Ethesia tanquana (Ornithogaloideae, Hyacinthaceae),
a new species from the Tanqua Karoo (South Africa),
with notes on E. haalenbergensis

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Abstract


As a part of a taxonomic revision of Ethesia Raf., a new species, E. tanquana Mart.-Azorín & M.B. Crespo, is described from the Tanqua Karoo in South Africa. This new species is at first sight similar to E. haalenbergensis (U. Müll.-Doblies & D. Müll.-Doblies) Mart.-Azorín, M.B. Crespo & Juan and also E. xanthochlora (Baker) Mart.-Azorín, M.B. Crespo & Juan, but it differs in floral and vegetative characters as well as in its ecology and isolated distribution. A complete description, data on biology, habitat, and distribution of the new species are presented. An identification key for Ethesia and new data on the rare Namibian E. haalenbergensis are also given.

Key words: Ethesia xanthochlora, distribution, ecology, habitat, taxonomy, Tankwa Karoo.

INTRODUCTION

Family Hyacinthaceae includes about 700-900 species of bulbous plants that are mainly distributed throughout Europe, Africa and SW Asia, with a single small genus in South America (Speta, 1998; APG II, 2002). Four monophyletic subfamilies are accepted within Hyacinthaceae: Hyacinthoideae, Ornithogaloideae, Urugiöeae and Ozioöeoidae (Pflosser & Speta, 1999; Manning & al., 2004). Alternatively, Hyacinthaceae has been treated as subfamily Scilloideae of the Asparagaceae, and the subfamilies above are then treated as tribes Hyacinthae, Ornithogaloideae, Urogiæae and Urugiæae (e.g. APG III, 2009; Chase & al., 2009).

Ornithogaloideae are distributed throughout Europe, SW Asia and Africa. In recent decades a number of morphological and phylogenetic studies were made on the group, focusing on circumscriptions of the genera. As a consequence, at least three very different taxonomic arrangements at generic level have been proposed for the Ornithogaloideae by Speta (1998) and Manning & al. (2004, 2009), all based exclusively on plastid DNA regions. The latest comprehensive study of the subfamily, including for the first time nuclear DNA regions, accepts 19 independent genera (Martínez-Azorín & al., 2011). These genera are based on monophyletic clades supported by a clear syndrome of morphological characters and distinct biogeographic patterns (cf. Martinez-Azorín & al., 2011), thus making this treatment highly consistent.

The genus Ethesia Raf. was described by Rafinesque (1837) to include a single species, E. prasina (Ker Gawl.) Raf. It was characterized as follows: "649. Ethesia Raf. (Nymph) diff. ad Loncomelos, filamentis equalis basi ovatis dilatatis, style elongato striato, stigma capitat. pubescens. - Type E. prasina Raf. Ornith. prasinum Édwd. b. reg. 158. fol. glaucis canalicul. apice tortilis, scapo racemoso, fl. viridescens. South Africa. ' Therefore, Ethesia was related to Loncomelos Raf., the latter including the species traditionally placed in Ornithogalum subg. Beryllis (Salisb.) Baker (= Beryllis Salisb.). Following the recent comprehensive studies in the Ornithogaloideae (cf. Martínez-Azorín & al., 2011), Loncomelos is a genus with ca. 20 species endemic to the Mediterranean basin, whereas Ethesia comprises four species, E. haalenbergensis (U. Müll.-Doblies & D. Müll.-Doblies) Mart.-Azorín, M.B. Crespo & Juan, E. polyplebeia (Baker) Mart.-Azorín, M.B. Crespo & Juan, E. prasina (Ker Gawl.) Raf., and E. xanthochlora (Baker) Mart.-Azorín, M.B. Crespo & Juan, all occurring in southern Africa. Both genera can be clearly differentiated by morphological features, and the phylogenetic analyses show that Ethesia and Loncomelos constitute two distant monophyletic clades within the tribe Ornithogaloideae (Martínez-Azorín & al., 2011).

