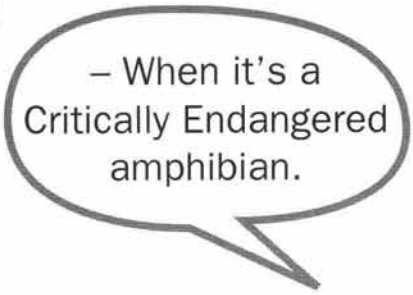
to name the cobra after him. Most would see it as a fitting tribute that Africa's largest spitting cobra should be named after such a larger-than-life character.

A number of interesting things emerge from this saga. One is that even well known animals can spring taxonomic surprises. And again the debate between the 'lumper' and 'splitter' schools of taxonomy raises its head. How great do the differences have to be between two animals that obviously had a common ancestor before you decide that they are different species? How far have the two forms moved apart on an evolutionary trajectory? Above all, though, this saga has shown us how little we know about our natural history.

The debate concerning ancestry and evolutionary trees may be fascinating, but it has little immediate relevance. It is the knowledge of what species we have, and where they live, that is of primary importance to conservation efforts on the ground. And even in a relatively well-explored country like Kenya, and among relatively well-known species such as the cobras, there is still an awful lot to be discovered.

Peter Bramwell, who used to run a snake park at Kilifi, told me he had seen a cobra on the Kenya–Tanzania border near Mkomazi that was black on the front half of the body and yellow on the back half. This does not match the description of any cobra that I know. Owen Sumbu, a herpetologist with the Nairobi Snake Park, told me of spitting cobras which he had seen at Kitale that were jet black above and below. And back in the 1970s, in the hill country southeast of Moyale, I collected a steel-grey cobra with a fine black throat ring. It escaped before I could get it to a museum, and I have never seen a cobra like it since. So, who knows what else might be out there? As Pliny the Elder famously remarked, '*Ex Africa aliquid semper novi*' – there is always something new out of Africa.



***Patrick K Malonza** and **John G Measey** tell*

The story of the **Kilima-mrota**

The small community of Sagalla Hill close to the town of Voi in Kenya's Taita-Taveta District was, a couple of years ago, plunged into a state of turmoil.

The cause of all the trouble was a competition. Sagalla Residents had been asked to come up with a new name for an animal they have always called *mng'ori* – earthworm. The competition was launched when scientists from the National Museums of Kenya (NMK), along with their European collaborators, discovered that this creature is really not an earthworm at all, but a legless amphibian known as a caecilian (Amphibia: Gymnophiona: Caeciliidae).

These animals can easily be mistaken for earthworms because they live in black soil, are long and thin, and even have rings around their bodies that resemble those of an earthworm. Yet they also have mouths, a skull, and a backbone. They may be subterranean predators, but they are not poisonous, and they pose no threat whatsoever to humanity. They are close relatives of frogs, but they have no legs. Their being mistaken for earthworms is ironic inasmuch as they *feed* largely on earthworms and termites.

In April 2006, IUCN, the International Union for Conservation of Nature, in conjunction with the Global Amphibian Assessment (or GAA), declared this but recently described species of caecilian to be Critically Endangered.

The introduction into the Sagalla area of exotic Eucalyptus trees has been bad news for this animal. Eucalyptus trees dry out the moist soils in which the caecilians live, and the leaf litter beneath such trees does not support the native earthworms and termites on which these tiny animals feed. With the spread of the Eucalyptus, the extent of what suitable habitat remains for the caecilians has been shrinking – fast.

When Eucalyptus trees are cut down, more Eucalyptus trees spring from their extensive root systems, making the problem worse, not better. People cannot get a good price for wood harvested from these trees, and water on the mountain is becoming very scarce.

Today, with so many people farming on Sagalla Hill, even the steepest of slopes are being cleared for cultivation. The inevitable consequence is soil erosion. And, as the fertile black soils are washed away, the caecilians are deprived of even more of their habitat. As Greshon Peter Kisombe, a Sagalla resident who works with amphibians, has aptly put it: "The interests

of the caecilians and those of Sagalla farmers are one and the same: namely moist, fertile soils."

