

of which it is separated by perhaps 200 miles of geographic distance and the interposition of subsp. *whipplei*. Its formal description follows.

***Yucca whipplei* subsp. *eremica* subsp. nov.**

Caudex caespitosus ramosus, ramulis usque ad 20 compactis; foliis plerumque rigidis glaucis 15-25 cm longis et ultra; scapo florifero altitudine ad 2.5 m sat crasso et paniculis sat congestis, corollarum lobis supra medium purpureis; capsulis ad 6 cm longis. BAJA CALIFORNIA: Brushy hills north of Laguna Seca Chapala, about 1000 feet, April 24, 1956, *C. Epling*; 13 mi southeast of Rosario in cirio-cardon community, April 15, 1957, *A. L. Haines 5759* (type, UCLA); 7 mi south of Santo Tomas, about 1000 feet, April 14, 1957, *Haines 5756*.

Yucca whipplei is a member of the Madro-Tertiary Geoflora and throughout its extensive latitudinal range is associated with different present-day facies of this vegetation. It is more commonly associated with the coastal sage and chaparral communities, but verges on oak and juniper woodland or enters into them and, with chaparral species, enters into the yellow pine forest, even to 6000 feet elevation or more. Its range lies on the coastal drainages and stops at the margins of the interior deserts in California. In Baja California, however, it appears to be a regular and abundant associate of the *Fouquieria-Pachycereus-Pachycormus* community. This is the taxon described here as subsp. *eremica*. It is adapted to the most rigorous conditions of precipitation of any of the subspecies.

The origin of the desert and semidesert communities of the western United States and their geographical segregation, beginning at least in Miocene time and culminating in the present communities during Pleistocene and recent time, have been amply described by Axelrod in a series of papers (notably those of 1950 and 1956¹). It would appear that they were in existence at least as local facies of more generalized communities even during Miocene time. We can infer reasonably that *Yucca whipplei* has had a similar history. If so, the possibility cannot be excluded that subspecific differentiation began or may even have been completed as early as Miocene time if each growth variant had a certain potential of adaptability in respect of the environments developing in its area. Their segregation into different regions would presumably have been fostered by the effects of the growth form on persistence in different environments. A generation of the multibranched growth forms such as subsp. *caespitosa* and *eremica* is certain to be longer than that of subsp. *whipplei*, which is monocarpic. One would expect the adaptability of each form to differ substantially.

¹ Evolution of desert vegetation in western North America. Carnegie Inst. Wash. Pub. 590: 215-306. 1950.

Mio-Pliocene floras from west central Nevada. Univ. Calif. Pub. Geol. Sci. 33: 1-322. 1956.