At what hour do Pied Flycatchers *Ficedula hypoleuca* lay their eggs?

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The nest-building and egg-laying periods overlap in some bird species, but not in others (Nice 1943). The Pied Flycatcher *Ficedula hypoleuca* belongs to the second category, although the egg-laying phase may follow immediately upon the nest-building; a female (V in Table 1) was seen to fetch nest material for the last time at 05.55 h and laid her first egg between 06.21 h and 06.47 h the same day. On this morning she brought nest material only four times.

Creutz (1955) and Curio (1959) published data on the time of day at which the Pied Flycatcher lays in Germany. According to Creutz, 54 eggs in 13 clutches were laid from before 05.00 h to 08.00 h, with a maximum at about 05.30–06.00 h. During laying the females spent 15–30 minutes in the nest-box. Curio recorded laying from about 05.30 h to 06.00 h. The minimum time spent by the laying female was only two minutes.

In the Willow Warbler *Phylloscopus trochilus*, Kuusisto (1941) studied egg-laying with the aid of mechanical recording. In two females it took place between 02.00 h and 04.30 h.

My own records were obtained in Lapfjärd, 62°25′ N 21°30′ E, by direct observation. At one nest my brother observed the laying. In all, 7 clutches were observed. The laying hour of the first egg was missed in all cases except one, because the commencement of laying was difficult to predict. The results are presented in Table 1.

It can be seen that the laying bouts varied between 20 and 74 minutes, the average being 34 minutes. The average laying bouts in single clutches varied between 26 and 44 minutes, averaging 34 minutes.

In the following text laying is assumed to have taken place halfway between the beginning and the end of the laying bouts given in Table 1. This procedure involves minor errors, but these are not serious enough to invalidate the use of the data thus obtained and presented in Fig. 1. The following conclusions regarding the laying hours seem justified:

1) In all studied clutches eggs were laid daily, the average interval being 36 seconds short of 24 hours, the shortest 22 h 41 min, the longest 25 h 7 min. In 5 out of 71 clutches studied by me, intervals of several days were established; 2 days were recorded 3 times, and 3 and 4 days once each. There were no indications of the weather causing these disturbances, as was the case in all clutches during a severe cold spell with snowfall in May 1944 (von Haartman 1951).

2) At the latitude of the observation site, sunrise becomes 24 min earlier from 29 May to 16 June, which corresponds to a daily difference of 1.25 min. (The hour of sunrise at Jyväskylä at the same latitude was used; data are given in the

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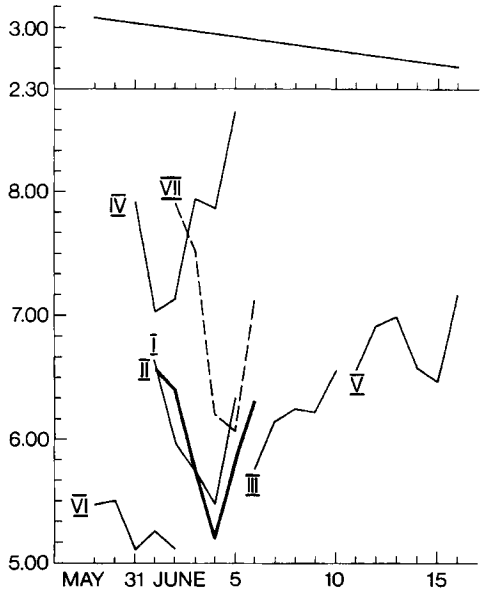

Fig. 1. Below: Laying hour of seven Pied Flycatchers at 62°25'N, 21°30'E. Above: Time of sunrise for the corresponding period and site. For details, see text.

almanac published yearly by the University of Helsinki.) This change is too small to explain variations in the laying hours of the present magnitude, where the maximal difference between the earliest and latest laying was a good 3,5 hours.

3) The date of laying did not influence the hour. For instance, of the two clutches with the earliest laying dates (IV and VI), one was the very earliest and the other the very latest with respect to laying hours. The clutch laid last of all was about medium as regards its laying hour.

4) The intra-individual variation was strikingly smaller than the variation between individuals. As the laying hours were not followed in any female for more than a single year, it is impossible to decide whether (as seems likely) they are individually characteristic.

5) Two females that started to lay on the same day, 29 May 1956 (I and II), showed considerable consistency with respect to their laying hour. This may indicate a regulatory effect of external conditions, such as the weather or available food.

6) The irregularity of laying hours in the Pied Flycatcher differs strikingly from the regularity observed by Kuusisto (1941) in the Willow Warbler: "Auffallend ist weiter die geringe, aber ganz regelmässige Verführung der Eiablage von Tag zu Tag. Diese Verschiebung läuft mit der Sonnenaufgang parallel, sie könnte vielleicht als eine Art von "Bahnung" der Eiablage regulierenden Prozesse gedeutet werden."

Yhteenveto: **Mihin aikaan päivästä kirjosieppo munii?**

Seitsemän naaraan munimisajat vaihtelivat huomattavasti sekä yksilöllisesti että yksilöiden välillä. Aikaisimman ja myöhäisimmän naaraan ero oli keskimäärin 2 1/2 tuntia, toisen ollessa poikkeuksetta toista myöhäisempi. Keskimäärin naaraat munivat 24 tunnin väliajoin. Laajemmassa aineistossa (71 naarasta) havaittiin kuitenkin 3 kertaa n. 2–4 vuorokautta kestäviä väliaikoja. Auringonnousun ajan muuttuminen ei vaikuttanut munimisen ajankohtaan.

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Table 1. Laying dates, times and laying intervals (min.)of each egg of the seven studied Pied Flycather females. ? = laying time not known.

Female and laying dates	Egg 1	Egg 2	Egg 3	Egg 4	Egg 5	Egg 6	Egg 7
I 31.V.–5 VI. 56							
Time	?	06.24–06.52	05.36–06.20	05.28–06.04	05.00–05.58	06.07–06.30	
Interval		28	44	36	58	23	
II 31.V.– 6 VI.56							
Time	?	06.33–06.46	06.13–06.37	05.33–05.58	04.58–0526	05.38–06.02	06.01–06.35
Interval		23	24	25	28	24	34
III 5 VI.– 10 VI.56							
Time	?	05.25–06.05	05.52–06.27	05.59–06.30	05.58–06.30	06.10–06.56	
Interval		40	35	31	32	46	
IV 30.V.– 4.VI.57							
Time	?	07.40–08.07	06.42–07.21	06.49–07.26	07.38–08.15	07.35–08.09	08.18–09.00
Interval		27	39	37	37	34	42
V 11.VI.–16.VI.57							
Time	06.21–06.47	06.42–07.10	06.36–07.24	06.23–06.57	06.18–06.38	06.51–07.28	
Interval (min)	26	28	48	24	20	37	
VI 28.V–2.VI.58							
Time	?	05.03–05.52	04.53–06.07	04.48–05.25	04.59–05.30	04.51–05.23	
Interval		49	74	37	31	32	
VII 2.VI– 7.VI.58							
Time	?	07.44–08.05	07.20–07.44	06.00–06.25	05.54–06.14	06.48–07.27	
Interval		21	24	25	20	39	

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