

## Roosting Habits of Red Junglefowl in Orchard Area

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### Abstract

The roosting habits of Red Junglefowl (*Gallus gallus spadiceus*) was studied in an orchard area of University Putra Malaysia, Serdang, Selangor Malaysia, planted with Chiku (*Achras sapota*), Cempedak (*Artocarpus integer*), Rambutan (*Nephelium lappaceum*), Pulasan (*Nephelium mutabili*), Durian (*Durio zibethinus*) and Kayu Manis (*Cinnamomum iners*). Roosting trees were identified when the Red Junglefowls started to crow early in the morning and late evening. The study showed that the Red Junglefowl preferred Cempedak trees. One male was observed to use the same Cempedak tree for 33 days and a Rambutan tree for 9 days. Males and females generally roosted at about the same height from the ground. Roosting height varied between 5 m and 9 m depending upon the tree species. Hens with chicks roosted lower (4 m) than those without chicks. Red Junglefowl left the roosting tree before sunrise and went to roost before sunset. Females went to roost earlier than males and the males departed the roosting tree earlier than females.

**Key Words:** Red Junglefowl, orchard area, roosting time, departure time.

### Introduction

This study describes the night roosts and roosting habits of Red Junglefowl. Red Junglefowl normally roost in trees from 6 m to 15 m above the ground (Bump and Bohl 1961). They may form a close group along a limb or be scattered over different parts of the same tree at night. The same roosting site may be utilized for a long period of time unless the birds are disturbed. Johnson (1963) reported that Red Junglefowl roosted on large clumps of bamboo. Birds belonging to a harem flew to individual perches 5 m to 6 m above the ground and selected a position well out on a bending cane and well screened above and below, and offering easy exit in case of imminent danger.

Red Junglefowl is widely distributed in all states of Peninsular Malaysia (Yatim 1992). However, no detailed work has been done on its habits, or particularly on its roosting behavior, in agriculture areas. This study examines the roosting behavior of Red Junglefowl in an orchard area of University Putra Malaysia, Serdang, Selangor.

### Materials and Methods

The area selected for the study was the 20 ha orchard area of University Putra Malaysia (UPM), Serdang, Selangor Malaysia. It is located about 23 km south of Kuala Lumpur (102°42'E 1°24'N). The main fruit tree species in the orchard area are Chiku (*Achras sapota*), Cempedak (*Artocarpus integer*), Rambutan (*Nephelium lappaceum*), Pulasan (*Nephelium mutabili*), Durian (*Durio zibethinus*) and Kayu Manis (*Cinnamomum iners*).

The study was conducted from August 1995 to 1996. Roosting trees were identified when the Red Junglefowls crowed early in the morning and late evening and by the presence of droppings under the tree (Boeker and Scott, 1969). A three-night survey was done with a torch light to examine the roosting behavior at night. Perch height was estimated directly and the tree species selected for roosting were recorded. Data on time of sunrise and sunset were obtained from the Islamic Calendar of the Islamic Department Shah Alam, Selangor, Malaysia, to assess the relationships between roosting time and sunset and sunrise time's.

### Statistical analyses

Student's t-test was used to test for differences in roosting height, and time of arrival at and departure from the roost between males and females. Correlations (Pearson correlations) were used to examine the relationship between departure time and sunrise time and arrival time and sunset time. The level of null hypothesis was taken as  $\alpha = 0.05$ . Statistical analyses were performed by using Statistical Analysis System software (SAS Institute Inc. 1994). Throughout this paper, data are reported as means  $\pm$ SE.

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## Results

Males always roosted solitary. However, the roosting habits of only two males (Male I and Male II) could be observed in the orchard area. The 114 days observations of Male I (November 1995 to June 1996) showed that it used different tree species for roosting at night. Rambutan and Cempedak trees were often used where as Durian, Pulasan and Kayu Manis were rarely used as roosting trees. Thus this male used Cempedak trees for 68 days (60% of the time), Rambutan for 37 days (32% of time), Kayu Manis for 3 days (3% of the time) and Pulasan for 2 days (2% of the time) and Durian for only one day (1% of the time). Male II which was observed for only 14 days, (in April and May 1996) used a Cempedak trees.

Generally the Red Junglefowl preferred a horizontal or bending branch for roosting. They frequently changed branches and trees before they decided where to roost. Sometimes they used the same tree and branch continuously for a few days; at other time they used the trees alternately. Male I used the same Cempedak tree for 33 days and Rambutan tree for 9 days in succession. Male II used only Cempedak trees on the same tree for 3 nights, different trees on other night (Table I). Both males preferred to roost on the same branch whenever they roosted in a tree they had used previously. The average roosting heights of Male I in Durian and Kayu Manis trees was 8 m and 9 m respectively, while in Rambutan, Cempedak and Pulasan, it was 5 m each respectively. In addition, we also managed to observe many females (two of them with chicks) for 22 days. However, the females could not be individually be identified. The roosting heights chosen by males and females were not significantly different ( $t = -0.66, p > 0.05$ ). The average roosting height of males was 5.2 m, that of females 5.44 m. The roosting height chosen by females with chicks was slightly lower about 3.7 m to 4.0 m above the ground. The hens were observed to fly to the roosting tree earlier than their chicks. While roosting, the mothers kept their chicks under the feathers.

