



Novelties in *Oxypetalum* (Apocynaceae-Asclepiadoideae) for the Argentine Flora

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Abstract

Including the results reported in this paper, there are 41 species of *Oxypetalum* (Apocynaceae, Asclepiadoideae) that occur in Argentina, eight of them endemic: *O. arenicola*, *O. fontellae*, *O. gracile*, *O. lynchianum*, *O. longipedunculatum*, *O. pubescens*, *O. tucumanense* and *O. teyucuaense*. The last is a new species from the Paraje Teyú Cuaré, San Ignacio, Misiones Province, Argentina, which is described and illustrated here. It shares some morphological features with *O. jorgensenii*, but, overall, it does not closely resemble any other species of the genus morphologically in its unique assemblage of characteristics. In addition to this new species, we here report two additional species for the first time in Argentina.

Keywords: Biodiversity, IUCN Red List, Misiones, new records, new species, *Oxypetalum teyucuaense*, taxonomy

Introduction

Among the provinces of Argentina, Misiones is exceptionally rich in plant species (Zuloaga *et al.* 1999; Ponce *et al.* 2002). Subtropical forest, along with southern savannas, occupies the central and northern parts of Misiones (Cabrera 1976; Biganzoli & Múlgura de Romero 2004). These regions, however, are important for agriculture, with more than half of the native forest already cleared (Laclau 1994). The conservation areas that have been established in Misiones include Iguazú National Park and Biosphere Reserve, Yaboti, together with other conservation areas that are local or administered by the provincial government. These conservation areas are not sufficient to protect endangered and still unknown biota (Biganzoli & Múlgura de Romero 2004).

One area of Misiones Province that is outstanding for its level of endemism is Teyú Cuaré, located next to the Paraná River on the western boundary of the San Ignacio. Geologically, it is characterized by outcrops of Misiones sandstone, which belong to the Botucatu formation. These outcrops form an undulating landscape that is geologically an extension of the Sierra Amambay of Paraguay (Teruggi 1970; Soria 1996). In Misiones Province this is a remarkable feature, since most of the surface of Misiones is covered by laterite soils derived from basalt (Ligier *et al.* 1990). Overall, the geological, pedological and hydrological characteristics of these regions have facilitated the development of a mosaic of vegetation characterized by mixed elements of subtropical rainforest, gallery forest, grasslands and savannas (Biganzoli & Múlgura de Romero 2004), justifying the floristic richness of the region. In 1991 Teyú Cuaré Provincial Park (27°16' S, 55°33' W) was established to conserve a landscaped area, geological, botanical and zoological, historical and ethnological features of great interest and uniqueness (SIFAP 2014). However, with an area of only 78 ha, the park is not of adequate size to protect these features properly. Consequently, there is a proposal to expand the park area to ca. 640 ha, which would be a much sounder plan for conservation (Soria 1996).

The plant family Apocynaceae, comprising the five subfamilies Apocynoideae, Asclepiadoideae, Periplocoideae, Rauvolfioideae and Secamonoideae (Endress & Bruyns 2000), is prominent within the Argentinean flora. Asclepiadoideae, one of the largest of these subfamilies, is mainly tropical and subtropical in distribution, with its greatest diversity in South America. In Argentina, 31 genera with ca. 145 species occur, 58 of them endemic to the country (Ezcurra 1999). The majority of the species of this subfamily are climbers, along with some erect or straggling shrubs or subshrubs. These plants inhabit subtropical forests, open habitats and semi-arid regions, occurring from 300 to 1500 m above sea level.

