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Miscellaneous notes and observations of the International
Crassulaceae Network



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Flora Mesoamericana Online:
Corrections of Genus Echeveria updated
and distribution revised

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Flora Mesoamericana online :
Genus *Echeveria* corrected

is no longer valid.

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Introduction

In 2018 I was asked to review the treatment of genus *Echeveria* in *Flora Mesoamericana*. To my surprise I found that it was far from being correct : Instead of basing his treatment on the protologues of the species in question, F.R. Barrie, the author of genus *Echeveria* in *Flora Mesoamericana*, relied on E. Walther's posthumous book *Echeveria*, 1972. He ignored that most of Walther's descriptions are useless because made from plants of unknown or uncertain origin. He also failed to consult either R.V. Moran or C.H. Uhl or the taxonomic changes published in the *Crassulaceae* volume of the *Illustrated Handbook of Succulent Plants*, 2003. Furthermore he said that regarding colours he had also relied on information found on the sheets of herbarium specimens. As is well known, this is not only highly problematic in itself but even more so as not seldom specimens are not correctly identified. In other words, the treatment was badly in need of corrections. However as these were not wanted at all, not even for the online version of *Flora Mesoamericana*, I published them in a volume of the online journal *Crassulacea*.

At that time only very few herbarium specimens of the plants in question were accessible online, and it was not possible to check those indicated for the countries grouped under the term Mesoamerica. In the meantime however an enormous increase of online accessible herbarium material has taken place, and it has turned out that F.R. Barrie, apart from compiling the treatment of genus *Echeveria*, had also found it necessary to re-determine a great many herbarium specimens of *Echeveria* species, especially those concerning the Mesoamerican species but others as well – a large number, however, erroneously.

An exhaustive examination, evaluation and correct identification of dozens of specimens of *E. australis*, *E. bella*, *E. coccinea*, *E. guatemalensis*, *E. maxonii*, *E. montana*, *E. pinetorum*, *E. pittieri*, *E. rosea* and *E. steyermarkii* has revealed that the common perception of the distribution of these species needs to be revised :

E. australis is occurring in Costa Rica & Panama, not present however in Honduras & Nicaragua.

E. bella fa *major* is not occurring in Guatemala.

E. guatemalensis is occurring in Guatemala & Nicaragua, however not present in Honduras & El Salvador.

E. maxonii is occurring in Guatemala & Honduras.

E. montana is not present in Guatemala – the Guatemalan plant wrongly considered *E. montana* most likely is an undescribed species.

E. pittieri is occurring in E. Salvador, Guatemala & Nicaragua, however not present in Costa Rica.

E. rosea is not occurring in El Salvador.

Flora Mesoamericana lists the following species :

- *Echeveria acutifolia* Lindl. > not present in Mesoamerica.
- *Echeveria australis* Rose
- *Echeveria bella* Alexander
- *Echeveria chiapensis* Rose ex Poelln. > name in the synonymy of *E. rosea*.
- *Echeveria coccinea* (Cav.) DC.
- *Echeveria corallina* Alexander = *Echeveria sessiliflora* Rose > *E. corallina* is a distinct species, while *E. sessiliflora* is in the synonymy of *E. pinetorum*.
- *Echeveria goldmanii* Rose
- *Echeveria guatemalensis* Rose
- *Echeveria gudeliana* Véliz & García-Mend.
- *Echeveria holwayi* Rose = *Echeveria acutifolia* Lindl. > Neither *E. holwayi* nor *E. acutifolia* are present in Mesoamerica.
- *Echeveria huehueteca* Standl. & Steyerl. = *Echeveria pinetorum* Rose
- *Echeveria macrantha* Standl. & Steyerl.
- *Echeveria maxonii* Rose
- *Echeveria montana* Rose > not present in Mesoamerica.
- *Echeveria papillosa* Kimnach & C.H. Uhl
- *Echeveria pinetorum* Rose
- *Echeveria pittieri* Rose
- *Echeveria prunina* Kimnach & Moran
- *Echeveria sessiliflora* Rose > name in the synonymy of *E. pinetorum*.
- *Echeveria steyermarkii* Standl.

Corrected list of species occurring in the region covered by the Flora Mesoamericana :

Echeveria australis Rose
Echeveria bella Alexander
Echeveria coccinea (Cavanilles) DC
Echeveria corallina Alexander
Echeveria goldmanii Rose
Echeveria guatemalensis Rose
Echeveria gudeliana Véliz & García-Mendoza
Echeveria macrantha Standley & Steyermark
Echeveria maxonii Rose
Echeveria papillosa Kimnach & Uhl
Echeveria pinetorum Rose
Echeveria pittieri Rose
Echeveria prunina Kimnach & Moran
Echeveria rosea Lindley
Echeveria steyermarkii Standley

Echeveria acutifolia

Flora Mesoamericana :

1. Echeveria acutifolia Lindley *Edwards's Bot. Reg.* 28: t. 29 (1842). Holotipo: México, Oaxaca, Hartweg 749 (CGE) ¹.

Ilustr.: Walther, *Echeveria* 214, t. 112 (1972) ².

Echeveria holwayi Rose. ⁴

Hierbas terrestres, glabras; tallos hasta 30 cm, sin ramificar. Hojas c. 300 × 100 mm, frecuentemente reducidas y escasas cerca del extremo de los tallos, oblongas a obovadas, las nervaduras rojas o verdes con púrpura y ligeramente glaucas, aplanadas, coriáceas, la base decurrente sobre el pecíolo, el ápice anchamente agudo, finalmente mucronato; pecíolo ancho, uniéndose con la lámina, los márgenes alados. Inflorescencias 20-100 cm, paniculadas, erectas, con 100 o más flores; pedúnculo 3-10 cm, rojo; ramas 9 o más, ascendentes, oblongas a lanceoladas, carinadas, de color similar a las hojas; pedicelos 3-5 mm. Flores con sépalos 8-10 mm, subiguales, ascendentes, lineares o lanceolados, comprimidos, glaucos, púrpuras, el ápice agudo; corola urceolada, los pétalos 10-13 mm, lanceolados, rojos o rosados por fuera, rojos por dentro o con líneas anaranjadas o rojas. Folículos no vistos. *Laderas secas rocosas.* ³

Ch (*Laughlin* 558, CAS). 1300-1800 m. (México [Oaxaca, Michoacán], Mesoamérica.)

¹ Regarding the origin of his plant Lindley says that Mr. Hartweg had collected it in Oaxaca - whether he had collected it in the wild or in a garden is unknown. No similar plant has since been found in Mexico, so in the absence of a locality for it in the wild it may well have been a hybrid and should bear a cultivar name > *Echeveria 'Acutifolia'*.

² Fig. 112 shows *E. holwayi*, not *E. acutifolia*. It is **Fig. 113** which shows *E. acutifolia*.

³ The Spanish text reflects Walther's description of "*E. acutifolia*" (*Echeveria*, 203, 1972), which in fact was made from a presumable clonotype of *E. holwayi* Rose, an entirely different plant, i.e. Walther's "*E. acutifolia*" is not identical with *E. acutifolia* Lindley.

⁴ *E. holwayi* Rose is not a synonym of *E. acutifolia* Lindley. It is a distinct species.

REINSTATED AS A DISTINCT SPECIES in Crassulaceae No.5, 2017 : Corrections in Genus Echeveria – 1.

https://www.crassulaceae.ch/docs/24ce97a908928a1874658e2bb182b218_Crassulaceae%20%20No%205%20-%202029.%20September%202017%20-%20Corrections%20in%20Genus%20Echeveria%201.pdf

***E. acutifolia* Lindley is NOT OCCURRING in Mesoamerica.**

Correct text :

***Echeveria acutifolia* Lindley, 1842**

Synonym : *Cotyledon acutifolia* (Lindley) Baker (1869)

Series *Gibbiflorae*

Type : K.T. Hartweg 749, among the plants found by Mr. Hartweg during a short visit to Oaxaca, possibly from a garden.

Etymology : Referring to the shape of the leaves.

Distribution : Mexico, no definite locality known.

Description by Lindley in *Edwards's Botanical Register*, new ser., vol. 5, pl. 29, 1842 :

Caulescent plant.

Leaves in rosettes at the top of the stem, subrhomboid, very acute, upper face concave, compared with *E. gibbiflora* they are much more green and richly touched with scarlet.

Inflorescence a short narrow erect cylindrical panicle, the lateral branches are short, straight, and only bear three or four flowers in a corymbose manner at the end.

Flowers : **Sepals** acute, much shorter than petals, **corolla** rich scarlet tinged with yellow.

Echeveria australis

Flora Mesoamericana :

2. Echeveria australis Rose, *Bull. New York Bot. Gard.* 3: 6 (1903).

Lectotipo (designado por Walther, 1972): Costa Rica, Pittier y Rose 523 (imagen en Internet ex US!).

Ilustr.: Walther, *Echeveria* 225, t. 7 (1972) ².

Subarbustos terrestres o epifíticos, glabros; tallos hasta 30 cm, escasamente ramificados, la corteza lisa. Hojas 15-70 × 10-35 mm, subarrosetadas a agregadas, obovadas, espatuladas, coriáceas, verdes matizadas con púrpura, escasamente glaucas, el haz cóncavo, el envés carinado, el ápice agudo. Inflorescencias hasta 25 cm, racemosas o paniculadas, con 30-50 flores, las más inferiores en pares; brácteas hasta 25 mm, numerosas, patentes, oblongo-ovadas, de color similar a las hojas; pedicelos 1-5 mm. Flores con sépalos 6-12 mm, subiguales, ascendentes o patentes, verdes matizados de púrpura; corola 11-14 mm, roja por fuera, rosada por dentro con líneas rojas, el ápice acuminado. Folículos 5-7 mm. *Selvas altas perennifolias, selvas húmedas.*¹

H (*Rodríguez 3583*, F); N (*Rueda et al. 18726*, MO); CR (*Hammel 22244*, MO); P (*White 39*, MO). 800-2200 m. (Endémica.)

¹ The Spanish text is based on Walther's re-description of *Echeveria australis* (*Echeveria* xx, 1972), made "from locally cultivated material" - that means from plants of unknown origin. Therefore the re-description is useless and consequently also the Spanish description in Flora Mesoamericana.

Correct text :

Echeveria australis Rose, 1903

Series *Nudae*

Type (Lecto-): Pittier s.n., Rose 523, Volcan Irazu, San José, Costa Rica, 1902. (US 397557)

Etymology : Latin adjective australis = southern - for the relatively southern distribution in relation to the bulk of the genus.

Distribution : Costa Rica, Panama, mostly epiphytic.

First Description by Rose, in Britton & Rose, *Bulletin of the New York Bot. Garden* 3: 6.1903 :

Caulescent, 20 - 30 cm long, or 50 - 60 cm including the inflorescence, glaucous.

Leaves broadly spatulate, rounded at apex, 3 - 7 cm long, sometimes 3 cm broad and spoon-shaped, somewhat glaucous and often purplish, thickly set at apex of branches, early falling off below.

Flowering branches stout, bearing numerous large oblong bract-like leaves, inflorescence an elongated equilateral raceme or sometimes more compound, forming a narrow panicle, **pedicels** 1 cm long or less, slender.

Flowers : **Buds** strongly 5-angled, acute, **sepals** unequal, the longer ones 12 mm long, ovate-oblong, purplish, glaucous, nearly or quite free to the base, **petals** bright red, thickish, a little longer than the longest sepals, nearly

distinct, cup-shaped at base, **stamens** 10, the 5 opposite the sepals borne on petals about one forth the distance above the base.

² The protologue as well as the watercolour painting of a plant of the type collection (Walther, *Echeveria* 225, plate 7, 1972) impart unmistakably that the flowers are red – the two flower photos below (published in the online version of the *Flora Mesoamericana*) therefore cannot possibly represent *E. australis*.

In view of the fact that in relevant literature *E. australis* has never been reported from Nicaragua it is astounding how many Nicaraguan specimens the author has listed, obviously without verifying them, otherwise he could have noticed that they do not represent *E. australis*. None of the specimens of Nicaragua to be found online is correctly named ; all of them represent ***E. pittieri***, not *E. australis*.

Nicaragua Estelí: Cerro Quiabuc, 1485 m, 13°06'50"N 086°25'30"W, 02 February 2010, W. D. Stevens, I. Coronado G. & O. M. Montiel 29385 (HULE, MO) = ***E. pittieri***, not *E. australis*.

Nicaragua Estelí: Cerro El Bolsón, 1100 - 1200 m, 13°08'00"N 086°27'00"W, 24 January 1981, W. D. Stevens 19022 (MO) = ***E. pittieri***, not *E. australis*.

