Flowering phenology and evaluation of pollination techniques To achieve acceptable fruit quality of red-fleshed pitaya (hylocereus polyrhizus) in Sabah, east Malaysia

ABSTRACT

As red-fleshed pitaya (Hylocereus polyrhizus) is not native to the tropical environment of the Malaysian state of Sabah, Borneo, little is known about its flowering phenology, pollination requirements, and potential pollinators, which has discouraged many farmers from growing this crop. Therefore, this study aimed to examine better pollination techniques to achieve acceptable fruit quality for red-fleshed pitaya production under local climatic conditions. For this purpose, stingless bees (Tetragonula laeviceps), self-pollination, natural pollination, and hand pollination were used. Pitayas were planted in the field from January 2018 to February 2022, and 40 flowers were observed to obtain data on flowering phenology and fruit quality. This study observed that anthesis of red-fleshed pitaya took about 24 hours in all treatments, depending on the local climate, starting at 6.30 p.m. and ending at 6.30 p.m. the next day. Besides self-pollination, the pitaya flowers were also successfully pollinated by natural, hand, and stingless bees. However, the fruits pollinated by stingless bees were the heaviest, longest, and thickest, indicating that the integration of pitaya cultivation and stingless bees is likely to improve the yield and quality of the fruits on the farm.