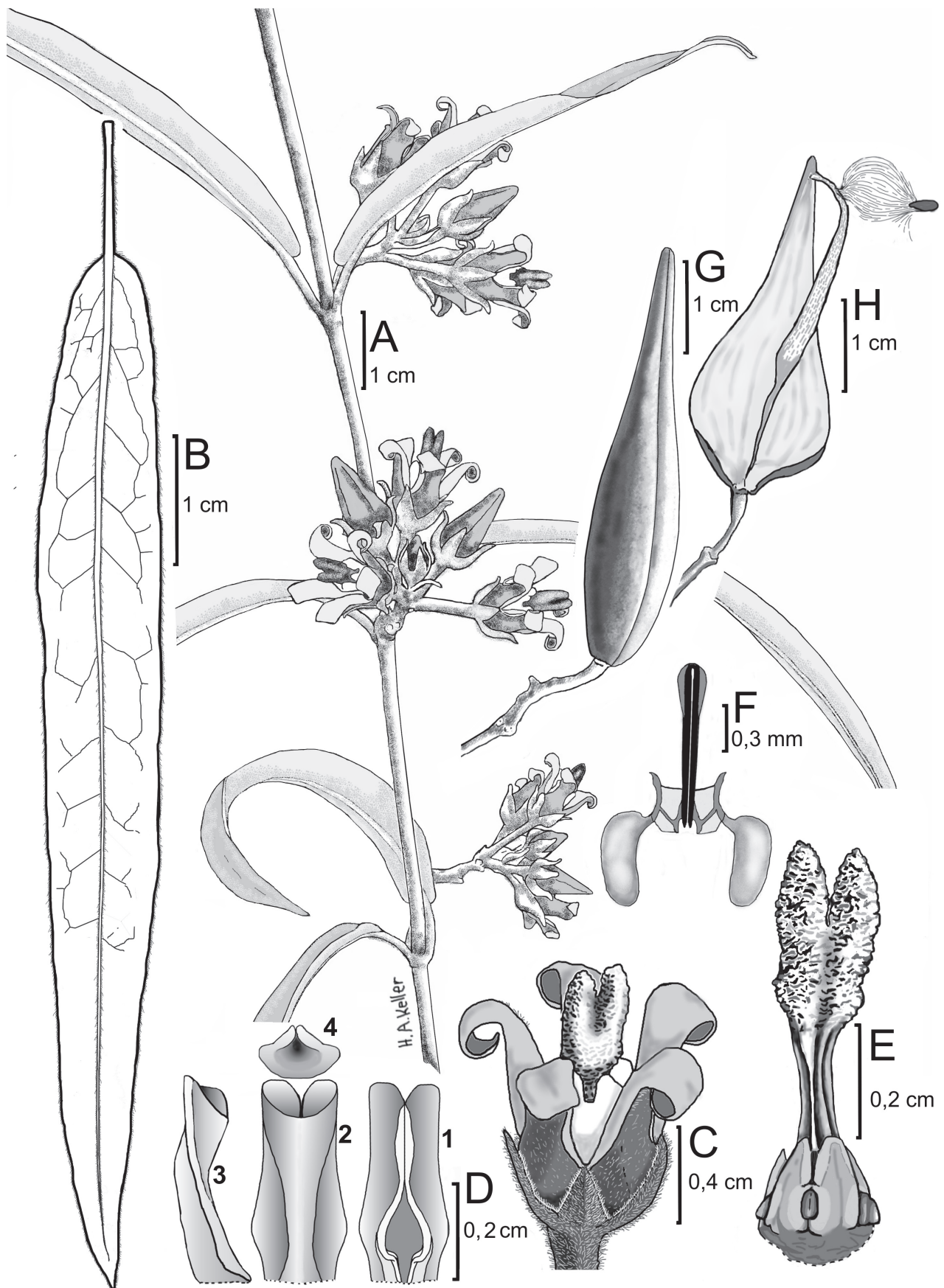


FIGURE 1. *Oxypetalum teyucuaense* Farinaccio & Keller—**A.** Branch with flowers. **B.** Leaf. **C.** Flower. **D.** Corona lobes: **D1.** Adaxial surface, **D2.** Abaxial surface, **D3.** Lateral view, **D4.** Top view. **E.** Gynostegium. **F.** Pollinarium. **G.** Immature fruit. **H.** Opened fruit and seed (A–F from paratype Keller 7740, CTES; G from paratype Keller & Franco 11949, CTES; H examined in field).

Oxypetalum Brown (1810: 30) is the largest Neotropical genus of Asclepiadoideae, with about 120 species distributed from central Argentina to Mexico. The species occur mainly in savannas and grasslands, and also along forest edges (Farinaccio & Mello-Silva 2006). The genus can be recognized by a combination of characters, which are, however, not all present in all of its species. These features include showy flowers, lanceolate lacinia, rostrate stylar head, well-developed retinaculum (about the size of pollinia or larger), and lateral teeth on the caudicle (Farinaccio 2008).