Nicaragua Jinotega: 1380 - 1400 m, 13°13'00"N 086°15'00"W, 16 November 1979, W. D. Stevens & Alfredo Grijalva P. 15762 (MO) = ***E. pittieri***, not *E. australis*.

Nicaragua Madriz: Cerro Buenavista, 1250 - 1300 m, 13°17'00"N 086°36'00"W, 4 enero 1982, **P. P. Moreno 14269 (MO)** = ***E. pittieri***, not *E. australis*.

Nicaragua Madriz: Cerro Buenavista, 1300 - 1400 m, 13°18'00"N 086°36'00"W, 4 enero 1982, **P. P. Moreno 14319 (MO)** = ***E. pittieri***, not *E. australis*.

P.P. Moreno 8208 = ***E. pittieri***, not *E. australis*.

R.M. Rueda et al. 12714 = ***E. pittieri***, not *E. australis*.

Stevens & Montiel 30448 = ***E. pittieri***, not *E. australis*.

D.A. Neill 115 = ***E. pittieri***, not *E. australis*.

This is consistent with the lack of reports of *E. australis* in Nicaragua. *E. australis* is also not present in Honduras.

To summarise :

Missouri Bot. Garden nrs

3761549,

6284537,

2907424,

3036005,

5561416,

3761548,

6310212,

3761550,

2797934,

3761547 and

Stevens & Grijalva 15762 all represent ***E. pittieri*** and not *E. australis*.



Fig. 1. Photo published in Flora Mesoamericana online, wrongly determined as *E.australis*.

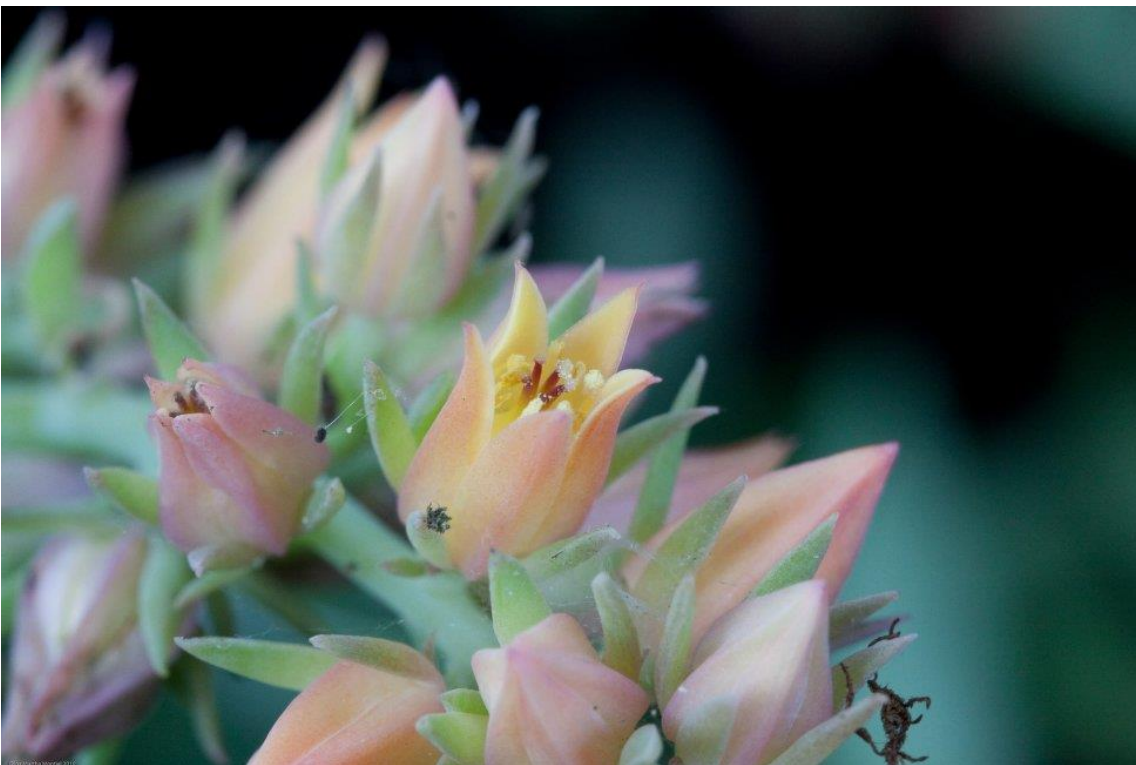


Fig. 2. Photo published in Flora Mesoamericana online, wrongly determined as *E.australis*.



Fig. 3. Copied from E. Walther, *Echeveria* 225, 1972.



Fig. 4. Type specimen of *E. australis* Rose.

Echeveria bella

Flora Mesoamericana :

3. Echeveria bella Alexander, *Cact. Succ. J. (Los Angeles)* 13: 133 (1941).

Holotipo: México, Chiapas, *MacDougall s.n.* (NY) ¹.

Ilustr.: Alexander, *Cact. Succ. J. (Los Angeles)* 13: 133, t. 73 (1941).

Hierbas terrestres, semi-caespitosas, glabras; tallos delgados, muy cortos, con numerosas ramas
Flora Mesoamericana, Volumen 2(3), Crassulaceae, página 7 de 25 laterales divergiendo cerca de la base. Hojas 20-25(-80) × 2-5(-25) mm, apretadamente agrupadas, marcadamente ascendentes, lineares, oblanceoladas, espatuladas, coriáceas, verdes, el haz y el envés convexos, el ápice agudo. Inflorescencias 1-varias, hasta 25 cm, racemosas, con 10-12 flores; pedúnculo rojo; brácteas c. 20 × 5 mm, oblongo-lanceoladas, verdes, comprimidas; pedicelos 3-10 mm, los más inferiores frecuentemente partidos y con 2 flores. Flores con sépalos 4-6 mm, subiguales, patentes o ascendentes, lineares, subteretes, verdes; corola c. 10 mm, c. 6 mm en diámetro basalmente, 5-angulada, ligeramente urceolada, la 1/2 inferior roja, amarilla distalmente, los lobos patentes en las puntas. *Laderas rocosas secas.* ²

Ch. 1800-2300 m. (Endémica.)

² The Spanish description is not correct because it is not based on the protologue by E. Alexander. Instead it is based on E. Walther's re-description (*Echeveria*, 357, 1972) which however - apart from being obsolete - is useless because it is made from "plants cultivated by V. Reiter, Jr. San Francisco, obtained from Dr. J. Meyran, Mexico City, 1959" - that means from plants without known origin. Moreover E. Walther died on July 1, 1959, so cannot possibly have been able to describe a plant only received from Dr. Meyran in 1959 by V. Reiter but already cultivated in his garden.

Correct text :

Echeveria bella Alexander, 1941

Series *Racemosae*

Type : MacDougall s.n. (NY). Plant collected winter 1938/39 near San Cristobal Las Casas, Chiapas, Mexico,

¹(referred to as E. B-6 in his fieldnotes).

Distribution : Mexico (Chiapas : San Cristobal Las Casas and near San Felipe Ecatepec, Zinacantán, Nabenchauk).

First Description by Alexander in *Cactus and Succulent Journal US* **13**(8): 133-135. 1941 :

Plant caespitose and freely offsetting.

The **rosettes** dense, 2 - 4 cm in diameter.

Leaves 1.2 - 1.8 cm long, narrowly oblanceolate, acute, 2 - 4 mm wide, bright yellow-green, not at all glaucous.

Inflorescence 10 - 20 cm tall, erect, its **bracts** very different from the leaves, 18 mm long and 5 mm broad, becoming reduced upwards, acutish, the upper ones somewhat glaucous as also is the reddish rachis; flowers 4 - 12 in a multilateral raceme, the **pedicels** reddish, 6 - 10 mm long, occasionally 2-flowered, the two bracts linear, 2 - 5 mm long.

Flowers : **Calyx** yellow-green, somewhat glaucous, the tube 1 mm long, the lobes spreading, linear, obtuse, nearly equal, 3 - 5 mm long; **corolla** 8 - 10 mm long, orange-yellow flushed with rosy-scarlet especially on the upper side,

campanulate, sharp-angled in bud, blunt-angled in flower, the lobes spreading apart nearly to the middle, the tips recurved; **stamens** opposite the petals 5 mm long, those opposite the sepals 6 mm long; **carpel**-cluster broadly ovoid, 7 - 8 mm long, the carpel bodies pale greenish-yellow, **stigma** and **styles** bright green, the styles 2 mm long; **nectarine** gland white, 1.5 mm broad.

Note :

Field Museum 1458964 has been determined as *E. sessiliflora* by F.R. Barrie. However the specimen represents *E. bella* Alexander and has been collected at the type locality of *E. bella* as is indicated on the original label.

Field Museum 1458970 from the very same locality, the very same collector and the very same date has been determined by F.R. Barrie as *Echeveria pinetorum*. However the specimen also represents *E. bella* Alexander.

Echeveria bella fa bella

Flora Mesoamericana :

3a. Echeveria bella Alexander var. **bella**.³

⁴ Hojas 20-25 × 2-5 mm, apretadamente agrupadas, marcadamente ascendentes, lineares a oblanceoladas, espatuladas, verdes, el haz y el envés convexos. *Laderas rocosas secas*.

Ch (*Carlson 160*, F). c. 1800 m. (Endémica.)

Correct text :

³ Correct name : *Echeveria bella fa bella*

Synonym : *Echeveria bella* var. *bella*

⁴ The description is not correct because it is based on Walther (l.c.) instead of on Alexander (l.c.)

Echeveria bella fa major

Flora Mesoamericana :

3b. Echeveria bella Alexander var. **major** E. Walther, *Echeveria* 358 (1972).⁵

Holotipo: México, Chiapas, *MacDougall B-180* (CAS).

Ilustr.: Walther, *Echeveria* 358, t. 116b (1972).⁶

Echeveria bella Alexander forma *major* (E. Walther) Kimnach.

Hojas 40-80 × 12-25 mm, obovadas, inconspicuamente carinadas en el haz. *Laderas rocosas secas*.⁷

Ch (*MacDougall B-180*, BH); G (*Molina R. 21446*, F)⁸. 1800-2300 m. (Endémica.)

Esta variedad solo se conoce de dos colecciones.

- Guatemala : [15°46'30"N 090°13'30"W], Antonio Molina R. 21446 (F)⁸
- Mexico Chiapas: 6000 ft, 1958, Thomas B. MacDougall B-180 (BH, CAS)

⁵ Correct name : *Echeveria bella fa major* (Walther) Kimnach, 1997

⁶ The illustration is Fig. 194, not 116b.

⁷ The measures given in the above description are not correct.

⁸ This is not correct, there are not two collections, the specimen Antonio Molina R. 21446, collected in Guatemala, has been wrongly identified, it do not represent *E. bella fa major* (Fig. 5), it shows an entirely different plant, which is anything but not an Echeveria species (Fig. 6 & 7). *E. bella fa major* is restricted to Chiapas, i.e. not occurring in Guatemala.

Correct text :

Echeveria bella fa major (Walther) Kimnach, 1997

Synonym : *Echeveria bella* var. *major* Walther (1972)

Type : MacDougall 1958/B.180, CAS 413925, collected on Pan-American Highway past Navenchauc, before San Cristobal Las Casas, ca 2000 m (Fig. 6).

Distribution : Mexico (Chiapas : Known only from type locality).

First Description by Walther as *E. bella* var. *major* in *Echeveria*, 358, 1972 :

Quite similar to var. *bella*, but differing clearly in having

- larger **leaves**, obscurely keeled above, which may be 8 cm long and 2 cm broad near apex, to 9 mm wide at base;
- only three of the lower **pedicels** were 2-flowered,
- the **sepals** appear somewhat broader and rather more ascending;
- the **corolla** is 11 mm long.

