Geological Society of Australia
Earth Science Showcase

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Termites could help mining sector strike it lucky, new research reveals

The humble termite could become the Australian mining industry's best asset, bringing soil samples from far below the Earth's surface without the need for expensive drilling and minimising the environmental and cultural impacts of mineral exploration, new research by Australian geoscientists has revealed.

"Termites are nature's little drillers — they travel up to 30 metres below the Earth's surface in search of water and also in search of soil from which they build their nests" said geoscientist Anna Petts, speaking as part of the Geological Society of Australia's *Earth Science Showcase*.

Anna, a member of the Geological Society of Australia and a PhD student from the School of Earth and Environmental Sciences at the University of Adelaide, has been undertaking research into termites with geoscientists from the Cooperative Research Centre for Landscape, Environment and Mineral Exploration (CRC LEME) and Geoscience Australia.

"The difficulty in reaching deep-lying bedrock in some areas of Australia can make it very challenging to explore for minerals that are far below ground level, and in these cases mining companies usually have to undertake expensive preliminary drilling to determine whether precious commodities such as gold and diamonds are even there" Anna said.

"Termites, however, conveniently bring subterranean soil samples to ground level to construct or fix their mounds. So by simply taking a sample of a termite mound, geologists can gain a good idea as to what minerals and metals can be found in the ground beneath it — making it a much cheaper way to undertake preliminary soil testing for minerals exploration. More intensive testing can then be undertaken if a site looks promising.

"The success of this approach has already been proven in Africa — local villagers in some areas actually pan the soil from termite mounds to extract gold nuggets which can be up to 1cm in diameter, and in other parts of Africa soil sampling of termite mounds has been the first step in uncovering substantial diamond mines. Sampling mounds of earth created over many years by soil organisms is also well-documented from Ancient Times.

"So it really has been a case of assessing whether termites in Australia work in the same way — that is where our research has come into play and it has proved to be the case.

"I also learnt a lot about the fascinating world of termites during our research. Termite mounds are very humid, can be hundreds of years old, and are made from a mixture of plants, water, faeces, saliva and soil, with hollow living areas inside for the termites and a thick outer wall to regulate internal temperatures. Spinifex

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grass is stored in the living areas as chaff for later consumption (although African termites tend to do things a little differently, actually farming fungus conveniently within the mound for food and avoiding the need for 'hunting and gathering').

"Termite mounds are often also the sites for full scale wars between rival termite colonies, when one colony wants to take over a sought-after mound. They can also be the site of royal coups, when princess and prince termites decide to overrule the queen.

"Thankfully I only found out after our research that termite mounds can also be home to snakes and goannas, as the mounds are often the only reliable ecosystem present in semi-arid and arid areas!"

Anna and her colleagues centred their research in the Tanami Desert at the Coyote gold deposit — now an active gold mine along the Tanami Track in Western Australia — and at the Newmont Asia Pacific-owned Titania Prospect in the Northern Territory (located near Rabbit Flat roadhouse, also along the Tanami Track). Anna has also spent some time in Tanzania studying termites.

There has already been some interest from Australian mining exploration companies in the research.

Anna Petts is available for interview. Photos of Anna near termite mounds are also available.

Also available for interview: GSA Executive Member, Dr Jon Hronsky, who can speak about Earth Science in general and the wide variety of exciting career paths it can offer.

Media contact: Patrick Daley, Patrick Daley PR, tel: 0408 004 890.

Important request to media: The Geological Society of Australia is seeking to promote Earth Science and careers in Earth Science to the Australian public and most importantly students. Please assist us to do this by mentioning in any interviews or articles that this story is part of the Geological Society of Australia's *Earth Science Showcase*. **Members of the public interested in subscribing to this free service to receive regular media releases on Earth Science research can do so by emailing mediasubscribe@gsa.org.au** with the following details: preferred email address, name, state, age (optional), organisation (if any) and phone number (to assist with clarification of email details if required). **Please also mention that the Society's website, www.gsa.org.au, is a good source of information on Earth Science.**