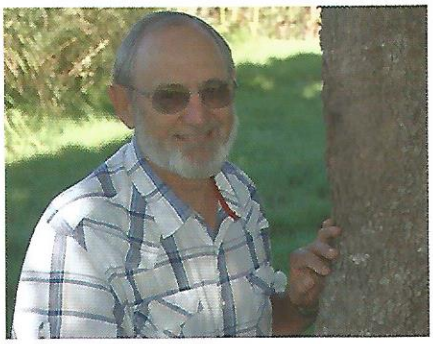
Opportunists underfoot



EUGENE MOLL muses on how humans are inadvertently co-opted into scattering plants far and wide

WINGS AND PARACHUTES; "buoyancy jackets" that enable coconut palms to establish themselves right across the tropics; hard coats that protect acacia seeds from being digested in an antelope's gut and marula pips that pass through elephant and are deposited in their own load of fertiliser; and seeds that are annoyingly sticky and/or prickly, with hooks and spines enabling them to adhere tenaciously to almost any surface . . . Plants have adapted in an astonishing range of diverse ways to achieve optimum dispersal of their seeds.

All known mechanisms were categorised and comprehensively described by Henry Ridley in his unsurpassed 1930 study, *The dispersal of plants throughout the world*. His categories had highly formalised scientific names – incidentally, particularly useful for Scrabble© fans!

They include zoochory (animal dispersal); myrmecochory (ant dispersal); epizoochory (seeds/fruits that are dispersed on the outside of animals); and endozoochory (seeds/fruits that are dispersed by going through the gut of animals, like the acacia and marula).

HIJACKED INTO SEED-CARRYING

But the experience of spiky fruit with an uncanny resemblance to drawing-pins filling the soles of my flipflops during a plant-ecology trip on the Cape west coast four decades ago suggested to me that Ridley missed one animal dispersal mechanism – the foot. Following his pattern, that would make the process 'podochory', combining the Greek for foot (*podo-*) and dispersal (*-chory*).

By late summer, the riot of flowering plants thriving on these calcium-rich sands have begun fruiting. Picking my way between the "lanes" of tightly packed bush-clumps, my flipflops were cushioned by the soft sand so I did not notice as the largish spiked fruits clung to my soles.

But when I reached the road, its hard tar surface forced the sharp-spiked seeds through the soles and deep into my feet. That stopped me dead in my tracks, reminding me why they are also known in the USA as "puncture burrs" because of their ability to deflate tyres.

The fruit of the devil's claw is about 70mm long and 50mm wide, armed with spring-loaded spines that snap shut like a gin-trap.

THUMB-TACK CHANCERS

After I had pulled out the seeds, I became curious about podochory and found 16 southern African plant species, in seven families and nine genera, with fruits that fitted my new category.

They mostly occur on sandy ground, especially in the south-western Cape and Kalahari. Intriguingly, whatever the size of the fruit – from about 10mm in dubbeltjies (*Tribulus*) to 50 or 60mm in devil's claw (*Harpagophytum*) – the spines were almost never longer than 6mm. Ridley believed such fruits were dispersed on the coats of mammals that had been resting. This seems far too opportunistic and untargeted.

JUST RIGHT FOR GERMINATION

Plants usually disperse their seeds in highly targeted and specific ways. These plants grow best in open soft, sandy ground between the bush clumps – exactly where mammals would walk, whether elephant, rhino, big cats, dogs or people.

In all these soft-footed mammals – even for people who have never worn shoes – the footpad (*Stratum corneum*) is up to 18mm thick. Even a 6mm-long spine would not cause any pain while a person or animal is hijacked by the seed on sandy ground. When reaching harder ground, the thorns stab into the footpad and an animal would rub its feet over the ground to remove the culprits.

So the seeds often end up in the contact zone where the soft surface meets harder ground. This is also a rainfall run-on area, ideal in these semi-arid environments for seeds to germinate along with burrs carried by vehicle tyres. This is why podochores now often form a continuous strip along the edge of tarred roads – and some are so successful that they have become agricultural pests.