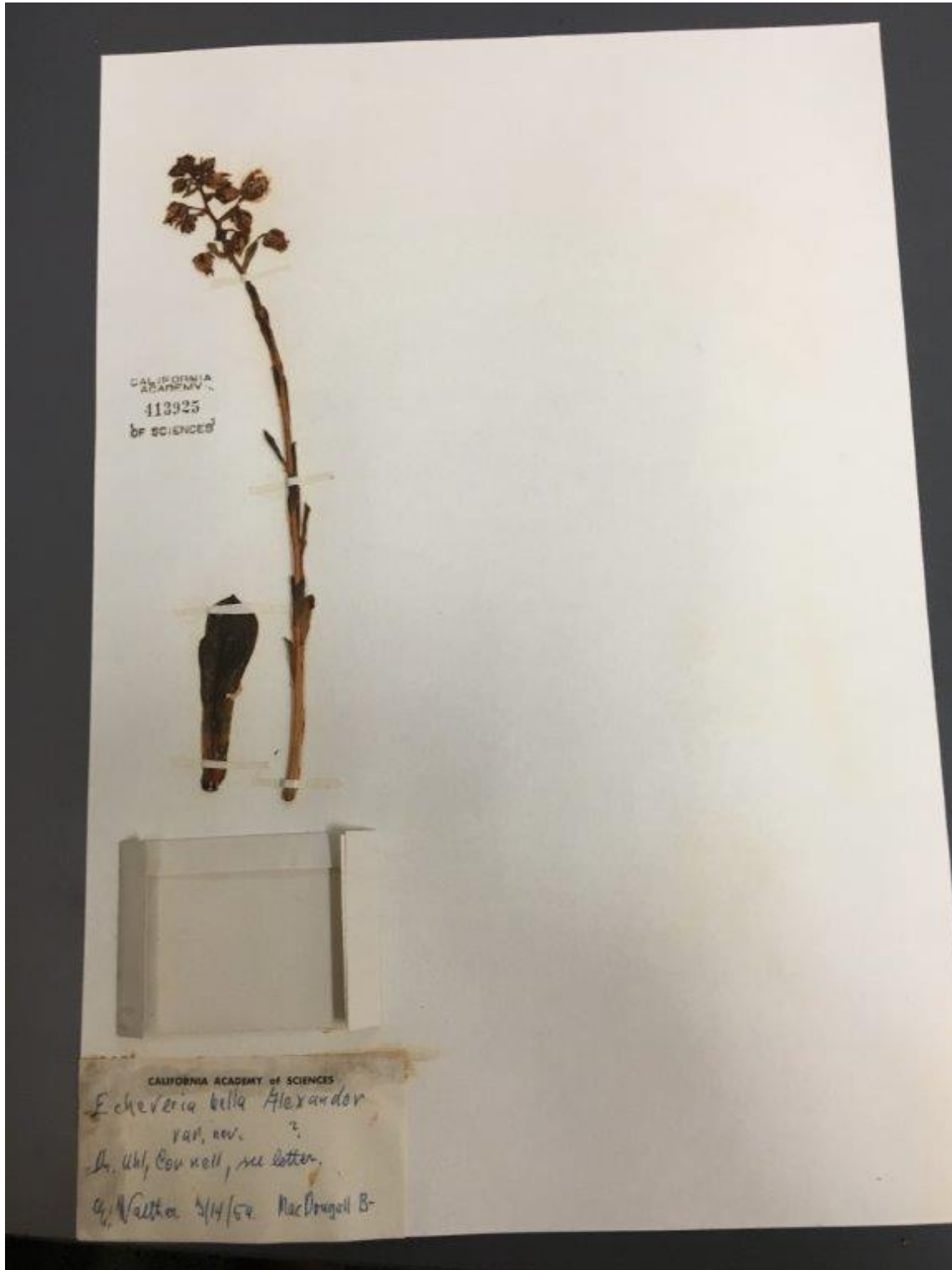


Fig. 5. Type specimen of *E. bella* fa *major* Walther.



Fig. 6. Molina 21446, collected in Guatemala, identified as *E. bella* fa *major* – very wrongly as it represents anything but not an Echeveria.



Fig. 7. Again Molina 21446, collected in Guatemala, very wrongly identified as *E. bella* fa *major*, however not representing an *Echeveria* species at all.

Echeveria chiapensis see **Echeveria rosea**

Echeveria coccinea

Flora Mesoamericana :

5. Echeveria coccinea (Cav.) DC., *Prodr.* 3: 401 (1828).
Cotyledon coccinea Cav., *Icon.* 2: 54 (1793).
 Lectotipo (designado por Walther, 1972): Cav., *Icon.* 2: t. 170 (1793).
 Ilustr.: Walther, *Echeveria* 389, t. 208 (1972).

Hierbas litofíticas, los tallos, las inflorescencias y las flores velutinos; tallos erectos, hasta 60 cm. Hojas 60-80 × 15-20 mm, laxamente agregadas cerca del extremo de los tallos, oblanceoladas, espatuladas, carnosas, verdes o verdes teñidas de rojo, el haz convexo, la base no definida ¹, los márgenes enteros, el ápice agudo. Inflorescencias 1 o 2, hasta 30 cm, espiciformes, erectas o ascendentes con 25-50 flores; brácteas similares a las hojas, gradualmente reducidas en tamaño distalmente; flores subsésiles o sobre pedicelos hasta 3 mm. Flores con sépalos 8-13 mm, ascendentes o patentes, linear-lanceolados, verdes o verdes teñidos de rojo, el ápice acuminado; pétalos erectos, 10-12 mm, marcadamente aquillados, rojo escarlata por fuera, anaranjados por dentro. Folículos 5-8 mm, pardos. *Laderas rocosas secas.* ²

Ch (*Carlson 1618*, F). 2100-2500 m. (México [Distrito Federal, Hidalgo, Oaxaca, Puebla³], Mesoamérica⁴.)

¹ The origin of this remark is unknown, it is definitely not from the First Description by Cavanille which indicates the base of the leaves as terete, neither from any subsequent description.

² Apart from being inaccurate in several respects, the Spanish description lacks the decisive feature : The bracteoles subtending the flowers are longer than the petals. Apparently the author failed to consult Reid Moran's article on *E. coccinea* in *Cactus and Succulent Journal* **US** 48 : 227-228, 1976 – see below.

³ The list of Mexican states is incomplete, Chiapas, Guanajuato, Querétaro, Tlaxcala and Veracruz are lacking.

⁴ If Mexico belongs to Mesoamerica, *E. coccinea* is occurring in Mesoamerica. If Mexico is not included in Mesoamerica, *E. coccinea* is not present in the latter.

Correct text :

Echeveria coccinea (Cavanilles) DC, 1828

Synonyms :

Cotyledon coccinea Cavanilles (1793)
Echeveria pubescens Schlechtendal (1839) / *Cotyledon pubescens* (Schlechtendal) Baker (1869)
Echeveria longifolia hort.

Series *Echeveria*

Type : Not designated.

Lectotype - Iconotype : Cavanilles, *Icones et Descriptiones Plantarum* 2, plate 170. 1793.

Etymology : Latin "coccineus" = deep red : referring to the red flowers.

Distribution : Mexico (Hidalgo, Distrito Federal, Guanajuato, Puebla, Oaxaca, Tlaxcala, Chiapas, Veracruz, Querétaro).

Description by Reid Moran in *Cactus and Succulent Journal US* **48**: 227-228. 1976 :

Plant gray velvety pubescent on all exposed parts, with tapering pluricellular trichomes to 2.5 mm long.

Stems to 70 cm high or trailing to 1 m or more, 0.5 - 2 cm thick, glabrescent, becoming silvery gray, usually little branched but sometimes shrubby.

Rosettes 5 - 20 cm wide, of 8 - 17 leaves crowded at stem apex, or the lower somewhat separated.

Rosette leaves elliptic to oblanceolate or cuneate-obovate, acute to acuminate, 3 - 13.5 cm long, 1 - 3.5 cm wide, 4 - 8 mm thick, channeled ventrally acutely so towards base, the margins rounded, the base subterete, 5 - 8 mm wide.

Floral stems arising just below stem apex but by late anthesis as much as 8 cm below, 20 - 70 (-100) cm high, 4 - 13 mm thick, with 25 - 60 leaves below inflorescence, the leaves ascending to downcurved, elliptic to oblanceolate, acute to acuminate, channeled ventrally, short-spurred, the lowest to 7 cm long, 2.5 cm wide, 4 mm thick.

Inflorescence spicate to subracemose, dense to rather open, of 15 - 60 (-110) flowers, the **bracts** lanceolate to oblanceolate, narrowly acute, **commonly exceeding flowers**, the **pedicels** 2 - 4 mm thick, 0 - 2 (-4) mm long, the paired bracteoles linear, 5 - 15 mm long.

Flowers July to March. **Calyx** disk 4 - 6 mm wide, the segments mostly spreading or slightly reflexed, nearly equal or those of one flower differing by as much as one-third, triangular-lanceolate, narrowly acute, 5 - 15 mm long, 2 - 5 mm wide, 1.5 - 3 mm thick, biconvex with obtuse margins.

Corolla scarlet to castilian red, orange-yellow within, 9 - 15 mm long, 7 - 10 mm wide at base, 8 - 11 mm wide above, pentagonal with flattish sides, **petals** connate 3 - 5 mm, narrowly ovate, acute to subacuminate, apiculate, 3 - 5 mm wide, slightly ascending from top of corolla tube and not in contact above middle of free part, acutely keeled, the well-defined nectar pit with conspicuously thickened upper rim, **filaments** yellow, subulate, 5 - 8 mm long from corolla base, 0.7 - 1 mm wide at base, **anthers** yellow.

Cytology : n = 23, 25.

<http://www.crassulaceae.ch/de/artikel?akID=48&aaID=2&aiID=C&aID=1129>

Echeveria corallina

Echeveria corallina Alexander, 1941

The author of genus *Echeveria* in *Flora Mesoamericana* failed to notice that Walther's text of *Echeveria sessiliflora* in fact is Alexander's description of *E. corallina*. While the name *E. sessiliflora* belongs into the synonymy of *E. pinetorum*, it is *E. corallina* which has to be indicated for Chiapas. (See remarks for *E. pinetorum* and *E. sessiliflora* below.)

REINSTATED AS A DISTINCT SPECIES in Crassulaceae No.5, 2017 : Corrections in Genus Echeveria – 1.
<http://www.crassulaceae.ch/uploads/files/Publications/Crassulaceae/Crassulaceae%20%20No%205%20-%2029.%20September%202017%20-%20Corrections%20in%20Genus%20Echeveria%201.pdf>

Series *Mucronatae*

Type : MacDougall s.n., collected south of Zapaluta (Trinitaria), Chiapas, Mexico, winter 1938-39.

Etymology : Named for the flower colour.

Distribution : Mexico (Chiapas).

First Description by Alexander in *Cactus and Succulent Journal US* **13**: 135-136. 1941 :

Plant short-caulescent.

Stem 2 - 3 cm long, eventually branching below.

Leaves in a loose terminal rosette, oblanceolate, abruptly acute, 6 - 8 cm long, 15 - 16 mm broad, pale green with brownish purple margins and red apiculus, the whole leaf frequently shaded with brownish pink, very glaucous, the glaucescence producing a soft pinkish tone to the foliage.

Inflorescence 40 - 50 cm tall, erect, with **bracts** similar to the leaves but more green and reduced upwards, the flowering portion roseate-salmon with a glaucous overcast.

Flowers 20 - 25, multilaterally arranged, sessile or on 1 mm **pedicels** which are oblique bulges off the rachis, **calyx** slate blue-green, the tube 0.5 mm long, the lobes appressed to the corolla, ovate to ovate-lanceolate, acute, very unequal, the two longest 7 mm long, the intermediate 6 mm long, the two shortest 4 mm long, **corolla** oblong-conical, 14 mm long, coral red, the **petals** 3 mm wide with recurved-spreading tips, **stamens** opposite the petals 6 mm long, the **filament** terete or nearly so, scarcely enlarged at the base, **anthers** 1.5 mm long.....

A rather unattractive plant, but beautiful in flower because of the unusual pastel coloring of the inflorescence. Related to *E. mucronata*, differing principally in its strongly glaucous character and closely appressed calyx-lobes.

Note :

Alexander compared *E. corallina* with *E. mucronata*. Nonetheless Walther considered it synonymous with *E. sessiliflora*; he actually copied Alexander's description of *E. corallina* and published it as description for *E. sessiliflora* (Walther, *Echeveria*, 384, 1972). MacDougall, the collector of the plant, clearly disagreed with Walther and stated : "It is unfortunate that Walther did not have access to types at the N.Y.B.G. As one result, we do not agree that *E. sessiliflora* and *E. corallina* are the same" (book review of Walther's *Echeveria*). Obviously there is no reason why *E. corallina* should be considered synonymous with *E. sessiliflora*.

Echeveria goldmanii

Flora Mesoamericana :

6. Echeveria goldmanii Rose, *N. Amer. Fl.* 22: 17 (1905).

Holotipo: México, Chiapas, *Goldman 802* (US!).

