First discovery of a hibernating primate outside Madagascar

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The pygmy slow loris are the first known hibernatig primates outside Madagaskar. Credit: Tilo Nadler

Up to now, three species of lemurs on Madagascar were the only primates known to hibernate. Researchers at Vetmeduni Vienna in Austria, now show for the first time that another primate species that lives in Vietnam, Cambodia, Laos and China, the pygmy slow loris, also uses hibernation to save energy. The results were published in *Scientific Reports* this week.

Hibernation is a state of energy conservation during which body temperature and metabolism are drastically reduced. If this state lasts longer than 24 hours, it is called hibernation. Shorter periods are called daily torpor. There are many mammals that hibernate. However, among primates hibernation is a rare capability, as it had been previously found in three species of lemurs only. Lemurs exclusively live on the island of Madagascar, where they hibernate during the dry season, mainly to conserve water.

Southeast Asian pygmy slow lorises regularly hibernate

Now a team at the Research Institute of Wildlife Ecology at the Vetmeduni Vienna, collaborating with colleagues from the Vietnamese Endangered Primate Rescue Center, has discovered another primate that hibernates: the pygmy slow loris (*Nycticebus pygmaeus*). They belong to the so-called wet nosed primates, reach a body size of about 20 centimeter and a body mass of 400 gram. They live in Southeast Asia and are nocturnal, tree-living animals.

The researchers investigated the body temperatures of five pygmy lorises in fall, winter, and spring in a Vietnamese primate reservation. It turned out that both sexes repeatedly showed hibernation episodes lasting up to

63 hours between December and February. According to first author Thomas Ruf, the underlying reason is likely an endogenous annual clock, which induces hibernation at a time of the year when food abundance is decreasing. However, it is also the decreasing ambient temperature that triggers hibernation. "In Vietnam, where we studied the animals, there are pronounced seasons. Ambient temperature can drop to 5 centigrade. This is exactly when the probability of animals entering a hibernation episode was highest", Ruf explains.

According to Ruf, free living pygmy lorises are adapted to reduced food availability in winter. During the cold season food is sparse. Hibernation then helps to save energy. "There had been anecdotal observations of pygmy lorises that remained inactive for several days. Occasionally animals were encountered that felt cool to the touch. However, we discovered only now that the lorises actually hibernate" explains first author Thomas Ruf.

Hibernation as an overwintering strategy among primates

Previously, scientists had assumed that the environmental conditions on Madagascar may have been crucial for the occurrence of hibernation among primates. "Our new finding of a hibernating primate species outside Madagascar sheds new light on the evolution of hibernation", emphasizes Ruf. "Possibly, hibernation as an overwintering strategy was lost in other primates in Africa, Asia, and the Americas. However, perhaps hibernation is also used by further primate species, which have not been studied yet."

More information: Hibernation in the pygmy slow loris (Nycticebus pygmaeus): multiday torpor in primates is not restricted to Madagascar, *Scientific Reports* 5, Article number: 17392 (2015) DOI:

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