

species maintained more negative water potentials and had lower whole plant hydraulic conductances than the C₃ species. These results do not support the mesic environment hypothesis outlined above. Measurements made during drought have yet to be investigated.

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A malachite sunbird pollination guild in the Cape flora, with implications for the endangered *Brunsvigia litoralis*

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In the Cape flora there are many specialized pollination systems. Specialization within the bird pollinated syndrome, however, has not been considered before. Plants have traditionally been classified as “bird-pollinated”, but this is a simplistic view, hiding the diversity that exists within the bird pollination category. Here I divide sunbirds into two groups: large and small, according to beak and tongue lengths. Plant species over a range of tube lengths were chosen and were predicted to be pollinated by either small- or large sunbirds based on floral tube length. Through field observation pollinators were determined and as predicted deep flowered species were pollinated solely by the only large sunbird, the Malachite Sunbird (*Nectarinia famosa*) and robbed by smaller avian nectarivours. This was substantiated by seed set data. This specialized pollination systems has important conservation implications; conserving deep-flowered species without conserving *N. famosa* would be to no avail. I used the endangered *Brunsvigia litoralis* as a case study. The study population is fragmented and threatened by human development. The only flower visitor (1.6 visits/flower/hour) *Cinnyris afra* (Greater Double-collared Sunbird) is unable to access the nectar in the usual way due to a long perianth tube (36.7 mm), and resorts to robbing. To substantiate the lack of an effective pollinator flowers were hand-pollinated, which increased seed set by an order of magnitude. I suggest the larger but regional absent *Nectarinia famosa* as the sole pollinator of *B. litoralis*.

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Could the trade-off between plant burial responses and light-competition result in the zonation of dune vegetation?

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It has been suggested that the ability of plant species to respond to burial results in the maintenance of the zonation of coastal dune vegetation. Mobile dunes are typified by species that can respond to burial by increasing growth rates, while stable dunes are dominated by species that show little or no ability to respond to burial. This simple relationship cannot explain why fast-growing mobile-dune species do not dominate the entire dune system. The zonation can be explained if a trade-off exists between a species ability to compete for light or respond to burial. We show that low stem tissue density (the cost of producing a volume of stem) allows mobile dune species to grow fast enough to survive burial, while stable-dune species are unable to respond to burial. Stem density also relates to mechanical strength, thus preventing mobile-dune species with low stem densities from growing tall and competing for light. We suggest that the trade-off of either having “cheap” stems or growing tall, and the niche differentiation that this implies, provides a more rigorous explanation of coastal dune zonation.

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A “Large Infrequent Disturbance” in an East African Savanna

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There is growing interest in Large Infrequent Disturbances (LIDs), but by definition they occur rarely and long-term data are needed in order to study their effects and frequency. Palaeoecological records have the potential to provide information on the effects and frequency of LIDs. By comparing recent sedimentary records with known historical data, the effects of LIDs on pollen, charcoal and sedimentary sequences can be assessed. In this paper, a LID in East Africa is described, and its representation in the palaeoecological record is explored. Historical records show that there was severe drought and famine in East Africa at the end of the 19th Century. Fossil pollen and charcoal records from this period show evidence of a disturbance event that occurred at approximately this time. Statistical comparison of pollen and charcoal data from before, during and after the disturbance event identified it as a LID. The data also suggested that an erosion event occurred part way through the drought, suggesting that an environmental threshold was exceeded.

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Algal culture, from laboratory to commercial production

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