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**SMELLY SIGNALS**

**MICROBE RICH PASTES KEY TO HYENAS'**

**SMELLY SIGNALS**

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**Original Study (http://www.pnas.org/content/early/2013/11/05/1306477110.abstract)**

**Posted by Layne Cameron-Michigan State (http://www.futurity.org/author/michigan-state-cameron/) on November 12, 2013**

The smelly markings let by hyenas get their odor from a surprisingly diverse set of bacteria in the scent glands, researchers have discovered.

“When hyenas leave paste deposits on grass, the sour-smelling signals relay reams of information for other animals to read,” says Kevin Theis, the paper’s lead author and Michigan State University postdoctoral researcher. “Hyenas can leave a quick, detailed message and go. It’s like a bulletin board of who’s around and how they’re doing.”

“SCENT POSTS ARE BULLETIN BOARDS,  
PASTES ARE BUSINESS CARDS, AND  
BACTERIA ARE THE INK, SHAPED INTO  
LETTERS AND WORDS THAT PROVIDE  
INFORMATION ABOUT THE PASTER  
TO THE BOARDS' VISITORS.”



([http://www.futurity.org/wp/wp-content/uploads/2013/11/hyena\\_text\\_770.jpg](http://www.futurity.org/wp/wp-content/uploads/2013/11/hyena_text_770.jpg))

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Interestingly, it's the bacteria in pastes—more diverse than scientists had imagined—that appear to be doing the yeoman's job of sending these messages.

“Scent posts are bulletin boards, pastes are business cards, and bacteria are the ink, shaped into letters and words that provide information about the paster to the boards' visitors,” Theis says. “Without the ink, there is potentially just a board of blank

uninformative cards.”

Theis, who co-authored the study with zoologist Kay Holekamp, studied multiple groups of male and female spotted hyenas and striped hyenas in Kenya. Their study appears in the *Proceedings of the National Academy of Sciences* (<http://www.pnas.org/content/early/2013/11/05/1306477110.abstract>).

By using molecular surveys, they were afforded unprecedented views of the diversity of microbes inhabiting mammals’ scent glands. The researchers were able to show that the diversity of odor-producing bacteria in spotted hyena scent glands is much greater than historical studies of mammals had suggested.

The diversity, however, still consistently varies between hyena species, and with sex and reproductive state among spotted hyenas, Theis adds. Importantly, the variation in scent gland bacterial communities was strongly correlated with variation in the glands’ odor profiles, suggesting that bacteria were responsible for the variation in scent.

“There have been around 15 prior studies pursuing this line of research,” Theis says. “But they typically relied on culture-based methods, an approach in which many of the similarities and differences in bacterial communities can be lost. If we used those traditional methods, many of the key findings that are driving our research wouldn’t be detected at all.”

For the current paper, Theis’ team was the first to combine microbial surveys and complementary odor data from wild animals. The studies’ findings leave Theis eager to return to the field.

“Now I just need to get back into the field to test new predictions generated by this study,” Theis says. “The next phase of this research will be to manipulate the bacterial communities in hyenas’ scent glands to test if their odors change in predictable ways.”

The National Science Foundation supported the research.

*Source: Michigan State University (<http://msutoday.msu.edu/news/2013/bacteria-may-allow-animals-to-send-quick-voluminous-messages/>)*



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