

WEEK 5 THREATS TO PLANTS: INTERVIEW WITH A BOTANIST

ACT – Anusuya Chinsamy-Turan

MM – Muthuma Muasya

ACT It's a real pleasure for me to welcome Muthama Muasya here today. Muthama is a plant scientist, based at the University of Cape Town in the Department of Biological Sciences, where he's also the head of the department. Muthama, his main interest is in the origin and evolution of the Cape Flora. And we're hoping that you will tell us about the way in which plants are being affected by the sixth extinction. So, one of the things that I'm well aware of is the extinctions of animals and their diversification. But the plant diversification, I mean, can you give us some ideas about what we understand from the fossil records of plants?

MM Thank you for having me and to talk about my passion part of research which is in plants. I would say that we have a scanty record on extinctions of plants. Especially if you look at fossil deposits.

By the nature of plants, fossilisation does not happen frequently. And where it has happened, it has left us with fragments of material that we cannot easily reconstruct as exhaustive as studies of animals. For example, if we look back into the West Coast Fossil Park, of a period of between five and ten million years ago, we see good record of animals. But the plant vegetation that was there then, is fairly scanty. We see from pollen fossils, evidence of palms. But all we can say is that there were palms from pollen. We cannot be able to say what kind of palms they were. And also we cannot talk much about the other communities that were there.

ACT Yes, that, I think is one of the biggest difficulties, hey. Because in that environment, there so many animals. And many of them look like browsers, but we

know nothing about the actual vegetation. And what about the sixth extinction? I mean what kinds of threats do plants face in the current Anthropocene?

MM I'd say, in Anthropocene, the biggest challenge for plants and the main source of plants being extinct, or extinct in the world, or highly threatened, is habitat transformation. We're sitting here in the Cape Flats. The Cape Flats was a very, an area teeming with vegetation. And quite a number of the plant species that were part of this habitat are either extinct in the world, or have not been collected in the past 100 years. And the small pockets that still have natural vegetation. They have subsequent to land transformation been also taken over by universal species. Species of plants coming from Australia and other parts of the world. And these have transformed what was a coastal, sandy fynbos vegetation, into an acacia bushland. And that has caused quite a number of the losses.

ACT So, in some of these places where you have the original indigenous vegetation preserved, I mean, can we refer to them as refugia? I mean, would they be considered refugia?

MM To some extent you could consider them as refugia. And those will be places where, as we still keep in hope, to see some of the species which have been considered to be extinct. We still go back to look for them. So I'm... In this spring, I'm teaming with a group from the SANBI, the Kirstenbosch Botanical Garden, to go look for one of the little plants. About 10cm tall, was a member of an essentially growing wetlands. Shallow wetlands in the Kenilworth Race Course area. Last collection was from 1890s. And we're hoping that it's still hanging on.

ACT So, do people think it hasn't been around, or it's gone extinct and you're going to look for them? Or, have people not looked for them? Is that what the problem is?

MM It's a combination. When we reconstruct occurrence of plants from herbarium specimens, mostly. And it's only been in the last 10 years that there has been effort to red list all South African plants and see which ones are... Have not been collected recently. And try to revisit those sites.

And so, for the taxon from, that I'm talking from the wetlands in Kenilworth Race Course, *Isolepis bulbifera*, it was known, it's last known from a specimen from a wetland from over 100 years ago. Have been there several times in the last ten years, I've not seen it. But I'm still living in hope. But in the same habitat, one of the *Ericas*, and *Ericas* are part of the South African fynbos vegetation. A species which was thought to be extinct, *Erica verticillata*, later found in a botanic garden outside South Africa, regrown from cutting, is being established in the same site. And it's picking up well.

ACT Goodness. And do we have any reason why that *Erica* went extinct?

MM It's mostly habitat transformation. But, you know, when we talk about habitat transformation, there's several aspects of it. One is the physical area of a plant. But also its associated co-system services. So for plants that are pollinated by animals, if you transform the habitat such that the pollinators are no longer there, then you might end up with a population so small it's not forming seed. And if there's a freak fire event, and no seeds are being formed, then it's wiped out. And that, perhaps, when you look at Anthropocene, fragmentation of habitats is a major threat. Where pieces of land are being reduced so small units such that viable community of interacting plants, and animals, and micro-organisms is destabilised.

ACT Yes. That's such a pity, hey. So, these loss of plants that we see in the sixth extinction. How does that actually impact for human kind? What is the impact for humans?

MM That's a difficult one. Because if you look at what we use directly, you could say that 90% of the starch that we consume globally, is coming from only about 10 plants. If you look at what we use for our medicines and such. Also, it's a subset. But what we, by losing the diversity, is our potential to use biodiversity into the future for needs that we no longer have now, and which will arise. That's from an ethical perspective. Also from a perspective of homo sapiens being a species, coexisting with other species, loss of innate species is still, it's a loss of the world.

ACT Biodiversity. Exactly, yes. Well, thank you very much for coming to join us and talking to us about the extinction of plants. I think we've all learned so much about how important it is to live in harmony with the environment. And it's not just a question of plants that are going extinct and that are not only the plants that are for our personal use, but rather the ones that are of value for ecosystem. I think that is really important to realise that we are not just lone animals on the planet, but we should live in harmony with everything else. So, thank you very much.

MM Thank you.



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