

## ABSTRACTS (MASTER THESIS)

# Effects of Diet Composition on Nutritional Physiology and Ecology of *Lyctus africanus* (Lesne)

(Graduate School of Agriculture,  
Laboratory of Innovative Humano-Habitability, RISH, Kyoto University)

Titik Kartika

Several artificial diet combinations, wood- and non-wood-based, had been developed for *Lyctus brunneus*. It was reported that cellulose-based diet was more suitable for mass culture of *L. brunneus* than that of the wood particle (sawdust)-based one. This study discussed the probability of wood- and non-wood-based diets for *L. africanus* by examining the growth rate, oviposition ability and digestive enzyme (endoglucanase) activity of *L. africanus*.

Three diets, wood particle-based (WP), cellulose powder-based (CP) and alpha cellulose-based (AC) diets, were prepared, and then subjected to adults of *L. africanus*. Subsequent generations were used to examine the growth rate, population, body weight, and sex ratio (adult stage), oviposition ability (adult stage) and endoglucanase activity (larval stage).

The WP and CP diets generated equivalent growth rate of *L. africanus* with the similarities on average population, sex ratio (male/female) and body weight (Table 1). In the oviposition test, adult insects fed with CP- and AC-based diets tended to oviposit more eggs than that WP-fed adult did. In addition, the adults generated from the CP-based diet tended to survive longer after ovipositing the eggs (Fig.1). The endoglucanase activity was higher in CP- and WP-fed larvae than in AC-fed ones (Fig.2). These results implied that WP and CP diets might substitute each other to support growth of *L. africanus*.

Table 1. Growth rate of *L. africanus* on three diets

| Diet sources | Population           | Sex ratio (M/F)    | Body weight (mg)   |
|--------------|----------------------|--------------------|--------------------|
| WP           | 206.000 <sup>a</sup> | 0.983 <sup>a</sup> | 1.983 <sup>a</sup> |
| CP           | 188.875 <sup>a</sup> | 0.834 <sup>a</sup> | 1.866 <sup>a</sup> |
| AC           | 55.875 <sup>b</sup>  | 0.753 <sup>a</sup> | 1.966 <sup>a</sup> |

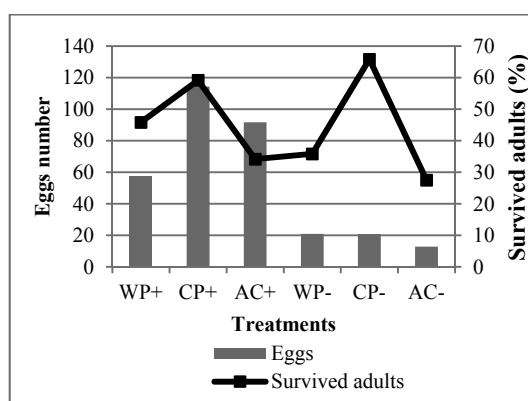


Fig 1. The number of eggs and survived adults of *L. africanus* after oviposition test

Note: (+) indicates the treatment of filter paper with nutritive solution; while (-) indicates the treatment of filter paper with water

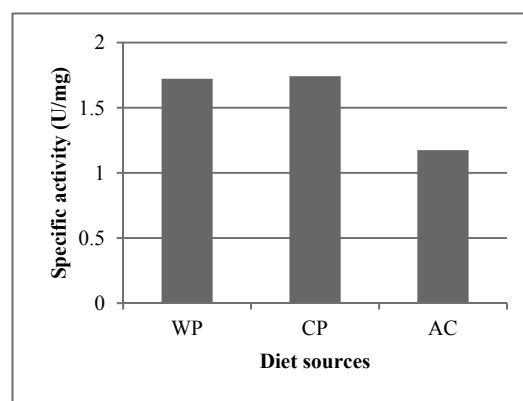


Fig. 2. Endoglucanase activities of *L. africanus* larvae fed with three different diets