Ilustr.: no se encontró.¹

Subarbustos terrestres, glabros; tallos hasta 20 cm, erectos, ramificados. Hojas 30-50 × 8-10 mm, subarrosetadas, lineares u oblongo-lanceoladas, completamente verdes o los márgenes y el ápice rojos, coriáceas, el haz profundamente cóncavo, la base cuneada, los márgenes atenuados sobre el pecíolo, el ápice agudo; pecíolo c. 5 mm. Inflorescencias 2-numerosas, c. 25 cm, espiciformes, erectas, con 10-15 flores, ligeramente remotas; brácteas hasta 4 cm, oblongas a obovadas, de color similar a las hojas, el ápice abruptamente acuminado; pedicelos 3 mm o menos. Flores con sépalos hasta 5 mm, desiguales, oblongo-ovados, carnosos, verdes, rojo escarlata basalmente; corola hasta 10 mm, erecta, roja por fuera, anaranjada por dentro. Folículos no vistos. *Bosques de Pinus-Quercus*.²

Ch (*Uhl U2883*, BH)⁴. 1000-2400 m. (Endémica.)

Specimens listed :

Mexico Chiapas: 27 December 1904, Edward A. Goldman 802 (US)³

Mexico Chiapas: C.H. Uhl U2883 (BH)⁴

¹ Illustrations are published in García & Chavez, *Las Crasuláceas de México*, photos 64, 249 & 250, 2003.

² The Spanish description is based on Walther's re-description of *Echeveria goldmanii* (*Echeveria* 319, 1972), made from "plants locally cultivated, presumably received from Dr. Rose" - that means from plants of uncertain origin. Therefore the re-description is useless and of course also the Spanish text.

³ The correct date is March 27, 1904.

⁴ Could not be verified.

Correct text :

Echeveria goldmanii Rose, 1905

Series *Nudae*

Type : Goldman 802, Comitan, Chiapas, Mexico, March 27, 1904. (US 399990).

Etymology : Named for the collector of the plant, Edward Alphonso Goldman.

Distribution : Mexico (Chiapas : Comitan and mountains near Pasitán).

First Description by Rose in Britton & Rose in *North American Flora* 22: 17. 1905 :

Stem at first erect and bushy, often prostrate and rooting at the nodes, sometimes becoming 20 cm high.

Leaves glabrous, shining, linear-oblong, 2 - 3 cm long, acute or obtusish, trough-shaped, pale-green with purple margins.

Inflorescence an equilateral (?) raceme, many-flowered; carpels erect.

Echeveria guatemalensis

Flora Mesoamericana :

7. Echeveria guatemalensis Rose, *Contr. U.S. Natl. Herb.* 12: 395 (1909).

Holotipo: Guatemala, *Maxon y Hay 3726* (imagen en Internet ex US!).

Ilustr.: Rose, *Contr. U.S. Natl. Herb.* 12: t. 47 (1909).

Hierbas sufruticosas o subarbustos epifíticos, o algunas veces terrestres, hasta 25 cm, glabros; tallos con múltiples ramificaciones desde la base, erectos o rara vez decumbentes. Hojas 20-45 × 15-20 mm, distribuidas más o menos uniformemente a lo largo de los tallos, no arrosetadas ni agregadas, oblongolanceoladas a obovadas, espatuladas, coriáceas, aplanadas, verdes o rojizas, la base cuneada, el ápice redondeado a obtuso o mucronato. Inflorescencias 2 o más, hasta 25 cm, erectas, con 15-20 flores; pedúnculos pardo-rojizos; pedicelos 5-9 mm. Flores con sépalos 8-10 mm, subiguales, lineares, patentes o ascendentes, verdes o matizados de rojo; corola c. 12 × 12 mm, pentagonal, los pétalos carinados dorsalmente, lanceolados, el ápice apiculado, rosados por fuera, amarillos en los márgenes y por dentro. Folículos c. 8 mm, rostrados. *Selvas altas perennifolias*.¹

G (*Steyermark 46297, F*)²; H (*Molina R. 725, F*)³; ES (*Linares 2505, MO*)⁴; N (*Standley 11104, F*). 1500-3200 m. (Endémica.)

¹ The Spanish text is based on Walther's re-description of *Echeveria guatemalensis* (*Echeveria* 286-287, 1972), made from "living plant obtained from Don B. Skinner of Los Angeles, California" - that means from a plant of unknown origin. Therefore the re-description is useless and accordingly also the Spanish description.

Correct text :

Echeveria guatemalensis Rose, 1909

Series *Nudae*

Type : Maxon 3726, Volcan de Agua, 2700 - 3000 m, Guatemala, March 22, 1905 US 399713).

Etymology : Referring to the type locality in its widest sense.

Distribution : Guatemala, Nicaragua.

First Description by Rose in *Contributions from the US National Herbarium* 12: 395. 1909 :

Stems branching especially at base, resembling somewhat both in habit and foliage *Sedum praealtum*, 10 - 15 cm high.

Leaves equally distributed on the stem, alternate, spreading nearly at right angles to the stem, fleshy but flattened and thinner than in most species of this genus, 2 - 4 cm long, 2 cm or less broad, spatulate, with a flat surface above, rounded at apex but with a decided mucro, rounded below into a broad petiole, pale green, slightly glaucous, the margins sometimes tinged reddish.

Flowering branch 20 - 30 cm long, from the axil of a leaf near the middle of the stem, reddish, bearing numerous reddish leaves.

Inflorescence an equilateral raceme bearing 20 or more flowers, **pedicels** 3 - 4 mm long.

Flowers : **Sepals** linear, acute, spreading nearly at right angles to the pedicels, **corolla** buds broadly ovoid, acute, the corolla when open 10 mm long and broad in proportion, pinkish below, yellowish above, the lobes acute, **stamens** 10, shorter than the corolla.

²"G (*Steyermark* 46297, F)" – F.R. Barrie has copied this number from E. Walther, without noticing that it is not correct – it should read "46927".

³"H (*Molina* R. 725, F)" / Field Museum nr 1374759 : This is *E. maxonii*, not *E. guatemalensis*. If specimens accessible online are correctly identified, it is obvious that **E. guatemalensis is not occurring in Honduras.**

⁴"ES (*Linares* 2505, MO)" is *E. pittieri*, not *E. guatemalensis*. If specimens accessible online are correctly identified it is obvious that **E. guatemalensis is not occurring in El Salvador.**

So not only are 2 of the 4 above listed specimens incorrectly determined, but a large number of other specimens have also been incorrectly determined by F.R. Barrie :

Field Museum of Natural History, Chicago nrs

934534

1637652,

1389756,

1765103,

1765099,

1857339,

1652017,

1656651,

1652016,

1058640,

2278404 and

R. Merrill 3180 - all represent *E. guatemalensis*, not *E. maxonii* as stated by F.R. Barrie,

1146388,

1146387,

1622480,

1662437 and

1146364 also represent *E. guatemalensis* and not *E. pittieri* as determined by F.R. Barrie.

On the other hand

1767765,

2316657,

Missouri Bot. Garden nrs

5561498,

04999035 and

04920279 represent ***E. pittieri*** and not *E. guatemalensis*.

And New York Bot. Gard. nr

04102076,

Field Museum Chicago

1034553 and

1660337 represent ***E. maxonii*** and not *E. guatemalensis*.

Missouri Bot. Gard. nrs

6393610 and

3761551 represent ***E. guatemalensis*** and not *E. australis*.

Coordinates added to Maxon et al. 3726 and Steyermark 46927 are identical – which is an impossibility, and moreover they are totally wrong and therefore highly misleading.

Echeveria gudeliana

Flora Mesoamericana :

8. Echeveria gudeliana Véliz et García-Mend., *Cact. Avent.* 91: 2 (2011).

Isotipo: Guatemala, Véliz y Velásquez MV 22564 (F!).

Ilustr.: Véliz y García-Mendoza, *Cact. Avent.* 91: 5, t. 1 (2011).

Hierbas epifíticas o litofíticas, hasta 1 m o más en flor, glabras, los tallos y las inflorescencias glaucos; tallos hasta 3 cm o más, robustos, verdes matizados de rosado. Hojas 80-200 × 40-60 mm, arrosadas en el extremo del tallo, obovado-espátuladas u oblanceolado-espátuladas, coriáceas, verdes matizadas de rosado, el ápice anchamente agudo a obtuso. Inflorescencias 3-4-ramificadas distalmente, con 20-25 flores; pedúnculo verde matizado de rosado o púrpura, glauco; ramas hasta c. 10 cm; pedicelos 3-6 mm. Flores con sépalos 4-5 mm, desiguales, ovados, rojos y glaucos, el ápice atenuado; pétalos 15-20 mm, lanceolados, rojos, el ápice atenuado; estambres escasamente más cortos que los pétalos. Folículos 12-15 mm. *Laderas rocosas secas.*¹

Ch (*Croat 46501*, MO); G (*Steyermark 51204*, F). 400-1300 m. (Endémica.)

¹ This text does not at all correspond to the description of *Echeveria gudeliana* by Véliz & García-Mendoza.

The **correct description** reads thus :

Echeveria gudeliana Véliz & García-Mendoza, 2011

Series *Pruinosae*

Type : Véliz 22564, Guatemala, Huehuetenango, municipio Nentón, Road to Gracias a Dios, 1074 m, 7 Feb 2011.

Etymology : Named for Gudelia Pérez Muñoz.

Distribution : Guatemala (Dept. Huehuetenango), Mexico (Chiapas). Growing in deciduous tropical low forest at 700 – 1100 m on rocks and calcareous hillrocks.

First Description by Véliz & García-Mendoza in *Cactus Aventures International* **91**: 2-7, ill., 2011 :

Perennial, succulent herbaceous plant, 50 - 120 cm high including the inflorescence, caulescent.

Stems up to 20 cm long and 2 cm in diameter, erect or ascending.

Rosettes at the end of the stems, 20 – 30 cm in diameter.

Leaves 15 – 20, ascending, oblanceolate, 15 - 20 cm long, 10 - 12.5 cm wide, sessile, pruinose, extremity blunt, apiculate, trinerved.

Inflorescence lateral, lax, paniculate, pruinose, with 3 – 4 cincinni, bracts similar to rosette leaves but smaller, floral bracts 2 – 3 cm long, 1.2 – 1.5 cm wide, sub-peltate, succulent, sessile, extremity thin, **pedicels** up to 3 mm long, pruinose.

Flowers secund, **Sepals** unequal, 3 of (5-) 8 - 12 mm long, 4 - 5 mm wide, lanceolate, and 2 of 14 - 22 mm long, 7 - 10 mm wide, fused at the base, fleshy, curved, green, **petals** 2 cm long and 6 - 7 mm wide, lanceolate-elongated, fleshy, carinate, acuminate, reddish, pruinose.

Flowering time : December – March.

The closest species is *Echeveria desmetiana* however the differences between the two species are obvious.

Echeveria macrantha

Flora Mesoamericana :

9. Echeveria macrantha Standl. et Steyerl., *Publ. Field. Mus. Nat. Hist., Bot. Ser.* 23: 159 (1944).

Holotipo: Guatemala, *Steyermark 32808* (F!).

Ilustr.: no se encontró.

Hierbas terrestres sufruticasas, las hojas, los pedúnculos y los sépalos hirtulos; tallos erectos, robustos, escasamente ramificados. Hojas 20-30 × 20-30 mm¹, densamente arrosetadas en los extremos de las ramas, orbiculares a muy ampliamente obovadas, carnosas, el haz y el envés hirtulos, verde pálido matizado de rojo a lo largo de los márgenes, la base anchamente cuneada, el ápice redondeado u obtuso; peciolo ausente. Inflorescencias con 3 o 4 flores¹; pedúnculos 50-60 mm¹, hirtulos; pedicelos 8-10 mm¹, hirtulos. Flores con sépalos c. 8 × 4 mm¹, ovados, hirtulos; corola de color desconocido, los pétalos (fructificación) 15-20 mm¹, angostamente lanceolados, carinados dorsalmente, el ápice acuminado; estambres no vistos. Folículos 15-20 mm¹, hirtulos. *Laderas rocosas secas.*

G (*Steyermark 32808*, F). 2000-2200 m. (Endémica.)

Echeveria macrantha solo se conoce del holotipo, un ejemplar en fruto con solo dos hojas.

¹The measures invariably do not correspond accurately with the First Description. As *E. macrantha* is only known from the type species, i.e. has never been in cultivation, the altered measures lack any basis.

Correct text :

Echeveria macrantha Standley & Steyermark, 1944

Series *Echeveria*

Type : *Steyermark 32808*, Guatemala, Dept. Jalapa : Dry rocky slopes, Montaña Miramundo at Buena Vista, alt. 2000 - 2200 m, December 6, 1939.

Etymology : Gr. "makros" = large and "anthos" = flower > for the large flowers.

Distribution: Guatemala (Jalapa).

Description by Standley and Steyermark in *Flora of Guatemala*, vol. 24: 407. 1946.

Plants erect, suffrutescent, sparingly branched, the branches as much as 1 cm thick, leafy only at the tips.