Ethesia was overlooked by modern taxonomic revisions in the Ornithogaloideae (Leighton, 1945; Obermeyer, 1978; Müller-Doblies & Müller-Doblies, 1996), and its four currently accepted species were placed in the morphologically heterogeneous Ornithogalum subg. Urophyllon (Salisb.) Baker. The concept of this subgenus has proved to be artificial, with a mixture of taxa of the tribes Ornithogaloideae and Albucaeae (cf. Manning & al., 2009; Martínez-Azorín & al., 2011). Manning & al. (2009), in their latest phylogenetic study on the Ornithogaloideae, again overlooked Ethesia and
placed *O. prasinum* Ker Gawl., the type of that genus, in their new *Albica* subg. *Namibiogalum* (U.Müll.-Doblies & D.Müll.-Doblies) J.C. Manning & Goldblatt. As discussed by Martínez-Azorín & al. (2011), the inclusion of *O. prasinum* in *A. subg. Namibiogalum* (= *Battandiera* Maire *sensu* Martínez-Azorín & al., 2011) is not consistent with the morphological data. Furthermore, other apparently related species, such as *O. haalenbergense* U.Müll.-Doblies & D.Müll.-Doblies and *O. xanthochlorum* Baker, were placed in *O. sect. Xanthochlora* (U.Müll.-Doblies & D.Müll.-Doblies) J.C. Manning & Goldblatt (= *Ethesia* Raf. *sensu* Martínez-Azorín & al., 2011) in their phylogenetic analyses by Manning & al. (2009). However, Manning & Goldblatt (2011) subsequently transferred *O. prasinum* to their widely circumscribed and morphologically heterogeneous *Ornithogalum*, a solution that implicitly corroborates the previous results by Martínez-Azorín & al. (2011). Manning & Goldblatt’s treatment was supported by the cytological data presented in Goldblatt & Manning (2011). *Ethesia* has the unique chromosome number 2n = 16 (x = 8), that it shares only with its sister clade *Galtonia* Decne.

The latest revision of *Ornithogalum* in southern Africa (cf. Müller-Doblies & Müller-Doblies, 1996) accepted *O. xanthochlora*, *O. prasinum* and *O. polyplebium* as independent species. These authors also described a new related species, *O. haalenbergense* that is endemic to a small area in the surroundings of Haalenberg in SW Namibia. This species is closely related to *E. prasina*, but it differs in the colour of the tepals and the number and morphology of the leaves. It is remarkable that no complete morphological description of this new species was presented, and no holotype or isotypes appear to have been deposited in the herbaria cited in the protologue (‘holotypus: WIND; isotypi: B, BTU, K, PRE’) since its description in 1996. As a consequence, a clear understanding of the taxonomic status of *E. haalenbergensis* is still lacking.

It is the aim of this paper to enhance our knowledge of the taxonomy of *Ethesia*. The study of living populations and herbarium collections of *Ethesia* from southern Africa reveals the existence of clear morphological differences that allow the description of a new species, *Ethesia tanquana* Mart.-Azorín & M.B.Crespo. This taxon appears to be closely related to *E. xanthochlora* and *E. haalenbergensis* from SW Namibia andNamaqualand. Data on morphology, biology, habitat, and distribution of *E. tanquana* and the rare and poorly known *E. haalenbergensis* are provided, together with a tentative key for the identification of *Ethesia* species.

**MATERIAL AND METHODS**

Morphological studies were mainly undertaken on living material from natural populations, usually within a few hours after collection, as described in detail by Martínez-Azorín & al. (2007, 2010) for other related groups of Ornithogoalidaceae. These data were complemented with studies of dried material conserved in the herbaria BOL, BNRH, GRA, J, K, KEI, KMG, NBG, NH, NU, PEU, PRE, PUC, UFFH, and WIND (acronyms according to Thiers, 2012). Authors of the cited taxa follow the IPNI (2012).

**RESULTS AND DISCUSSION**

Species of *Ethesia* are characterized by tepals ovate-oblong, free, all spreading, greenish, with branched outer nerves, sometimes with white margins; staminal filaments showy, pure white, and also spreading; capsule obcordate or widely globose and truncate to retuse at the apex, about equal or wider than long (cf. Martínez-Azorín & al., 2011). From a phylogenetic point of view, *Ethesia* is monophyletic and considered sister to the *Galtonia* clade (including *O. saundersiae* Baker) (cf. Martínez-Azorín & al., 2011). *Galtonia* is easily differentiated from *Ethesia* by the large leaves sheathing the stem; racemose inflorescence, with flowers nodding; tepals fused into a campanulate tube for about half of their length; filaments cylindrical, adnate, and included; and capsule oblong-cylindrical and acute, usually longer than wide. Only *G. saundersiae* (Baker) Mart.-Azorín, M.B. Crespo & Juan shows a disruptive flower structure in the genus, it having the tepals almost free and spreading, and the ovary globose and shining black. Further studies, including molecular data, are needed to elucidate its final taxonomic position. *Galtonia* and *Ethesia* show different biogeographic patterns since species of the former genus occur...
in summer-rainfall, high-altitude regions of the Drakensberg, Low Drakensberg, Southern Berg and Natal Midlands (South Africa and Lesotho), whereas *Ethesia* species occur in winter-rainfall, sub-arid regions in western and central South Africa and southern Namibia.

