

SUMMARY

The Sunda Velvet Dragonfly (*Euphaea variegata*) is a member of the Euphaeidae family, commonly found near waterfalls in clear water ecosystems characterized by dense or moderate open vegetation. Sunbathing behavior contributes to thermoregulation, especially in environments with microclimate changes. This study aims to identify the habitat characteristics for sunbathing, population engaged in sunbathing, daily sunbathing behavior patterns, and sunbathing duration of *E. variegata* at the Telu waterfall, Orak Arik waterfall, and Ceheng waterfall ecosystems.

This study used a *purposive sampling* method and a *focal sampling* method for behavioral observation. Environmental parameters measured included air temperature, humidity, and light intensity. MANOVA was used to test the effect of environmental conditions on sunbathing duration and the number of dragonflies sunbathing at a significance level of $p < 0.05$. This was followed by multiple correlation testing to determine the strength of the relationship between several variables. Principal Component Analysis (PCA) was used to analyze the main components in the environmental factor data.

Environmental variables, including air temperature, air humidity, and light intensity, significantly affected the duration of sunbathing and the number of *E. variegata* individuals. Based on the results of multiple correlations on these variables, environmental variables have a very strong relationship with the duration of sunbathing and the number of *E. variegata* individuals. Maximum sunbathing duration occurred when the temperature range was between 25.0–28.0°C and light intensity was between 3699–41811 lx, with the highest average sunbathing duration of 10 minutes 7 seconds and the shortest duration of 2 minutes 11 seconds. However, in the evening, both the number of dragonflies and sunbathing duration decreased due to high air humidity and repeated rainfall during the observation period.

The behavior of *E. variegata* during sunbathing includes self-cleaning (*grooming*), wing stretching, perching obelisks, territorial defense, predation, and mating. The most common behaviors exhibited by *E. variegata* during sunbathing were self-cleaning (*grooming*), wing stretching, and perching in an obelisk posture at all three sites. The least common behavior was mating. The highest average abundance of *E. variegata* was found at Orak Arik waterfall, with 14 individuals, and the lowest abundance was found at Telu waterfall, with 11 individuals. This study explains the thermoregulatory adaptation ability of *E. variegata* to environmental variables. Additional research during the dry season is needed to understand variations in sunbathing behavior under different climatic conditions.

Keywords: Ceheng waterfall, Ecological indicators, Orak Arik waterfall, Sunbathing behavior, Sunda velvet dragonfly, Telu waterfall.