PERHILITAN

ISSN 0127-8126
Vol XXV 2008

The Journal of WILDLIFE and PARKS

Journal Of Wildlife And Parks, (2008) 25: 12-15

Note On Mating Behavior Of The Edible-Nest Swiftlet (*Aerodramus Fuciphagus*)

***Azman Othman & Siti Hawa Yatim**

Biodiversity Conservation Division, Department of Wildlife and National Parks (DWNP), Peninsular Malaysia, KM 10 Jalan Cheras, 56100 Kuala Lumpur.
*Corresponding author email: azman@wildlife.gov.my

ABSTRACT – Study on the mating behavior of the Edible-nest Swiftlets (*Aerodramus fuciphagus*) using direct observation was conducted at a bird house in Sepang, Selangor on the 20th until 21st December 2008. Photographs of the activities were taken and sorted according to mating sequences. There were four mating stages identified in this study namely; chasing, approaching, mating and separating. Mating behavior in the air took about 15 minutes.

Keywords - *Aerodramus fuciphagus*, mating behaviour, observation.

ABSTRAK – Perilaku mengawan burung layang-layang gua (*Aerodramus fuciphagus*) telah dikaji dan direkodkan dengan kaedah pemerhatian secara langsung di kawasan rumah burung di Sepang, Selangor pada 20 hingga 21 Disember 2008. Gambar-gambar telah diambil, dianalisis dan turutan perilaku mengawan di udara telah diperolehi. Terdapat empat peringkat perilaku berjaya dikenalpasti iaitu kejar-mengejar, mendekati, mengawan dan pemisahan. Jangkamasa proses mengawan yang direkodkan adalah 15 minit.

Kata kunci - *Aerodramus fuciphagus*, perilaku mengawan, pemerhatian.

The mating processes of the Edible-nest Swiftlet (*Aerodramus fuciphagus*) is one aspect of behaviour which have yet to be documented. No published description are available so far to describe this process. Most of the descriptions came from the bird house operators who have observed the process (Cranbrook and Lim, 2002; Budiman, 2006). Some operators claimed that the mating process of this species occurs in flight and also while nesting (Nugroho and Whendrato, 1996; Fahmin, 2008). Therefore, the objective of this research is to record aerial mating behavior of *A. fuciphagus*. Direct observation was done at the study site to detail out the mating sequences of this species in-flight.

Direct observation method was done at a bird house in Taman Dahlia, Sepang Selangor. The bird house is surrounded with papaya and oil palm plantation, an open area with shrub and fish pond. Leucaena trees or "petai belalang" (*Leucaena leucocephala*) were also abundantly found around the house which attracted a lot of insects. A fish pond located 500 m to the bird house provides water for the birds. The observation was conducted from the 20th until 21st December 2008. The weather at the study site was also noted. Recording was done from 0730 hours to 1900 hours by using a Nikon D300 camera with 70-300 mm 1:4 - 5.6G lens. Each frame was then analyzed and isolated.

Mating behavior during flight by swiftlets from different genera has been studied by several researchers. del Hoyo et al. (1999) studied the aerial mating behavior of Common Swift (*Apus apus*) and reported that the mating sequence starts with the chasing between the male and female. The female flies in front of the male with her wings held close to the vertical, causing a

TABLE 1
Stages of mating process of the Edible-nest Swiftlet (*Aerodramus fuciphagus*).

No.	Mating Process	Time (minute)														
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1.	**First Stage** Chasing															
2.	**Second Stage** Closing															
3.	**Third Stage** Mating															
4.	**Fourth Stage** Separation															

forward plunge. The male rapidly follows and as the female levels out into a horizontal flight on quivering wings, the male will attempt to mount the female in a shallow gliding descent. Mating occurs several times with the altitude plays an important part for successful mating.

Unlike the American White-throated Swift (*Aeronautes saxatalis*), del Hoyo *et al.* (1999) discovered that mating behavior starts when the pair flies directly towards each other, unite and then "pin-wheel" towards the ground for several seconds. Aerial mating behavior was also studied on the African Palm Swifts (*Cypsiurus parvus*) by van Gelder (1996) who observed individuals tumbling out of the same palm tree 22 times within 30 minutes, locked together and spiraling like a winged seed. The birds broke from physical contact just above the ground and then circled back into the palm fronds to start again.