Leaves densely rosulate at the ends of the branches, sessile, rounded-cuneate, 3 cm long, 20 - 28 mm wide, broadly rounded or subtruncate at the apex and very shortly apiculate, very broadly cuneate at base, thick-carnose, abundantly but not very densely hirtellous on both surfaces, pale yellowish green, the margins rose-colored.

Peduncle stout, 45 mm long, about 3-flowered, the fruiting **pedicels** 8 mm long, thick, densely hirtellous.

Flowers : **Sepals** almost free, 8 mm long, lanceolate-oblong, gradually narrowed to the obtuse apex, densely hirtellous, **corolla** in age persistent, pubescent outside, 2 cm long, the **petals** narrowly lanceolate, gradually attenuate to the apex, acutely carinate dorsally, **follicles** 15 mm long, sparsely pubescent (ventrally) with brownish hairs, the body lanceolate-oblong, 8 mm long, attenuate into a slender beak of about the same length.

Echeveria maxonii

Flora Mesoamericana :

10. Echeveria maxonii Rose, *Contr. U.S. Natl. Herb.* 12: 395 (1909).

Holotipo: Guatemala, *Maxon 3406* (imagen en Internet ex US!).

Ilustr.: Rose, *Contr. U.S. Natl. Herb.* 12: t. 48 (1909).

Subarbustos epifíticos o litofíticos, hasta 80 cm, glabros; tallos de madera suave, erectos o decumbentes. Hojas 20-50 × 5-15 mm, arrosetadas o laxamente agregadas en el extremo de los tallos, obovadas, espatuladas, coriáceas, el haz profundamente cóncavo, el envés redondeado, diminutamente papilosas², verdes a amarillo-verdes, el ápice obtuso o agudo, la punta generalmente mucronata. Inflorescencias 20-60 cm, racemosas, con 10-25 flores; pedúnculo delgado, rojizo; brácteas c. 10 mm, ovadas, las flores verdes o amarillo-verdes; pedicelos 4-6 mm. Flores con sépalos 3-5 mm, desiguales, oblongos, carnosos, purpúreos; pétalos 8-10 mm, oblongos, rojos, con rayas amarillo brillante o sin estas; estambres 6-8 mm. Folículos 6-10 mm. *Laderas rocosas secas.*¹

G (*Skutch 798*, F). 2500-3500 m.³ (Endémica.)⁴

¹The Spanish summary seems to be a mixture of the re-description by Standley & Steyermark' (1946) and Walther's re-description (1972), in any case not a translation of the First Description by Rose (1909).

²"diminutamente papilosas" refers to Walther's re-description, the protologue does not mention any papillae. So it is doubtful whether the plants Walther described were identical with Rose's *E. maxonii*, what means his re-description is useless and accordingly also the Spanish description.

⁴According to specimens accessible online *E. maxonii* is not endemic.

Correct text :

Echeveria maxonii Rose, 1909

Series *Nudae*

Type : Maxon 3406, Guatemala, Dept. Quetzaltenango, Chuacús, between Salamá and Las Canoas, January 22, 1905. (US 473390)

Etymology : Named for William R. Maxon, who had collected the plant.

Distribution : Guatemala (Dept. Quetzaltenango, Solola, Zacapa, Baja Vera Paz, El Progreso, Totonicapan); Honduras (Dept. Francisco Morazán).

First Description by Rose in *Contributions from the US National Herbarium* 12: 395. 1909 :

Stems glabrous, frutescent, at first erect, becoming decumbent, 60 - 80 cm long, naked below, very leafy near tips.

Leaves on young or slowly growing plants massed near the top but in vigorous shoots rather distant, standing at right angles to the stem, 3 - 10 cm long, spatulate, narrowed at base into a more or less definite petiole, rounded below, decidedly trowel-shaped above, obtuse or acutish, green on the under surface, not at all glaucous, the margins more or less purplish.

Inflorescence an equilateral raceme or sometimes becoming a narrow panicle, peduncle elongate, 20 - 30 cm long, leafy (in our herbarium specimens often naked).

Flowers : **Sepals** distinct, semiterete, acute, glaucous, unequal, spreading with age, **petals** distinct nearly to the base, erect except the tips, these spreading, salmon-pink in color, **stamens** 10, **scales** white.

³ Skutch 798 with orange flowers is of course *E. guatemalensis*, not *E. maxonii* !

Wrongly determined specimen :

Missouri Bot. Garden 2260157 was determined as *E. maxonii* – in spite of the fact that the chromosome number $n = 62$ unmistakably refers to *E. pittieri*.

Field Museum 1048238 is *E. pittieri*, not *E. maxonii*.

Two fairly similar specimens from Honduras, both accessible online, clearly representing the same species, have been determined by F.R. Barrie differently :

- Rodriguez 3585, Zamorano, Dept. Morazán (this is near Tegucigalpa) as *E. guatemalensis* and

- A.Molina 725 / Field Museum 1374759, 5 km SW of Tegucigalpa, obviously the same region as the former, as *E. australis*.

However both specimens represent *E. maxonii*. If herbarium specimens accessible online are correctly identified, they do not provide evidence that either *E. guatemalensis* or *E. australis* are present in Honduras.

What concerns Rodriguez 3585 : the coordinates added by the author of *Flora Mesoamericana* are completely wrong. This applies to several other specimens listed in *Flora Mesoamericana*. They seem to have been added randomly.

Field Museum 1651541 represents *E. maxonii*, not *E. montana*.

Echeveria montana

Flora Mesoamericana :

11. Echeveria montana Rose, *Bull. New York Bot. Gard.* 3: 6 (1903). Holotipo: México, Oaxaca, Pringle 4706 (imagen en Internet ex US!). Ilustr.: Walther, *Echeveria* 282, t. 149 (1972). *Echeveria nuda* Lindl. var. *montana* (Rose) Poelln. ¹

Hierbas terrestres ², glabras ³; tallos hasta 50 cm, escasamente ramificados distalmente. Hojas 40-70 × 30-40 mm ⁴, agregadas en el extremo de los tallos, obovadas a anchamente obovadas, coriáceas ⁵, verdes, el envés carinado, el ápice obtuso, mucronato, la base abruptamente atenuada hacia un pecíolo corto de 1-3 mm. Inflorescencias 1 o 2, racemosas, con 10-20 flores; pedúnculo hasta 60 cm, amarillo-verde, matizado de rosado; brácteas c. 2 × 1 cm ⁶, similares a las hojas pero menores; pedicelos 1-4 mm. Flores con sépalos 6-12 mm ⁷, desiguales, lanceolados, verdes, el ápice agudo; corola urceolada, roja-anaranjada a rojo escarlata, amarilla por dentro, los pétalos 10-14 mm ⁸, ovados, el ápice acuminado; estambres incluidos. Folículos c. 10 mm. *Selvas medianas perennifolias mixtas*.

Ch ⁹ (*Matuda 2047*, MEXU); G ¹⁰ (*Soule y Prather 3061*, MO ¹¹). 1500-3400 m. (México [Oaxaca], Mesoamérica.)

¹ Poellnitz' reducing of *Echeveria montana* to a variety of *E. nuda*, without discussion or explanation, is not comprehensible.

² *E. montana* is also growing epiphytically.

³ *E. montana* is not glabrous. Already Rose, though describing it from dried material, indicates that the flowering stem is granular-roughened, and Reid Moran in his detailed description states that the plant is papillose (*Cactus and Succulent Journal US* 37(6): 178-183. 1965).

^{4, 5, 6, 7, 8} Not corresponding to the protologue.

⁹ The specimen *Matuda 2047*, MEXU is far too poor to provide evidence that *E. montana* is occurring in Chiapas (Fig. 8).

¹⁰ Standley and Steyermark (1946) reported *E. montana* from Guatemala, but they worked from dried material and R. Moran (*CSJ US* 37(6) : 178-183), after having examined the specimens on which their report is based, did not consider any of them to be *E. montana*.

¹¹ Soule y Prather 3061 with orange-red flowers is not *E. montana*.

Correct texts :

Echeveria montana Rose, 1903

Synonym : *Echeveria nuda* var. *montana* (Rose) von Poellnitz (1936).

Type : Pringle 4706, collected 1894, on ledges, trees etc. Sierra de San Felipe, ca 3150 m. US 48365.

Series *Nudae*

Etymology : Referring to the habitat.

Distribution : Mexico : Oaxaca, not occurring in Chiapas and Guatemala
The relevant specimens have been incorrectly identified.

First Description by Rose in *Bulletin of the New York Botanical Garden* **3**: 6. 1903 :

Cauliscent.

Leaves in a dense rosette at the top of the stem, orbicular or obovate, somewhat narrowed below, glabrous, 5 - 6 cm long.

Flowering stems somewhat **granular-roughened** above, rather densely leafy-bracted below, 20 - 30 cm long, many-flowered, inflorescence an equilateral raceme.

Flowers : **Sepals** ovate-lanceolate, 6 - 7 mm long, **corolla** 1 cm long.

Rose' description is based on dried material, therefore the papillosity characteristic for *E. montana* was not visible. Nevertheless the flowering stem is described as granular-roughened.

Description by Reid Moran in *Cactus and Succulent Journal US* 37(6): 178-183. 1965 :

Caudex erect, ± branching, 20 - 50 cm tall, 8 - 23 mm thick, at first pale green, becoming greener, then sometimes tan or marked with brown, then gradually silvery gray, appearing smooth but **finely papillose**, in age minutely and irregularly furrowed, the old leafbase sites enlarging sometimes to 18 mm wide and 12 mm high, the attachment scars elliptic, pinkish tan, later fading, sometimes becoming 10 mm wide and 12 mm high, the single bundle scar elliptic, 1 - 2 mm wide sometimes with aerial roots.

Rosettes flattish, 10 - 25 cm wide, of 15 - 25 leaves rather crowded or the lower well separated.

Rosette leaves glossy green, paler dorsally, in sun sometimes red dorsally and on margins, spatulate to obovate-spatulate, obtuse to rounded, mucronate, 4 - 12 cm long, 2.5 - 4.5 cm wide above, 6 - 10 mm wide at the base, 5 - 8 mm thick at the base and gradually thinner upward, rounded and faintly keeled dorsally, flattish or mostly channelled or slightly cupped ventrally, the **margins** acute except toward the base, **narrowly hyaline, sometimes red, papillose, sometimes irregularly crenulate, minutely undulate, or subfimbriate, the surface appearing smooth but minutely low-papillose by the lenticular protrusion of each epidermal cell.**

Floral stems erect, 25 - 55 cm tall (including the raceme), 5 - 8 mm thick at the base, becoming dark purplish red, bare in the lower 1 - 3 cm, with 12 - 25 ascending leaves rather equally distributed above; **the stems, bracts, pedicels, calyx and corolla very finely muriculo-papillose**, the papillae one per epidermal cell but smaller than the cell surface, ca. 0.025 mm high and about as wide at the base.

Stem leaves obovate-spatulate, mucronate, spurred, the lower 2.5 - 5 cm long, 1.5 - 2.5 cm wide, the upper narrower, the spur white, obliquely cuspidate, ca 3 - 4 mm long.

Inflorescence erect from the first, a raceme 15 - 25 cm long, of 15 - 25 flowers, the lowest 1 - 2 branches sometimes 2-flowered, the flowers often all ± turned to one side. **Bracts** like the upper stem leaves but narrower upwards, the middle and upper elliptic-oblongate, acute, the base appressed the blade spreading to deflexed. **Pedicels** horizontal, 2 - 13 mm long, 1.5 - 3 mm thick, red, the two **bracteoles** anywhere from base to apex, subequal, green elliptic, acute, spurred, 7 - 15 mm long, 1.5 - 5 mm wide.

Flowers in June and July (San Diego), open mostly 6 - 7 days.

Calyx disk 4 - 7 mm wide, the segments nearly equal, ascending or in anthesis sometimes wide-spreading, oblong-lanceolate, acuminate, green, 6 - 12 mm long, 2 - 6 mm wide, 1 - 1.5 mm thick, biconvex, with acute margins, the upper one sometimes spurred.

Corolla 8 - 14 mm long, 6 - 13 mm thick at the base, **3 - 5 mm wide at the apex**, dandelion yellow at the apex and within, bright red toward the base and on the keels especially on the upper side, **pyramidal-ovoid**, sometimes slightly oblique at the mouth by the protrusion of the upper petals, the sides broadly channeled to a depth of 0.5 - 1.5 mm. **Petals** non-convolute, connate 2 - 5 mm, oblong-ovate, to oblong-spatulate, broadly acute, apiculate, 3.5 - 8 mm wide, 1 - 1.5 mm thick, subacutely keeled, with concave flanks, ventrally broadly channeled in the distal half, the channel below ca 1 mm wide and deep, between prominent shoulders, the nectar pit hemispheric, 2 - 2.5 mm wide, the keel ending in a stout conic subdorsal apicula 0.5 - 0.8 mm long.

