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Fossil fame for UCT zoologist

Research into extinct moles may help save existing species

University of Cape Town zoologist Dr Gary Bronner has had a five million-year-old fossil of a mole named after him in recognition of his “major contributions” to understanding the biology of Africa’s endemic and enigmatic golden moles.

Dr Bronner, of the Department of Zoology, says he feels “rather bemused” at the honour. “Naming new fossil species after someone is not rare, and it is always great to have your research efforts acknowledged. But having a five million-year-old fossil named after you when you are in your forties, tends to make one feel rather like a fossil yourself,” he says.

The fossil, *Chrysochloris bronneri*, was recently discovered at the West Coast Fossil Park in Langebaanweg by Professor Rob Asher of Cambridge University. The presence of fossil golden moles at Langebaanweg has been known for several decades, but they had not been studied until Prof Asher visited South Africa in late 2008. The paper describing the new fossils was published in March 2010 in the online scientific journal *Palaeontologia Electronica*.

Bronner is a member of an international research team that includes Asher as well as fellow researchers from the University of Pretoria: Professor Nigel Bennett, Professor Paulette Bloomer and Dr Sarita Maree.

They are developing a comprehensive phylogeny (evolutionary tree) for the poorly studied and exclusively African family of mammals. This would improve conservation management: 10 of the 21 species are threatened with extinction due to sand mining, poor agricultural practices, increasing urbanisation, and predation by domestic cats and dogs.

The team recently published the first phylogenetic estimate for golden moles based on both molecular and morphological data. Bronner says that fully resolved phylogeny based on more species and data suites will be published later this year. The other author of the paper describing the new species is Dr Margaret Avery, formerly a palaeontologist at Iziko Museums in Cape Town and now retired.

Golden moles belong to the family Chrysochloridae. They are taxonomically distinct from the “true” moles of Europe (family Talpidae), and the rodent moles (family Bathyergidae) that are common in South Africa.

Most species are found only in South Africa. They live almost exclusively underground, in a variety of habitats including sandveld, grasslands, forests, swamps, deserts, or mountainous terrain. Like several other burrowing mammals, they have very small eyes (sight being of little use underground) and streamlined bodies without external ears (to reduce drag when burrowing through soil).

The most distinctive features of golden moles are short forelegs with powerful digging claws, very dense fur that repels dirt and moisture, and toughened skin, particularly on the head. They are called “golden” moles not because their fur has a golden colour but because of the iridescent sheen on their fur, which ranges from silver through bronze, golden and violet.

The fossil mole – dating back to the early Pliocene at least 5.2 million years ago – is closely related to the living Cape golden mole *Chrysochloris asiatica*, which is common in the southwestern Cape, including the Cape Peninsula, and the Northern Cape coastal plain.

Bronner explained that the characteristics that set the new fossil species apart from other golden moles are subtle, based on only partial skeletal remains. So, for example, the lower jaw bone of *C. bronneri* is more strongly developed than that of the *C. asiatica*, its closest living relative, or *C. arenosa*, another fossil species with which it lived at Langebaanweg.

C. bronneri shows a stout, enlarged lower second incisor lacking a posterior cusp, unlike other golden moles. The upper arm bone (humerus) is also proportionately longer (relative to its breadth) than in *C. asiatica*.

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