

Abortion of reproductive organs to adjust reproductive costs to the daily fluctuating production of a tropical pioneer, *Melastoma malabathricum* (Melastomataceae)

Tamaki KAMOI¹, TANAKA Kenzo², Koichiro KURAJI³, Kuniyasu MOMOSE¹

¹ Faculty of Agriculture, Ehime University, Japan

² Forests and Forest Products Research Institute, Japan

³ University Forest in Aichi, The University of Tokyo, Japan

We demonstrated that the abortion of reproductive organs of a tropical pioneer, *Melastoma malabathricum*, is an adaptation to environmental fluctuations at shorter time scales than have previously been reported in other plants. We measured the fluctuations of the demand and supply of resources in natural conditions, and clarified how plants adapt to those fluctuations through increasing and aborting their reproductive organs. Respiration and transpiration of the reproductive organs were measured at various stages. The growth and abortion ratios of reproductive organs on trees were monitored. Based on these data, the daily demand for carbohydrates and water by reproductive organs at the level of individual plants was calculated. Using leaf photosynthesis and solar radiation data, the daily photosynthetic production was estimated. The daily carbohydrate demands of the reproductive organs were significantly correlated with total photosynthetic production per leaf area during the previous one, three and five days, but no correlations were found between the demands for water and rainfall or accumulated radiation. The daily abortion ratios of the population were also correlated with the following quantity: (demand for carbohydrates on the previous day) / (total photosynthetic production per leaf area).