



Agave temacapulinensis (Agavaceae), Another Brand New Species from Jalisco, Mexico.

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Habitat of *Agave temacapulinensis*, Río Verde Canyon, Jalisco, Mexico.

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INTRODUCTION

Continuous field work and plant exploration carried it out in Jalisco state, in western Mexico, during the last few years by the authors and other associated people (Oscar M. Valencia, Ignacio Contreras, Jose A. Machuca, Gregorio Nieves, Miguel A. Muñiz, Jesus Padilla-Lepe, Jesus Trujillo, Rene Ramos), has rendered several botanical novelties, namely 4 new species described: *Agave valenciana* Cházaro & A. Vazquez



Agave temacapulinensis, inflorescence and habitat, Jalisco, Mexico.

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(Cházaro *et al.*, 2005a and 2005b); *A. vazquez-garciae* Cházaro & O. Valencia (Cházaro *et al.*, 2006 and 2007); *Agave arcedioanensis* A. Vazquez & Cházaro (Cházaro *et al.*, 2009), and *A. Cházaro* A. Vazquez & O. Valencia (Vazquez *et al.*, 2009), so, we are reporting hereafter, the 5th new species of *Agave* found and described by us, that we recently published in the US botanical journal TAXON (Vazquez-Garcia *et al.* 2012).

RESULTS

In early 2009, while working for the Comisión Estatal del Agua (State of Jalisco Water Bureau), doing geographic and botanical inspection at Acasico ravine, Municipality of Mexicacán, north of Cañadas de Obregón, in the Jaliscan high plateau, adjacent to the big Rio Verde ravine, in an area where a dam (Presa Zapotillo) will be constructed soon by this Bureau, Oscar Valencia first observed vegetative populations of this *Agave*. He right away identified it as the long lost and unknown in habitat *Agave americana* var. *expansa* Gentry, reported as cultivated by Gentry (1982) from Tepatitlan, not too far from there. One month later, O. Valencia took M. Cházaro and Ignacio Contreras to the Acasico ravine to see this century plant; however M. Cházaro got the impression that it was a population of *Agave americana* escaped from cultivated plants after seeing at the town of Acasico.

On 12th September 2009, in order to carry out a floristic study at Cerro Viejo (a big hill west of Palmarejo), as they were travelling from Temacapulín towards Palmarejo, in the Verde river canyon, along the unpaved road, M. Cházaro, Jesus Padilla-Lepe, Miguel A. Becerra and Rene Ramos found the very same *Agave* discovered a month before by Valencia at the Acasico river canyon, but again no flowers nor fruits were present, however, evidence pointed out that it was a wild “century plant” since it was thriving at unreachable cliffs and not an escape as previously thought by Cházaro.

On the 5th of May 2010, during a field trip, J. A. Vazquez and M. Cházaro found flowering material at the vicinity of Palmarejo, Municipality of Cañadas de Obregón, that they collected as a specimen Vázquez-García & Cházaro 9070 (herbaria IBUG, MEXU); a close examination showed us that the quick determination made by O. Valencia and M. Cházaro as *A. americana* var. *expansa* was indeed wrong, and due to its medium-sized panicles with dimorphic tepals it belonged in the subgenus *Agave*, as a distinct new species and second record of group *Ditepalae* for the state of Jalisco.

Agave temacapulinensis A. Vázquez & Cházaro, sp. nov.

Type: MÉXICO. Jalisco; Cañadas de Obregón. Bajío de Temacapulín, road to Palmarejo, 1670 m, 24th Apr 2011 (flowers), Vázquez-García 9092 w/Cházaro (holotype IBUG; isotypes: MEXU, MO, MICH, WIS).



Rosettes medium, 80-110 (-115) × 172 cm, occasionally surculose, light greyish glaucous, with 20-25 green leaves and ca. 20 dry leaves; leaves 75-85 (-90) × 16-19 (-20) cm, ovate to lanceolate, well armed, firm; marginal teeth 7 × 7 mm, curved and born from broad bases, 15-21 mm apart at mid leaf, 12-29 mm apart above, closely dentate (6-10 mm apart) toward the base; spine 3.5-4.5 × 0.9 cm, flexuous, black to bluish-gray, channeled and long decurrent; panicles open, 4-6 (6.5) m tall; bracts 20 × 13 cm, triangular, persistent, mostly reflex, scarious, 4-11 cm apart; shaft with 16-18 laterals, reddish to yellowish at anthesis; laterals 49 × 40 cm, 17 cm in diameter at the base.

