

Evolution of eye colour may be related to ambient light



An image showing the range of primate eye colours across different ambient light conditions. Researchers analysed hundreds of photographs of 77 primate species and their findings suggest that it may be more evolutionarily advantageous to have blue eyes at higher latitudes. PHOTO: JUAN OLVIDO PEREA-GARCIA

NUS study on primates finds that species farther from equator have lighter eyes

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People often have different eye colours depending on where they originally come from. Like humans, primates boast varied eye colouration too.

Now, a group of scientists from the National University of Singapore (NUS) has found that these differences are related to the amount and quality of light in different geographical regions.

Dr Juan O. Perea-Garcia, a former NUS doctoral student and first author of the study, said this finding may explain variation in eye colour in human populations as well.

“In the past, we used to think skin colour in humans was driven by sexual selection... but today, it’s common knowledge that skin pigmentation has to do with the ge-

ographical region where our ancestors lived, with those living near the equator having darker skin to protect them from more intense UV radiation,” he said.

He added: “It’s logical that this global effect of light would have an impact on pigments in other tissues, not just skin.”

The researchers analysed hundreds of photographs of 77 primate species. The photos were measured for brightness and colour of different parts of the eyes.

The study also found that iris colour also shifted to become greener or bluer as populations were found farther away from the equator, where irises tend to be browner.

The study, published in *Scientific Reports* on Oct 15, found species living farther from the equator tend to have lighter conjunctiva, that is, the tissue surrounding the iris. The iris is the coloured tissue at the front of the eye that contains the pupil in the centre.

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This suggests that it may be more evolutionarily advantageous to have blue eyes at higher latitudes, said Professor Antonia Monteiro, who led the NUS research team.

As blue light is responsible for “tuning” the circadian clock by stimulating special receptors in eyes, bluer irises may allow more blue light to reach those special receptors in regions with less light, thus boosting energy levels.

Prof Monteiro, of the NUS Department of Biological Sciences, said: “What is exciting about this research is that by using the comparative method in evolutionary

biology, we find that many species of primates independently evolved bluer eyes at higher latitudes, just like what happened within our own species.”

She added: “This helps tip the balance towards an ecological, rather than sexual selection, explanation for the evolution of blue eye colour in humans, but sexual selection may still play a role.”

This finding is also part of growing evidence that a person’s eye colour affects his or her susceptibility to Seasonal Affective Disorder, said Dr Perea-Garcia, where those with blue and green eyes are less likely to suffer from depressed moods associated with the condition.

Prof Monteiro said: “Some members of our own species living in northern Europe evolved blue eyes... This colour might have given them an advantage in those areas of the world where there is little natural environmental blue light involved in mood regulation.”

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