

unit that grades from strong-winter rainfall regime in the west to a weak winter one in the east. Associated with this west–east gradient is a decline in the reliability of cool-season precipitation, a trend for increasing soil fertility within substrata associated with the continuous Cape Folded Belt, a greater incidence of weather conditions suitable for cool-season fires and increasing magnitude of Late Cenozoic geomorphic uplift leading to a greater spatial extent of fire-free environments in the east. Many independent lines of evidence suggest that stability of Pleistocene paleoclimates also declined along this gradient. Here I discuss the well documented patterns of plant and animal diversity and range size in relation to contemporary and historical environments. I also compare other ecological (fire response, phenology) and evolutionary (lineage turnover, phylogenetic diversity) phenomena along this gradient. I conclude that patterns of environmental stability have played – and continue to play – a huge role in shaping the contemporary biota, and are possibly responsible for the emergence of modern humans in the region about 165,000 years ago.

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### So many fungi, so little time: The southern African scenario

P.W. Crous

*CBS Fungal Biodiversity Centre, PO Box 85167, 3508 AD Utrecht, The Netherlands*

Although plant and insect biodiversity have been relatively well researched in southern Africa, the fungi remain a largely unexplored group of organisms of which only the most common examples are known at species level. A conservative estimate based on the number of unique fungi per plant species suggest that approximately 200,000 species of fungi should occur in South Africa. In spite of this, however, less than 1000 novel species have thus far been described from South African collections. Many habitats, ecosystems and host plants have, for instance, never been investigated, and thus their microbial inhabitants remain unexplored, unknown, and underutilized. Although the implementation of novel molecular techniques can provide a quick insight into the microbial diversity present, these taxa will have to be collected, cultured and preserved to enable researchers to fully explore their novel metabolic activities and industrial applications. In spite of being host to a significant part of the world's microbial biodiversity, research on endemic fungi has been poorly supported in South Africa. Developing countries strongly rely on ecotourism, and thus the preservation of indigenous biodiversity will remain a priority. Preserving minute microbial diversity, which safeguards macrobiodiversity, remains a major, unrealised challenge in Africa.

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### Landscapes, people and plants: Future directions for ethnobotany in linking livelihoods and sustainable resource use

A.B. Cunningham

*People and Plants International, Kirton, Fremantle, Western Australia, Australia*

At a time when the international focus is on major environmental challenges such as climate change, should we be paying any attention to ethnobotany, which links traditional ecological knowledge (TEK) with more formal science? Is there room for innovative quantitative approaches in what historically has been seen as a “soft” science recording TEK in a descriptive way? In this presentation, I suggest that we need to pay closer attention to links between landscapes and local people's knowledge for a variety of reasons. This includes the value of understanding how people have adapted to droughts in the past. Quantitative ethnobotany (and ethnoecology) as integrated, inter-disciplinary research areas have a crucial role to play in how sustainable development is implemented in Africa. Although local people live integrated lives, many university researchers tend to work within single disciplines. If the Millennium Development Goals (MDG's) are to be attained in Africa, it is important that this situation changes, through a more creative approach to university training, applied research and in the implementation of policies dealing with sustainable rural development.

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### The legacy of Darwin's studies of floral adaptation and plant mating

L.D. Harder

*Department of Biological Sciences, University of Calgary, Calgary, Alberta, Canada T2N 1N4*

The 200th anniversary of Charles R. Darwin's birth prompts reflection on his prodigious contributions in discovering and illustrating the central organizing principle of biology, adaptation by natural selection. In this spirit, I will consider Darwin's studies of plant reproduction, identifying pervasive themes and summarizing the scope of Darwin's findings, and considering the extent to which Darwin's contributions continue to motivate and inform current research on floral mechanisms, pollination, mating, and sexual systems. Plant reproduction received considerable attention from Darwin, serving as the subject of three of his books, as it best integrated two key biological principles. As he described in his autobiography, 20 years prior to the publication of *The Origin of Species*, Darwin “was led to attend to the cross-fertilisation of flowers by the aid of insects, from having come to the conclusion in my speculations on the origin of species, that crossing played an important part in keeping specific forms constant”. Darwin's detailed natural-history