Four species are currently accepted in *Ethesia* (cf. Martínez-Azorín & al., 2011). Among them, *E. xanthochlora* is probably the most well-known species of the genus, perhaps because of its large size and abundance in Namaqualand, NW South Africa (Fig. 1). This species was described in *Ornithogalum* by Baker (1897) based on a Harry Bolus collection from ‘Western region: Little Namaqualand; Kaus Mountain, 2500 ft., Bolus 6598!’. The original description includes the following characters: ‘… raceme dense, 6-8 in. long; pedicels stout, erecto-patent, lower 1-1¾ in. long, … petal yellowish-green, ½ in. long …’. In summary, this species is characterized by the long and narrow, dense, inflorescence with short and stout pedicels, and flowers with uniformly yellow-green tepals. A similar concept was followed by Leighton (1945) ‘Inflorescence many flowered, dense … pedicels 2-3 cm long … petal green …’. Later Obermeyer (1966) illustrated this species in *Flowering Plants of Africa*. The description and figure showed plants with a long and cylindrical inflorescence with pedicels short and stout, all of similar length, and greenish flowers. The specimen figured was collected by A. Amelia Obermeyer ‘about 21 miles north of Springbok near the road to Steinkopf, not far from the type locality’. She gave interesting distribution data on this species, saying that it has been collected fairly often in the Namaqualand area, while a few records come from Calvinia and Ceres’. A few years later, Obermeyer (1978) characterized the same species again as having ‘Inflorescence … with a long, dense, many flowered, cylindrical raceme … pedicels arcuate, lengthening and hardening in fruit, up to 30 mm long … Perianth green …’. She also cited a list of herbarium collections distributed from the Richtersveld in the north to near Ceres in the south.

Müller-Doblies & Müller-Doblies (1996), in their revision of *Ornithogalum* in southern Africa accepted *O. xanthochlorum*, though with no new morphological data, and only citing Obermeyer’s distributional information. Moreover, these authors described a new species *E. baalenbergensis*, which was known from a single locality in the surroundings of Haalenberg in SW Namibia. It was considered to be related to *O. prasinum*, but it differs by the tepals green with a white marginal region and the 2-3 narrowly oblong and decumbent leaves. No complete morphological description of *E. baalenbergensis* has been published to date and no types are available in any southern African or European herbaria.

