Agave jimenoi (Polycephalae group, Asparagaceae) a new species from the Totonacapan region, Veracruz, Mexico

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Abstract

A new hydrophytic species of Agave from the Tlapacoyan region, Veracruz, Mexico, is described and illustrated. Agave jimenoi belongs to the subgenus Littaea, and to the Polycephalae group, it differs from A. gomezpompae in its smaller rosettes, hanging stems, leaves and inflorescences and glaucous-green pruinose leaves. A distribution map and key to the species of the Polycephalae group is presented.

Resumen

Se describe e ilustra una nueva especie hidrofítica de Agave de la región Tlapacoyan, Veracruz, México. Agave jimenoi pertenece al subgénero Littaea y al grupo Polycephalae. La especie difiere de A. gomezpompae en tener rosetas más pequeñas, tallo más corto, escapo floral más corto, y hojas de color verde, glauco, pruinosas. Se presenta un mapa de distribución y una clave para las especies del grupo Polycephalae.

Key words: Polycephalae group, endemic, Tlapacoyan

Introduction


Description of the new species

Agave jimenoi Cházaro & A.Vázquez, sp. nov. (Figs. 1, 2 and 3)

Agave jimenoi is morphologically similar to Agave gomezpompae in sharing a long bifurcate stem, ob lanceolate flexible foliage, lateral erect inflorescence with flowers along the upper half of the shaft, polycarpic habit, and habitat at low to mid elevation tropical subperennial forest. However, it differs from the later in its shorter stems (33–35 vs. ca. 150 cm long), hanging vs creeping stems, smaller leaves (39–40 vs. 80–85 cm long), pattern of denticles (lacking in the 6 cm below the spine vs all along the leaf margin), and size of inflorescence (132–140 vs. 250–265 cm tall).
Type:—MEXICO. Veracruz, Municipio: Tlapacoyan, Cascada El Encanto, at Filobobos river, 19°59’0.38”N, 97°10’40”W, 150 m, 30 April 2009 (fl), D. Jimeno, G. Sánchez, J.R. Fernández 702 (holotype XAL!, isotypes MEXU!, IBUG!)

Perennial plants up to 60 cm tall, non surculose, polycarpic; stems 34–90 cm long, 5.1–6 cm in diameter at the base, hanging, bifurcate, each branch bearing a terminal rosette that turns upright with 16–20 leaves per rosette; leaves 39–42 × 8.4–8.5 cm, oblanceolate, flexible, adaxially concave when young, green–glaucous; marginal denticles the same color of leaf blade, lacking in the upper 6 cm below the spine; spine 0.5–1.3 cm long, dark brown, flexible; inflorescence stem 132–140 × 1.3–1.45 cm, lateral, an erect spike; bracts (2.2–)10–160 × 2.2–12 mm, lanceolate, narrow, acuminate at the apex; flowers 28–30 × 2–2.6 mm (without the stamens), geminate; pedicels 3–5.8 × 2.3–3.6 mm; tepals 6, 17.5–20 × 5–6.5 mm, united at the base forming a tube 7 × 5 mm, lanceolate, yellowish; stamens 41–44 mm long, with reddish to yellow anthers of ca. 15 × 1.5 mm; ovary 13–13.3 × 4–4.5 mm long; styles about 4.7 × 0.15 cm; capsules 15.8–18.8 × 12–13 mm, elliptic; seeds 2–3.3 × 3.4–4.8 mm, black.

**FIGURE 2.** *Agave jimenoi*. A. Stem showing the bifurcation scar, indicated with a yellow arrow, B. Habit, C. Inflorescence, D. Seedlings growing in dry capsules, E. Inflorescence. Photographs by Gerardo Sánchez-Vigil (A, B and D), Alberto Badía (C), and H. David Jimeno-Sevilla (E).
**Taxonomic relationships:**—*Agave jimenoi* belongs to the subgenus *Littaea* (Tagliabue 1816: 106) Baker (1888: 164), and to the Polycephalae group (Gentry 1982). In addition to the morphological relationships in the diagnosis, this species differs from *A. gomezpompae* in its distribution pattern (Totonacapan vs. Córdoba-Zongolica region). In terms of morphology, *Agave jimenoi* is distantly related with *A. pendula*, sharing with the latter its bifurcate hanging stem and pattern of denticles (lacking denticles in the upper portion of the leaf below the spine); nevertheless, it differs from the latter in having stems 33–35 vs. ca. 200 cm long, leaf shape oblong vs. oblong to lanceolate, leaves 38–42 × 8.4–8.5 vs. ca. 93 × 4.8 cm, leaf color pattern without a central stripe vs. with a yellow central stripe, inflorescence lateral erect vs. pendulous, and flowers located in the upper half vs. in the upper third of the shaft (Table 1).

