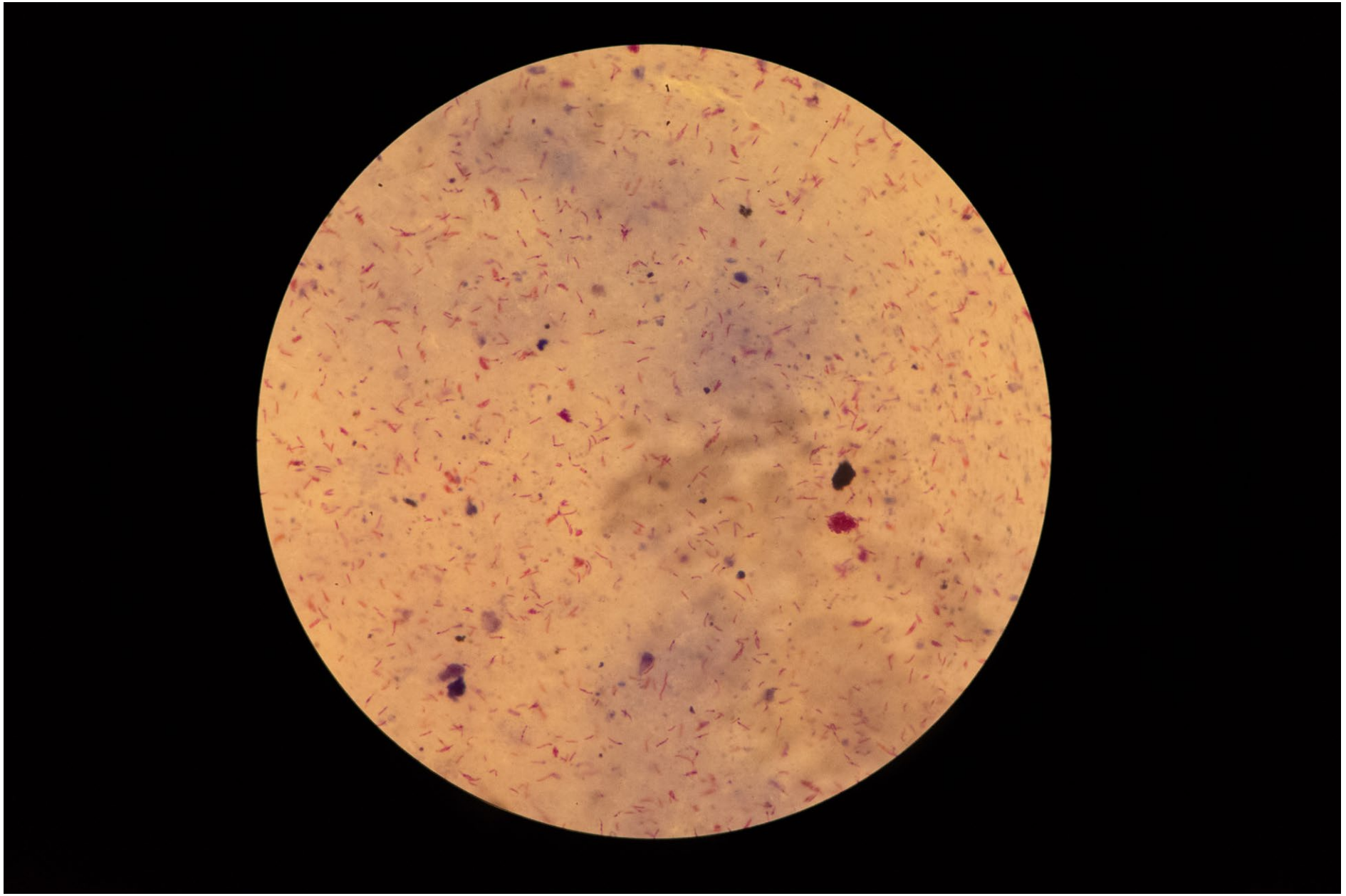
TANZANIA

HeroRATs

by Karl Mancini



Morogoro. Microscope analysis of a hospital sample from a patient with *Mycobacterium tuberculosis*, detected in the laboratory by the HeroRATs. The sample shows visible signs of numerous bacteria.

HOW AFRICAN GIANT POUCHED RATS ARE HELPING FIGHT TUBERCULOSIS AND DETECT LANDMINES

Alongside many better-known animals, Africa is also home to the giant pouched rat *(Cricetomys Gambianus)*, a creature that possesses an extraordinary sense of smell. Belgian NGO APOPO is harnessing the huge potential of this skill in two very different fields: the detection of landmines and the identification of tuberculosis.

