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Scientists find features of mammalian sleep in [birds](#)

London | June 27, 2008 1:45:27 PM IST

American scientists have unearthed evidence of mammalian-like sleep in birds by studying zebra finches.

The [study](#) conducted by experts at the [Salk Institute](#) for Biological Sciences in La Jolla, California, attains significance as sleep had previously been assumed to be the sole preserve of mammals.

The researchers say that the appearance of features of sleep in [zebra](#) finches raises new questions about the complexity of the brains of birds, and about the evolution of sleep as scientists know it.

Mammalian sleep is characterised by distinct stages: slow wave sleep (SWS), intermediate sleep (IS) and rapid-eye-movement (REM) sleep, with a progression towards more REM sleep. EEG recordings of the brain's electrical activity also show specific landmarks called "K-complexes" and "spindles" during SWS.

Lead researcher Philip Low says that K-complexes had been observed only in mammals to date, and that is why neuroscientists assumed that a neocortex - an area of the brain involved in higher functions such as conscious thought and language - was needed to generate them.

During the study, he and his colleagues monitored five zebra finches during the night, tracking eye and body movements, and brain activity.

The researchers observed the presence of all the characteristics of mammalian sleep, including K-complexes, in the birds that lack a neocortex.

"The neocortex is at best sufficient, but not necessary for the production of these mammalian patterns," New Scientist [magazine](#) quoted Low as saying.

The researchers say that their findings suggest that mammalian-like sleep might have evolved earlier than previously assumed, and before higher brain structures like the cortex developed.

"These very specific characteristics of sleep that are observed in humans may go back to very ancient times - to birds," said Luca Finelli, a sleep expert at Novartis in Basel, [Switzerland](#).

Low said that it might also be possible that birds possessed a cortex-like structure, but that it looked different to the mammalian one.

"Perhaps they are able to perform the same computations that we can, but the structure is (different)," he said.

He further said that the findings raised another question as to whether birds use sleep the same way as mammals.

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"Are these signals linked with memory consolidation, and do they have anything to do with learning? If there's so much structure during bird sleep, is it possible that this structure is being used in a similar way?" asks Low.



Warning against over-interpreting the findings, Finelli said: "We don't know if these were actually K-complexes, or something that looks like them."

The researchers are now planning to study the underlying physical processes that generate such electrical signals in birds.

The current study has been published in the journal Proceedings of the National Academy of Sciences. (ANI)

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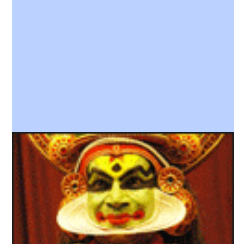
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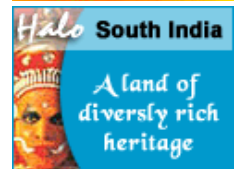
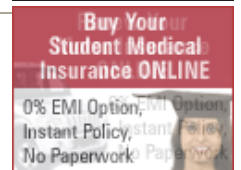
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