Facial attraction: Red-fronted lemurs recognize photos of their own species

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Wild red-fronted lemurs (*Eulemur rufrifrons*) appear to be able to recognize individuals belonging to the same species (conspecifics) from photographs, a study published in the open access journal *BMC Evolutionary Biology* suggests.

Researchers at the German Primate Center found that red-fronted lemurs spent significantly more time looking at pictures of conspecifics than at pictures of other, closely related species (heterospecifics).

Dr Hanitriniaina Rakotonirina, the corresponding author said: "We were surprised to find that the animals appear to be able to differentiate among closely related sister species. For example, males of the rufous brown lemur (*Eulemur rufus*) and the red-fronted lemur (*Eulemur rufifrons*) are difficult to distinguish by the human eye. However, we found that lemurs seem to be able to do it."

The time lemurs spent looking at pictures correlated with genetic difference; the more genetically different individuals were (which corresponded to how different they looked), the less time lemurs would spend looking at their pictures. Females showed a more pronounced response than males. This may indicate that female red-fronted lemurs perceive and respond to differences in fur patterns and coloration to recognize viable mates from their own species, enabling them to avoid costly interbreeding.

The results also suggest sexual variation in color vision. Whereas male

red-bellied lemurs are dichromatic (their eyes have receptors for two different colors), females can be dichromatic or trichromatic, allowing them to see three or more colors. However, the authors caution that the genetic tests required to test this assumption were not performed as part of this study.

Dr Rakotonirina added: "These findings are particularly interesting because *Eulemur* species actually hybridize in nature - that is they mate with individuals from other species - even though they are able to recognize individuals of their own species. Future studies in hybrid zones - places where two or more species occur together - are required to examine whether experience with closely related species affects their ability to discriminate between species."

To test their hypothesis that red-fronted lemurs would respond more strongly to pictures of their own species and that females would show a stronger response than males, the authors showed eight female and seven male adult red-fronted lemurs pictures of five species that didn't occur in the same area (they were geographically separated). These included red-fronted lemurs and three closely related species - white-fronted lemurs, brown lemurs and rufous brown lemurs - as well as genetically more distant red-bellied lemurs.

Experiments were conducted in Kirindy Forest, Western Madagascar, making this is the first study to test lemurs' ability to distinguish between conspecifics and heterospecifics in the wild, something that had only been tested in captive settings before.

The authors also found that red-fronted lemurs spent more time sniffing at pictures of their own species than pictures of other species. Dr Rakotonirina said: "The fact that they not only looked at the pictures but also showed sniffing behavior suggests that they use two different sensory modalities, smell and sight, at the same time to differentiate

between individuals of their own species from other *Eulemur* species. Hence, cross-modal recognition appears to play an important role for species recognition; an interesting subject to study in the future."

More information: Hanitriniaina Rakotonirina et al, The role of facial pattern variation for species recognition in red-fronted lemurs (Eulemur rufifrons), *BMC Evolutionary Biology* (2018). DOI: 10.1186/s12862-018-1126-0

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