Filaments subulate, yellowish, extending to 3 - 7 mm from the corolla base, 0.6 - 1.0 mm wide, the epipetalous inserted at the upper margin of the nectar pit, the antesepalous slightly longer, adnate 1 - 3 mm, **anthers** yellow.

Cytology : n = 22.

Steyermark 46926 / Field Museum 1146360 from Volcan Santa Clara, Dept. Sololà, Guatemala, June 5, 1942, has been determined as *E. guatemalensis* Rose by Clausen and subsequently also by F.R. Barrie.

Steyermark 46927 / Field Museum 1146381 from exactly the same locality and the same date has been determined by J.A. Steyermark as *E. guatemalensis* and subsequently also by F.R. Barrie.

Steyermark 46929 / Field Museum 1146359, again from the same locality and date, however has been determined by F.R. Barrie as *E. montana* which is all the less understandable as the specimen lacks inflorescences and flowers and the shape of the leaves is not clearly recognizable.

The following specimens have already been examined by Reid Moran and determined as **not** corresponding to *E. montana* Rose, so why nevertheless F.R. Barrie redetermined them as *E. montana* can only be explained by his ignorance of Moran's detailed publication (l.c.) :

- 1114814 / Standley 86093
- 1108655 / Standley 81933
- 1048219 / Steyermark 34960
- 1047170 / Steyermark 36547
- 1055581 & 1055585 / Steyermark 34017
- 1046735 / Steyermark 35766
- 1055633 / Steyermark 35829

More specimens of the Field Museum wrongly determined as *E. montana* by F.R. Barrie :

- 1651541 / Williams et al. 25261 / from mountain slopes above Lake Atitlán, Dec. 6-7, 1963, represents *E. maxonii*, not *E. montana* – neither the shape of the leaves nor the inflorescence correspond to *E. montana*.
- 1656652 / Williams et al. 25849 with orange-salmon flowers is not *E. montana*, moreover it is a re-collection of Steyermark 35166.
- 1651540 / Williams 26120 is from a region where *E. guatemalensis* is occurring, so most likely it represents the latter and not *E. montana*.
- 1622479 / Williams et al. 23021 with orange-red flowers is not *E. montana* and moreover it is a re-collection of Steyermark 34960.

- 1638378 is *E. maxonii*, not *E. montana*.

- 722340 is not *E. montana*.

- 599216 is Maxon's collection of 1905, i.e. *E. guatemalensis*, as already determined by E. Walther.

So in all probability *E. montana* Rose is not present in Guatemala. The Guatemalan plant misidentified as *E. montana* Rose seems to be a yet undescribed species.

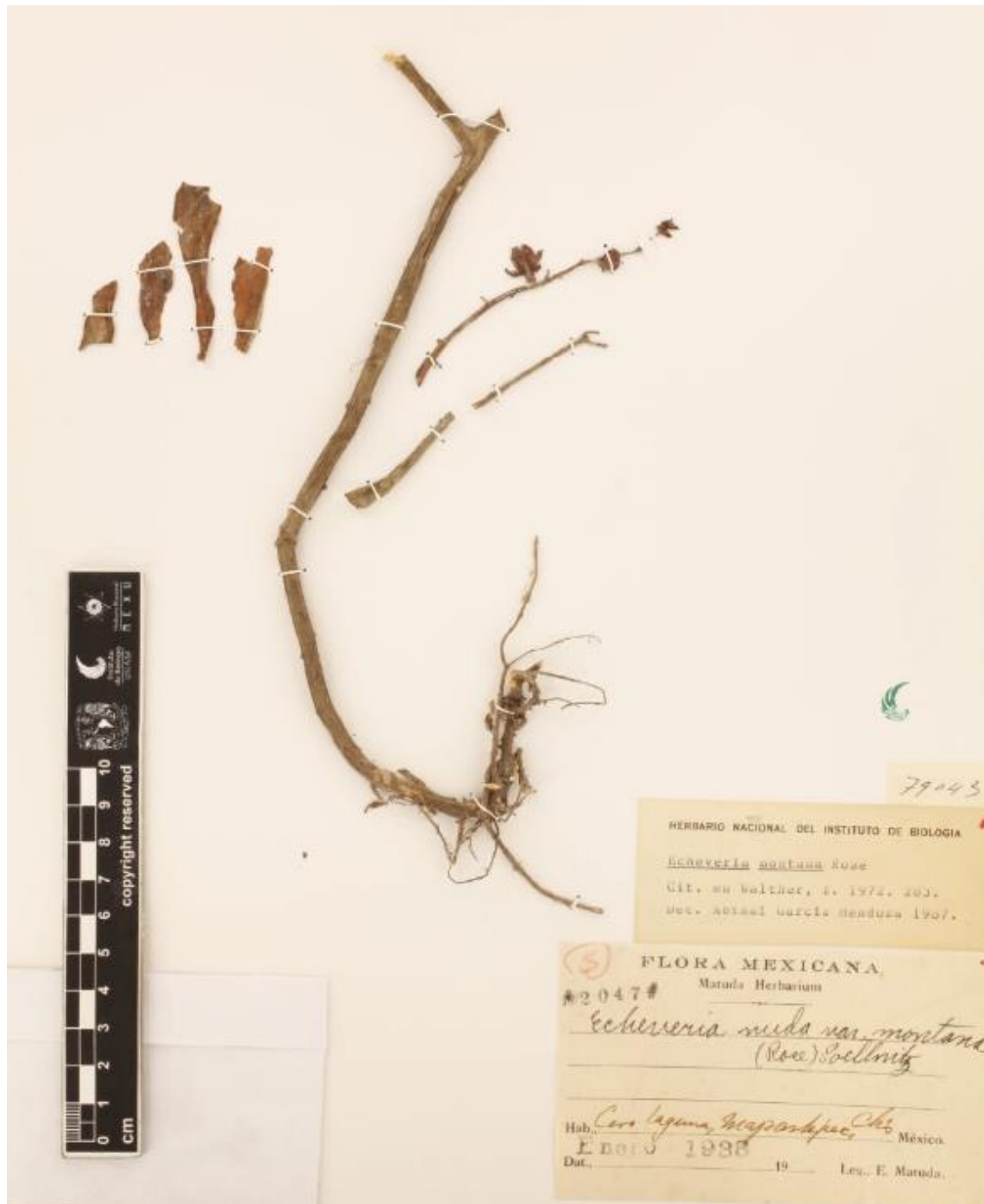


Fig. 8. Matuda 2047 – no proof for the presence of *E. montana* in Chiapas.

Echeveria papillosa

Flora Mesoamericana :

12. Echeveria papillosa Kimnach et C.H. Uhl, *Cact. Succ. J. (Los Angeles)* 55: 27 (1983).

Isotipo: Guatemala, *Uhl 2589* (imagen en Internet ex US!).

Ilustr.: Kimnach y Uhl, *Cact. Succ. J. (Los Angeles)* 55: 29, t. 3 (1983).

Hierbas litofíticas, los tallos, hojas y flores papilosos ¹; tallos hasta 8 cm o más, esparcidamente papilosos. Hojas 25-35 × 10-16 mm, en una roseta laxa ² en el extremo de los tallos ³, obovado-oblancoeladas y espatuladas ⁴, carnosas ⁵, el envés carinado, el haz y el envés verdes, uniformemente papilosos, los papilas diminutas y hemisféricas, los márgenes rojizos con papilas oblongo-ciliadas, el ápice obtuso, la punta mucronata ⁶. Inflorescencias hasta 5 cm o más, reclinadas, racemosas, con 7-20 flores; pedúnculo 6-8 cm, verde matizado de rojo, moderadamente papiloso; brácteas 1.5-2.5 × 1-1.3 cm, similares a las hojas, verdes; pedicelos 4-25 mm, rojizos, esparcidamente papilosos. Flores con los sépalos 5-8 × 2-3 mm, subiguales, ovado-elípticos, verdes o rojizos, densamente papilosos; corola 8-10 × 6-8 mm, globoso-campanulada, los pétalos ovado-elípticos, carinados dorsalmente, densamente papilosos, rojizo-anaranjados por fuera, amarillos por dentro; estambres 2-3 mm. Folículos no vistos. *Laderas rocosas secas.*

G (*Uhl 2589*, BH). c. 3000 m. (Endémica.)

Echeveria papillosa solo se conoce de la colección tipo.

The Spanish summary of Kimnach & Uhl's description leaves much to be desired :

¹ Not all parts of the flowers are papillose - androecium and gynoecium explicitly are not papillose.

² The rosette is diffuse, not lax.

³ This is not mentioned in the original text.

⁴ The original text does not describe the leaves as spatulate.

⁵ Neither are they described as "carnosas"

⁶ "El ápice obtuso, la punta mucronate" - obviously this refers to the papillae, however the papillae are not mucronate !!! it's the leaf apex which is mucronate

etc. etc.

Correct text :

Echeveria papillosa Kimnach & Uhl, 1983

Series *Racemosae*

Type : Uhl 2589. HBG 42174. Guatemala : Dept. Totonicapán, at base of cliffs 0.4 km S of Pan American Highway at a point 19 km SE of junction at San Cristobal Totonicapán, 3000 m, Jan. 6, 1980.

Etymology : For the more or less dense covering of papillae on almost all parts of the plant.

Distribution : Guatemala (Totonicapán).

First Description by Kimmach & Uhl in *Cactus and Succulent Journal US* 55(1): 27-30. 1983 :

Plant papillose in all parts except androecium and gynoecium.

Roots fibrous.

Stems to 8 cm long or more, 8 - 12 mm thick, nearly lacking papillae.

Rosettes proliferous, to 18 or more, rather diffuse, 5 - 10 cm wide, 2 - 3 cm high, with 15 - 25 leaves.

Leaves obovate-oblongate, subobtusate, mucronate, 2.5 - 3.5 cm long, the mucro acute, 1 - 3 mm long, often curved to one side, the shoulders of the leaf-apex often unequal, 10 - 16 mm wide at the widest part (ca 3/4 above base), 8 - 10 mm wide at base, ca 5 mm thick at widest part, ca 3 mm thick near base, ± concave in apical third, flat to somewhat convex below, the lower surface obtusely keeled, more acutely keeled toward apex, the epidermis green, somewhat reddened along margins and at apex, the papillae minute and hemispherical on upper and lower leaf-surfaces, forming oblong, obtuse cilia in several parallel rows along margins, largest near leaf-apex, colorless to red.

Flowering stems to five or more, suberect, equilaterally racemose or often with the lower flowers in two's 10 - 12 cm long, the **peduncle** 6 - 8 cm long, the lower 1 - 3 cm without leaves, 4 - 7 mm thick, moderately papillose, strongly reddened, the leaves 12 - 18, their points of attachment ca 5 - 7 mm apart, ascending, more rarely spreading, shaped like the rosette-leaves, 1.5 - 2.5 cm long, 10 - 13 mm wide, green, rather loosely attached and with a gibbous to divergent, semi-clasping, obtuse or sometimes sub-acute basal spur; inflorescence densely sub-capitate in bud or in early flowering, later 4 - 9 cm long, 7 - 20 - flowered, branches 2 - 6, ascending, 4 - 25 mm long, 2 - 3 mm thick, smooth and shiny, nearly epapillose, reddened, each branch with 1 - 3 **bracteoles** that are 8 - 14 mm long, 3 - 7 mm wide, 2 - 3 mm thick, papillose, ciliate, green.

Flowers : **Sepals** united at base for 1.5 - 2 mm, ascending, ovate-elliptical, acute, somewhat unequal, 5 - 8 mm long, 2 - 3 mm wide, 1.5 - 2 mm thick, heavily papillose, ciliate, green, or often reddish, becoming thickened (to 4 mm) after flowers dry, **corolla** campanulate-globose, 8 - 10 mm long, 6 - 8 mm thick, the limb 5 - 8 mm wide, the **petals** united at base for less than 1 mm, ovate-elliptical, acute, subapiculate with the apices recurving slightly in some clones, sub-erect in others, 2.5 - 3.5 mm wide, more or less distinctly keeled on back, reddish orange and heavily papillose on outer surface, yellow and epapillose within, gibbously swollen inside near base on each side
.....

Cytology : n = 15.

Echeveria pinetorum

Flora Mesoamericana :

13. Echeveria pinetorum Rose, *N. Amer. Fl.* 22: 20 (1905).

Holotipo: México, Chiapas, *Goldman 1013* (imagen en Internet ex US!).

Ilustr.: Walther, *Echeveria* 383, t. 205 (1972).