Based on our observation on *A. fuciphagus*, four distinct mating stages were identified namely; (1) chasing (2) closing (3) mating, and (4) separation. All the stages took an estimated time of 15 minutes. Figure 1-4 demonstrate the sequences of mating process according to the four stages as documented using the still camera. Mating process started with the chasing stage. Several males were observed chasing a female and during this stage, a sharp chipping call was vocalized. In birds, chipping call were uttered frequently especially during breeding season and each vocalization can determine the types of behavior and the birds taxonomy (del Hoyo et al., 1999; Budiman, 2006; Fahmin, 2008). The study on the Common Swift (*Apus apus*) showed that the male utters a "*ree*" scream and the female produced a high-pitched "*swee*". As a result, together they both produced the distinctive call "*swee-ree*" (Kaiser, 1997).

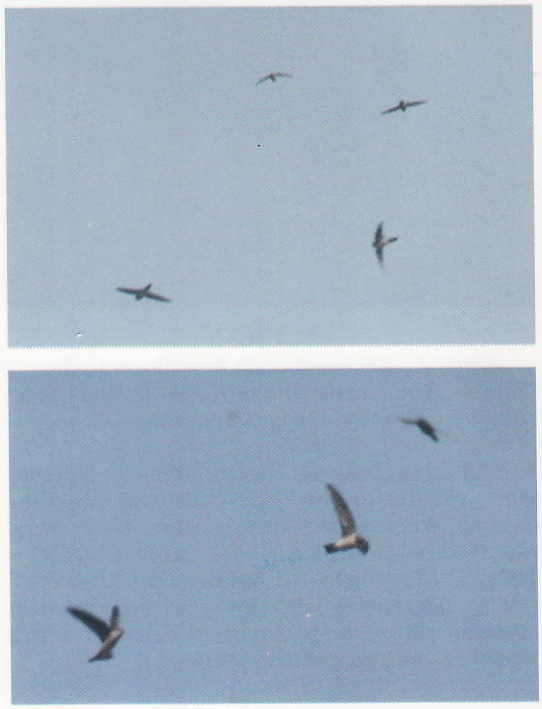

FIGURE 1
Stage 1 - Mating process starts with the chasing stage between several males and a female. Eventually, only one male will be accepted by the female.

FIGURE 2

Stage 2 - Accepted male flew closer to the female. The female then turn over its body as a sign that she is ready to mate

The chasing behavior lasted about 9 minutes when eventually only one male was observed chasing the female. This chasing ritual were observed happening in an open area about 50 – 100 m above ground. According to del Hoyo *et al*, (1999), the chasing behavior is believed to be an essential part of a synchronized behavior which would ensure successful breeding.

FIGURE 3

Stage 3 - Male started to get close to the female. Mating process started when the male positioned himself above the female.

A study by Fischer (1958) on the breeding behavior of Chimney Swift (*Chaetura pelagica*) described two phases involved in the chasing stage, namely the "early" and the "later" phase. The early phase took place during summer where the swifts break up into smaller groups comprising of four to seven individuals. This separation occurred as a preparation for the synchronized behavior which would ensure their breeding success (del Hoyo *et al.*, 1999). The later phase started in a trio-flying formation which consists of two males and a female chasing each other with a loud distinct call. This behavior would last for 5 minutes and covered an area of 150 m above ground. Finally, the pair-bonding occurred when the female produced a call and followed by the successful male. This behavior was also observed on Common Swift (*Apus apus*) (del Hoyo *et al.*, 1999).

In the second stage, the male flew close to the female and the female will then turn her body over as a sign of acceptance and this behavior took about 5 minutes. The actual mating process occurred in the third stage within 2 minutes where the pair flew directly towards each other, mate and then "pin-wheel" towards the ground and separate. The same behavior has also observed on the African Palm Swifts (*Cypsiurus parvus*) (van Gelder, 1996).

