The rediscovery of the elusive Echeveria tobarensis

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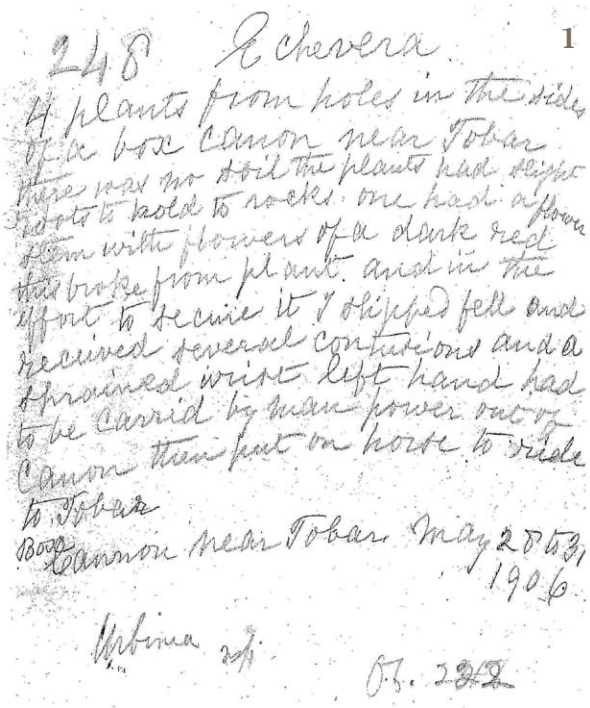
Historical Background

On May 28, 1906, the 76-year-old Edward Palmer, a self-taught botanist and archaeologist, collected plants under the number 248, in a box canyon near Tobar, Durango, Mexico. In his notes, Palmer wrote "Collected in the dry season. Plants from Tobar Durango, 9 Miles S.W. of Tepehuanes, 6,500 feet Elevation, May 28 to 31 1906, No 228 to 257″ (Palmer 1906). Palmer sent four plants together with a brief undated note to the US National Herbarium in Washington, D.C. The note began with his identification of the plants "248 Echevera (sic)" and was followed with the location together with a description of his fall and injury (Fig. 1).

Only two of Palmer's plants arrived alive. One of them flowered on April 22, 1908, but died soon afterwards. The last surviving plant was not in good condition either and died soon thereafter. The only remaining evidence of Palmer's collection was then his undated note and an herbarium sheet at the US National Herbarium, consisting of two mistreated leaves and an inflorescence, as can be seen in Fig. 2.



1 Palmer's note, sent with four of his plants to the U.S. National Herbarium.

2 Herbarium sheet of Palmer 248 at the U.S. National Herbarium.

3 Abandoned houses in the old mining town of Tovar (2001).

Palmer's 248 was described as *Urbinia lurida* by Rose (1911). Alvin Berger (1930) renamed the species *Echeveria tobarensis*. Walther (1972) cited Palmer's note in his description of *Echeveria tobarensis* in his monograph of the genus.

This is an abridged version of the history of a mysterious plant never found again after its original discovery in 1906.

Past Expeditions

We know of several people who have tried in vain to find *Echeveria tobarensis*. Myron Kimnach (1980), for example, has tried twice to find the plants near Tovar. The Mexican botanist Jeronimo Reyes Santiago, together with Christian Brachet, also made an unsuccessful attempt at finding the plant (pers. comm.). After Kimnach brought the lost species to our attention (pers. comm.), we too had searched for the elusive plants in vain on two occasions in 2001 and 2003.

Various people have published their guesses about *Echeveria tobarensis*. In his monograph of the genus *Echeveria*, Walther (1972) wrote "I have seen examples of *E. agavoides*, in its native habitat, depauperate because of their environment, which might be indistinguishable from *E. tobarensis* as described above. *Echeveria chihuahuaensis* varies with leaves often narrower or more highly colored." *Echeveria agavoides* has a wide range of distribution from the border region between Zacatecas, Durango and Jalisco, through Guanajuato and San Luis Potosi down into Hidalgo. The northernmost point where we have seen *E. agavoides* lies west of Huejuquilla el Alto, Jalisco, near the village of Santa Lucia de la Sierra in the Sierra Huicholes. This locality is about 250 km (155 miles) away from Tovar, Durango, as the crow flies. Kimnach (1980) wrote "[*E. colorata*'s] nearest ally may be *E. tobarensis* Berger, though of this there is no certainty due to insufficient knowledge of that species." He suggested that *E. tobarensis* might be extinct in the box canyon where Palmer had found it originally. His other guess was that *E. tobarensis* could be identical to *E. chihuahuaensis*, a species that can be found about 50 kms (31 miles) southwest of Tovar near Los Altares.