The training of the so-called “HeroRATs” is conducted in collaboration with the Tanzanian armed forces in the heart of the country, in Morogoro, where the “click-reward” method is used to teach the animals to scratch on top of the landmines they detect. In difference to conventional metal detectors, the rodents are fast and efficient. In terms of training, the best specimens, which can reach a weight of up to one and a half kilos, are sent to conflict zones or countries that are still mined, such as Mozambique and Cambodia. The problem of landmines, in fact, is a serious one that affects around 60 countries around the world and every year causes thousands of injuries and fatalities.

Every year, worldwide there are around 1.4 million deaths from tuberculosis, the world’s most lethal infectious illness. The HeroRATs are capable of “sniffing it out” through samples of mucus or catarrh taken from suspected positive cases, thereby speeding up rates of clinical detection by 40% and refining a method that in much of the world is still slow and inaccurate.

Morogoro. Microscope analysis of samples of expectorate. These particular samples have been identified by the rats as testing positive for tuberculosis.

Morogoro. Every morning before training in the minefield, the staff from APOPO weigh the rats taking part in the exercise.

Morogoro. At the APOPO training centre, a young mouse enjoys a meal of mashed avocado and banana, a particular favourite of these animals.

Morogoro. APOPO trainers pose with HeroRATs.

Morogoro. At the APOPO training centre, the working day for the HeroRATs starts early: the rats are nocturnal animals and are very sensitive to the heat.

Morogoro. A researcher at the NGO APOPO positions a rat in the cage at the laboratory during a training session, where the animal will learn to recognize the samples of human expectorate infected with tuberculosis.

Morogoro. A harness used by HeroRATs during daily practice at the APOPO training centre.

Morogoro. A trowel used by APOPO trainers to position devices filled with TNT. These devices simulate the landmines that the HeroRATs learn to detect during the exercise.

Morogoro. A trainer positions a harness onto the rat in preparation for the day's practice at NGO APOPO's training minefields. Every day from Monday to Friday the rats train to detect landmines.

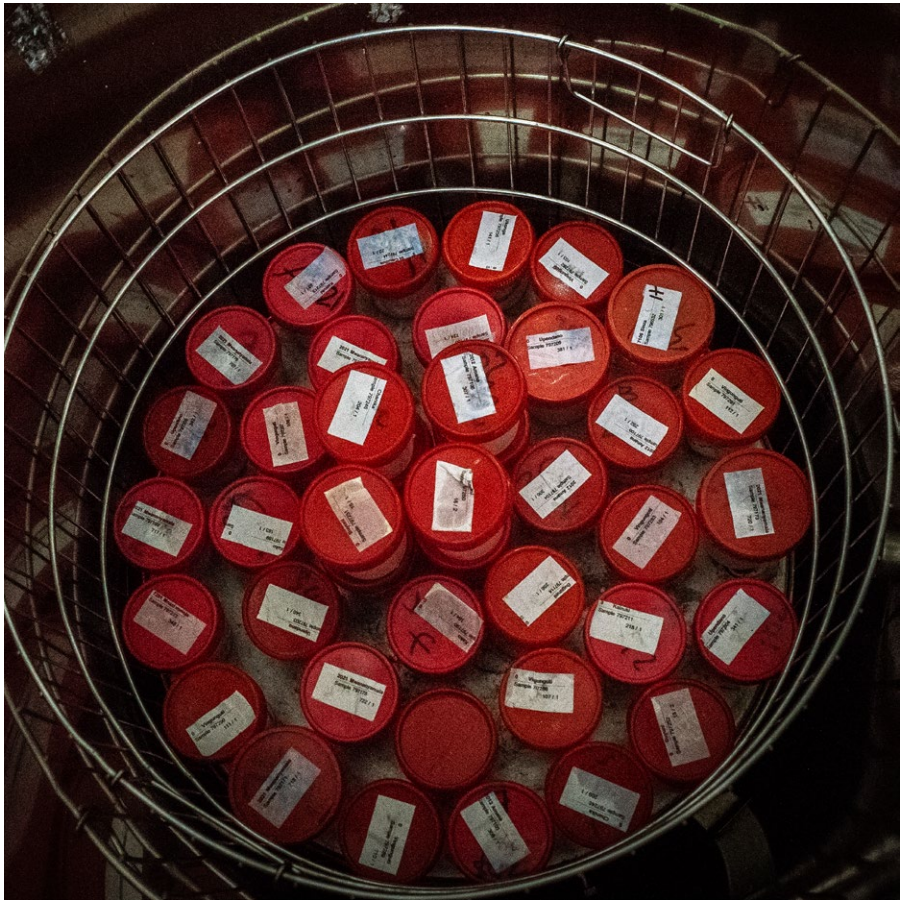
Dar es Salaam. Left: a TB patient who has lost 20 kg in one month attends a check up at the Tambuka Reli Hospital. Right: A lung X-ray of a patient suffering from tuberculosis.

Patients wait to see a doctor at the tuberculosis ward at the Tambuka Reli Hospital in Dar es Salaam. Some of the patients receive anti-tuberculosis medication.

Morogoro. A juvenile mouse explores its surroundings at the APOPO training centre.