Several authors have contributed to the knowledge of *Oxypetalum* through revisions and local Floras (e.g., Hoehne 1916; Malme 1927; Farinaccio 2005; Fontella-Pereira *et al.* 2004). For Argentina, Meyer's publications (e.g., 1943, 1950) on the genus stand out. Today, the knowledge of the *Oxypetalum* flora of Argentina is in a state of flux and is progressively increasing due to field and herbarium collection work. The purpose of this study was to reveal new data, and update the number of *Oxypetalum* recorded for Argentina.

Results and discussion

Species richness

The results reported here increase the number of species of *Oxypetalum* in Argentina from 31 (Ezcurra, 1999), 33 (Ezcurra *et al.* 2008) or 38 according to the Digital Flora of Argentina (Anton & Zuloaga 2014) to 41 [with addition of species previously included in *Schistogyne* Hooker & Arnott (1834: 291) (Rapini *et al.* 2011)], of which the following are endemic: *O. arenicola* Hauman ex Lillo (1919: 416), *O. fontellae* S. Cáceres (1993: 31), *O. gracile* Meyer (1941: 341), *O. lynchianum* Meyer (1943: 70), *O. longipedunculatum* (Malme) Goyder & Rapini (Rapini *et al.* 2011: 13), *O. pubescens* (Malme) Goyder & Rapini (Rapini *et al.* 2011: 13), *O. tucumanense* (Meyer) Goyder & Rapini (Rapini *et al.* 2011: 13). The first four are erect herbs, the rest are vines (previously recognized in *Schistogyne*). Of the 41 species, 25 occur in Misiones Province, 13 of them vines and 12 erect plants. Thus, relatively more erect species of *Oxypetalum* are found in this region than in the country as a whole, considering that only about 50 of the total of approximately 120 species of the genus are erect, the remainder vines. The new species presented below has been included in these figures.

Oxypetalum teyucuaense Farinaccio & Keller, *sp. nov.* (Figures 1 and 2)

The new species shares some morphological characters with *O. jorgensenii*; both are unbranched erect herbs, the leaf blades, pedicels, pollinia and stylar heads have similar dimensions and the two species possess umbelliform inflorescences. However, *O. teyucuaense* has a set of features that are unique in *Oxypetalum* in that it is the only unbranched erect species that is up to 1.50 m tall with calyx lobes pubescent adaxially, and corona lobes with an internal fold, open apically to form a cup, and the thick and ruminant stylar head appendages.

Type:—ARGENTINA. Misiones: San Ignacio, Paraje Teyú Cuaré, 27°16'51.6" S, 55°33'45.1" W, 30 October 2013 (fl), H.A. Keller, R. Ramírez & M.M. Franco 11726 (holotype, CTES!; isotype K!, SI!, CGMS!).

Plant erect, slender, woody only at the base; 1.30—1.50 m; unbranched, virgate, stem cylindrical, striate when dry, lactescent; glabrous near the base, puberulent towards the apex; nodes pubescent; internodes 4—8 cm long. *Leaves* opposite; petioles 0.5—1.1 cm long, tomentose, smooth, flanked by 2 colleters proximally; blades ovate, 7.5—11 x 0.5—0.9 cm, concolorous, margin entire, base retuse, apex acuminate to acute, tomentose, chartaceous, venation brochidodromous, 2 colleters at base of adaxial side. *Inflorescence* umbelliform, extra-axillary, pendent, alternate, peduncles 7.2—10.3 mm long, tomentose; 3—5(-6)-flowered, pedicels 3.6—7.2 mm long, tomentose. *Calyx* divided almost to the base, green, sometimes brownish, lobes ovate, 4.2—5 x 1.2—1.6 mm, acuminate, tomentose above, pubescent below, 4—6 colleters at the sinus, one larger than the others. *Corolla* purple to reddish-brown and pubescent outside, yellow with purple dots inside and glabrous, barbellate only at the mouth of the tube, campanulate, tube 2.5—3.5 mm long; lobes oblong, 7.8—8.55 x 1.8—2.2 mm, erect, recurved in the distal third, marginally revolute, apex rounded. *Corona* pink in lower half, cream above; lobes connate at the base of the tube, oblong, 3.7—5.1 x 0.8—1.2 mm, taller than the anthers, their adaxial side folded, open and cup shaped above. *Anthers* quadrangular, 0.5—0.7 x 0.7—1 mm, terminal appendage lanceolate, 1.2—1.6 x 0.6—0.7 mm, apex acute, dorsum shorter than wings, rectangular, wings prominent. *Corpusculum* narrowly oblong, expanded distally, spatulate, 0.86—0.96 x 0.06—0.08 mm, apex acute, caudicles 0.12—0.21 mm long, flattened, broad, translucent, with horny teeth 0.12—0.14 mm long, reflexed outward, free, pollinia oblong, 0.40—0.48 x 0.13—0.18 mm. *Gynostegium* yellow-greenish, 1.7—2 mm