Kimnach (1980) gives the following short description of his attempts at finding the plants: "I have twice attempted to recollect the species at the type locality (described as a 'box canyon near Tobar'), first in 1967 in the company of Fred Brandt, Foreman of the Huntington Botanical Gardens. At that time, Tovar proved to be an

4 A cluster of *Sedum glabrum* with dried inflorescences growing on the shady canyon walls.

abandoned mine site some nine miles along the dirt road from Tepehuanes to Topia. Several hours' search in the deep canyon revealed only *Echeveria paniculata*. In 1976 I again visited the locality, this time with Hernando Sánchez-Mejorada. By now, mining had been actively resumed, with new roads that allowed access further up the canyon, but no trace of *E. tobarensis* could be found. Most

5 The end of Palmer's box canyon, blocked by a deep pool of water.

probably it is extinct in this canyon, though it may still exist in neighboring areas. It is unfortunate that Palmer did not indicate more precisely the exact locality where he found his plants." Having visited the same area three times, we believe that Kimnach & Sanchez-Mejorada never found Palmer's original box canyon. The new road, from Tepehuanes to Topia that Kimnach mentions, is probably the dirt road from Tepehuanes to Mesa de los Navar, San Juan del Negro and on to the paved road from Santiago Papasquiaro to Topia. This road does not go by the mines of Tovar. We found it almost impassable in 2001, and in 2010 the first 25 km (16 miles) behind Tepehuanes were more or less paved or under construction. In several personal discussions Kimnach could not remember where he went exactly on his two attempts.

2001: First Attempt

Resolving mysteries surrounding long lost plants has always fascinated us. We made our first attempt at finding *Echeveria tobarensis* in April 2001. Some locals at the gas station in Tepehuanes explained how to reach the mines at Tovar, the settlement that was spelled Tobar a century ago. On a small dirt road we reached the abandoned mine village (Fig. 3). There was only one family living in a house, and they proved to be of little help. After hiking along the stream, crossing it numerous times, three quarters of the way into the most promising looking canyon, we had to give up and turn back because of a sprained ankle resulting from an unfortunate jump over big boulders. Inquiries with the above-mentioned family showed only that they did not have the slightest idea about the plant. They guided us to a flowering *Penstemon* species after we showed them photos of other *Echeveria* species and their flowers as examples for *E. tobarensis*. We gave up.

2003: Second Attempt

In January 2003 we visited Tovar for a second time. Not much had changed since our prior visit. The mine was still abandoned and the same family lived in the nearby stone house and remembered our rather special truck. This time we hiked along the entire canyon until we reached a large pool of water at its end with vertical cliffs inhibiting further advance. In the note that Palmer attached to the type specimen plants he sent back to Washington (Fig. 1), he said: "*Echevera* (sic): Four plants from holes in sides of box canyon near Tobar. There was no soil, the plants had slight

6 Typical *Agave parryi ssp. parryi* populating the mountain slopes behind the old mining town.

roots to hold to rocks, one had a flower stem with flowers of a dark red, this broke from the plant, and in the effort to secure it I slipped, fell, and received several contusions and a sprained wrist, left hand, and had to be carried by man-power out of the canon, then put on a horse to ride to Tobar." The vertical cliffs we saw in front of us could well have been interpreted as Palmer's box canyon. We searched in vain and finally had to give up and hike back to Tovar empty-handed. The only *Crassulaceae* species we found were *Echeveria paniculata*, *Sedum glabrum* (Fig. 4), and *Villadia aperta*.

