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**PRESS RELEASE**

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**White rhinos communicate through their ablution habits**

A study by a University of Pretoria (UP) researcher into the ablution habits of white rhinos in the Hluhluwe iMfolozi Game Reserve, KwaZulu-Natal, has revealed that these animals use their place of defecation to communicate with each other and take decisions that can affect their ecology.

Their places of defecation are known as “middens” and are found throughout male territories, in specific areas like rhino paths and on the side of roads. Behavioural ecologist and Associate Professor in the Mammal Research Institute (MRI) and Department of Zoology and Entomology at UP, Prof Adrian Shrader (and his colleagues, Dr Courtney Marneweck and Prof Andreas Jürgens) discovered white rhino middens are serving as centres to pass on information.

A key question that has bothered Prof Shrader was, who was providing information at these middens and who was receiving it. To answer this, the frequency that individuals visited the middens had to be monitored. In a white rhino territory, there is one territorial male only, and one or two resident subordinate males that do not try to stake claim of the territory. Since male territories are smaller than the many overlapping female home ranges, several adult females and adolescents pass through them regularly.

To find out more about the information transferred, Prof Shrader’s team extracted odour samples from around the dung of specific individuals, using a micropump. He explains, “any odours, even odours from food or perfume, are nothing more than a combination of Volatile Organic Compounds (VOCs), and from the samples we collected, we could determine the actual compounds being released from the dung.” From these odours alone, white rhinos are able to pick up information about the age and sex of individuals that have defecated at the midden; and whether the females are in oestrus (heat) and whether the males were territorial or not.

To test these findings, Prof Shrader and his team created artificial dung odours of a female in oestrus and a territorial male to check if the VOCs that were picked up, did in fact transfer this information. Then, they tied dried grass together to mimic dung, and soaked it in liquid containing the scent of a female in heat. The fake dung was then placed in a midden and the territorial male’s responses to the scents were recorded, using a camera trap.

When the fake scents were placed in the midden, the number of visits there by the dominant bull increased, as well as the time he spent there. Prof Shrader says, “this is probably because he wants to check if he is picking up the right scent – because he hasn’t been able to find either a territorial male or an oestrus female in his territory.” These responses, along with other behavioural observations, confirmed their findings on the information that rhinos communicate at the middens.

The study also found that there are individual males that wander into territories and visit these information centres. They are potential threats to the dominant bull and are believed to be there to ascertain information about who owns the territory, how many females there are, and how much of a threat the dominant bull is. Once they have gathered this information from the midden, they may challenge the dominant bull for his territory.

Another finding from the study was that there are a number of middens throughout the territory used by the dominant bull. Dominant bulls manage to defecate in smaller volumes so that they can disseminate “information” over the middens of their territory. “It is quite remarkable to think a 2 300kg body is able to control his bowel movements so that he can ensure sufficient information is disseminated throughout his territory,” says Prof Shrader.

Prof Shrader explains that there is a specific spatial component to these middens. The dominant bull defecates in the centre of the midden only, and nowhere else. He will also kick the dung to enhance the scent, showing who is boss. Other rhinos tend to defecate around the edge of the midden. A challenger to the dominant bull’s territory might defecate in the centre, indicating that he is challenging the dominant bull.

Prof Shrader and his colleagues concluded that while white rhinos passing by use the middens, the dominant bull provides the most information, as well as gathers the most information from these areas.

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*Photos:*

*Photo of midden: please credit Prof Adrian Shrader*

*Photo of Prof Adrian Shrader: please credit Nicole Hagen-Shrader*

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