

SWIFTS' SLEEPING BEHAVIOUR

(Apus apus)

A Day in Nestlings' Life

by Ninon Ballerstädt

SLEEP – why do we sleep?

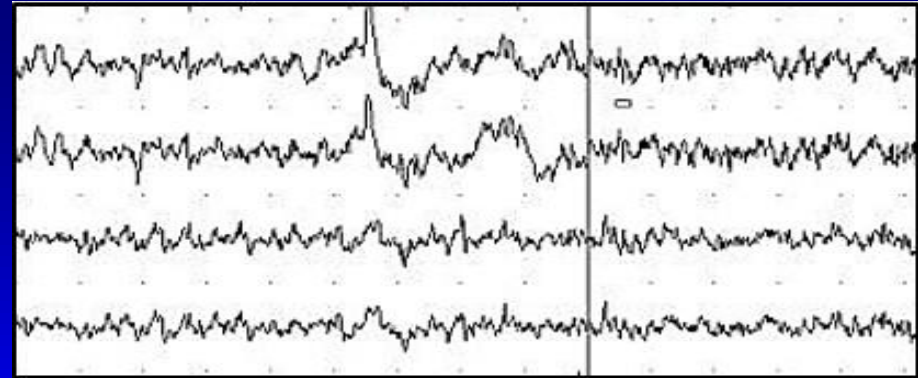
Sleep is essential, and as far as we know, needed by every creature.

A lack of sleep – sleep deprivation - leads to sickness and in worst case to death, not only in humans (mammals) but in birds as well.

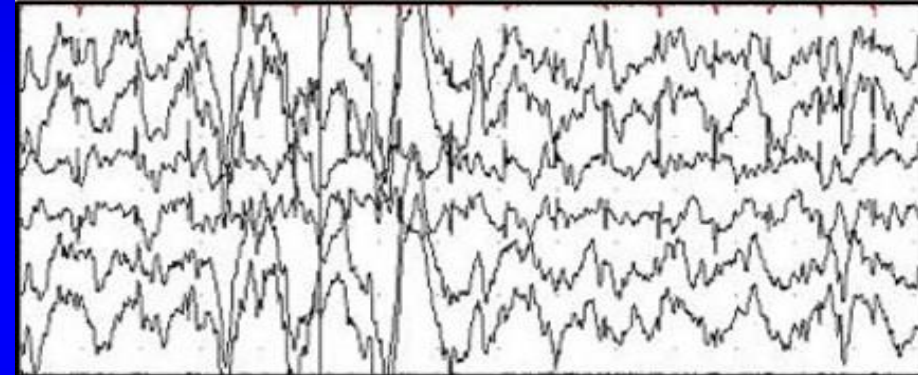


SLEEP – what is sleep?

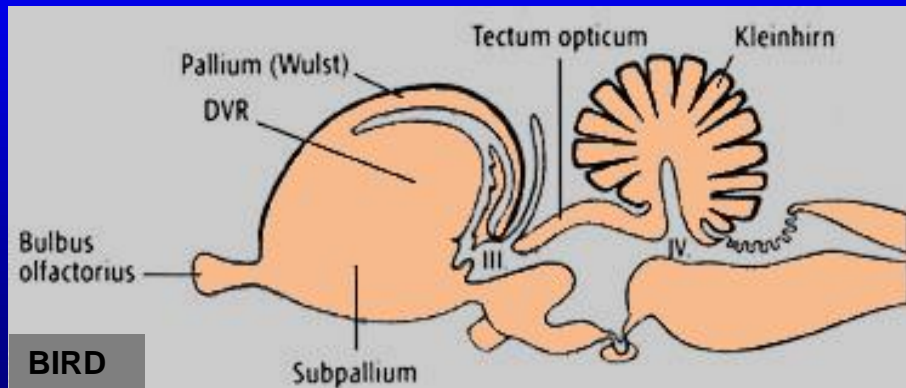
The most important processes of sleep are generated in the brain.



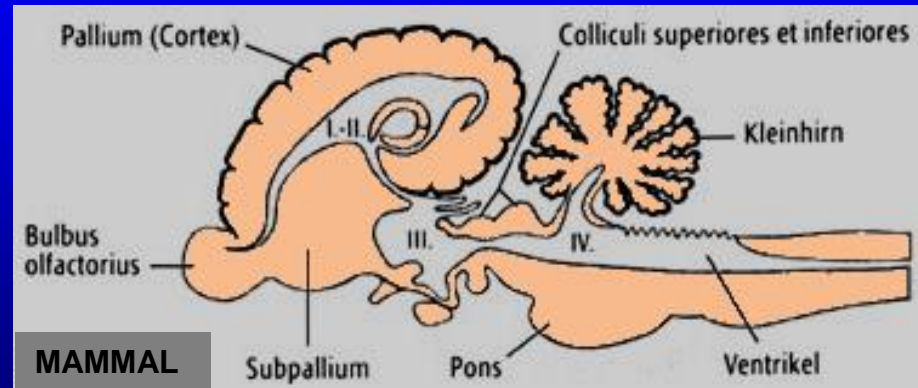
REM – Sleep („Dreaming“)



NonREM – Sleep /SWS („Deep Sleep“)



BIRD



MAMMAL

SLEEP – special adaptations

How do birds manage their migration in spring and fall, when they have to fly day and night without any stop-over while crossing barriers like Sahara dessert or oceans?

