ECHEVERIA ANDICOLA, A NEW SPECIES FROM CENTRAL PERU

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Abstract: Echeveria andicola Pino, a new species endemic to central Peru, is described. Although fairly common in the departments of Junin, Pasco and Huanuco, the plants had formerly been identified as E. chiclensis or E. peruviana; however, careful analysis supports the recognition of these plants as an unpublished species. A comparison with other similar species of the area is presented.

Key words: Echeveria andicola sp. nov., Crassulaceae, Peru flora

Introduction

Macbride (1938) listed all the Peruvian species of Echeveria known up to that time. Among the collections of E. chiclensis (Ball) Berger, he mentions plants collected at Huanuco, Tarma (Junin) and Huariaca (Pasco), as well as plants of E. peruviana Meyen from Tarma, all of which were growing far away from their type localities and at relatively lower altitudes. Herbarium material collected later at those localities does not adequately show the distinguishing features of these species. While we were studying the varieties of E. chiclensis, we visited these localities to examine the plants in habitat and noticed how they differed from E. chiclensis and E. peruviana.

Results

Echeveria andicola Pino sp. nov.

Planta succulenta glabra caule subterraneo erecto 4-10 cm longo 1-2 (-3) cm crasso, rosula 7-13 (-18) cm diam., foliis plants, juvenilibus obovatis postremo obovatis oblongis 5.5-8 cm longis 2.5-4 cm latis 3.4 mm crassis, supra viridibus, infra saepe rubropunctatis, apicibus subacutis vel obtusis, mucrone triangulato parvisimo piano vel deorsum curvato instructis. Caulis floriferus racemosus erectus simplex 20-35 cm longus 4-6 mm basin diametentis, bracteis lanceolatis caducis 3-5 cm longis 9-13 mm latis 2-3 mm crassis, pedicellis ascendentibus rubribus 0.2-1 cm longis. Flores prismatipentagonales, corollis 12-14 mm longis 8-10 mm crassis prope basin, sepalis erectis lanceolatis 6-9 mm longis 1.8-2.2 mm latis, petalis rubribus ellipticis oblongis 1-1.4 cm longis, gynoeceio ovoido 8.9 mm longo 4-5 mm crasso stylis rubribus apicem versus. Floret a Novembri ad Majum. Habitat supra saxa in an-dibus centralibus Peruviae apud 2500-3500 m.

Type locality: Peru, Dept. Junin, Prov. Tarma, Dist. Acomayo, road to Chanchamayo, between Picoy and Palcamayo, near Pisqamarka ruins, on a 45° slope of rocks and clay at the side of the road, 3170 m, growing with Ephedra andina and Peperomia aff. hartwegiana, 11°18’56”S, 75°42’35”W, April 13, 2004, G. Pino 1320.

Holotype: USM 190013.

Etymology: andicola in reference to its habitat in the Andes mountains.
A succulent glabrous herb, usually with a single rosette. **Roots** 3-8, tuberous, 0.4-0.6 cm thick, 5-12 cm long, light brown to white. **Stem** subterranean, 1-3 (-4) cm diameter, 4-10 cm long, rarely branched, erect. **Rosette** 7-13 (-18) cm diameter. **Leaves** 18-40, sessile, succulent, horizontally flat, obovate when young, later lanceolate-obovate to oblong, 5.5-8 (-10) cm long, 1.5-2.5-3.5 (-4) cm wide 2 cm from apex, 2.5-4 cm wide at middle, 1.2-1.8 (-2.2) cm wide at base, 2-3 mm thick, acute or sometimes obtuse, with a miniature triangular mucro 0.5 mm long, 1 mm wide, flat or sometimes recurved, upper side flat to slightly convex, light green, sometimes slightly glaucous, lower side flat, green, sometimes red-dotted and obscurely keeled, margins smooth but faceted near apex when young. **Flowering stem** simple, erect, 20-35 cm long, 4-6 mm diameter at base, 1.5-2 mm diameter at apex, yellowish green near base, bright red towards apex. **Peduncular bracts** 7-10 (-15), lanceolate, 3-3.5 cm long, 9-13 mm wide, 2-3 mm thick, yellowish green. **Flowers** 11-22, appearing from November to May. **Pedicels** erect, 0.2-1 cm long, 1.2-1.5 mm diameter, bright red, with 1 linear, curved bracteole, 0.9-1.3 mm long and 1.8-2.2 mm wide, yellowish green. **Calyx** lobes united at base, erect. **Sepals** linear-lanceolate, acute, 6-9 mm long, 2-2.5 mm wide, green, reddish at base. **Corolla** ovoid, pentagonal, 8-10 mm thick near base. **Petals** elliptic-oblong, acuminate, 1.0-1.4 cm long, 3-3.5 mm wide, exterior red, keeled, apex uncinulate, recurving, inner surface pink. **Stamens** 10, the 5 epipetalous 4-5 mm long, the antesepalous 7-8 mm long. **Filaments** cream, 0.8 mm thick at base, gradually tapering to 0.1 mm. **Anthers** ovoid, greenish yellow, 1.2-1.4 mm long and 0.5-0.6 mm wide. **Gynoecium** ovoid, 8-9 mm long, 4.5 mm thick. **Carpels** 5, greenish white. **Styles** 4-5 mm long, parallel, almost touching each other, stigma red. **Fruit** pentalocular, loculicide capsule 0.6 mm long and 0.5 mm wide. **Seeds** narrow-ovoid, 0.7-0.8 mm long, 2.3 mm diameter, light brown, apex acuminate.

