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Food for Feeding Red-Whiskered Bulbul (*Pycnonotus jocosus* Pattani)

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Abstract. Food of an economic bird, Red-whiskered bulbul (*Pycnonotus jocosus* pattani), was investigated since November 2017 – August 2018 in yala province, Thailand. They were studied by applying survey method. The samples were the red-whiskered bulbul caretakers selected by convenience sampling. Deep Interview and rating scale questionnaires were used as research tools to find the kind of food for most likely tendency by average and percentages. The results showed that 98 percent of samples were male, their education level were undergraduate and lower. The average income was between 10,000 - 30,000 baht. The majority of food which the caretakers used for feeding their pet birds at different ages were the same. They were derived from plants 18 families, including 24 species. The main plants were Kluai Hin (*Musa acuminata* × *balbisiana* (ABB Group) 'Saba'), Kluai Nahm Wa (*Musa sapientum* Linn.), papaya (*Carica papaya* L.), water melon (*Citrullus lanatus* (Thunb.) Matsum. & Nakai), tomato (*Solanum lycopersicum* L.), cucumber (*Cucumis sativus* L.), chinese squash (*Luffa acutangula* (L.) Roxb.) and Tam Lueng (*Coccinia grandis* (L.) J.Voigt.). Some insect such as mealworm (*Tenebrio molitor* L.), crickets (*Gryllus bimaculatus*), some species of grasshopper, and ant eggs were also provided. However, some caretakers mixed some supplements such as vitamins and chili curry into their food for feeding the mature pet bird. Meanwhile, honey and ready-made meals were only used into rearing their chicks.

1. Introduction

Yala province of Thailand has mountainous areas from the middle to the south of the province. It is higher than sea level between 100 and 200 meters. Most areas are covered with rainforest trees and rubber plantations. Thus, Yala province is suitable towards being a habitat of various birds. According to the Checklist of The World, there are 478 species of birds in Yala province. Moreover, there is in a threatened state of 18 species and 3 species of imported birds. Raising Java doves and birds cage for competition as a cultural tradition of the legendary Yala. In 2011, yala province was selected by the Department of Intellectual Property, Ministry of Commerce to be the model city of creative economy from the presentation of YALA: Bird City, Bird's Economic Center. There is an important activity which is to organize the ASEAN Dove Bird Competition by receiving cooperation both in countries and neighboring countries in ASEAN such as Malaysia, Singapore, Indonesia and Brunei. The Tourism Authority of Thailand has packed this competition in the tourist calendar of Thailand, distributed throughout the world. Moreover, many dove hobbyists raise other birds as well. The red whiskered bulbul (*P. jocosus* pattani, in the Thai name “*nok grong hua juke*”) have been raised for their melodious singing. These birds are raised rather than a Java dove. Because a Java dove is more expensive.



P. jocosus pattani is a colorful bird in the bulbul family (PYCNONOTIDAE) [1]. It is a bird that likes to live as a group of flocks. The lifespan is average 15 - 25 years. The body hair is black-brown with gray color. The hair on the head may straight or be bent forward. The end of this point that is attached to the neck is completely black. The cheeks are white hair and have red spots on the sides of the eyes. The eye has a black stripe drawn through the cheek to the neck. The lower tail base is red. The bird in this family are well known as generalist frugivores which feed on fruits of numerous plant species [2]. Interestingly, nok grong hua juke has beautiful singing voice. It has been listed as a protected animal according to the Thai Wildlife Protection and Reservation Act 1992 [3]. However, people in the south of Thailand generally bring to rear as caged birds, listen to the vocals and bring to compete in the vocals. Every village has nok grong hua juke hanging at the eaves or under the tree inside the house. The red-whiskered bulbul singing contest is growing popularity in southern Thailand. Meanwhile, the bird raising encourages relationships between people in the community or between other communities. The popularity of the red-whiskered bulbul singing contest became a mechanism for the economic growth of merchandise associated with nok grong hua juke. Besides the sale of birds, it fosters the sale of bird cages, bird medicines, and bird song audio tapes.

Generally, song of birds is thought to play a role in establishing and defending a territory and in attracting a mate [4]. However, there are intraspecific differences in song features (e.g., repertoire size, song length, song "quality") in the wild, but it is difficult to determine the origin of this variation. It is well known that food for feed animal have a critical role in relation to development of them. Because nutrients from food act as signals that alter gene expression, affecting not only the immediate development of the oocyte and/or embryo, but also programming subsequent development of the foetus or neonate [5]. Therefore, changes in nutrient supply during their lifespan might affect the integrity of all the tissues and organs of the body, contributing to the future health and performance about singing of the birdsong. Although, Bulbuls are well known as generalist frugivores which feed on fruits of numerous plant species [6]. Unfortunately, currently, it is no official information about what kind of food that the bird caretakers should feed nok grong hua juke to perform the good singing. Hence, it was important to gather information on local wisdom about food that the bird caretakers used to feed their own birds during the lifespan. These results could provide valuable additional information for further intensive studies on the role of food for nok grong hua juke singing. Moreover, these knowledges will also apply to STEM collaborative instruction between university and community partnerships in a biology classroom for undergraduate students at the Yala Rajabhat University, Thailand.