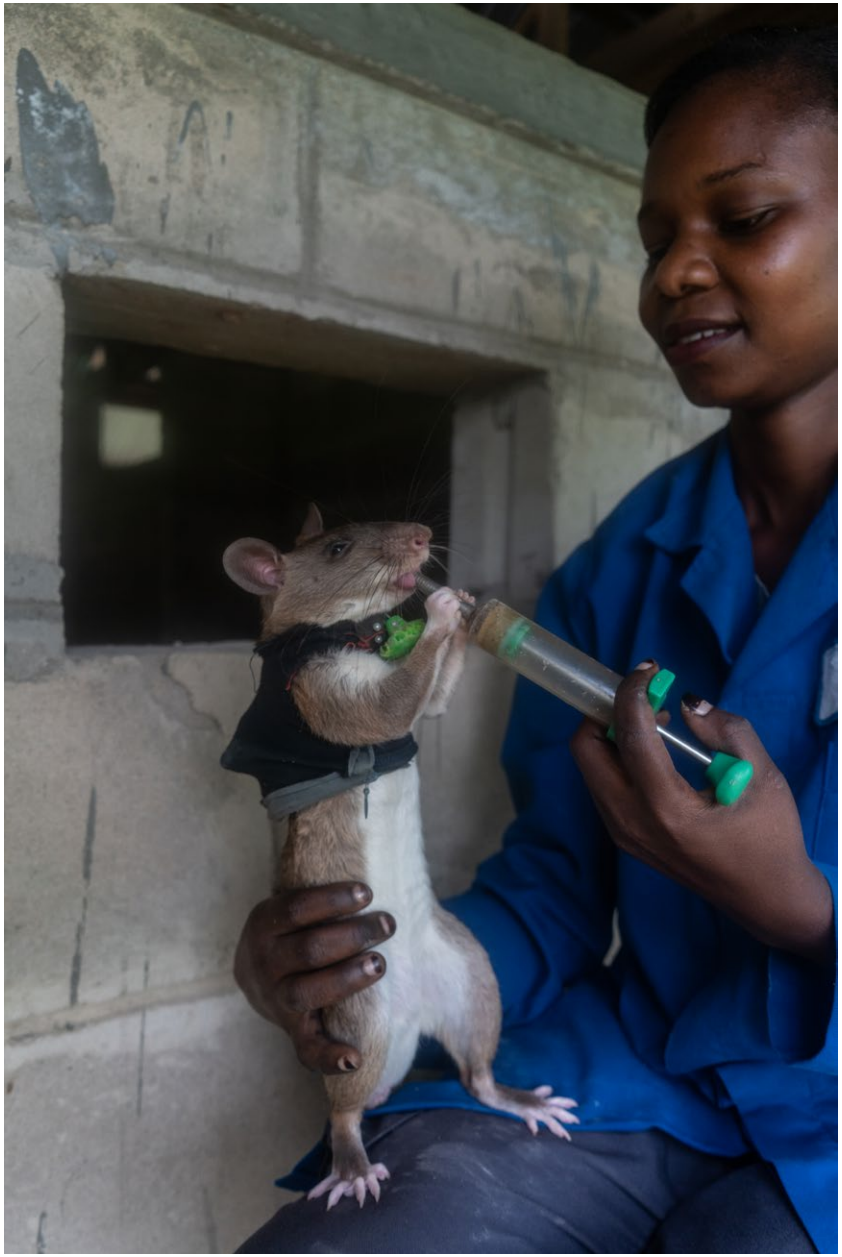
Morogoro. A HeroRAT during daily practice at he APOPO's training minefields. Every day, from Monday to Friday, the rats are trained to recognize landmines. The skill level of each animal depends on the type and duration of its training.

Morogoro. Antida Ngongi, a lab technician at NGO APOPO.



Dar es Salaam. Positive tuberculosis samples are about to be autoclaved.

Morogoro. A view over the town centre.



A rat receives a reward at the end of a “Save & Rescue” exercise at NGO APOPO. The HeroRATs that reach an advanced level of training are assigned to special missions where the rats offer their help to identify people trapped in rubble. As soon as the rat finds a person it signals to its handler by touching a device worn around its neck.

Morogoro, NGO APOPO's training centre. A rat undergoes daily training in the minefield.

Dar es Salaam. Slides ready for observation under the microscope. These particular samples have been identified by the rats as testing positive for tuberculosis.

Morogoro. “Indication Training”. Before venturing into the minefields, the HeroRATs are trained in small spaces at the APOPO training centre where they familiarize themselves with the terrain and learn to locate a target sample in a restricted space. The sample contains TNT explosive, which is what the rats learn to recognize. Once they detect the sample, the animals receive a reward.

Morogoro. A rat in a cage at the laboratory during a training session at NGO APOPO, where the animal will learn to recognize the samples of human expectorate infected with tuberculosis.

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