

BIOLOGY OF *XENYLLA* SP. (COLLEMBOLA: HYPOGASTRURIDAE) AND EFFECTS OF EFFECTIVE MICROORGANISM (EMTM) ON ITS DEMOGRAPHY

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Currently, Effective Microorganism (EMTM) is widely used to increase crop yields in Thailand. However, there is little knowledge and no scientific proof on the influence of EM and the mechanisms on soil organisms, especially soil microarthropods which serve as bioindicators of soil fertility. A species of springtail in the genus *Xenylla* was extracted from Nakhon Pathom Province area and mass-cultured in bottles containing plaster of Paris-charcoal substrate and baker's yeast as food under 25-28 °C. Observations under stereo microscope were made and their life history as well as fecundity were recorded. The life history consists of three developmental stages – egg, juvenile and adult – which took an average of 21.67 days to complete. The egg stage lasted 6.44 days whereas the juvenile stages I to VI were 4.44, 2.14, 2.09, 2.21, 2.27 and 2.26 days, respectively. The first oviposition was as early as 12 – 16 days after hatching and the fecundity was 137.07 on average. The mean longevity of an adult was 64.27 days. Sexes could not be differentiated by morphological characters before the adult reached 30 days after hatching. That was when females were visibly larger in body size and the body color was bright yellow. Males of the same age had a darker body due to the distribution of pigments. Histological methods revealed a pair of ovaries in each female. Sex determination is an underlying problem for most springtails. For this species reared in the laboratory, it is possible to use the combination of body size and color to differentiate the sexes. Based on the life table, the means of life table statistics (R_0 , λ , r_c , r_m , T , T_c and D) were obtained as 17.08, 1.09, 0.07, 0.08, 33.52, 37.12 and 8.54, respectively, and survivorship curve is of Type I. The influence of EM1 caused a decrease in percentage of eggs hatching and e_x and delayed developmental time from juvenile stage I to adult when compared to the control ($p < 0.05$). This is probably due to a rapid growth of fungi that covered egg surfaces, in addition to the lower relative humidity (RH) and accumulation of metabolic wastes. The effects of EM1 and EM5 were not significantly different. Vinegar had no effects on the egg hatching, but promoted higher fecundity (R_0), while effects of rice whiskey were similar to EM1. Based on this study, EM does not have any positive effects in the population of *Xenylla* sp., but this does not guarantee negligible effects in the field.

**KEY WORDS: *XENYLLA*/ COLLEMBOLA/ SPRINGTAIL/ DEMOGRAPHY/
EFFECTIVE MICROORGANISM/ BIOLOGY/ LIFE TABLE**

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