真空吸力應用於蜂王漿採收之研究

The Study of Vacuum Suction Applied to the Royal Jelly Harvest

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[摘要]

本研究為避免影響蜂王漿品質, 使用一般醫療用之四種注射針筒配合七組吸頭, 以手動試驗吸取王台杯內之蜂王漿, 在多種吸取方式中找出最佳吸取方式, 再以真空吸力及機械原理設計取漿機構, 並期望透過此機構設計出一部適合現場使用、機動性高、操作簡單且保有蜂王漿原質的取漿機械。試驗中僅以 1 支針筒吸取, 吸取效果最佳者為「針筒旋轉向下同時活塞桿向上拉伸」, 可運用在將來推估至一次吸取 96 個王台杯（1 支採漿框)。由於癸烯酸是判別蜂王漿品質優劣的重要指標, 含量愈高者品質愈佳, 所以將本機構吸取後的蜂王漿, 依相同條件分別貯存 1~3 個月再做癸烯酸含量檢測, 並與人工取漿及離心力取漿方式採收之蜂王漿做比較, 經比較結果發現, 四種取漿方式所取得之樣本一開始即有癸烯酸含量 的差異, 人工取漿為 2.23%、本機構吸取為 2.16%、離心力不使用隔離網為 2.07%、離心力使用隔離網為 1.93%, 在 5℃相同貯藏條件下存放 73 天, 其含量分別下降至 1.8%、1.73%、1. 66%、1.60%, 顯示取漿方式確實會影響癸烯酸含量。本機構設計以塑膠針筒吸取蜂王漿, 不僅保有王漿原質且吸取速度可手動控制, 吸取過程穩定, 無吸入過多空氣、摻入蜂蜜、王台條損壞、拆裝繁瑣、電源供應等顧慮, 有別於以往之連續式真空吸取系統且較離心力取漿為佳。

關鍵字: 蜂王漿 royal jelly、真空吸力 vacuum suction、 離心力 centrifugal force
癸烯酸 10-HDA

[摘要]

To avoid the quality of royal jelly was affected, four types of hypodermic needle and seven sets of suction tip are used to try manually suck theroyal jelly in the crown princes cup. This study tried to find the best one from several suction methods, then designs harvesting device with using vacuum suction and mechanism. It developed a harvesting mechanism that was goodto use on site, easy mobile and operated. This way can preserve the purity of royal jelly and keep higher quality. In the study, one needle was used tosuck the royal jelly. The best result, at piston is pulled up while the syringeis swirled down, was obtained, it may be used when 96 cells are sucked at the same time in the future. Because more quantity of 10-HDA means higherquality of royal jelly. This experiment is to preserve the royal jelly harvestingby four methods under the same condition for 1 to 3 months, than compare with their 10-HDA contents. The 10-HAD levels were different when harvesting,at 2.

23% by handy-harvesting, at 2.16% by our equipment, at 2.07% bycentrifugal force without mesh, and at 1.93% by centrifugal force with mesh. After preserving at 5℃ for 73 days, the results has shown that their 10-HDA contents decreased to 1.8%, 1.73%, 1.66% and 1.60%, which manes the 10-HDA contents were affected by different harvesting methods. One equipment is designed to harvest royal jelly with plastic syringes in this study. This harvesting method in this study can keep the purity of the royal jelly,and the suction speed can be adjusted manually. The suction process is stable, with no excess air brought in, no extra honey leaks in, and has no problemon the queen cell damage, complex assembly or power supply. It’s differentthan continuous vacuum suction system and better than centrifugal forceharvesting method.