**TABLE 1.** Differences between *Agave jimenoi*, *A. gomezpompae* and *A. pendula*.

<table>
<thead>
<tr>
<th></th>
<th><em>A. jimenoi</em></th>
<th><em>A. gomezpompae</em></th>
<th><em>A. pendula</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>Stem structure</td>
<td>bifurcate, hanging</td>
<td>bifurcate, creeping or erect in the distal portion</td>
<td>bifurcate, sometimes creeping, mostly hanging</td>
</tr>
<tr>
<td>size (cm)</td>
<td>33–35 × 5.1</td>
<td>ca. 150 × 8–15</td>
<td>ca. 200 × 5–11</td>
</tr>
<tr>
<td>Leaf shape</td>
<td>oblancoate</td>
<td>oblancoate</td>
<td>oblong, lanacoate</td>
</tr>
<tr>
<td>size (cm)</td>
<td>38–42 × 8.4–8.5</td>
<td>80–85 × 10–13</td>
<td>81–93 × 4.8–10.1</td>
</tr>
<tr>
<td>colour</td>
<td>glaucous-green, pruinose, without a yellow central stripe.</td>
<td>green, without a yellow central stripe.</td>
<td>light green with a yellow central stripe.</td>
</tr>
<tr>
<td>Denticulation pattern</td>
<td>lacking in the 6 cm below the spine</td>
<td>all along the leaf margin</td>
<td>lacking in the 12–16 cm below the spine</td>
</tr>
<tr>
<td>Inflorescence</td>
<td>lateral, erect</td>
<td>lateral, erect</td>
<td>lateral, pendulous</td>
</tr>
<tr>
<td>size (cm)</td>
<td>132–140 × 1.3–1.45</td>
<td>250–265 × ca. 2</td>
<td>130–180 × 1–1.3</td>
</tr>
<tr>
<td>Flower arrangement</td>
<td>upper half of the shaft</td>
<td>upper half of the shaft</td>
<td>upper third of the shaft</td>
</tr>
<tr>
<td>Habitat</td>
<td>tropical subperennial forest</td>
<td>tropical subperennial forest and cloud forest</td>
<td>tropical deciduous forest</td>
</tr>
<tr>
<td>Flowering</td>
<td>April–June</td>
<td>May–June</td>
<td>January–February</td>
</tr>
<tr>
<td>Fruiting</td>
<td>May–July</td>
<td>July–September</td>
<td>March–April</td>
</tr>
<tr>
<td>Distribution</td>
<td>Central Veracruz: Totonacapan region</td>
<td>Central Veracruz: Córdoba-Zongolica region</td>
<td>Central Veracruz, Chiapas, Guatemala</td>
</tr>
</tbody>
</table>

**Distribution, habitat and phenology:**—This species is only known from the Central Veracruz state in two localities: the Type locality at Cascada El Encanto, Filobobos river, in Tlapacoyan, and a second population that we saw but we could not collect on a cliff near San Pablo, at Gutiérrez-Zamora municipality. *Agave jimenoi* is a cliff dweller, thrives at the lowlands (ca. 150 m a.s.l.). In fact, among the Polycephaalae group, *Agave jimenoi* is the one growing at the lowest altitude, in tropical subperennial forest (Rzedowski 1978). Flowering from April to May and fruiting from May to July.

**Eponymy:**—The specific epithet honors Biol. Héctor David Jimeno-Sevilla, from Universidad Veracruzana, Xalapa, Veracruz, Mexico; recently incorporated to the Instituto Tecnológico Superior de Zongolica, Veracruz; an enthusiastic explorer, a gifted botanical illustrator, a curator, a professional scientist devoted to the study of the succulent flora of Mexico, and a scholar of the genus *Echeveria* Candolle (1838: 401) and the family Crassulaceae Saint-Hilaire (1805: 123) in the Veracruz state.

**Additional specimens examined (paratypes):**—MEXICO. Veracruz, Municipio: Tlapacoyan, Cascada El Encanto, Filobobos river, 19°59’0.38”N, 97°10’40”W, 150 m, (fr) 16 July 2011 (fr) Cházaro, et al. s.n. (XAL!, MEXU!, IBUG!).
Key to the species of *Agave* (Polycephalae group)

1. Leaves lanceolate, firmly fleshed; flowers slender, not trigonous, not markedly furrowed on tube and ovary .........
   - Leaves ovate or oblong to lanceolate, soft fleshy; flowers thick, fleshy, tube and ovary trigonous, 6-furrowed ...... 2.
2. Bractlets large with broad bases; flowers large, 60-90 mm long, tepals 3-4 times the tube length .................... 3.
   - Bractlets small, narrow, inconspicuous; flowers small, 35-60 mm long; tepals 1-2 times the tube length ............  4.
3. Teeth large, 3-10 mm long, not united on a continuous reddish margin .......................................................... *A. chiapensis*
   - Teeth closely serrate, 2-3 mm long, united on a continuous reddish margin ............................................. *A. warreliana*
4. Leaves ovate to oblong or spatulate, short-acuminate, the length 4-6 times the width ............................... *A. mitis*
   - Leaves lanceolate to oblong lanceolate, long acuminate, the length 7-10 times the width ..........................  5.
5. Stemless ....................................................................................................................................................... *A. wendtii*
   - Stems bifurcate .............................................................................................................................................. 6.
6. Leaves with a yellow central stripe; inflorescence pendulous, with flowers in the upper third .................. *A. pendula*
   - Leaves without a central yellow stripe; inflorescence erect, with flowers in the upper half .......................  7.
7. Stems distally creeping or erect, 150 cm long; leaves 80-85 cm long, denticles all along the margin; inflorescence 250-265 cm long .......................................................................................................................... *A. gomezpompae*
   - Stems distally hanging, 33-35 cm long; leaves 38-42 cm long, denticles lacking in the 6 cm below the spine; inflorescence 132-140 cm long............................................................... *A. jimenoi*
Acknowledgements

The authors are deeply thankful to H. David Jimeno-Sevilla, Roberto Castro-Cortes, José Ramón Fernandez, Gerardo Sánchez-Vigil, Alberto Badía, Jerónimo Vazquez-Ramírez, Héctor Narave-Flores, Apolonia Hernández-García and Pedro Padilla-Sanchez for their assistance during field work; to H. David Jimeno-Sevilla for the drawings and to Gerardo Sanchez-Vigil, Alberto Badía and H. David Jimeno-Sevilla for the photographs.

References