

# Bomb-sniffing elephants? Not so nutty, US Army says

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In this photo taken on Thursday, June 13, 2013 released by Adventures With Elephants, a handler identified as Sugar rides an elephant called Chishuru during a smell test in Bela-Bela, north of Pretoria, South Africa. Armed with a sharp sense of smell, dogs have a long history of detecting explosives for their human handlers. Trained rats sniff out land mines from old African wars. In Croatia, researchers have tried to train bees to identify TNT. (AP Photo/Graham Alexander, Adventures With Elephants)

Armed with a sharp sense of smell, dogs have a long history of detecting explosives for their human handlers. Trained rats sniff out land mines from old African wars. In Croatia, researchers have tried to train bees to identify TNT.

Now [elephants](#). New research conducted in South Africa and involving the U.S. military shows they excel at identifying explosives by smell, stirring speculation about whether their extraordinary ability can save lives.

"They work it out very, very quickly," said Sean Hensman, co-owner of a game reserve where three elephants passed the smell tests by sniffing at buckets and getting a treat of marula, a tasty fruit, when they showed that they recognized samples of TNT, a common explosive, by raising a front leg.

Another plus: elephants remember their training longer than dogs, said Stephen Lee, head scientist at the U.S. Army Research Office, a major funder of the research.

The research comes as elephant populations across Africa are threatened. Poachers across the continent have annually killed tens of thousands of elephants for their tusks in recent years because of a surge in demand for ivory in Asia, primarily China.

A pachyderm's potential prowess in detecting explosives was noticed in Angola, a country that many elephants had returned to after a 2002 peace deal ended a protracted war that saw many elephants being slaughtered. While there was peace, the land remained sown with mine fields. Some elephants seemed to intentionally avoid them, though it might not have been a scent that kept them away—they could instead have associated those areas with danger because elephants had died there in the past.



In this photo taken on Thursday, June 13, 2013 released by Adventures With Elephants, an elephant called Chishuru is rewarded by David, left, on the target mat for having completely a successful scent trial as colleague Sugar sits on top, in Bela-Bela, north of Pretoria, South Africa. Armed with a sharp sense of smell, dogs have a long history of detecting explosives for their human handlers. Trained rats sniff out land mines from old African wars. In Croatia, researchers have tried to train bees to identify TNT. (AP Photo/Graham Alexander, Adventures With Elephants)

Researchers were inspired to find out what was going on.

Near Bela-Bela, a town north of the South African capital of Pretoria, elephants named Shan, Mussina and Chishuru were administered smelling tests. The elephants detected TNT samples 73 out of the 74 times that they encountered its odor in a line of buckets, said Ashadee

Kay Miller, a zoology student at the school of animal, plant and environmental sciences at the University of the Witwatersrand in Johannesburg.

In the same tests, the elephants wrongly identified only 18 out of 502 buckets as containing TNT, amounting to a 3.6 percent error rate, Miller said. In the buckets containing TNT, the explosive was dissolved in acetone on filter paper; only the acetone and [filter paper](#) were put in the other buckets.

In a second set of tests, the elephants scored 100 percent, detecting TNT in 23 out of 23 buckets when "distractor odors" of tea, bleach, soap and gasoline were placed in the other buckets, she said.

Lugging around the huge mammals to mine fields wouldn't be practical, so one idea is to bring parts of the mine fields to them.

Unmanned drones would collect scent samples from mined areas; a trained elephant would then smell them and alert handlers to any sign of explosives, Hensman said. Lee, of the U.S. Army, said another aim is to "replicate that sense of smell" and incorporate it into electronic sensors that detect dangerous materials, building on research with dogs and rats.

Lee said researchers are also thinking of designing a sensor based on an elephant trunk, which puffs out air, stirring up an area, and then sucks in air to smell. Florida International University participated in the initial research, and it was done on a "shoestring" budget with volunteers, he said.

The findings did not surprise George Wittemyer, an assistant professor at Colorado State University's department of fish, wildlife and conservation biology. Wittemyer, who was not involved in the South Africa survey, has studied elephants in Kenya.

"Their world is primarily olfactory," he said. "The sensitivity is recognized as being unparalleled."

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