Echeveria huehueteca Standl. et Steyerl. ¹, *E. sessiliflora* Rose var. *pinetorum* (Rose) Poelln.

Hierbas acaulescentes o subcaulescentes, terrestres, con raíces carnosas, fusiformes, glabras. Hojas 20-40 × 10-25 mm, en rosetas densas, angostamente oblanceoladas, coriáceas, el haz aplanado o ligeramente cóncavo, el envés redondeado, amarillo-verdes, los márgenes matizados de rojo, el ápice agudo a acuminado; pecíolo ausente. Inflorescencias 1 o 2, hasta 30 cm, racemosas, erectas, con 8-20 flores; brácteas 1-3 cm, lanceolado-ovadas, amarillo-verdes, los márgenes matizados de rojo; flores sésiles o los pedicelos 1-4 mm. Flores con sépalos 2-3 mm, subiguales, ovados, amarillo-verde oliva, el ápice agudo; corola 8-10 mm, urceolada, los pétalos rojo escarlata basalmente, amarillos apicalmente; estambres 6-8 mm. Folículos no vistos. *Bosques de Quercus o Juniperus*. ²

Ch (*Calzada et al. 3568*, MO) ³; G (*Smith 114*, F). 2000-3500 m. (Endémica.)

¹ *Echeveria huehueteca* has been described from plants found in Guatemala, Dept. Huehuetenango. Uhl is not convinced that it is identical with *E. pinetorum* from Chiapas and Oaxaca. However as long as there is no living material available, this problem remains unsolved.

² Instead of consulting the First Description by Rose, the author of the Spanish text relied on E. Walther, *Echeveria*, 1972. Had he studied carefully Rose's publication he would have noticed that Rose's description of *E. pinetorum* is almost identical with his description of *E. sessiliflora*. The types of *E. pinetorum* and *E. sessiliflora* have been collected at the same locality : 20 miles southeast of Teopisca, Chiapas, and at the same time : May 8 and May 24, 1904. The only difference worth mentioning is the colour of the leaves : *E. pinetorum* has green leaves with red margins while *E. sessiliflora* has pale blue leaves which are somewhat glaucous. This means that Rose did not describe two different species but two a bit different clones of one and the same species. He already was aware that the true relationship of *E. pinetorum* is with *E. sessiliflora*. (In habitat green and bluish leaved forms are found growing together.) That means *E. sessiliflora* is a synonym of *E. pinetorum*.

Walther also agreed that *E. pinetorum* is rather close to *E. sessiliflora*. However unfortunately and not understandably he considered *E. corallina* as identical with *E. sessiliflora* and published the latter with the description of the former with the result that *E. pinetorum* and *E. sessiliflora* henceforth appeared as two distinct species (Echeveria, 384, 1972). Tom Macdougall, the collector of *E. corallina*, already in 1972 draw attention to Walther's error but none of the subsequent authors dealing with genus Echeveria made an effort to correct it and to reinstate *E. corallina* as distinct species, not to be confused with *E. sessiliflora*.

³ Calzada et al. 3568 is not *E. pinetorum*, the pedicels are far too long.

Correct text :

Echeveria pinetorum Rose, 1905

Synonyms :

Echeveria sessiliflora Rose (1905)

Echeveria sessiliflora var. *pinetorum* (Rose) von Poellnitz (1936)

Echeveria huehueteca Standley & Steyermark (1944)

Series *Mucronatae*

Type : Goldman 1013, collected in pine woods 20 miles southeast of Teopisca, Chiapas, Mexico, May 8, 1904.

Etymology : Named for the occurrence in pine forests.

Distribution : Mexico (Chiapas, Oaxaca and probably also in other Mexican states), Guatemala – if *E. huehueteca* is considered a synonym of *E. pinetorum*.

First Description by Rose in *North American Flora* **22**: 20. 1905 :

Acaulescent, forming very dense rosettes of leaves.

Leaves bright-green, the margin tinged with red, narrowly oblanceolate, 2 - 4 cm long, 1 - 1.5 cm broad, rounded beneath, acute and mucronate-tipped.

Flowering stem, including the inflorescence, 10 - 25 cm long, bearing closely set leaves 2 - 3 cm long, below, and small ovate ones above.

Inflorescence an open-flowered equilateral raceme or spike.

Flowers subsessile, **sepals** ovate, acute, somewhat unequal, **corolla** 8 - 10 mm long, its lobes acute.

Field Museum 1458964 is not *E. sessiliflora*, this is *E. bella*, collected at its type locality, as the label indicates.

Echeveria pittieri

Flora Mesoamericana :

14. Echeveria pittieri Rose, *Contr. U.S. Natl. Herb.* 13: 296 (1911).

Holotipo: Guatemala, *Pittier 1880* (imagen en Internet ex US!).

Ilustr.: Walther, *Echeveria* 321, t. 174 (1972).

Subarbustos epifíticos o litofíticos, glabros; tallos decumbentes, ramificados. Hojas 40-80 × 15-30 mm, laxamente arrosietadas en el extremo de los tallos, elípticas a obovadas u oblanceoladas, coriáceas¹, el haz cóncavo, verde oscuro, el envés carinado, verde pálido, la base cuneada y atenuada, el ápice agudo y frecuentemente mucronato; pecíolos 5-15 mm. Inflorescencias hasta 20 cm, espigadas², con 15-30 flores, distalmente congestas, sésiles o subsésiles; brácteas 2-4 cm, similares a las hojas, verdes basalmente, teñidas de rosado o púrpura por debajo de las flores³. Flores con sépalos 6-7 × 1-1.5 mm, subiguales, angostamente elípticos, verdes a púrpura pálido, el ápice agudo; corola 10-15 mm, campanulada, marcadamente pentagonal, rojo oscuro por fuera, rosada por dentro, los pétalos elípticos, acuminados; estambres 9-11 mm. Folículos 8-10 mm. *Laderas rocosas boscosas.*

G (*Standley 80761*, F); ES (*Sandoval 790*, F); N (*Standley 9837*, F)⁴. 1000-3000 m. (Endémica.)

¹ "coriáceas" is not mentioned in the protologue, and the leaves of *E. pittieri* are definitely not "coriáceas".

² Inflorescences of 20 cm are not "espigadas".

³ The bracts and bractlets subtending the flowers are not 2 – 4 cm long.

The protologue neither indicates the width of the leaves nor the length of the petiole nor the number of flowers nor the size of the sepals nor the length of the filaments. The Spanish description is arbitrary. *E. pittieri* is often confused with *E. australis*, see Notes for *E. australis*, p.7.

⁴ Standley 9837 is wrongly identified – it represents *E. maxonii*, not *E. pittieri*.

Correct text :

Echeveria pittieri Rose, 1911

Series *Spicatae*

Type : Pittier 1880, collected around the lagoon on the Volcan Ipala, Guatemala, 1500 m, 1907. (US 618381)

Etymology : Named for Henry Pittier, collector of Central American and Venezuelan plants.

Distribution : El Salvador, Guatemala (Depart. Chiquimula, Sololá, Zacapa, El Progreso, Huehuetenango, Jutiapa, Totonicapan, Quetzaltenango); Nicaragua (Dept. Jinotega & Esteli), epiphytic or on rocks in shaded forests.

First Description by Rose in *Contributions from the US National Herbarium* **13**(9): 296. 1911 :

Cauliscent, 10 cm or more high, crowned at the apex by a loose rosette of leaves, glabrous throughout.

Leaves 6 - 8 cm long, oblanceolate, tapering into a distinct petiole, acute, greenish or somewhat purplish, sometimes a little glaucous.

Flowering stem about 20 cm long, leafy, leaves similar to stem leaves.

Inflorescence a dense spike 4 - 5 cm long, flowers subtended by small linear rose-colored **bracts** and two inner **bractlets**.

Flowers : **Calyx** cleft nearly to the base into linear, acute lobes about two-thirds the length of the corolla, rose-colored, **corolla** when in bud somewhat 5-angled, corolla about 12 mm long, deeply cleft, the lobes stiff, erect or slightly spreading, acute, rose-colored, with a pronounced pocket near the base within, 5 **stamens** opposite the 5 petals inserted just above this pocket, the other 5 attached to the corolla but lower down, **ovaries** erect, tipped by the long, slender **styles**.

Cytology : n = 62.

The following specimens from **El Salvador** are wrongly determined :

Galán 2223, Field Museum 2316657 / Missouri Bot. Gard. 6659026 is ***E. pittieri***, not *E. guatemalensis*.

A. Molina 21614, Field Museum 1767765 is ***E. pittieri***, not *E. guatemalensis*.

A. Molina 21791 is ***E. pittieri***, not *E. guatemalensis*.

Linares 2505 / Missouri Bot. Gard. 04999035 is ***E. pittieri***, not *E. guatemalensis*.

A. Molina 21740 / Field Museum 1671760 is ***E. pittieri***, not *E. guatemalensis*.

Missouri Bot. Gard. nrs

04920279 is ***E. pittieri***, not *E. guatemalensis*

2260157 is ***E. pittieri***, not *E. maxonii*.

Field Museum nr 1048238 is ***E. pittieri*** and not *E. maxonii*.

Echeveria prunina

Flora Mesoamericana :

15. Echeveria prunina Kimnach et Moran, *Cact. Succ. J. (Los Angeles)* 53: 295 (1981).

Holotipo: México, Chiapas, *MacDougall B-138* (imagen en Internet ex HNT!).

Ilustr.: Kimnach y Moran, *Cact. Succ. J. (Los Angeles)* 53: 297, t. 6 (1981) ¹.

Hierbas litofíticas, glabras; tallos hasta 10 cm. Hojas 60-90 × 25-45 mm, laxamente ² arrosetadas, obovado-espatuladas, carnosas ³, cóncavas, el ápice redondeado, la punta mucronata, las hojas jóvenes color violeta y glaucas, las hojas maduras verde-rojizas y no glaucas. Inflorescencias erectas o decumbentes, racemosas, simples o 2-3-ramificadas ⁴, con 6-14 flores; pedúnculos 19-24 cm, color violeta, glaucos; brácteas 1.8-**4.8** ⁵ × 0.6-1.8 cm, similares a las hojas, color violeta, glaucas; pedicelos 4-8 mm. Flores con sépalos 6-16 × 2-6 mm, desiguales, patentes en la antesis, elíptico-oblongos, color violeta verdoso, el ápice agudo a obtuso; corola 10-13 × c. 8 mm de diámetro, marcadamente pentagonal, los pétalos lanceolados, rosado-rojizos, glaucos, carinados dorsalmente; estambres 5-6 mm ⁶. Folículos no vistos. *Acantilados y afloramientos de roca caliza.*

Ch (*Breedlove y Thorne 30020*, MEXU). 1300-1400 m. (Endémica.)

¹ Five photos on pp.294, 295 & 296.

² The English description reads : Rosettes rather **diffuse** – not lax !

³ "carnosas" is not mentioned in the English text.

⁴ "simples o 2-3-ramificadas" is simply wrong. There can be 1 – 3 floral stems, however the floral stem is not branched at all, and the inflorescence has 1 – 2 cincinni.

⁵ The bracts are 1.8 × **4.3** cm, not 4.8 cm.

⁶ The filaments are **6-7** mm long, not 5-6 mm.

Conclusion : The Spanish text is inadequate.

Correct text :

Echeveria prunina Kimnach & Moran, 1981

Series *Gibbiflorae*

Type : MacDougall B-138, on rocks at Mirador Cuesa, El Sumidero, near Tuxtla Gutierrez, ca 4000' alt., Chiapas, Mexico.

Etymology : pruninus lat., like a plum or prune : for the glaucous plum-coloured leaves.

Distribution: Mexico : Chiapas (at the type locality El Sumidero – apparently never found elsewhere).

Description by Reid Moran in *Cactus and Succulent Journal US* 53(6) : 295-298. 1981 :

Plant glabrous.

Stem to ca 10 cm long or more, 1 – 1.5 cm thick, often with aerial roots.

Rosette usually single, rather diffuse, with ca 15 – 25 leaves, 14 – 15 cm wide, to ca 5 cm high.

Leaves spatulate-obovate, somewhat asymmetrical, with one shoulder often more rounded than the other, obtuse, mucronate, 6 – 9 cm long, 6 – 10 mm wide at base, 2.5 – 4.5 cm wide ca 1.5 cm from apex, ca 5 mm thick at base, 2 – 3 mm thick near apex, strongly concave on upper surface when young, only slightly so when mature, obtusely keeled on lower surface, the margins rather sharp, the youngest leaves violet, heavily glaucous, the intermediate plum-coloured and lightly glaucous, the oldest bronzey reddish-green and non-glaucous, mucro subulate, terete, less than 1 mm long, reddened on young leaves, becoming obscure or lacking on older leaves.