Discussion
The leaf-shape, although quite variable, differs from that of all other Echeveria taxa growing in the area. Young leaves are obovate (Fig. 1). On very young leaves the margins and apices are angled or faceted (Fig. 2). When the plants are in growth they develop rather oblong leaves that are almost linear in some plants growing in the shade (Fig. 3). Leaf margins lose their angles and become rounded (Fig. 4). They are flat or somewhat convex but never clearly concave as in E. chiclensis, where they are almost always lanceolate to linear-acute from the earliest stages (Pino, 2002). Another acute-leaved species from the area is E. excelsa A. Berger, with very large, narrowly triangular leaves, glaucous with a purple tinge, very rigid and similar to those of an Aloe species (Fig. 5). A very remarkable character of the leaves of E. andicola is the presence of a minute triangular apical mucro that may be obscure because it is sometimes curved backwards and hidden by the leaf margin (Fig. 6). A geographically close species with such a structure is E. oreophila from the south of Cajamarca and north of La Libertad (Kimnach, 2002). It also shares the obovate shape of the leaf, but this character is constant and leaves are almost always spatulate. The mucro in E. oreophila is, however, larger and always obvious, and this species also quickly develops a very thick and long aerial stem that later branches from the base.

Flower development is also characteristic. The flowering stem of E. andicola is erect with a constantly straight apex. Peduncular bracts are deciduous and present only at the base of the stem, as in E. chiclensis (Fig. 7), but in the new species the flowers are regularly distributed along the stem and in the latter they are clustered near the apex. In E. oreophila the bracts persist at the base of each flower pedicel and all along the stem, doubling the length of the corolla. In E. andicola, E. peruviana and E. oreophila the pedicel is short and almost always straight, compared to the long, sometimes decurved pedicels of E. chiclensis. The length of the corolla is shorter than in all the other species compared and therefore prismatic rather than pyramidal (Fig. 8). The color of petals and stems is redder than in the other related species (Fig. 9).

Figure 8. Comparison of flowers of E. andicola (left) and E. chiclensis (right).

Figure 9. Apex of flowering stem with bright red flowers.

Figure 10. Fruiting E. andicola at the type locality.

Figure 11. Echeveria andicola on the road to Chanchamayo.
Table 1. Main differences among *E. andicola*, *E. chiclensis*, *E. oreophila* and *E. peruviana*.

<table>
<thead>
<tr>
<th></th>
<th><em>E. andicola</em></th>
<th><em>E. chiclensis</em></th>
<th><em>E. oreophila</em></th>
<th><em>E. peruviana</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>Stem</td>
<td>Subterranean and simple</td>
<td>Subterranean but sometimes aerial, seldom branching</td>
<td>Constantly aerial in adult plants, branching readily from the base</td>
<td>Subterranean and simple</td>
</tr>
<tr>
<td>Leaf form</td>
<td>Obovate to obovate</td>
<td>Lanceolate-obovate</td>
<td>Spatulate to ovate</td>
<td>Ovate to obovate</td>
</tr>
<tr>
<td>Leaf surface</td>
<td>Flat to slightly convex</td>
<td>Concave</td>
<td>Flat</td>
<td>Flat to concave</td>
</tr>
<tr>
<td>Leaf tip</td>
<td>Acute with 0.5 x 1 mm micro</td>
<td>Acute</td>
<td>Ovate to truncate with 1 x 2 mm micro</td>
<td>Acute to acuminate</td>
</tr>
<tr>
<td>Flowering stems</td>
<td>Erect and straight at tip</td>
<td>Erect but often crooked (near apex)</td>
<td>Emerging from the sides of the plant, then recurving upward</td>
<td>Emerging from the sides of the plant, then erect</td>
</tr>
<tr>
<td>Peduncular bracts</td>
<td>Deciduous, lanceolate, 3-3.5 cm long, 9-15 mm wide</td>
<td>Deciduous linear-oblanceolate, 5-6 cm long, 6-10 mm wide</td>
<td>Persistent and constant at the base of each flower, erect-oblanceolate, 3-3.5 cm long, 7-9 mm wide</td>
<td>Persistent lanceolate, 3.5-3 cm long, 6-12 mm wide</td>
</tr>
<tr>
<td>Flower pedicel</td>
<td>0.2-1 cm long, erect</td>
<td>0.8-2.5 cm long, sometimes recurved downward</td>
<td>0.2-1.6 cm long, erect</td>
<td>0.4-1.2 cm long, erect</td>
</tr>
<tr>
<td>Corolla size</td>
<td>1-1.4 cm long, 0.6-1 cm diameter</td>
<td>1-1.6 cm long, 0.6-0.8 cm diameter</td>
<td>1.2-1.6 cm long, 0.5-0.6 cm diameter</td>
<td>1.4-1.6 cm long, 0.6-0.8 cm diameter</td>
</tr>
<tr>
<td>Color of petals</td>
<td>Dark red</td>
<td>Light orange at base tips red</td>
<td>Light orange</td>
<td>Dark red</td>
</tr>
<tr>
<td>Sepals</td>
<td>Linear-lanceolate</td>
<td>Linear-oblong</td>
<td>Ovate-lanceolate</td>
<td>Lanceolate</td>
</tr>
<tr>
<td>Distribution</td>
<td>Valleys of Pasco, northern Junín and southern Huánuco</td>
<td>Valleys of Lima and southern Ancash</td>
<td>Valleys of southern Callecas and northern Lima and Libertad</td>
<td>Valleys of Tacna</td>
</tr>
</tbody>
</table>

The distribution of this species is mainly along the Peruvian Central Highway after it turns north beyond the city of La Oroya, crossing the departments of Pasco and Huánuco, along the upper Huallaga River basin (Fig. 10) as well as in the valleys in the northern part of Junín draining to the Palca River (Fig. 11).

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Literature Cited

