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APPLICATION OF AROMA FOR EDIBLE-NEST SWIFTLETS ATTRACTION.

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Abstract

Based on sharing of experiences with trusted swiftlet farming consultants and scientific approach, it is concluded that birdhouse aroma are divided into top and floor aroma. Formulated from natural plant, top aroma known as attractant aroma served to lure swiftlets especially young couple to enter the birdhouse. However, additional top aroma known as pheromone aroma also need to be applied on nesting plank to stimulate those birds mate and breed. This aroma is made up of the bird's nest waste water from cleaning process. In addition, floor aroma that is usually applied on bottom region of birdhouse cannot be neglected as the smell of swiftlet's guano will convince those birds that the house is safe and were populated by other swiftlets although it is not. The main concern in aroma application is that ranchers need to avoid the wrong practice as swiftlets are sensitive to odour and may not build their nest on nesting plank stained with their guano.

1. Introduction

Swiftlets are highly valued for their ability to produce edible nest made up of glutinous secretion from their two sublingual salivary glands [1] [2] [3]. Demands for the nest continually to increase with white nest sold at extremely high price peaked at RM5000 – RM6800 in 2002 [4]. Nowadays, the EBN market has expanded to China, Hong Kong, United State and Middle East countries [2]. However, over exploitation of the nest and non-organized harvesting resulted in declination of edible-nest swiftlet species, thus reduced the nest production [5] [6]. Therefore, people started to build birdhouse to address the problems. Nevertheless, the lack of ranchers' knowledge on sustainable swiftlet ranching resulted in unpopulated birdhouse and lead to financial loss [2]. Generally, sustainable swiftlet ranching involved strategic location, birdhouse interior environment, building design, sound system and birdhouse aroma. As such, we describe herein the proper aroma concept based on sharing of experiences from trusted swiftlet farming consultants and scientific approach.

2. Materials and Methods

Edible white nest and swiftlet's guano were collected in our successful birdhouse at Aspa Cottage Kuantan, Pahang. Three commercial aroma products were purchased from various swiftlet farming suppliers around Kuantan. Solid phase microextraction (SPME) technique coupled with gas chromatography mass spectrometry (GC-MS) was used for chemical compound identification. SPME fiber was conditioned at 250 °C for 30 min

followed by headspace sampling at 30 °C for another 30 min. The exposed fiber was injected into GC-MS with DB-1MS capillary column (30 m × 0.25 mm I.D.; 0.25 µm film thickness). The oven was programmed at 60 °C for 3 min, then ramped at 3 °C/min to 240 °C and held for 10 min.

3. Results and discussion

There are two main types of birdhouse aroma which consist of both top and floor aroma. The top aroma can be categorized as attractant and pheromone aroma, usually applied at the upper section of birdhouse. Attractant aroma is made up of volatile compounds from plants (Comm. A). The odour was contributed mainly by terpenes and served to lure swiftlets into the birdhouse. Automatic spray and water dispenser system with time range of 15 min are the most effective ways to disperse the aroma inside birdhouse. The smooth flying path installed with attractant aroma will encourage swiftlets to venture deeper into the house and provided with proper interior environment those birds possibly will consider to brood.

Table 1: Headspace analysis of bird's nest and guano in comparison with commercial aroma.

Chemical constituents	Aspa Cottage birdhouse		Commercial aroma		
	Bird's nest	Guano	Comm. A	Comm. B	Comm. C
Limonene	-	-	5.81	-	-
2-Ethyl-4-methylthiazole	1.25	-	-	9.80	-
2-methyl-4-propyl-thiazole	-	-	-	13.92	-
α-terpineol	-	-	15.53	-	-
α-terpinene	-	-	3.42	-	-
β-patchoulene	-	-	2.93	-	-
β-caryophyllene	-	-	2.35	-	-
α-guaiene	-	-	9.32	-	-
α-bulnesene	-	-	9.57	-	-
2,6-di-tert-butylquinone	-	-	-	-	29.06
Patchouli alcohol	-	-	4.00	-	-
n-tetradecanoic acid	8.24	1.89	-	6.50	-
n-pentadecanoic acid	1.96	-	-	-	-
Z-11-hexadecenoic acid	5.82	0.98	-	3.52	-
n-hexadecanoic acid	36.30	5.62	-	15.44	10.34
Crodamol DOA	5.61	61.92	-	12.46	30.51

Comm. A: Attractant aroma; Comm. B: Pheromone aroma; Comm. C: Floor aroma

However, attractant aroma cannot guarantee that swiftlets will breed. Therefore, pheromone aroma (Comm. B) is applied directly on nesting planks to stimulate swiftlets to roost and nest. The current practice by consultants and experienced ranchers revealed that bird's nest waste water from cleaning process proven to be effective as their pheromone aroma. The usage of white yolk from swiftlet eggs is not encourage as swiftlets tend to feel unsecure and possibly left to find a new house. The mixture of duck's egg yolk and honey is also a risky practice as the pungent odor from egg yolk and sweetness of honey may attract ants and rats. Therefore, low quality or shattered bird's nest may serve as an alternative for homemade pheromone aroma [1].

On the other hand, swiftlet's guano is the main ingredient in floor aroma (Comm. C) and applied at lower region of birdhouse to convince swiftlets that the house farm was

populated although in fact it is not [7]. The guano is soaked in water for a few days to reduce ammonia (NH₃) content to produce moderate pungent guano-like smells [1]. The application of floor aroma is a good practice since it will encourage ranchers to clean their birdhouse that is also prevent the breeding of pest such as lizards, rats, mosquitos and cockroaches. Cleaned birdhouse may also reduce nitrate contamination, thus enhances the bird's nest quality.

4. Conclusion

The birdhouse aroma plays important role in swiftlet ranching that there are many commercial aroma can be found in the market. Each of the product may differ as the formulation is based on guesswork of manufacturers. However, it is important for the ranchers to avoid wrong aroma application i.e. applying floor aroma on the upper region of birdhouse. The stains of guano will discourage these birds since swiftlets will make their nest on clean and secure spot.

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