Teddy bears and chain fruits

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One of the many pleasures of walking in the Sonoran Desert is occasionally coming across large, nearly uniform stands of chain fruit cholla (Cylindropuntia fulgida) or teddy bear cholla (Opuntia bigelovii). Recently, while wandering around the northeastern corner of the Sonoran Desert National Monument, which I had not previously explored, I encountered several such stands in the alcoves of one of the north-south running hills that rise steeply out of the surrounding creosote flats that dominate this part of the Monument. The vegetative exuberance of these colonies provides a sharp contrast to the austere dusty plains to the west and the jumbled piles of dark boulders on the ridge to the east. When I located one of these attractive forests I walked carefully among the densely packed cacti, especially those of the teddy bear persuasion, which are notorious for their adhesive nature. Even the most cautious of visitors to a group of teddy bears runs a good chance of inadvertently picking up a fallen teddy bear joint on a boot and then transferring it emphatically to a leg. Trying to remove an embedded cholla joint is never much fun. Nonetheless, a close inspection of a colony of either of these two chollas is worth the risk of a cactus attack because of the aesthetic features of the cacti.

For one thing, the tightly packed spines of the teddy bear cholla form attractive images for the amateur photographer. And when one steps back (carefully) in a cholla forest, the entire cacti are also hard to resist especially when a camera is available, as it always is on my walks. To my eye, the grouped teddy bears resemble a massed array of kachina dolls while a chain fruit forest looks rather like a convention of prickly scarecrows with drooping arms held all akimbo.

The appeal of these dense stands of cholla, however, can be more than merely aesthetic. Their existence poses all sorts of questions for an admiring observer-photographer as well, questions that can be pondered while walking back to where you left your car. For example, why do these two species often form such dense and uniform colonies when other cacti, like barrels and saguaros, are never found by the hundreds packed in side by side? My search of the scientific literature on this point took place well after my hike. I soon learned that one answer to my question, which has apparently been widely accepted, has to do with the distinctive method of reproduction employed by teddy bears and chain fruits. These species, unlike barrels and saguaros, typically reproduce asexually with fallen joints capable of giving rise to offspring, provided that they are not eaten by white-throated woodrats. Given the very limited dispersal power of a fallen joint (unless it attaches itself to a passing mammal), clonal offspring of an adult of either species of cholla can form a mini-colony around the parent plant. As the newer members of a clone begin to reproduce asexually, the colony can expand, eventually forming very large groups of individuals, all of whom may be genetically identical to the colony founder.

Another factor that may make these super-clones possible is the ability of the joints to take root wherever they fall, even on bare ground out in the full sun. Those cacti that reproduce sexually produce seeds that, if they are lucky, will germinate and begin life as a very small and very vulnerable plantlet. Often, the survival of a baby saguaro depends on the chance deposit of the seed under a sheltering

nurse plant where the youngster can grow without direct exposure to sunlight. No wonder that you never find dozens of saguaros in a dense clump of massive individuals. In contrast, a teddy bear joint has already achieved a considerable mass and a dense coat of reflective (and protective) spines, factors that help it survive and grow next to its parent and siblings without the necessity of hiding for years under a nurse plant.

Although this explanation for the large monocultures of teddy bear and chain fruit chollas that one finds here and there in the desert makes a good deal of sense to me, I still wonder about the general absence of other cacti and desert shrubs in many colonies of these chollas. Do teddy bears and chain fruits drive competitors to extinction during the expansion of a colony? Or do colonies form in places where for one reason or another very few other plant species can manage to grow? Moreover, in the course of my cactusogical reading, I learned that cholla colonies often persist for only a few decades, which surprised me. The two species look remarkably tough and long-lived, capable of shrugging off drought and depredation by herbivores, which goes to show, I guess, that looks can be deceiving. But why should all the members of a clone, young and old alike, go down together just 30 or 40 years after the establishment of a colony? Here I have a continuing question to think about as I plod from a big stand of chain fruits to a prickly gathering of teddy bears, each population monopolizing a big chunk of desert out in the middle of a beautiful nowhere.

Central Spine December, 2008