Based on our fieldwork in South Africa and the revision of the main herbaria in that country, we present data supporting the description of a new species, *E. tanquana*, for populations growing in the Tanqua Karoo (also known as Tankwa Karoo), South Africa. It shows clear affinities to both *E. xanthochlora* (with which it has been usually misidentified) and *E. baalenbergensis*, though reproductive and vegetative characters allow easy separation from the latter. Since *E. xanthochlora* is a well-known species for which extensive information is available, complete morphological descriptions as well as data on biolog...
Deciduous bulbous plant. Flowering scapes (10)15-28(37) cm high. Bulb hypogaeal, ovoid, 4-9 × 2.5-6 cm, with a flat, small, basal plate, and dark leathery outer tunic. Leaves 5-11, in a basal rosette, not sheathing the stem, completely or mostly withered in full anthesis, lanceolate-oblong, loricate, flat, curved outwards and downwards, (8)11-18(25) × 0.8-4.5 cm, somewhat fleshy, glabrous, green, entire with a narrow hyaline margin. Inflorescence with (7)15-28(35) flowers, in a short, conical raceme, (3.5)5-16 × (2.5)3-6(8) cm, ca. 1-2 times longer than wide; peduncle erect, stout, terete, green, 6-15(20) × 0.7-1.2 cm; flower pedicels erect-patent, (1.8)2.4-4.3(4.8) × 0.2-0.3 cm; fruit pedicels lengthening and hardening, (3)3.2-4.4(5) × 0.2-0.3 cm, ascending, slightly arculate, forming an obtuse callus above; bracts narrow-triangular, slightly clasping pedicles, 1.8-3.5 × 0.8-1 cm, usually not overtopping the flowers, at least in the basal portion of the inflorescence shorter than fruiting pedicels, greenish-yellow with a membranous translucent margin, persistent, drying out slowly and becoming brown from the tip downwards. Flowers sweet-scented; tepals fleshy, pale grey-green with white margin, with distinct darker green venation, and branched lateral veins; outers ovate, 13-14 × 6-8 mm, with a slightly cucullate, white, papillate apex; inners narrowly ovate-lanceolate, 12-13 × 3-6 mm. Filaments all similar, ovate-lanceolate or narrowly triangular, acuminate, thick, fleshy, white, 8-9.5 × 2-2.5 mm, all spreading not enclosing the ovary; anthers small, 2-2.5 × 1-1.2 mm after dehiscence. Ovary oblong, turbinate, trigonous, 6-6.5 × 3.5-4 mm, green, with septal nectaries in the apical portion of the carpel sutures, which produce abundant nectar; ovules biseriate; style thickened, white, 5.5-6 × 1 mm, as long as the ovary, erect or somewhat curved; stigma shortly 3-lobed, somewhat capititate, with conspicuous papillate lobes. Capsule broadly globose-oblong, truncate, retuse at the apex, as wide or wider than long, 13-15 × 15-19 mm, trilobate in section, surrounded by the persistent perianth; seeds flattened, semidiscoid to irregularly discoid, 5-7.5 × 4-6 mm; testa shining black, with a very shallow undulate cell pattern.

Etymology. Named after its confined distribution to the Tanqua Karoo in South Africa (tanquana = from Tanqua Karoo).

Chromosome number. 2n = 16 (cf. Goldblatt & Manning, 2011; as O. xanthochlorum = Snijman 2227 NBG).

Flowering time. August-October, fruits appear in late September-November.

Habitat. Flats with dry open karroid shrubby vegetation (Succulent Karoo Biome), over clayey soils on shale mudstones or red-brown sandy and slightly stony soils derived from shale arenites.

Distribution and biogeography. It is confined to the Tanqua Karoo in the inland areas of SW South Africa, from south of Calvinia to north of Ceres (Fig. 5). This region comprises the lowlands located south west of the Hantam-Roggeveld Centre (HRC) of plant endemism (Van Wyk & Smith, 2001), and includes the vegetation units Tanqua Karoo and Koeboesberge-Moordenaars Karoo in the Bainshoof Valley Karoo bioregion (Mucina & Rutherford, 2006). Other taxa, such as Babiana tanquana J.C.Manning & Goldblatt, Moraea tanquana Goldblatt & J.C.Manning, Octopoma tanquanum Klak, Lampranthus tanquanus H.E.K.Hartmann, Euphorbia gentilis subsp. tanquana L.C.Leach, or Tanquana H.E.K.Hartmann & Liede, are also found in the same geographic area, thus emphasizing the fact that the Tanqua Karoo is a remarkable biogeographical unit in terms of endemism.

Diagnostic characters and relationships. Ethesia tanquana is easily identified by the tepals olive-green with a broad white margin and dark nerves, the bracts up to ¼ the length of fruiting pedicels, and the leaves mostly withered at the full anthesis. Ethesia xanthochlora can be related to E. tanquana on the basis of its robust habit, with stout inflorescence peduncle and flower pedicels, but it differs in its uniformly green-yellowish tepals, the cylindrical narrow inflorescence with bracts longer than pedicels in fruit (Table 1). On the other hand, E. baadenbergensis shares with E. tanquana the tepals green with a white margin, but differs in its smaller flowers and inflorescence, with only 2-3 leaves per flowering stem, among other characters (Table 1). It is also notable that despite its floral similarities with E. baadenbergensis, E. tanquana occurs in continental
areas to the south of the main populations of *E. xanthochlora*, whereas *E. haalenbergensis* is found in coastal regions further north of the *E. xanthochlora* populations (Fig. 5).

**Observations.** Herbarium materials of the new species have usually been misidentified as *O. xanthochlorum* (= *E. xanthochlora*). The first known collections were made by R.H. Compton in Gansfontein, in Tanqua Karoo, in 1935 (*Compton 5991 NBG*). The most recent flora of the Roggeveld and the Tanqua Karoo (cf. Van der Merwe & Van Rooyen, 2010) includes a photograph of this species, although again as *O. xanthochlorum*.

