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Editorial:

Drawing analogies from the theory of Island Biogeography to understand the challenges biodiversity scientists face in Namibia and suggestions to face these challenges

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(Editor)

Namibia is a large country populated by a small number of people (a density around just over 2 people per km^2). Although it may seem that this is a very low density, the population distribution is clumped, naturally so in high rainfall areas, along perennial rivers, where crops can be produced. These areas tend to be most degraded as a consequence.

Namibia's low population numbers result in challenges for biodiversity science. Ecological principles and theories provide attractive analogies to explain this. I draw primarily and very briefly on one of these (with a few sprinkled in), the Theory of Island Biogeography.

The Theory of Island Biogeography, developed by MacArthur and Wilson in the 1960s, one of the few truly general theories to come out of the field of ecology, amongst other things states that large islands support a larger diversity of species than small islands. The reasons for this include 1. More habitat variation: there is a greater chance for habitat variation with an increase in surface area, and hence more niches to occupy by species, 2. More space for low density rare species: Some species are naturally rare or occur at low densities. While both small and large islands may support common or high density species, low density species require large surface areas for home ranges or territories. Small islands may not have sufficient surface area to support minimum viable populations of these low density or naturally rare species. As a consequence, they do not occur there, or occur in precariously low, and constantly threatened numbers. The theory has been useful in the field of conservation biology when explaining the decline of biodiversity in fragmented habitats (habitat islands) on mainlands, even in situations where the overall habitat size is large (when the fragments are added together). This theory is analogous to the situation that biodiversity scientists in a small country (population wise) like Namibia find themselves in. Biodiversity scientists, in any country, are rare, or low density "species", but in countries with large population sizes, these low density "species" abound, since they are not found in numbers hovering around minimum viable population size (the size at which a population is theoretically viable). Species finding themselves below this threshold are constantly at risk of extinction due to

chance events, as well as the Allee Effect (for example, low density populations are often also unable to pollinate). And so Namibia is faced with a situation in which there are very few biodiversity scientists (including botanists), and their numbers (jobs) are probably not very secure. Given that there is a huge bias towards biodiversity scientists studying charismatic animals (elephants, rhino and the big cats) then the "species" occupying the niche of studying small plants is in an even more precarious situation. Since there is such a low number, precariously focussed on "maintenance" activities such as excessive administration work, output (analogous to reproduction, I suppose) is very low. What this amounts to then is that Namibian biodiversity scientists constantly find themselves in a suboptimal situation where productivity (research output) is low, and where ideas within the field are potentially limited.

How has Namibia dealt with this problem of these rare species (scientists involved with studying small plants and animals) to date? One way has been for generalist species to evolve, that is scientists who study just about everything that comes their way. Another way has been for entomologists, small vertebrate biologists, and botanists to become generalists ***within*** their fields (specialist-generalists or generalist-specialists, and to just "cope"). However, I believe all these very rare "species" in Namibia would agree that the strategy best suited to success (high quality high quantity research output) is the collaboration with "species" (scientists) from larger "islands" (countries). These collaborations (we could call these mutualisms in ecology), since both "species" benefit, if done cleverly, benefit both partners of the association as well as the country in general. These mutualisms or collaborations have been, and should be, a primary strategy for biodiversity scientists to follow in Namibia today, in order to be most productive in terms of output and creativity. I am pleased to say that this edition of Dinteria is a prime example of such mutualisms. We have had a real mix of both authors and reviewers from Namibia and abroad, particularly from the BIOTA-Africa pool of scientists. I have to sadly announce that BIOTA-Africa comes to an end in 2009 after 9 years, but its legacy will live on in terms of its contribution to biodiversity science in Namibia. For 9 years, scientists funded under BIOTA (both local and international scientists) have done wonderful science in Namibia and contributed greatly to our understanding of biodiversity. No doubt there will be further collaborations, and it is important for Namibian biodiversity scientists to keep the doors open for clever partnerships such as this in the future.

The publication of this edition of Dinteria is a case in point regarding a small country. Obtaining reviewers from a small pool of already overworked scientists is not an easy task. I sincerely thank the contributors to this edition, the authors, reviewers and all who made it possible, and hope that we can assist to maintain biodiversity science (in the field of botany) in this country for many years to come.