It seems that birds in „migration-mode“ are able to practice something like uni-hemispheric sleep - very similar as it is know from marine mammals (e.g. dolphins).

In some birds this type of sleep seems to be regular, e.g. in common swifts.

SLEEP – unihemispheric?

There is evidence to suggest uni-hemispheric sleep when animals keep one eye open while the other is closed.

The opposite brain region of the closed eye might be asleep:
If the right eye is closed the left hemisphere of the brain is resting.



An EEG would show proof of this assumption. But it is not easy to get.

Swifts are so special ...

- roosting in the air while flying
- even swift nestlings don't behave like other birds during night-time

Because I am not able to measure the EEGs of swift nestlings (it would be invasive and you need a permit from the government) I decided to observe them with an IR-camera. Even a video recording can deliver an insight into the „sleeping behaviour“ of these amazing birds.

Equipment

- 1 IR-camera
- video recorder (VHS)
- 180-min. video tape for 24 hours a day: fast motion with 8 pictures/second
- in total 30 days of video recording
- „nestbox“ with 3 (the first two weeks 5) nestlings

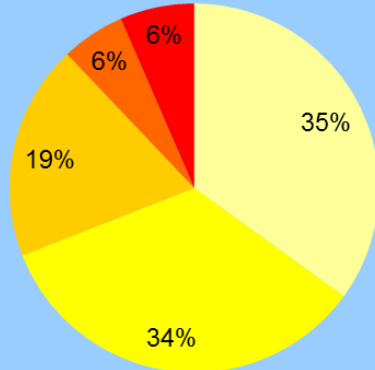
Procedure

- analysis of a 180-min. video tape
- at the beginning of every minute (hh:mm:00) the „behaviour“ of each swift was collected and documented in an excel data sheet
- „behaviour“ was divided in 5 classes with increasing intensity of activity:
 - 1) calm/no movement
 - 2) head movement/looking around
 - 3) preening/scratching/stretching
 - 4) walking around
 - 5) push-ups/wing-flapping
- additionally the status of the eyes (separated into the left and right eye) was recorded:
 - 1) opened
 - 2) half-opened
 - 3) closed

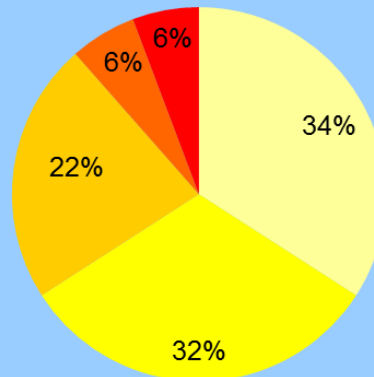
Results - Behaviour

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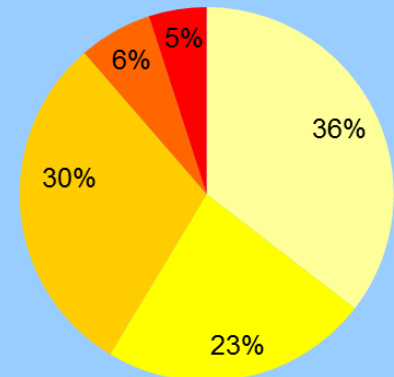
Swift No. 1



Swift No. 2

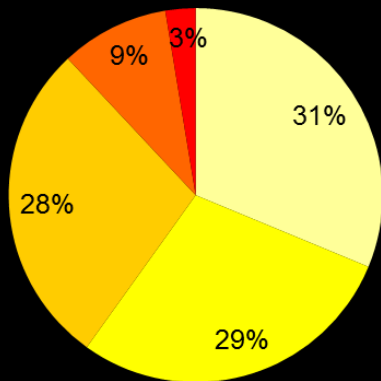


Swift No. 3

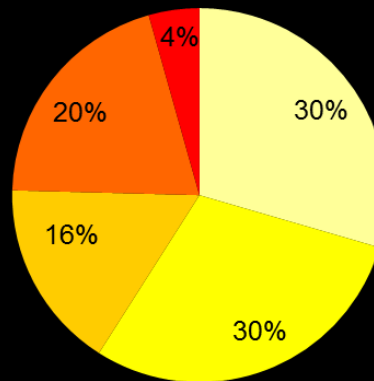


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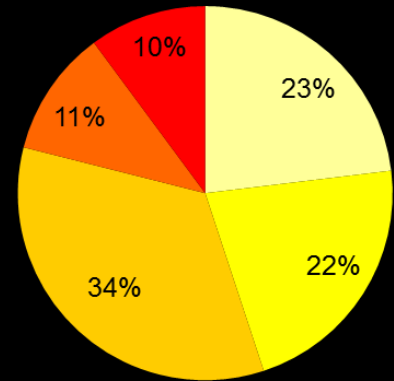
Swift No. 1