Flowers 50-70 per lateral, 6-7.1 × 1.2 cm, reddish at the tip in bud and bright yellow at anthesis; tube 1.4-1.5 cm deep, equalling or longer than tepals; tepals dimorphic, drying leathery, persisting erect, the outer 1.4-1.5 cm and overlapping the inner, red-tipped, conspicuously corneous at apex, the inner ones 1.2-1.3 cm, hairy and galeate at apex; with the sides thinner; filaments inserting unequally in mid tube, the three opposite to outer tepals, inserted 1 mm higher; anthers 21 × 2.5 mm, linear; Ovary 17 × 5 mm, the neck 7 × 3 mm, pistil slender, with clavate trilobate glandular stigma, over-reaching the stamens in post-anthesis; capsules 4.4-5.1 × 1.4-1.8 cm, oblong-obovoid, carpels 4.4-5.5 × 1.5-1.6, seeds 5-6 × 3-4 mm, sub-circular to hemi-circular, triangular (after Vazquez *et al.*, 2012)..

Specimens examined:

MÉXICO. Jalisco; Mun. Cañadas de Obregón, road from Palmarejo to Cofradía, 1690 m, 5th May 2010 (with flowers), Vázquez-García & Cházaro 9070 (IBUG, MEXU); Mun. Cañadas de Obregón, Río Verde ravine, between Temacapulín and Palmarejo, 12 Jun 2010 (with flowers), Cházaro & López-V. 9817 (IBUG, IEB, XAL, erroneously distributed as *Agave americana* var. *expansa*). Mun. Cañadas de Obregón, road from El Zapotillo to the Verde river, 24th Apr 2011 (sterile), Vázquez-García *et al.* 9093 (IBUG). Mun. Mexxicacán, margins of the Acasico river, 24th Apr 2011 (sterile), Vázquez-García *et al.* 9094 (IBUG).

Phenology:

Flowering from May to June, fruiting starting in June.

Etymology:

The species is named after the village Temacapulín, a small town with hot-spring pools and spas, with courageous inhabitants that are fighting against the disappearance of his hometown under the water, as a result of the construction of dam Project (*presa* in Spanish) El Zapotillo, now under construction by the Federal government.



Agave temacapulinensis, inflorescence; right, Miguel Cházaro, Jalisco, Mexico. © M. Cházaro

Conservation status:

the habitat is already heavily degraded, vegetation cover is usually depleted for agricultural and livestock expansion. However, the major threat to these populations is the El Zapotillo dam project, that may flood large portion of its habitat, causing at least a considerable lost of its genetic diversity. *Agave temacapulinensis* is locally very abundant, however it is a regionally rare species, thus it is recommended its inclusion to the Mexican endangered species act (SEMARNAT, 2010) under the special protection category.

Until now, *Agave temacapulinesis* is only known from Jalisco, being endemic to the Rio Verde (Green river) drainage at the municipalities of Cañadas de Obregón and Mexticacán. It grows in calcareous outcrops at elevations from 1600-1750 m, on the ecotones between *Juniperus* forest, *Acacia* & *Prosopis* thorn forest and *Taxodium mucronatum* gallery forest, together with *Prosopis laevigata*, *Yucca australis*, *Acacia schaffneri*, *Stenocereus queretaroensis* and *Opuntia jaliscana*.

The deep tube of its flowers is expected to hold large amounts of nectar and likely to become attractive to birds and/or bats. In fact, the tepals are hardened like leather, perhaps to protect the nectar, this corresponds to an adaptation to bat pollination, however is yet to be tested.

Agave temacapulinensis in the group *Ditepalae* of Gentry (1982), it is closely related to *A. wocomahi* Gentry, from the western Sierra Madre, that reach the northeast corner of Jalisco at the Ojuelos region, and even more close due to its glaucous coloured leaves, to *A. durangensis* Gentry, also from the western Sierra Madre, known only from Durango and Zacatecas, not too far from the Jalisco border.

Agave temacapulinensis it is an attractive plant and therefore has a great potential as an ornamental.

The number of *Agave* species that occurs in Jalisco state as increase steadily, from 11 species reported by McVaugh (1989), then 23 species reported by Hernandez-Vera *et al.* (2007) up to 28 species reported by Vazquez-Garcia *et al.* (2009).

Nowadays, we have, at national level, the following figures for the 3 most richness of *Agave* states: Oaxaca, with 30 species (Garcia-Mendoza *et al.*, 2004), Jalisco with 28 species (Vazquez-Garcia *et al.*, 2007) and Durango with 27 species (Gonzalez-Elizondo *et al.*, 2009).



Agave temacapulinensis & inflorescence, Jalisco, Mexico.

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Agave temacapulinensis, inflorescence, Jalisco, Mexico.

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