

nagging disappointment. A tiny minority began taking on Creamsicle oranges in time, and the few with patterns proved to be anticipated islands of beauty on the bench to catch my eye. Naturally I segregated the best for breeding purposes, giving them roomier quarters to grow into!

Scanning at natural size, but at a resolution much higher than the 300 dpi needed to get good results in print, takes only a few minutes. An hour or more is spent cleaning up the dust and color correcting the digital file in Photoshop, and in the end the scan reveals some surprising variation beyond color and pattern in the leaves. All these plants were sown on the same day. They received identical treatments. But some have flowered and doubled their leaves, while others remain tiny—

ten times smaller! Their leaf absorption has also varied widely. Some sloths have near-complete sets of old leaves still, a few exhibitionists have shed them entirely, and the rest can be found at every step in between, slowly churning the water contents of the old set through who knows what vesicle into the newly emerged pair(s). Are these tendencies largely individualistic, repeating year to year? Are my runts really runty, or just losing the battle of resources jostling around in a pot with the others? Would breeding for runtiness be droll or terminally dull? One thing that is certain, that leaf patterning on the best ones can be expected to get better as the years go by, and even the plainest now may grow up to be gorgeous clumps. Only time will tell. ❖

## ► Book Review

ROOT GORELICK

**Copiapoa in their Environment (2006)** by Rudolf Schulz. Schulz Publishing, Teesdale, Victoria. 240 pp, cloth. ISBN 0-9585-1678-2. \$84.95.

Schulz and Kapitaný's 1996 book, *Copiapoa in their environment*, initiated a craze for a genus that was previously rather obscure. Copiapoas are found in the fog deserts of northern Chile, and intriguing photos showing massive clumps of these often white-skinned cacti (an effect difficult to achieve in cultivation) prompted many collectors to take notice. This new book, with essentially the same title as its predecessor, is a natural history account of the genus, albeit with quite a different bent. The earlier volume covered an incredible amount of background information and, at times, was rather quantitatively ecological, while this new book focuses much more on the taxa of *Copiapoa*, always in a qualitative way, and over the entire geographic range of the genus—although without any circumscriptions or keys to the taxa.

The book's core is divided into six sections, each covering a geographic swath of Chile. Within each, Schulz provides a distribution map and then covers species in alphabetic order, devoting 2–4 lavishly illustrated pages to each species, showing range of variation, distribution and conservation status. The presentation is elegant, with text and figures beautifully integrated to impart a feel for the plants and their environment. And while a great deal of text is devoted to discerning true species, core areas, existence of putative hybrids, and environmental and developmental plasticity, without herbarium specimens it is hard to know what to make of this emphasis. When is a puta-

tive hybrid simply the offspring of two members of a highly variable species? If *Copiapoa* taxa are as variable and promiscuous as Schulz believes, then they probably form an almost genus-wide comparium (that is, a group of interbreeding plants).

The most interesting aspect of this book is a set of seven photographic comparisons of *Copiapoa* populations taken one or more decades apart (in the glorious tradition of Bob Humphrey and Ray Turner, who conducted similar photographic comparisons in the Sonoran Desert). Probably Schulz's estimates for Methuselan longevities and glacial growth rates of *Copiapoa* are based on these photographic comparisons and may explain his disbelief in the more modest age estimate (derived by carbon isotope analysis) of the one plant he had analyzed.

This volume suffers somewhat from being self-published. Although nicely designed, it contains many minor errors, such as missing arrows on figures, spelling mistakes, and incorrect page references to photos. And the author's continual allusion to effects of man, rather than humans, seems anachronistic. But these are minor quibbles; this is a beautiful book that any avid cactus hobbyist will want to have on their shelves. ❖

