

Elephants possess 'superior' sense of smell, study finds

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They have five times more olfactory receptors than humans, and the most of any animal characterized to date. Credit: Eric Green.

Elephants possess a sense of smell that is likely the strongest ever identified in a single species, according to a study by Japanese scientists out Tuesday.

The African elephant's genome contains the largest number of olfactory

receptor (OR) genes—nearly 2,000—said the study in the journal *Genome Research*.

Olfactory receptors detect odors in the environment.

That means elephants' sniffers are five times more powerful than people's noses, twice that of dogs, and even stronger than the previous known record-holder in the animal kingdom: rats.

"Apparently, an elephant's nose is not only long but also superior," said lead study author Yoshihito Niimura of the University of Tokyo.

Just how these genes work is not well understood, but they likely helped elephants survive and navigate their environment over the ages.

The ability to smell allows creatures to find mates and food—and avoid predators.

The study compared elephant olfactory receptor genes to those of 13 other animals, including horses, rabbits, guinea pigs, cows, rodents and chimpanzees.

Primates and people actually had very low numbers of OR genes compared to other species, the study found.

This could be "a result of our diminished reliance on smell as our [visual acuity](#) improved," Niimura said.

The research was funded by the Japan Science and Technology Agency and the Japan Society for the Promotion of Science Grants-in-Aid program.

More information: Niimura Y, Matsui A, Touhara K. 2014. Extreme

expansion of the olfactory receptor gene repertoire in African elephants and evolutionary dynamics of orthologous gene groups in 13 placental mammals. *Genome Res* doi: 10.1101/gr.169532.113

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