In 2005, when – as part of a team of international scientists – we described the **Sagalla Caecilian** as a new species, we gave this animal the scientific name ***Boulengerula niedeni*** (after the German scientist Fritz Nieden, who has contributed a great deal to the taxonomy of reptiles and amphibians in East Africa). Yet on Sagalla Hill the animal was still being called *mng'ori* – earthworm.

This presented us with a very obvious conservation problem. In order to help conserve this species for future generations, we had to ensure that people in Sagalla recognise – and appreciate – it as something special. If the creature could acquire a local Kisagalla name, then the Sagalla people, we thought, might start recognising it for the important endemic species that it is. They would realise that they have something unique: something to be proud of.

In April 2006, we came up a novel solution: We would make the re-naming of this 'earthworm' the subject of a contest within the local community. The competition's launch soon afterwards attracted much interest in Sagalla. A great deal of discussion ensued. People remarked on how this animal was nothing like an earthworm, conceding that it had been a mistake to refer to it as such. Some even voiced their sadness over how the animal was no longer as abundant as it had been in the past, when rich black soils and water were more plentiful on the slopes of their mountain.

By the time the competition closed (on 8 October 2006), there were 336 entries to consider. The Sagalla community's Environmental Committee then set about the difficult task of selecting a winner. After much serious deliberation on the part of the judges, one clear winner did emerge. The winning entry came from **Shali Kiugha**, a Standard 6 pupil at the Wray Primary School in Sagalla, who suggested that the creature should be named ***Kilima-mrota***.

The prefix *Kilima-* features in the Kisagalla names given to several local animals. Most are elongated species found on, or in the soil, or among leaf litter. *Mrota* means to get thin. As Shali noted on her winning entry: "If it is exposed to sunlight, the caecilian will become very thin and may even die; for, like all amphibians, its skin must remain moist at all times, or it will not be able to survive."

On hand to present Shali's prize at a special gathering held on the grounds of the Wray Primary School on 9 November 2006 was the local area Sub-Chief, along with Forestry Department officials and representatives of the Sagalla Environmental Committee. The prize itself included a KSh 5,000 cash sum. Shali was congratulated on having "found a name that not only fits in well with the existing Kisagalla lexicon for animals found in the area, but which – at the same time – will also help give the Critically Endangered amphibian known to scientists as *Boulengerula niedeni* a unique identity.

"The Sagalla Caecilian," it was announced, "will in future always be referred to here, not as *mng'ori*, but as *Kilima-mrota*."

The extent of the local conservation awareness that this simple competition (which of course was also a lot of fun) has created has been very satisfying. And we look forward to a day when we can stage other contests that might help to

© PATRICK K MALONZA / NMK

'No simple earthworm, this': Acquisition of a local Kisagalla name has greatly enhanced the conservation prospects, at the community level, for the Sagalla Caecilian, *Boulengerula niedeni*, a Critically Endangered endemic species of amphibian that until now, unfortunately, has been mistakenly referred to – and treated – as a mere earthworm.

Winning words: Shali Kiuga, then a Standard 6 pupil at Sagalla's Wray Primary School near Voi in SE Kenya, receives her prize for having come up with the vernacular name – *Kilima-mrota* – adjudged to be most apt for the hitherto unheralded Sagalla Caecilian.

draw attention to the plight of similarly threatened endemic animals. Everybody in Sagalla now knows that this caecilian is special – and that it is most definitely *not* an earthworm.

The competition is just part of a much larger study we are carrying out with funding from Conservation International's Critical Ecosystems Partnership Fund (CEPF). Our study addresses amphibian biodiversity in Kenya's Taita Hills area (including Sagalla, Dawida, Kasigau, and Mbololo), which form part of the 'Biodiversity Hotspot' encompassing the Eastern Arc Mountains and Coastal Forests of Tanzania and SE Kenya.

