A New Method to Increase Propolis Production by Activating Nest Repair Behavior in Stingless Bees

Leeja, Metawee (School: Damrongratsongkroh School)
Luanghan, Chonnaphat (School: Damrongratsongkroh School)
Prommin, Nattakarn (School: Damrongratsongkroh School)

Propolis, a natural product of high economic value from stingless bees (Tetragonula pegdeni), has been used as an ingredient in pharmaceutical and daily life products. Increasing propolis production and improving its quality are challenging tasks for stingless beekeepers. We noticed that when the plastic sheet covering the nest of stingless bees was torn, nest repair behavior through propolis production could be activated. The aim of our work is thus to develop a method to increase propolis production by observing nest repair behavior of stingless bees under different conditions. First, we observed nest repair behavior when creating openings (0.5 cm2) on the plastic sheet under the nest cover in triangle, square and circle shapes. It was found that the circle tear could best activate propolis production. The worker stingless bees produced propolis to seal the tear starting from the edges and the corners first, then moving around until all the tears were fully covered with propolis. The effect of position and the number of tears per nest were then determined. The result showed that 15 tears near the brood pot were optimal because it gave highest propolis weight. Most importantly, this activation did not initiate aggressive behavior and the queen still lived in the hive. When compared to control, the propolis produced was 1.72 times higher and of better quality, with 13.5% higher inhibition for Rhizopus sp. growth and less contamination from debris or pieces of wood. Moreover, other beneficial products from bee hive were not affected.

Awards Won: