

DESIGNING AND ASSESSING ARTIFICIAL NESTING SITES FOR COLONIZING SOLITARY BEES

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Solitary bees play an important role in pollinating agricultural crops. However, native solitary bee populations have declined due to the degradation of habitats and floral resources caused by intensive agriculture. Providing artificial nesting sites is a popular habitat restoration method for native bees in agroecosystems. Therefore, a study was conducted to assess the effectiveness of introduced nesting sites on the colonisation of solitary bees, at the Faculty of Agriculture, Rajarata University of Sri Lanka. A bee hotel was constructed near the vegetable field using drilled wood logs, clay bricks, bundled bamboo sticks, weed stems, and plastic straws, each with two cavity sizes. The introduced nests were examined periodically to confirm the acceptability of bees. The nested adult bees were collected, identified, and measured their head capsule diameter and body length. The species diversity of different nesting sites was calculated using the Shannon-Wiener index (H) and Simpson's index (D). Also, the temporal variation of bee visits and the relationship between cavity diameter of nesting sites and body parameters of bees were assessed. The acceptability towards the introduced nests was significantly different ($p < 0.001$) among the nested bee species: *Megachile vigilans*, *M. hera*, *Xylocopa violacea*, *Ceratina cockerelli*, *Hylaeus* sp., and *Osmia* sp. Weed straws and bamboo sticks were the most attractive materials and no bees were occupied in plastic straws. There was no temporal variation in the nest visiting of bees. The acceptability for different-sized cavities was not correlated with the head diameter while it was positively correlated with the body length. Several wasps including *Gasteruption jaculator*, *Paraphylax* sp., *Trypoxylon* sp., *Chrysis* sp., and *Ancistrocerus* sp. also visited the nests and exhibited parasitism on the colonised bees. It is concluded that the introduced nesting sites with naturally available materials would be useful in solitary bee conservation and restoration programmes within agroecosystems.

Keywords: Bamboo sticks, Bee conservation, Bee hotel, Nesting, Parasitic wasps