

# New theory on why male, female lemurs same size

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Male and female lemurs grow to the same size. Credit: Rice University/Photos.com

When it comes to investigating mysteries, Sherlock Holmes has nothing on Rice University biologist Amy Dunham. In a newly published paper, Dunham offers a new theory for one of primatology's long-standing mysteries: Why are male and female lemurs the same size?

In most primate species, males have evolved to be much larger than females. Size is an advantage for males that guard females to keep other males from mating with them, and evolutionary biologists have long

wondered why lemurs evolved differently. Some theories have suggested that environment played a role or that lemur social development was altered due to the [extinction](#) of predatory birds.

"Scientifically, this is quite a big question that researchers have debated for over 20 years," said Dunham, assistant professor of ecology and evolutionary biology. "I actually started doing research on lemurs as an undergraduate, working in Ranomafana (National Park in Madagascar), and the question about size monomorphism has bugged me since then."

In a paper featured on the cover of this month's [Journal of Evolutionary Biology](#), Dunham offers one of the first new theories on lemur monomorphism in more than a decade.

After an exhaustive review of the observational work done on lemurs, Dunham came to the conclusion that male lemurs do guard their mates, just like other primates. But unlike [gorillas](#) and other primates that fight for mating rights with females, male lemurs have evolved to passively guard their mates.

They do this by depositing a solid plug inside the female's reproductive tract just as they finish mating. The plug is deposited as a liquid protein but quickly hardens and stays in place for a day or two. Since many female lemurs are sexually responsive to males for only one day out of the entire year, the plug serves the purpose of preventing other males from mating with the female, while also freeing the male to mate with other females during the brief time they are available.

"If the female has a short receptivity period, as most lemurs do, then we hypothesize that this is likely to be an advantageous strategy," said Dunham, who co-authored the paper with Rice evolutionary biologist Volker Rudolf.

To test their hypothesis, Dunham and Rudolf examined 62 primate species and found that copulatory plugs were most likely to occur in species where female sexual receptivity was very brief and where males and females were the same size. This was true both for lemur species and for a few other species, like South American squirrel monkeys.

"Our idea needs further testing because it's new, but it's more parsimonious than some of the old theories, and we're very excited about looking into it further," Dunham said. "We've made some explicit predictions about the conditions where this strategy should be favored, so there are plenty of ways it can be tested."

Dunham said she hopes to travel to Madagascar within the next year to begin gathering data for a new project that will examine the impacts of climate change on [lemur](#) populations.

Lemurs evolved on the African island in isolation from other primates for 65 million years, and they are well-known for having odd traits not found in other primates. For example, some lemurs hibernate, storing fat in their tails, and all have toothcombs -- teeth that are perfectly shaped for grooming. Lemurs also differ from other [primates](#) in another key respect that has also stymied primatologists for years: The females are usually the dominant sex.

Dunham's investigations into the long-standing mystery of female dominance among lemurs led her to put forward another important theory last year. Published in the journal *Animal Behavior*, the theory suggests that female lemurs tend to dominate males because the females do all of the work in rearing the young and therefore have more will to fight and win.

"Game theory predicts that when the fighting abilities of two contestants are comparable, the outcome will depend upon the value that each

contestant places on the resources they are fighting over," she said. "In this case, the females clearly have more at stake, but the only reason the females are in a position to compete for dominance is because they're roughly the same size and strength as the males."

Source: Rice University ([news](#) : [web](#))

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