

**NOTE ON *ERIGERON DIVERGENS* AND *E. INCOMPTUS* (ASTERACEAE)  
IN THE SANTA CATALINA MOUNTAINS, ARIZONA**

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I have been surveying vegetation in Finger Rock Canyon of the Santa Catalina Mountains at least twice monthly since 1984 (Bertelsen 2018) and 1743 field surveys have been completed to date. I did not distinguish between *Erigeron divergens* and *E. incomptus* until 2015, following the publication by Nesom (2015) on their distinction. This note places on record observations of *E. incomptus* and *E. divergens* in Finger Rock Canyon in early season 2020. Observations ended 8 June 2020 because of the 118,000+ acre Bighorn fire that has burned at least half of the canyon.

The six *Erigeron* species found in Finger Rock Canyon with their elevation ranges are as follows:

- E. divergens* (3100-5600 feet, with individual plants at 6000, 6450, and 7100 feet)
- E. incomptus* (3600-5550 feet)
- E. lobatus* (three plants at 3250 feet)
- E. neomexicanus* (6680-6900 feet, with a single plant at 6000 feet)
- E. oreophilus* (3500-7250 feet)
- E. tracyi* (5300-5700 feet).

The only location where more than two *Erigeron* species are found in close proximity is on a north-facing slope between 5200 and 5500 feet elevation, where *E. divergens* (uncommon), *E. incomptus* (common), *E. oreophilus* (common), and *E. tracyi* (uncommon) are usually found. *Erigeron oreophilus* commonly grows nearby all the other *Erigeron* species except *E. lobatus*. *Erigeron divergens* and *E. incomptus* are found in close proximity only on this north-facing slope — I have been unable to determine any preferred habitat or microhabitat differences between the two species.

Nearly all the *Erigeron divergens* plants observed in the canyon have been the multi-stemmed form described in Nesom (2015) (annual, with multiple, ascending stems from the base, all usually arising compactly from a caudex-like taproot apex; *E. wootonii* Rydb. the earliest name at species rank, fide G. Nesom). The single-stemmed form (typical, widespread *E. divergens*, annual, branching mostly above the base) has been seen only at the lower and higher end of the elevation range (in desert scrub and oak-pine woodland). The three plants found above 5600 feet elevation were single-stemmed, and all plants seen in desert scrub have been single-stemmed. These single-stemmed plants remained single-stemmed from the base throughout the season. My data on the single-stemmed form of *E. divergens* are scanty since it is very uncommon in Finger Rock Canyon, and I cannot say anything about its life history except that it appears to flower only in spring. In 2020, several marked plants of the multi-stemmed form of *E. divergens* initially were single-stemmed but produced several stems from the base after they began flowering. By contrast, *E. incomptus* begins to produce new stems as the plants begin to grow in spring, before flowering. I do not know whether they continue to produce new stems throughout the growing season or if stems die back to the root during cold winters.

Based on data collected from November 2015, the multi-stemmed form of *Erigeron divergens* and *E. incomptus* flower primarily in the spring (March-May) and again during the summer monsoon (August-September). The spring flowering season is longer and more productive, in terms of number of heads, than the monsoon flowering season. Both species, however, have been seen flowering every month of the year. The two species are similar in height, normally 12–16 inches, and inflorescence size. In Finger Rock canyon, the basal leaves of *E. divergens* are always spatulate and entire while

those of *E. incomptus* are always pinnatifid. I see no significant difference between the two species at any given time of year in the length of the rays, although the rays of both are nearly always shorter than those of *E. oreophilus*. On 8 June, I found several *E. incomptus* plants (a shaded site at 4450 feet elevation) with noticeably longer rays than those of plants higher up (and in sunny sites).

Inspection of the base of plants is necessary to distinguish between *Erigeron divergens* and *E. incomptus*. In spring, the spatulate basal leaves of *E. divergens* disappear soon after plants begin to flower, but the pinnatifid basal leaves of *E. incomptus* remain green for several weeks and dried-up fragments remain throughout the monsoon. Both species become largely dormant in June and much of July except in microhabitats, but green up with the onset of the rains. While dormant, the stems of both appear dead, but they quickly produce cauline leaves and flowers with the onset of the monsoon. New basal leaves are not produced by either species during the monsoon.

The 2019-2020 cool season (October-March) was characterized by above normal rainfall, but no rain fell until the last week in November. In my experience, November precipitation is essential for good growth of native annual species in spring; consequently I made a point of looking for annual seedlings in 2020. In general, native annuals did poorly but non-native annuals were abundant. Perennials, with a few exceptions, have had an exceptionally good flowering season.

After the mild winter, *Erigeron incomptus* began greening up in January and was first observed flowering on 10 February. Over the next couple of months, the number of stems and height of plants steadily increased and new plants appeared in large patches where I had not seen the species previously, suggesting that new plants germinated. This is certainly the most prolific year for *E. incomptus* since 2015, with more plants than I have seen before. In addition the stems of most plants were much longer (16–24 inches) than I have seen in previous years.

In contrast, *Erigeron divergens* is relatively uncommon and scattered this year and the plants are only about 16 inches high, perhaps because of a near absence of precipitation in November 2019. Seedlings of *E. divergens* were first recognized in mid-February. One plant in the bottom of the canyon, was first observed flowering on 9 March, but I did not see the species flowering at higher elevations until 13 April.

I regularly look for seedlings throughout the year, particularly at the beginning of the growing seasons, but I have not yet seen seedlings of *Erigeron incomptus*, perhaps because they are generally found in close proximity to mature plants. I have seen *E. divergens* seedlings in spring but not in summer.

After nearly five years of observing the *Erigeron incomptus* and *E. divergens*, I am convinced they are separate species. The morphological characteristics noted above have been consistent, and I have seen no evidence of hybridization or intergradation.

#### LITERATURE CITED

- Bertelsen C.D. 2018. Thirty-seven years on a mountain trail: Vascular flora and flowering phenology of the Finger Rock Canyon watershed, Santa Catalina Mountains, Arizona. *Desert Plants* 34: 2–247.
- Nesom, G.L. 2015. Variants of *Erigeron divergens* (Asteraceae). *Phytoneuron* 2015-61: 1–24.