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Why Hippo Dung is the 'Life Force' of African Rivers

by Brian Stallard

What would you say is most important to Africa's ecosystems? Is it isolation, stability, or maybe biodiversity? According to a new study of Africa's essential rivers, it's none of those, as hippo dung is actually the "life force" that keeps the region vibrant and alive.

Of course, all those other factors we mentioned *are* very important, especially as the impact of humanity and climate change continues to affect delicate habitats all around the world. However a study recently published in the journal *Ecosphere* argues that even if humans weren't around to make things worse, a lot of animals and plant life would be in trouble if Africa's rivers didn't get their daily dose of hippo dung.

"The ecological importance of hippopotamus-vectored subsidies has been widely speculated, but we use tools from chemistry to directly demonstrate that these hippo nutrients are being directly picked up and used by aquatic animals," study author Douglas McCauley, of the University of California at Santa Barbara, explained in a statement.

It may sound a little off-putting, but McCauley and his team found that a surprising number of fish species in their native habitat of Kenya's Ewaso Ng'iro River (watch a webcam of the study site here) feed on the nutrients that hippo droppings provide. These feeding habits were later verified in a controlled lab setting.

Using stable isotopes - a class of natural chemical markers - the researchers also traced the flow of organic matter through the food pipeline, starting at the backend of a hippo who just spent its night out of water and grazing on tropical grasses. Stunningly, these lumbering animals can consume 80 to 100 pounds of the stuff per meal, resulting in a lot of nutrients finding their way into a hippo's home-river (where the animals spend up to 16 hours a day) by morning.

"Ecologists are really interested in how materials and energy flow across ecosystems, and here is a very clear boundary - aquatic versus terrestrial," McCauley added. "These two worlds are clearly distinct, but our research shows that wildlife such as hippos build important connections across these ecosystem gaps. Our study confirms that hippos are bringing a part of terrestrial ecology - nutrients and energy - into this other domain of rivers."

Interestingly, the researcher also learned that hippos become more important to river ecology when water levels are low, as less of that key 'organic matter' is diluted and washed away. That means that hippos could be essential to river recovery in the wake of dry seasons - which may become more common as climate change presses in. It is worrisome, then, that the hippo has been classified as a vulnerable species since 2006.

"The linkages that we highlight in our research illustrate that the fate of the hippo is intimately linked to the fate of whole food webs and to the functioning of entire ecosystems," McCauley pressed. "With hippo populations declining in Africa and water regimes changing rapidly, it is critically important that we understand more about the ecological role of hippos."

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Douglas McCauley collects water samples to analyze for natural chemical markers. (Photo by: Ian Warrington/U.C.S.B)