Male I and II left their roosting trees at significantly different times ( $t_{74} = 3.21, p < 0.05$ ). The average departure time of Male I was  $0710 \pm 1.10$  h and Male II was  $0702 \pm 1.05$  h. There was no significant variation in time of roosting and departing time between the male and female ( $t_{16} = 0.18, p > 0.05$  for roosting;  $t_{39} = -1.58, p > 0.05$  for departing time). Male stated to roost at about  $1914 \pm 2.17$  h whereas females went to roost at  $1913 \pm 2.20$  h. The average departing time from the roosting tree of male was  $0706 \pm 1.43$  h while that of female  $0709.54 \pm 1.38$  h.

Red Junglefowl departed from the roosting trees about 3 minutes before sunrise and went to roost

about six minutes before sun set (Table 2). Both times for departure from the roost and times for going to roost and sunset were positively correlated ( $r = 0.73, p < 0.05$ ). Similarly times for going to roost and sunset were also positively correlated ( $r = 0.40, p < 0.05$ ).

## Discussion

In the studied orchard, Red Junglefowl seemed to prefer Cempedak tree over other tree species for roosting. This is probably because Cempedak trees have fewer branches with leaves especially underneath the canopy. This might enhance the Red Junglefowl's ability to detect predators and to fly away under the canopy. Stray cats were common in the orchard area. Remains of a depredated male Red Junglefowl were found in the area. Johnson (1963) reported that the Red Junglefowl selected a bending cane which was well screened above and below, a location offering easy exit in the case of danger. According to Ward and Zahavi (1973) the main defense of some bird species lies in the selection of a site inaccessible to predators for roosting. The Red Junglefowl's preference for an open space underneath the canopy is probably an antipredator strategy during roost selection. We observed a White-bellied Sea-Eagle (*Haliaeetus leucogaster*) detecting Male I while he was crowing in a tree in the evening. The eagle perched near the Red Junglefowl's roosting site. When Male I left the roosting tree, the eagle immediately attacked him but he managed to escape. Red Junglefowl departed the roosting tree just before sunrise. This might be due to the fact that they preferred to start feeding early in the morning especially in the open areas (Bump and Bohl 1961). In the morning arthropods are inactive and can easily be caught by the Red Junglefowl (A.S. Sajap personal observation). Hoffman (1968) reported that Merriam's Turkey (*Meleagris gallopavo merriami*) departed the roosting tree before sunrise and went to roost before sunset. The time of departing the roosting tree was highly correlated with sunrise. The Red Junglefowl probably responds generally to light, as many other birds do (Davis and Lussenhop 1970, Gill and Dow 1985).

Female Red Junglefowl roosted earlier than their chicks. Noske (1985) concluded that female Varied Sittellas (*Daphoenositta chrysoptera*) roosted earlier than their off springs. Gill and Dow (1985) reported that the fledged birds follow old birds for roosting. This might be the learning process of the chicks to seek guidance from the mother for the selection of suitable roosting site to protect themselves against the predators.

In this study it was noticed that the roosting height for both males and females varied from about 5 m to

9 m in the orchard. However female with chicks roosted slightly lower (4 m). Bump and Bohl (1961) reported that the Red Junglefowl preferred to roost at a height of 6 m to 15 m in their natural habitat (Sal forest) in India. Similarly Johnson (1963) reported that a height of 5 m to 6 m was preferred in his studies of Red Junglefowl conducted in Thailand. This might be the most suitable roosting height for the Red Junglefowl to avoid both ground and aerial predators.

Chicks stayed with their mothers while roosting. These findings are consistent with Yasmin (1993) who reported that a female and yearlings of Peafowl (*Pavo cristatus*) roosted together in groups. This might be associated with patterns of social organization. Red Junglefowl chicks are dependent on their parents for up to two months. Sharma and Chandola-Saklani (1992) stated that female of White-crested Kalij pheasant (*Lophura leucomelana*) roosted with their chicks. This might be a form of protection against predators and adverse weather, such as rainfall.

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**Table 1 Number of days spent for roosting on each tree by Male I and Male II in Orchard area at University Putra Malaysia.**

Tree species	No of days	
	Male I	Male II
Cempedak 1	33	-
Cempedak 2	4	-
Cempedak 3	2	-
Cempedak 4	4	-
Cempedak 5	3	-
Cempedak 6	4	-
Cempedak 7	-	3
Rambutan 1	9	-
Rambutan 2	2	-
Rambutan 3	3	-
Rambutan 4	2	-

**Table 2 Roosting and departure time of Red Junglefowl, sunset and sunrise time in Orchard area at University Putra Malaysia.**

Sample	Time	Sample	Time
Sunrise time	7.11±0.008 a.m.	Sunset time	7.19±0.005 p.m.
Departure time	7.08±0.007 a.m.	Roosting time	7.13±0.014 p.m.