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*Presoldier cuticle contributes to the soldier morphogenesis in termites*

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In all termite species, the soldier differentiation occurs through a presoldier stage and the drastic morphogenesis with body-part modifications occurs through the molts into presoldier and into soldier. However, it was considered that the morphological alternation might occur even during the presoldier stage because, during the presoldier stage, termites possess soft bodies covered with whitish or transparent cuticles. Thus, we hypothesized that presoldiers possess elastic cuticles that enable the drastic morphogenesis even after the molt into presoldiers, leading to the formation of soldier-specific morphologies. In this study, using the damp-wood termite *Hodotermopsis sjostedti*, we artificially induced the presoldier molt by applying a juvenile hormone analog and then measured the sizes of 5 body parts after the molt. Results indicated that the head length significantly increased during 7 days after the presoldier molt in contrast to the pseudergate molt (stationary molt). Furthermore, on the 14th day after the presoldier molt, the head length showed a further increase. To elucidate the cuticular characteristics underlying the head elongation after the presoldier molt, we observed head cuticles by scanning electron microscopy, showing the folding structure on the head of newly-molted presoldiers which was then unfolded during 7 days after the molt. Histological observations also indicated that the folding structure was unfolded due to the additional cuticle synthesis during the 7 days. Then, the thickened cuticle was stretched by 14th day after the molt. Our results firstly showed that the soft and elastic cuticle in presoldiers contribute to the head elongation, like body cuticle of holometabolous larvae. This study suggests that, as well as the molts itself, this developmental process during the intermolt stage after the presoldier molt contributes to the formation of soldier-specific exaggerated morphologies.