Habitat loss threatens the survival of many of the range-restricted endemic species – including the Sagalla Caecilian, *Kilima-mrota* – that occur in this zone. The CEPF project has done much to expand our understanding of the zone's existing biodiversity, while at the same time helping to promote development of sustainable ways of conserving natural environments for people, animals, and plants.

Our role has been one of monitoring the amphibian fauna, both in remaining indigenous forests and in the exotic plantation forests and *shambas*. Already, we have recorded marked differences in species composition, even between sites that are not widely separated. In what is left of the natural forest on the Taita Hills, there are still many species to be found that occur nowhere else on Earth. The exotic plantations are generally poor biologically, but in the *shambas* there are still areas with indigenous trees enough to provide shade, and with enough clean water and moisture to support amphibian populations.

Another aspect of the project involves monitoring the effects on amphibian populations of the replacement, with stands of indigenous trees, of some of the exotic plantation forests, a joint Ministry of Forestry and CEPF undertaking. For a number of amphibian species – including the recently discovered (and named) *Kilima-mrota* – the rehabilitation of natural forest on the Taita Hills has potentially life-saving consequences, from which the area's many local farmers also stand to benefit immeasurably.

At present, those remaining patches of indigenous forest on the Taita Hills are far apart, making it impossible for small frogs and caecilians to travel between them. If enough indigenous trees can be planted, and if local Taita farmers go on supporting this initiative on their own *shambas*, then perhaps 'forest corridors' might take root, re-connecting long-isolated fragments of habitat.

Photo: © PATRICK K MALONZA / NMK

Caecilians still account for just five of the 96 described amphibian species known to occur naturally in Kenya. Study of this fascinating group is in its infancy, however, and there are likely to be others – *several* other species, perhaps – that are still awaiting discovery. As it is, we already know of one new species that is in the process of being described, and which doubtless will be the subject of an article in a future issue of SWARA. A single specimen of this new species was collected in February 2007 by the well known herpetologist Stephen Spawls from the edge of the Ngaia Forest, near Kenya's Meru National Park.

For the record, the other four species that have been described, besides the Sagalla Caecilian, are: the **Tana Mud-dwelling Caecilian**, *Schistometopum gregorii*, the **Taita Hills Caecilian**, *Boulengerula taitanus*, the **Changamwe Lowland Caecilian**, *B. changamwensis*, and the **Tana River Caecilian**, *B. denhardti*.

Both *S. gregorii* and *B. denhardti* are restricted in Kenya to the Tana Delta region. *B. taitanus* is found on the Taita Hills, including the Dawida forest block and Mount Mbololo; while *B. changamwensis* (*See report in SWARA Vol. 23 No. 3 /July–September 2005; pp. 34–35*) is found around Mombasa and along the Kenya Coast. Like the Sagalla Caecilian, both *B. taitanus* and *B. denhardti* are thought of as Kenyan endemics. The other two species are treated as 'near endemics' (meaning they occur, or might occur, in northern Tanzania as well). Only *B. taitanus* is locally abundant and well studied.

If you find (or think you might have found) one of these burrowing, worm-like amphibians in a part of Kenya that is not listed above, then the chances are: it could be a new species! So don't be put off by those who tell you that what you are looking at is really "just an earthworm". Who knows? It could well be a Critically Endangered caecilian! To find out, you can always bring a specimen, complete with all the details of where you collected it, to us – at the Herpetology Department of the National Museums of Kenya in Nairobi.

Patrick K Malonza is Head of the Department of Herpetology at The National Museums of Kenya in Nairobi. He can be reached via < pkmalonza@yahoo.com >. **Dr John Measey**, of the University of Antwerp in Belgium, can be reached via < john.measey@ua.ac.be >. A copy of their scientific description, *A new species of* Boulengerula *Tornier (Amphibia: Gymnophiona: Caecilidae) from an isolated mountain block of the Taita Hills, Kenya*, which appeared in *Zootaxa* 1004: 37–50, is posted on < http://john.measey.com/pdf/Muller_et_al_2005_niedeni.pdf >.