Swift No. 2



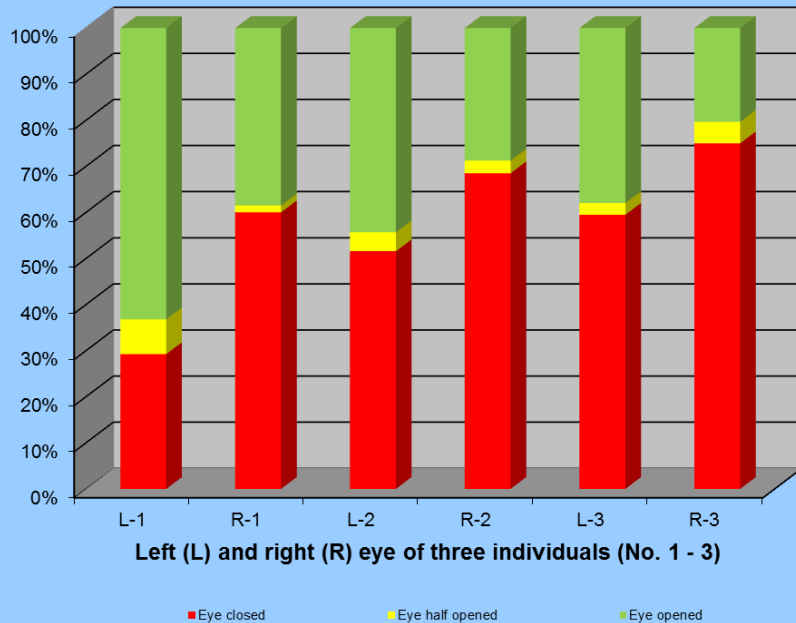
Swift No. 3



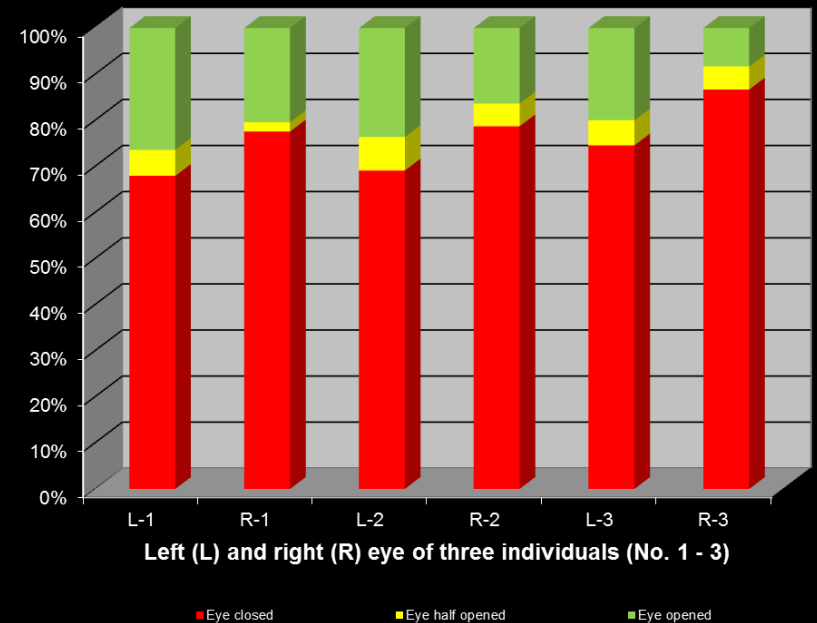
 CALM  MOVING HEAD  PREENING ETC.  WALKING AROUND  WING FLAPPING

Results – Eye Status

Swift-Eyes during day-time, 2007-08-12



Swift-Eyes during night-time, 2007-08-12



 EYE OPENED

 EYE HALF-OPENED

 EYE CLOSED

Bareisl-Film-Studios present:

The Night of the Swifts

with

Louis from Seeshaupt

Amadeus from Tutzing

Monika from Seeshaupt

The End

The Night of the Swifts

Actors

- Louis from Seeshaupt
- Amadeus from Tutzing
- Monika from Seeshaupt

Producer

- Alois Seidl

Director

- Ninon Ballerstädt

Assistant Director

- Kruschel

Camera

- Flori

Sounds

- sorry, silent film

Thank you for your attention!



Any questions???