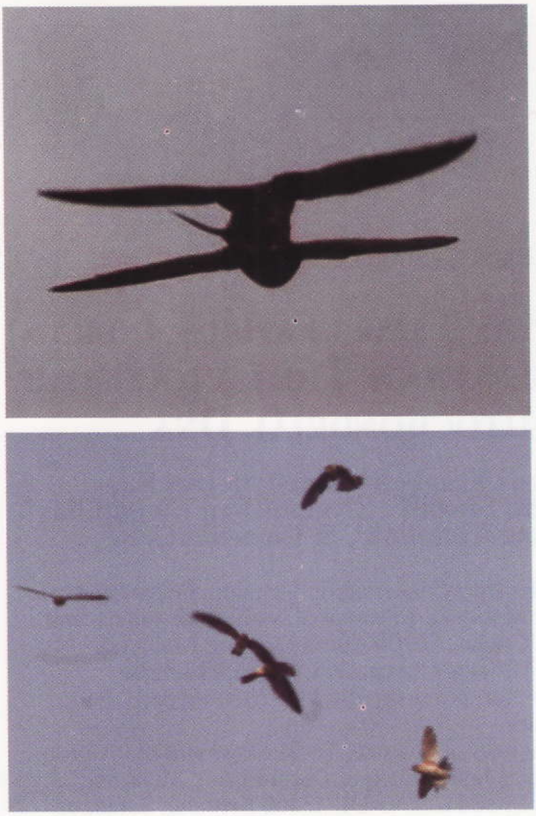

FIGURE 4

Stage 4 - Separation between male and female individuals took place after mating process ended

In stage four, after mating process took place, the pair started to separate. The mating process for the pair could occur up to 5 times a day from 0730 hours until 1900 hours. In comparison, mating between the African Palm Swifts (*Cypsiurus parvus*) occurs about 22 times within 30 minutes (van Gelder, 1996).

According to Marzuki, (1994), Lim (1999) and Budiman (2006), food resources such as insect abundance and the weather plays an important factor in determining the mating behavior as well as the breeding success of the swiftlets. Therefore, further studies on these factors are needed to enhance the mating success of this species. Overall, our observation was able to document four distinct stages in the mating process of A. fuciphagus.

REFERENCES

Budiman. A. (2006). *Pedoman Membangun Gedung Walet.* Jakarta: PT AgroMedia Pustaka.

Cranbrook, Earl of. & Lim, C.K. (2002). Swiftlets of Borneo: Builders of Edible Nests. Kota Kinabalu: Natural History Publications (Borneo).

del Hoyo, J., Elliot, A. & Sargatal, J. (1999). (Eds.) *Handbook of the World.* Vol. 5. Barn-owls to Hummingbirds. Pp 387-466. Barcelona: Lynx Editions.

Fahmin, M.A.A. (2008). *Memelihara Walet.* Pp 10-11. Synergy Media.

Fischer, R.B. (1958). The Breeding biology of Chimney Swift *Chaetura pelagica* (Linnaues). *New York State Museum and Science Service Bulletin*, **368**: 1-139.

Kaiser, E. (1997). Sexual Recognition of common swifts. *British Birds*, **90**: 167-174.

Kang, N. & Lee, P.G. (1991). The Edible-nest *swiftlets Aerodramus* spp. *Nature Malaysiana*, **16 (2)**: 44-51.

Lim, C.K. (1999). Sustainable Management and Conservation of the White-nest Swiftlets of Sarawak. *Hornbill*, **3**: 74-85.

Mardiastuti, A. & Soehartono, T. (1996). Current Situation of the Edible-nest Swiftlets in Indonesia: A Revision. (Ed.) *In Proceedings of the workshop on conservation of swiftlets of the genus Collocalia.* 4-7 November 1996. Surabaya, Indonesia.

Marzuki, H.A.F. (1994). *Prinsip-prinsip budidaya pemeliharaan burung walet.* Surabaya: Biro Pusat Rehabilitasi Sarang Burung Walet.

Nugroho, E. & Whendrato, I. (1996). The Farming of Edible-nest Swiftlets in Indonesia. (Ed.) *In Proceedings of the workshop on conservation of swiftlets of the genus Collocalia.* 4-7 November 1996. Surabaya, Indonesia.

van Gelder, M. (1996). Palm Swifts: copulation or territorial confrontation? *Mirafra*, **13**:70-71.