long, sessile, stylar head 5.6—6.1 mm long, purple-greenish, exserted, channeled and 5-angled in lower half, purple, thick and ruminant in the upper half, this portion bifid from middle, branches, flat. *Follicles* green, fusiform, ca. 6.5 cm long, only one developing. *Seeds* light brown, ovate, ca. 5 x 2.5 mm, rugose, with a toothed margin, coma white, 2.7—3 cm long.

Distribution, habitat, and phenology:—*Oxypetalum teyucuarense* is endemic to Teyú Cuaré, San Ignacio, Misiones, Argentina. Its slender, flexible stems rise over a sparse cover of tall grasses. The specimens were found growing within the crevices of a rocky sandstone substrate, at ca. 160 m elev., bordered by cerrado (savanna). Flowering occurs from October to January and fruiting in January to February.

Conservation status:—*Oxypetalum teyucuarense* can be considered very rare, as it is known from only one population of 23 individuals. The area where it was found has ca. 400 m² and is situated in a private conservation reserve for ecotourism. This area has been explored by botanists and plant collectors for many years (Biganzoli & Múlgura de Romero 2004), so it is unlikely that other population of the species occur in the locality. Its conservation status should thus be considered as critically endangered (CR D) (IUCN, 2001).

The discovery of this new species near Teyú Cuare Provincial Park, but outside the protected area, complements the arguments of Soria (1996) and Fontana (2005) that the protected area of Teyú Cuaré provincial park should be expanded.

Etymology:—The specific epithet refers to the locality Teyú Cuaré, where all of the specimens were collected.

Additional specimens examined (paratypes):—ARGENTINA. Misiones: San Ignacio, Acceso a Parque Provincial Teyú Cuaré, 24 November 2009, H.A. Keller 7740 (CTES); *ibidem*, 27°16'51.6"S, 55°33'45.1"W, 11 December 2013 (fl, fr), H.A. Keller & M.M. Franco 11949 (CTES).