2010: Third Attempt and Rediscovery

We made our third attempt in December of 2010. To our surprise the dirt road was in good shape and much travelled. From a junction we were able to see Tovar below us and noticed that mining had resumed. We decided to try our luck at another place and drove to a small ranch, Los Sauces, where we were greeted in a very friendly manner by its owner. We camped near some abandoned adobe houses from where we explored the area on foot. Two young men on their Christmas vacation, returning to the ranch from a short hike, told us about a small waterfall close to our campsite. They were sure to have seen plants similar to the ones we showed them in photographs. The waterfall turned out to be really small and we were unable to find anything interesting apart from *Sedum glabrum* and *Villadia aperta*. Next we hiked up to a pass on an abandoned dirt road. *Echeveria paniculata* grew on the rocky slopes and hope for more *Echeverias* arose. From the pass, we had a good overview and decided to head for some dark cliffs in the distance.

We hiked over yellow meadows and climbed countless barbed wire fences towards the distant cliffs until we reached a small creek, which we followed into a broader canyon with a beautiful river. We turned upstream, suspecting that we had again ended up in the same canyon as in 2001 and 2003 (Fig. 5). We examined every rock and cliff in this very promising looking locality. The oak trees were covered with various *Tillandsia* species. *Agave parryi, Dasylirion wheeleri*, and *Nolina durangensis* populated the steep slopes (Fig. 6). In shady parts of the cliffs we found more *Sedum glabrum* and *Villadia aperta*, but there was no trace of an *Echeveria*. Suddenly a purple dot on a rock attracted our attention. When we got closer we realized we had found an *Echeveria*.

Judging from its form, color and size it could only be the long lost mysterious Palmer plant, 248, later *Echeveria tobarensis*. We found one adult plant and many younger ones growing in moss (Figs 7–9). When we continued hiking on in the canyon to find out if it really was the same one as in the years before; we soon reached the large pool of water with the vertical cliffs surrounding it. We were back in the same place as in 2001 and 2003 and we were convinced now to have found Palmer's box canyon, or at least a nearby locality for his 248. It was a great feeling to have finally rediscovered this long lost, beautiful species.

Botanical Comments

McVaugh (1956) wrote of Palmer "Even in his earliest independent collections, made before 1870, his remarks on morphology, on dates, and on localities were set down methodically and in considerable detail. Only rarely, however, have his notes accompanied his specimens into the herbaria to which the latter were distributed." In the case of Palmer's 248 it seems that only the note accompanying the four collected plants made it to Washington. In his list of plants collected during the May 1906 Tobar trip to Durango and vicinity (Palmer, 1906), that accompanied his other specimens to the Gray Herbarium at Harvard University, there's a short description for every number he collected, except his 248. It is most probable that he had forgotten to add his 248 to his field notes after he got back to his camp in Tobar, and that he just sent the four plants back to Washington with the short note mentioned above.

Rose (1911) described the plants as *Urbinia lurida*. This may sound confusing because Palmer sent the plants back indicating that they belonged to the genus *Echeveria*. Britton and Rose (1903) had segregated some genera such as *Oliveranthus* and *Urbinia* from *Echeveria*. The new genus *Urbinia*, named for Dr. Manuel Urbina, at that time acting director of the National Museum of Mexico, was described as a "very peculiar genus, quite distinct in its habit and calyx from *Echeveria* and well deserving to be separated." (Britton & Rose, 1903) It consisted then of only the type species, *U. agavoides*. Later *U. purpusii* and *U. lurida* were added. In time, the genus *Urbinia* was abandoned, as were all these other small

7 A beautiful adult specimen of *Echeveria tobarensis* growing on top of a mossy rock. *8* The similar colors of rock, lichen and plant make it difficult to spot the rosettes of *Echeveria tobarensis*.

genera consisting of only a few species and the three were moved back into the genus *Echeveria* as *E. agavoides*, *E. purpusorum* and *E. tobarensis*. The genus *Echeveria* is currently divided into 17 series (Walther, 1972; Kimnach, 2003).

Rose (1911) described the plants in his original description as follows: "Leaves clustered in a dense rosette, very thick, ovate, acuminate, glabrous, purple or lurid in color, 3 to 4 cm. long, 1.5 to 2.5 cm. broad at widest point; flowering stem 25 cm.

