bat species are randomly dispersed in multivariate morphological space. In contrast, if they are organized (due to phylogeny, competitive interactions, etc), multivariate morphological space will be partitioned regularly. This study is also testing the significant difference of FA levels between species of bat in the community to see the interspecies relationship among them.

A total of 128 bat specimens from 16 species were collected. The wing morphology of each specimens were measured using digital caliper. The wing characters measured were the Metacarpal of the first to the fifth digit of the bat, the first and the second Phalanges of the third to the fifth digit of the bat, Forearms, and Tibiae. A total of 13 characters were measured. These characters was analysed using multivariate statistics, Principal Component Analysis (PCA).

Principal component analysis indicates that differences in size of the wing (PC-1) contribute 86% of niche partition, whereas wing width membrane differences (PC-2) contribute only about 8% of niche partition. The guild of bat community in Lore Lindu National Park was not distributed randomly in multivariate space. Instead we found that the morphological space is partitioned regularly, probably due to competitive interactions The pattern of fluctuating asymmetry between the two bat species showed no significant differences of FA level between the sexes within The study of ecomorphological attributes on bats in Lore Lindu National Park is still needed to be continued in order to find out the niche partition in the whole area of the park and also to see the level of disturbance in the area.