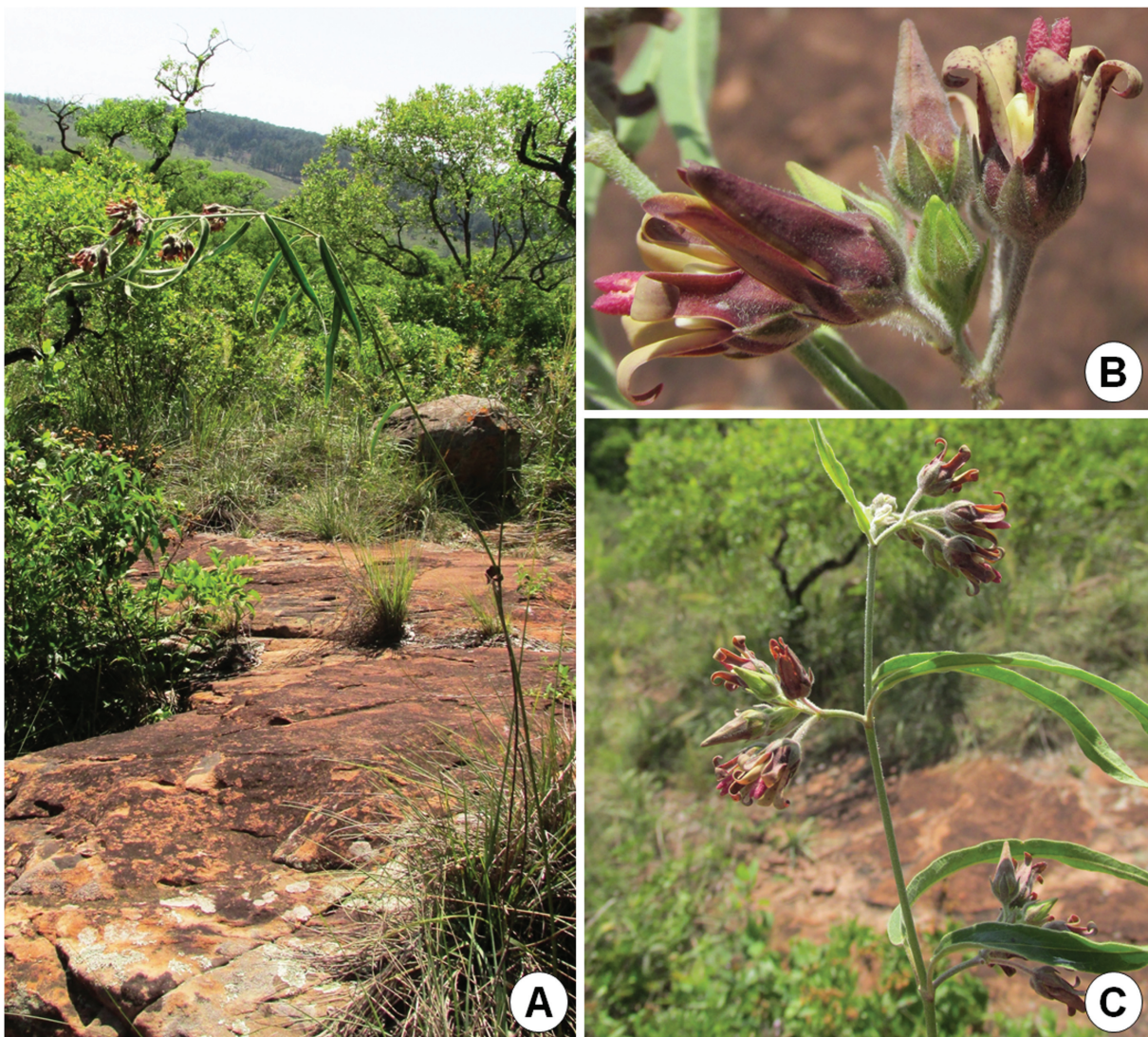


FIGURE 2. *Oxypetalum teyucuarense* Farinaccio & Keller—A. Habitat and habit. B. Flower. C. Flowering branch. (Keller 7740; photos by H. Keller)

Discussion:—The erect habit of *Oxypetalum teyucuarensense*, suggests that it belongs to of the clade that includes only erect species of *Oxypetalum* (Farinaccio 2008). It shares some features with *O. jorgensenii* Meyer (1943: 60–63), which also occurs in Misiones: both are erect, unbranched herbs with similar-sized leaf blades, pedicels, pollinia and styler heads as well as umbeliform inflorescences. Despite this overall similarity, *O. teyucuarensense* has a set of features that is unique in the genus. It is the only unbranched erect species that grows up to 1.50 m tall. In addition, its flower morphology is unusual in that the corona lobes present an internal fold that opens at the apex as a cup. The thick apex of the gynoeceum is ruminant. The latter feature makes this species easy to recognize in the field. When the tall, slender plants are in flower, they become deflexed.

New Records

1. ***Oxypetalum oblanceolatum*** Farinaccio & Mello-Silva (2006: 236)—*O. oblanceolatum* was described from one collection from the Brazilian State of Paraná (Farinaccio & Mello-Silva 2006). This species was considered as vulnerable according to IUCN (2001) Red List criteria, but the recent study of the one collection of COR herbarium (Thiers 2008) extends its range into Misiones Province, Argentina. Here it grows in a clearing surrounded by a monoculture of *Pinus*, and thus *O. oblanceolatum* should still be considered as vulnerable (IUCN 2001).

Additional collection:—ARGENTINA. Misiones: San Pedro, Arroyo Liso, unos 5 km pasando San Pedro, desvío por ruta 16 hacia el este, 26°37'35.1"S, 54°01'54.2"W, 590 m, 9 December 2002 (fl), G. Barboza, F. Chiarini, M. Matesevach & C.I Carrizo García 468 (COR!).

2. ***Oxypetalum wightianum*** Hooker & Arnott (1834: 288)—*O. wightianum* is broadly distributed in south and southeastern region of Brazil, reaching western Paraguay (Farinaccio 2005). One new collection of this species into Argentina was identified in Department Iguazú, at the border with Brazil, thus extending its range to Misiones Province.

Additional collection:—ARGENTINA. Misiones: Iguazú. Paraje Aguaray, Lote APSA, rodal 5–6, 27 December 2001 (fl, fr), H.A. Keller & D. Colcombet 1528 (CTES!).

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