9 Two young plants hide under the spines of an *Echinocereus sp.*

long, two-branched in only specimen seen; stem leaves small, bract-like, scattered; sepals small, ovate, acute; corolla 6 to 7 mm. long; petals acute, erect except the small outturned tip; carpels distinct to the base." In his note that accompanied the plants sent to the herbarium, Palmer commented "one had a flower stem with flowers of a dark red." Rose (1911) added to his description of *Urbinia lurida* that the "species is much smaller than any of the other three species of *Urbinia* and has much more highly colored leaves."

Kimnach (1980) commented on the plants and flower "…a painting by Walpole intended for publication in "Addisonia" was never published, and the original seems to have been lost…" and Walther (1972) "the illustration mentioned by Dr. Rose seems to have been mislaid, and so cannot help me. The type specimen is most scanty, and fully covered by Dr. Rose's description."

The herbarium sheet of the type is, as can be seen in figure 2, really not very helpful. Both of the leaves of the herbarium specimen are half destroyed, but they at least show their ovate and sharply acuminate form. The inflorescence measures 25–30 cm, is two-branched with few, relatively small flowers of undistinguishable color. The plants we found near Tovar are compared to Palmer's 248 according to Rose's description in Table 1.

Differences between the two plants can be seen in the size of the leaves and the size and color of the flower. The smaller leaf size of the type specimen could be explained by only 2 living plants from which the original description was made. Palmer could have collected four medium sized plants to send back to Washington, which did not live long and so did not have the chance to grow to their adult size. We have only found one adult plant from which we took our measurements, but there were many small and a few medium-sized plants around. The form of the leaves coincides with Rose's description, as does the size of the inflorescence. The other significant differences are the size and color of the flower. Our plant has a flower almost double the size of Palmer's plant. Again, this could be due to the bad state of the flowering plant in cultivation, producing only small flowers under stress. The flower color, reported by Palmer as "dark red", does not match our pink colored flower either (Fig. 10). Rose does not give a flower color in his first description because he had only the herbarium specimen to go by and the flower color cannot be distinguished from the dry inflorescence. Walpole's painting of the flower and plant that was to be published in Addisonia somehow got lost, so we will probably never for sure know if the dark red flower

Table 1 A comparison of Palmer 248 with the plants found near Tovar.

	URBINA LURIDA (ROSE 1911)	PROPOSED *ECHEVERIA TOBARENSIS* (ETTER/KRISTEN #03121)
ROSETTE	leaves clustered in a dense rosette	leaves clustered in a dense rosette
ROSETTE SIZE		12 cm diameter, ± 40 leaves per rosette
FORM OF LEAVES	very thick, ovate, acuminate, glabrous	thick, ovate, sharp acuminate, underside keeled, glabrous
SIZE OF LEAVES	3-4 cm long, 1.5–2.5 cm broad at widest point	4–6 cm long, 2.5–3.5 cm broad at widest point
COLOR OF LEAVES	purple or lurid	grayish-purple
FLOWERING STEM	25 cm long, 2-branched	25–30 cm long, 2-branched
STEM LEAVES	small, bract-like, scattered	small and thin, to 1 cm long, regularly spaced
SEPALS	small, ovate, acute	small, to 5 mm long, ovate, acute, 1–1.2 cm long
COROLLA	6–7 mm long	10–12 mm long
PETALS	acute, erect except the small outturned tip	acute, erect except the small outturned tip
CARPELS	distinct to the base	distinct to the base
FLOWER COLOR	dark red	pink
NECTARIES		whitish

color that Palmer reported really belonged to the plant he collected near Tovar.

Conclusion

Comparing Rose's description of Palmer's 248 and the plants we found near Tovar, we believe both to be *Echeveria tobarensis*. Describing a plant from a scanty herbarium sheet with only two leaves and one inflorescence is a difficult task. Since there is no other species of *Echeveria*, Series *Urceolatae*, known from the area of Tovar, the plant we have found must be either Palmer's *Echeveria tobarensis* or a new species. We do not believe that it is a good idea to describe it as a new species, especially since the original description of *E. tobarensis* was not made from living material, but from one sad-looking herbarium sheet, which can explain the differences in leaf size, and size and color of the flowers noted in Table 1. Now that *E. tobarensis* has finally been rediscovered, there are other mysterious *Echeveria* species waiting.

10 Inflorescence of *Echeveria tobarensis* flowering in cultivation in February 2011.

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