

The Hidden Helpers Living Inside the Plants at Molelwane Farm

A science story by Prof. Olubukola Oluranti Babalola 

A short storytelling based on the peer-reviewed paper:

[Ngoma, L.](#), Esau, B., [Babalola, O.](#) (2013). Isolation and characterization of beneficial indigenous endophytic bacteria for plant growth promoting activity in Molelwane Farm, Mafikeng, South Africa. **African Journal of Biotechnology** 12(26)

At **Molelwane Farm in Mafikeng, South Africa**, plants were growing quietly in the field.

To the farmer, a plant is something visible: leaves reaching for sunlight, roots holding it in the soil, and eventually a harvest. But what if some of the plant's most important helpers could not be seen at all?

Inside healthy plants, scientists can find communities of microorganisms known as **endophytes**. These bacteria live within plant tissues without necessarily causing disease. Some can form beneficial relationships with their host plants and contribute to plant growth.

The question was simple but important:

Could healthy plants growing on a local South African farm be carrying their own beneficial bacterial partners? This was the question explored by L. Ngoma, B. Esau and Olubukola O. Babalola.

The researchers went to **Molelwane Farm** and isolated indigenous endophytic bacteria associated with plants growing in that environment. Rather than bringing microorganisms from somewhere else, they looked for the potential helpers that were **already living inside locally adapted plants**. One by one, these microscopic organisms were isolated and characterised. The scientists then asked what these bacteria could do. Could they promote plant growth? Could they possess characteristics that might make them useful agricultural partners?

The investigation revealed a collection of **beneficial indigenous endophytic bacteria with plant-growth-promoting potential**. For the farmer, this opens an intriguing possibility. The solution to improving plant growth may not always have to come from outside the farm.

Some of the help may already be living inside the plants.

Think of an endophytic bacterium as a tiny tenant living inside a plant. It occupies a place that humans cannot see, yet its activities may influence the plant's ability to grow. This is part of a much larger story about the **plant microbiome**. Just as humans have communities of microorganisms associated with their bodies, plants have their own microbial communities. Some live around the roots in the rhizosphere. Others live on plant surfaces. And some can live **inside the plant itself**.



At Molelwane Farm, the researchers began uncovering this hidden microbial community. That makes the study particularly meaningful for African agriculture. Indigenous microorganisms have evolved in local environments alongside the plants and soils in which they are found. Understanding these native microbial resources can provide opportunities for developing locally relevant biofertilisers, microbial inoculants and sustainable crop-production technologies.

Imagine a future farmer planting a crop together with a carefully selected microscopic partner originally discovered in the soils and plants of the same region. Instead of fighting nature, agriculture could increasingly learn to work with nature. The journey begins with something as simple as looking more closely at a plant. The researchers at Molelwane Farm did exactly that. They looked beyond the leaves. They looked beyond the roots. They looked inside the plant. And there they found a hidden world of bacteria with the potential to help plants grow. The bacteria were invisible. The plant was visible.

But together, they told an important story:

Healthy plants can carry a hidden community of microbial partners—and understanding these partners could help shape a more sustainable future for agriculture.

Research lesson:

Sometimes the most valuable agricultural resources are already present in the local environment. By discovering and understanding indigenous plant-associated microorganisms, scientists can uncover biological tools for improving plant growth while working with, rather than against, nature.

Original citation

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