2. Methods

The study was conducted in yala province, southern Thailand. All bird caretakers were determined as the population. The sample size of 50 bird caretakers was calculated using the formula developed by Yamane (1973) [7]. The respondents were selected through a convenience sampling method. The data were collected during November 2017 – August 2018 by structure interview. The theory principles and related documents was studied as the preliminary data to be a concept and guide in creating the questions. They covered the socio-demographic background of the respondents and their knowledge. The questionnaire was taken to a sample of 30 people who were not the actual sample used in the study. Testing of the reliability of knowledge used the Kuder-Richardson reliability coefficient (KR-21) [8] with the reliability value of 0.943.

The data analysis utilized both descriptive and inferential statistics. Frequencies, percentages, arithmetic means, and standard deviations were used to describe the data. The life span of birds was recognized as three phases. The first phase was a parenting period for new born birds referred to the period of rearing the baby birds until 4 months. The second phase was the feeding period of the birds in the cage meant the period of raising the baby birds between 4 months to 5 years. The last one was a parenting period for young birds (race birds) referred to the period of raising the baby birds from the age of 5 years

onwards or the young birds that could compete. The presence of each foods item was counted to estimate the percent frequency of occurrence (%F) by following these equations:

$$\text{Percent frequency of occurrence (\%F)} = (\text{frequency of each item} / \text{total number of item}) \times 100$$

3. Results and Discussion

Socio-demographic background

The majority of respondents were male (98.0 %) and was 40 years olds onward. This result was in accordance with previous findings in dove-raisers in the past which tended to be elderly men who raised birds as pets [9]. The level of education was in the lower secondary level (36.0 %). The career of most bird caretakers was government officials and state enterprises. The average cost of their bird breeding was 20,001 - 30,000 baht/month (38.0 %). The majority of bird caretakers raised birds for competition (86.0 %). The number of birds raised between 3-11 birds (92 %). The purpose of raising birds was for happiness in building relationships in the community, for cultural preservation and to make money. Bird raising could create a career for bird owners to had income from selling birds. Especially, birds with good sound would get a high price.

Food for feeding bird

These results showed the local wisdom about food that bird caretakers used to feed their birds in the south of Thailand. There were some fruit and supplements. The majority of fruits which the caretakers used for feeding their pet birds at different ages were not different. They were derived from plants 18 families, including 24 species. The main plants were Kluai Hin (*Musa acuminata* × *balbisiana* (ABB Group) 'Saba'), Kluai Nahm Wa (*Musa sapientum* Linn.), papaya (*Carica papaya* L.), water melon (*Citrullus lanatus* (Thunb.) Matsum. & Nakai), tomato (*Solanum lycopersicum* L.), cucumber (*Cucumis sativus* L.), Chinese squash (*Luffa acutangula* (L.) Roxb.) and tam Lueng (*Coccinia grandis* (L.) J.Voigt.). The percent frequency of occurrence has showed in table 1.

Table 1 The percent frequency of occurrence (%F) of food that the bird caretakers feed their birds in each stages of growth.

Type of food	%F		
	The new born birds (0 - 4 months)	The period of raising the baby birds (4 months to 5 years)	The young birds that could compete (5 years onwards)
<i>Musa acuminata</i> × <i>balbisiana</i> (ABB Group) 'Saba'	44	60	100
<i>Musa sapientum</i> Linn.	44	60	100
<i>Carica papaya</i> L.	44	60	100
<i>Citrullus lanatus</i> (Thunb.) Matsum. & Nakai	44	60	100
<i>Solanum lycopersicum</i> L.	40	68	100
<i>Cucumis sativus</i> L.	38	68	100
<i>Luffa acutangula</i> (L.) Roxb.	30	70	100

Type of food	%F		
	The new born birds (0 - 4 months)	The period of raising the baby birds (4 months to 5 years)	The young birds that could compete (5 years onwards)
<i>Coccinia grandis</i> (L.) J.Voigt.	44	60	100
Grasshopper	64	60	100
<i>Tenebrio molitor</i> L.	64	60	100
ant eggs	4	-	-
Honey	40	60	100
Vitamins	-	20	100
chili curry	-	70	100
ready-made meals	60	6	36

Kluai Hin is so far known only in the lower south of Thailand and domestically used as cooked banana. It is found to have a sporadic distribution along the Pattani to the collapse of the bank [10]. The content of its resistant starch (up to 68.1%) is much higher than other tropical banana cultivars [11]. Papaya has been used in traditional medicine for animal in Indonesia. Papaya latex was used as an anthelmintic against patent infection of *Ascaridia galli*, a chicken parasitic nematode [12]. Investigation revealed watermelon seeds are rich source of protein. Feeding experiments with chicks showed normal growth with up to 15% whole watermelon seeds in the diet [13]. Tomato can improve the oxidative stability of Japanese quail meat, following the dietary supplementation of 5% of dry tomato pulp, with lycopene and beta-carotene as main components [14]. Moreover, mealworm (*Tenebrio molitor* L.), crickets (*Gryllus bimaculatus*), some species of grasshopper, and ant eggs were also nourished. Some caretakers mixed some supplements such as vitamins and chili curry into their foods for feeding the mature pet bird. Meanwhile, honey and ready-made meals were only used into rearing their chicks. To date, however, they are not directly accessible to scientific investigation about the role of these food.

4. conclusion

Collectively, the findings from this study highlight the local wisdom about the foods that bird caretakers used to feed their birds in the south of Thailand. It should be possible in future experiments to manipulate visual, chemosensory, and tactile cues associated with food to determine their relative contributions in the regulation of singing in *P. jocosus pattani*. Moreover, these knowledges will also apply to STEM collaborative instruction between university and community partnerships in a biology classroom for undergraduate students at the Yala Rajabhat University, Thailand.

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