

Getting the message across: The Imbovane Outreach Project



Members of the Imbovane project team teaching learners about ant morphology during classroom lessons. Image: Imbovane Outreach Project



Learners attending Imbovane learner workshops using microscopes to identify invertebrate samples. Image: Imbovane Outreach Project



Learners attending Imbovane learner workshops are introduced to invertebrates in different ecosystems. Here they are exploring aquatic invertebrates sampled from a nearby river. Image: Imbovane Outreach Project

Dorette du Plessis and **Sophia Turner** tell us how ants are being used to teach learners about biodiversity

South Africa is globally renowned for its rich diversity of plant and animal life. Among the variety of ecosystems, South Africa has three internationally-recognised biodiversity hotspots: the Maputo-Pondoland Albany, the Fynbos and the Succulent Karoo biomes. For national and international scientists, the country provides many opportunities to study and observe different ecosystems. However, in a country where resources are scarce and science education is a privilege, we as scientists need to take science to the public.

Communicating science

Education, particularly environmental education, is essential if we want to protect biodiversity. While the scientific community has an understanding of the threats to biodiversity, the vast majority of South Africans are not familiar with biodiversity, biodiversity loss and the pressures on our ecosystems. If we want the public to support conservation efforts, we need to put initiatives in place to educate the public about the environment. The participation of the public in research activities is one way of increasing awareness of and appreciation for biodiversity. This is known as citizen science, and gives members of the public or non-scientists opportunities to get directly involved with scientific research and to help create knowledge.

School-ground science

In 2006, the DST-NRF Centre of Excellence for Invasion Biology (C.I.B) decided to take biodiversity science to the people through the development of a science outreach project: The Imbovane Outreach Project.

In essence, Imbovane (meaning 'ants' in isiXhosa) takes biodiversity to schools in the Western Cape, particularly to schools in communities with little or no previous exposure to biodiversity science. The Imbovane Outreach Project gives learners a chance to participate in a

scientific project, the results of which are used to monitor changes in biodiversity, specifically ant diversity. Learners and educators from partnership schools receive training and tools to collect their own biodiversity data in the field and to use the data collected in the classroom. Learners collect ants at sampling areas located in modified and pristine areas. The modified areas are on the school grounds and show learners how the disturbance of a habitat affects ant communities when comparing their results to that of a pristine site, which is in a nearby nature reserve or national park. By using areas with different levels of disturbance and observing the effects on the ant diversity, learners get a better understanding of biodiversity and biodiversity loss.

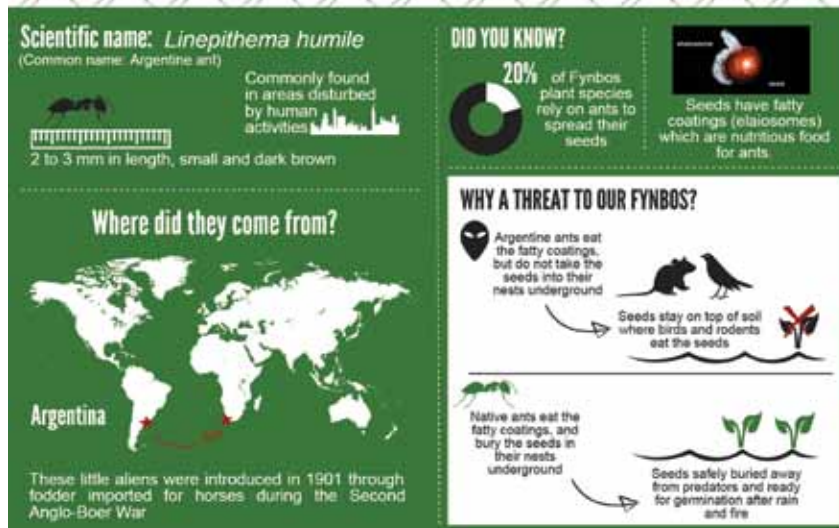
The presence of the invasive alien Argentine ant (*Linepithema humile*) in ant communities on school grounds teaches learners about invasive alien species and their effects on local biodiversity (see Box 1 and infographic). The learners' experience with sampling and data collection is supported by lessons presented by the project team. These lessons align with the national Life Science curriculum focusing on biodiversity, critical thinking and scientific inquiry. The tools provided to the partnership schools include a high-quality microscope, a computer, a data projector, an ant reference collection, and an electronic guide to identify the ants.

Impact of science outreach

The value of science outreach projects such as Imbovane, lies mainly in its contribution to science and biodiversity education at school level. The project uses an 'experiential learning' approach, which integrates the appreciation of biodiversity and the knowledge of how science works into the lives of learners who are not regularly exposed to science. Through the course of

TINY THREATS

Alien ants in our Fynbos



Box 1. Tiny threats – alien ants in our fynbos

The Argentine ant (*Linepithema humile*) is a tiny black-brown ant from South America, which has already established itself in many parts of the world. This little invader usually occurs in areas that have been disturbed by human activities, for example, gardens, parking lots, etc. and is often present in many of the school grounds that the limbovane Outreach Project monitors.

So how do Argentine ants threaten our ecosystems? Many plant species in fynbos ecosystems rely on native or indigenous ants to spread their seeds (this is known as myrmecochory). An indigenous plant has an oily nutrient-rich layer around their seeds, which attracts ants. Indigenous ants take the seeds of these plants into their nests underground, where the seeds are protected from rodents and fires. Argentine ants, however, only eat the oily layer without taking the seeds underground, leaving the seeds exposed on the surface of the soil. (See more information in the article on ant invasions by Natasha Mothapo and Theresa Wossler.)

their participation, the learners get to experience all the steps of the scientific method. They ask questions about biodiversity, answer the questions through data they collect, and learn to interpret graphs and calculate diversity measures. Besides creating awareness of biodiversity, limbovane makes learners aware of conservation and wider environmental issues such as climate change and sustainable development. Learners also get to see what the job of a researcher, particularly a biologist, involves. After participating in limbovane, these learners bring biodiversity knowledge into their families and communities.

The impact of the limbovane Outreach Project on participating learners is evident.

'I really found the fieldwork informative because I saw what hard work it is to collect many different specimens and to do research. One of my favourite things during the week was the lab work and the microscope work. Our school does not have many microscopes and we do not get to work with them often, which is why it was so interesting to work with them last week. I also want to do forensic science and I

love the possibility of just being in a lab and doing experiments all day. The week was very, very informative and I have learned new skills because I am not an outdoorsy person but I learned that I can do it and I can survive the elements and work under different types of conditions. I've also learned so many things in the lab like learning how to identify different insects and use the microscope to do so.' (Learner from Malibu High School)

'I've learnt that ants are very important to us even if they're small and that we must value biodiversity.' (Learner from Vusisizwe Secondary School)

'The workshop was extremely helpful - working with actual microscopes was great. The fieldwork was awesome, as it made me realise how precious those animals are and also how human activities can affect animals' habitats.' (Learner from Sarepta Secondary School) **Q**

Dorette du Plessis is the outreach manager of the C-I-B and manages the limbovane Outreach Project. Sophia Turner is the technical officer for the limbovane Outreach Project. She assists with schools outreach visits, field sampling and the processing of ant samples for the project.



Learners planting pitfall traps to collect ants and conducting vegetation surveys as part of their participation in the limbovane Outreach Project.

Image: limbovane Outreach Project



The limbovane project team teaching learners how to draw graphs and interpret biodiversity data.

Image: limbovane Outreach Project