Floral stems maturing from February to March, up to 3, erect to decumbent, (10-) 19 – 24 cm long, ca 5 mm thick at base and ca 3 mm thick just below cincinni, violet, glaucous ; leaves 10 – 15 (-25), more or less evenly spaced, ca 2 cm apart, the lower expanding, spatulate, not mucronate, the upper ascending, elliptic-oblong, with a mucro less than 1 mm long, all leaves below inflorescence obtuse, truncate or retuse, 18 – 43 mm long, 6 – 18 mm wide, 2.5 – 5 mm thick, the inner surface flat to convex, coloured like the stem leaves.

Inflorescence cymose-racemose, the cincinni 1 – 2, at first laxly circinnate, 6 – 11 cm long, with 6 – 14 flowers, the leaves elliptic to linear, acute, with a basal spur less than 2 mm long, 3 – 16 mm long, 1 – 6 mm wide, 1 – 3 mm thick, **pedicels** 4 – 8 mm long, 1 – 1.25 mm thick at base, gradually widening to 2 mm just below calyx, the **bracteoles** 1 – 2 mm long, 1 mm wide or less, deltoid.

Flowers : **Calyx disc** sub-umbilicate, 3 – 4 mm wide, some sinuses extending almost to the pedicel, the **sepals** ascending-spreading, markedly unequal, coloured like the leaves, the smaller ones lanceolate to sublinear, acute, 6 – 7 mm long, 2 – 2.5 mm wide, the larger ones elliptic-oblong, acute to obtuse, 8 – 16 mm long and 3 – 6 mm wide, **corolla** pentagonal in cross section, with flattened sides, 10 – 13 mm long, ca 8 mm thick 2 mm from base, ca 5 mm thick just below apex, ca 6 mm wide at apex, **petals** lanceolate, acute, connate 1.5 – 2.5 mm, the exterior glaucous-pink, reddish-orange beneath wax, the interior face coloured the same on apical third but light yellow below, ca 4 mm wide near base, ca 2 mm thick but channeled ventrally and hollowed basally to ca 1 mm deep, with a prominent nectar pit ca 2 mm wide and 3 mm long, subobtusely keeled dorsally, the margins acute, **filaments** 6 – 7 mm long, yellow.

Cytology : n = 28 +1.

Echeveria rosea

Flora Mesoamericana :

4. Echeveria chiapensis Rose ex Poelln. ¹, *Repert. Spec. Nov. Regni. Veg.* 39: 224 (1936).

Holotipo: México, Chiapas, *Rose 1011* (imagen en Internet ex NY!).

Ilustr.: Walther, *Echeveria* 393, t. 175 (1972).

Subarbustos epifíticos o litofíticos, glabros; tallos de madera suave, escasamente ramificados. Hojas 40-70 × 15-25 mm, laxamente arrosietadas en el extremo de los tallos, oblanceoladas a obovadas, coriáceas, el haz verde brillante, el envés amarillo-verde, escasamente glauco, el envés carinado, la base atenuada, el ápice redondeado, la punta mucronata; pecíolo 5-9 mm. Inflorescencias 2 o 3, hasta 50 cm, espiciformes, patentes o erectas, con 15-20 flores en un agregado compacto; pedúnculos verdes cerca de la base, rosados o rojizos distalmente, escasamente glaucos; brácteas 2-4 × 0.5-1 cm, similares a las hojas, verdes cerca de la base, tornándose de manera progresiva rojo oscuro distalmente; pedicelos ausentes o hasta 3 mm. Flores con sépalos 6-10 mm, subiguales, lineares, verdes matizados de rosado o rojo oscuro, glaucos; corola 8-10 mm, pentagonal, los pétalos amarillos; estambres 6-8 mm. Folículos 7-8 mm. *Selvas medianas perennifolias*.

Ch (*Martínez S. y Stevens 23820*, MO); ES ² (*Herrera 3714*, MO). 2000-2300 m. (México [Oaxaca, Puebla, Veracruz], Mesoamérica.) ³

¹The correct name is *Echeveria rosea* Lindley, *E. chiapensis* is in the synonymy of *E. rosea* :

Echeveria rosea Lindley, 1842

Synonyms :

Courantia echeverioides Lemaire (1851)

Courantia rosea Lemaire (1853)

Cotyledon rosea (Lindley) Baker (1869) / *Courantia rosea* (Lindley) Britton & Rose (1903)

Cotyledon roseata Baker (1869)

Echeveria chiapensis Rose ex von Poellnitz (1936)

Echeveria omiltemiana Matuda (1963)

Series Spicatae

Type : Mexico, Anonymous, s.n.

Etymology : for the rose-coloured sepals.

Distribution : Mexico (Hidalgo, Puebla, San Luis Potosí, Veracruz, Guerrero, Oaxaca, Chiapas); usually epiphytic in cloud forests.

First Description by Lindley in *Edwards's Botanical Register* **28**: t. 22. 1842 :

Caulescens, foliis ovalibus erectis acutis nunc terminalibus rosulatis nunc imbricatis, spica cylindracea densissima, bracteis inferioribus coloratis lanceolatis basi angustatis triquetris corollis longioribus, sepalis linearibus acuminatis corollae campanulatae aequalibus.

Caulis carnosus, teres, pedalis, ramosus, lutescens.

Folia carnosa, ovalia, basi angustata triquetra ; in apicibus ramorum sterilium aggregatis viridibus roseo-marginatis, aut secus ramos floridos imbricatis roseis.

Sepala linearia, acuta, rosea, corollae campanulatae 5-partitae aequalia, bracteis linearibus ipsis aequalibus suffulta.

Stamina 10, corollae basi inserta.

Carpella 5, acuminata, squamis nullis hypogynis.

² If specimens of *E. rosea (chiapensis)* accessible online are correctly identified, they evidence that this species is **not present at all in El Salvador**. What is occurring in this state is the somewhat similar *E. pittieri*.

³ *E. rosea* is not present at all in Mesoamerica. It is restricted to the Mexican states Hidalgo, Puebla, San Luis Potosí, Veracruz, Guerrero, Oaxaca and Chiapas

Echeveria sessiliflora see **Echeveria pinetorum**

Flora Mesoamericana :

16. Echeveria sessiliflora Rose, *N. Amer. Fl.* 22: 15 (1905).

Holotipo: México, Chiapas, *Goldman 978* (imagen en Internet ex US!).

Ilustr.: Walther, *Echeveria* 385, t. 206 (1972).

Echeveria corallina Alexander.¹

Hierbas terrestres, 2-3 cm, glabras; tallos simples o el cáudice poco ramificado. Hojas 60-80 × 15-20 mm, en una roseta terminal, oblanceolado-espátuladas, coriáceas, azul glauco, los márgenes púrpuras, rojas distalmente, el ápice acuminado a apiculado. Inflorescencias erectas, espiciformes, con 10-20 flores, sésiles o subsésiles; pedúnculos verdes, color salmón distalmente; brácteas disminuyendo en tamaño distalmente, obovadas a oblanceoladas, verdes. Flores con sépalos 4-7 mm, desiguales, ovados o lanceolado-ovados, gris-verdes, el ápice agudo; corola 10-14 mm, oblonga, roja o anaranjada, los pétalos y puntas recurvados; estambres 8-10 mm. Folículos c. 5 mm. *Laderas rocosas en bosques de Quercus.*

Ch (*Breedlove 10244*, MO); G (*Steyermark 5120*, F)². 1700-2200 m. (Endémica.)

¹ *Echeveria corallina* is a distinct species and not a synonym of *E. sessiliflora* which for its part is a synonym of *E. pinetorum*.

² Steyermark 5120 is not traceable at F.

See Crassulacea No.5, 2017 : Corrections in Genus Echeveria – 1.

https://www.crassulaceae.ch/docs/24ce97a908928a1874658e2bb182b218_Crassulacea%20%20No%205%20-%2029.%20September%202017%20-%20Corrections%20in%20Genus%20Echeveria%201.pdf

Echeveria steyermarkii

Flora Mesoamericana :

17. Echeveria steyermarkii Standl., *Publ. Field. Mus. Nat. Hist., Bot. Ser.* 23: 160 (1944).

Holotipo: Guatemala, *Steyermark 43145* (F!).

Ilustr.: no se encontró.

Hierbas epifíticas o litofíticas, glabras, acaules. Hojas 25-65 × 10-20 mm, agregadas en una roseta, oblongo-espátuladas u obovado-espátuladas, coriáceas¹, aplanadas, el haz¹ verde, el envés¹ verde pálido y frecuentemente¹ matizado de púrpura, el ápice redondeado a obtuso, la punta apiculada. Inflorescencias 3-5, en racimos simples o 2-3-ramificados¹, con 3-10 flores¹; pedúnculos 5-20 cm, delgados; brácteas 1-2 cm¹, lineares, verdes¹, frecuentemente matizadas¹ de roja o púrpura, el ápice obtuso; pedicelos 5-15 mm. Flores con sépalos 1.4-5 mm¹, desiguales, patentes en la anthesis, ovados u ovado-oblongos, verdes, el ápice agudo; corola 8-11 mm, los pétalos angostamente lanceolados, rojos o amarillo-rojizos con los márgenes amarillos¹, carinados dorsalmente, el ápice patente. Folículos 7-8 mm. *Laderas rocosas*.

Ch (*Breedlove10941*, F)²; G (*Steyermark 40762*, F)³. 1800-4000 m. (Endémica.)

¹ All this is not mentioned either in the Latin First Description of 1944 or in the English version of 1946 and as the species has never been recollected, an amended description cannot be possible at all.

Walther's re-description is useless because "compiled from all available specimens / all available material which was collected at several distinct stations in Guatemala, often at considerably different elevations", moreover it is totally obsolete in view of the detailed texts of the protologue.

² Breedlove 10941 from Chiapas is named *Echeveria cf steyermarkii*. It does not correspond to the type of *E. steyermarkii* from Guatemala, the pedicels are far too short and the inflorescence has too many flowers - Standley wrote: "The species is **noteworthy for its small, few-flowered inflorescence and very long pedicels**" - therefore there is no proof at all that *E. steyermarkii* is also occurring in Chiapas.

³ The number is wrong, the correct number reads 47062

Correct text :

Echeveria steyermarkii Standley, 1944

Series *Gibbiflorae*

Type : Steyermark 43145, Guatemala, Dept. Zacapa : On rocks, between Santa Rosalía and San Lorenzo, alt. 1200 - 1600 m, January 24, 1942.

Etymology : Named for the collector Julian A. Steyermark.

Distribution: Guatemala (Dept. Solola, San Marcos, Huehuetenango, Zacapa); epiphytic or on rocks, 1300 – 3700 m.

First Description in Latin by Standley in *Field Museum of Natural History, Botany*, **23**(4): 160. 1944. The description below is the English version published in *Fieldiana : Botany*, **24**: 410. 1946 :

Plants glabrous, acaulescent, solitary or cespitose.

The **roots** fibrous.

Leaves usually very numerous and forming a dense rosette, spreading or ascending, green, sometimes tinged with pink or purple, narrowly or very broadly oblong-spatulate, 2.5 - 6.5 cm long, 1 - 2 cm wide, rounded or very obtuse at the apex and obtusely short-apiculate, carnosose but not very thick, broadly cuneate at the base.

Scapes solitary or few, 5 - 20 cm high, the flowers few, short-racemose or subcorymbose; **leaves of the scapes** few and inserted near the base or more numerous and continued to the inflorescence, linear or oblong, the largest 2 cm long, obtuse, ascending.

Flowers 3 - 10, long-pedicellate, the **pedicels** slender, mostly 8 - 15 mm long, the **bracts** oblong or almost linear, much shorter than the pedicels; **sepals** unequal, green, fleshy, 5 - 8 mm long, oblong or ovate-oblong, obtuse, appressed or somewhat spreading, **petals** rose-red or vermilion, 8 - 11 mm long, lanceolate or narrowly lanceolate, erect but excurved at the apex, attenuate-acuminate, **anthers** ca 1.5 mm shorter than the petals, oblong-ovate, **follicles** 7 - 8 mm long, suberect, long-rostrate, brownish-red.

The plants placed here show a great deal of variation in leaf form but it is believed that all represent a single species. Further collections may possibly show that two or more species are represented but it is believed that all the apparent variations may be explained by moisture and exposure conditions. The corolla is variously described as vermilion throughout, rose-red or with petals reddish yellow edged with vermilion. The leaves may be either grass-green throughout or sometimes paler beneath, and often tinged with red or purple. **The species is noteworthy for its small, few-flowered inflorescence and very long pedicels.**

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