Additional specimens studied

**SOUTH AFRICA:** *Northern Cape*: (3119DC) Tankwa Karoo, Kalkgat Oos, next to road, 31°11’18”S, 19°54’29”E, 7-IX-2004, 452 m, *H. Rösch* 239 (KMG, NBG); (3219BB) Tankwa Karoo, along Roodewerf road, 32°00’14”S, 19°52’14”E, 18-IX-2006, 543 m, *H. Rösch* 564 (KMG, NBG); (3219BC) Wupertal, Elands Vlei, lower Tanqua, *Marloth 10465* (cf. Obermeyer, 1978).

**Western Cape**: (3219DA) Tanqua Karoo, farm De Mond, just E of Doorns River, 6-X-2008, D.A. Snijman 2227 (NBG); (3219DA) Calvinia CP, Tanqua Karoo, Gansfontein, 26-VIII-1993, 1500 feet, *Compton 5991* (NBG); (3219DA) Tanqua Karoo, 3.8 km from main road on turn off to Middelpos, 32°39’44”S, 19°44’21”E, 3-IX-2011, 469 m, M. Martínez-Azorín, A. Martínez-Soler & R. McKenzie MMA818 (GRA); (3219DB) Farm Grootkapelsfontein, 8 km along road to Middelpos from Ceres/Calvinia turn off, 31-VIII-1982, 450 m, D.A. Snijman 612 (NBG); (3219DD) between Ceres and Sutherland, in the Tanqua Karoo, near Bizansgat, 24-IX-1987, M. Viviers & J. Vlok 338 (NBG); (3219DD) on road to Sutherland, just before turn off to Onder-Wadrif, north of river crossing, 1-X-1974, K. Hiemstra 586 (NBG);


*Ornithogalo prasino* affine, sed differt foliis solum 2-3, planis, humo appressis, anguste oblongis.

Deciduous bulbous plant. Flowering scapes 5-6.5 cm high. Bulb hypogaeal, ovoid, 4-7 × 2-3 cm, with a flat, small, basal plate, and brown leathery outer tunics. Leaves 2-3, in a basal rosette, not sheathing the stem, coetaneous with flowers, narrowly-oblong, lorate, flat, curved outwards and downwards, 7-12 × 0.4-1.2 cm, somewhat fleshy, glabrous, glaucous green, entire with a narrow hyaline margin. Inflorescence with (9)11-20(22) flowers, in a short, conical raceme, 2.3-5 × 2.8-3.2 cm, about as long as wide; peduncle erect, terete, green, 2.3-5.2 × 0.2-0.3 cm; flower pedicels erect-patent, 0.6-1.4(1.6) × 0.1 cm; fruit pedicels 0.7-1.7 × 0.1 cm; bracts mostly white-membranous, broad-ovate and widely clasping the pedicels, 0.8-1.5 × 0.6-0.7 cm, about as long as fruiting pedicels. Flowers erect-patent; tepals fleshy, pale olive-green with white margin, with distinct darker green venation, and branched lateral veins; outs ovate, 7-9 × 4-6 mm, with a slightly cucullate, white, papillate apex; inners narrowly ovate-lanceolate, 7.8 × 3-4 mm. Filaments all similar, ovate-lanceolate or narrowly triangular, acuminate, thick, fleshy, white, 4.5-6.5 × 1.5-2.2 mm, all spreading not enclosing the ovary; anthers small, ca. 2 × 1 mm after dehiscence. Ovary oblong, turbinate, trigonous, ca. 3.5 × 2.5 mm, green, with sepalnectaries in the apical portion of the carpel sutures; ovules biseriate; style white, ca. 3 × 0.5 mm, about as long as the ovary, erect; stigma shortly 3-lobed, somewhat capitate, with conspicuous papillate lobes. Capsule

![Fig. 4. Infrutescence of *Ethesia tanquana* showing the long pedicels with shorter bracts [corresponding to the holotype: M. Martínez-Azorín, A. Martínez-Soler & R. McKenzie MMA815 GRA]. Scale in mm.](image1)

![Fig. 5. Known distribution of *Ethesia haalenbergensis* (squares), *E. xanthochlora* (circles) and *E. tanquana* (triangles) in SW Africa.](image2)

broadly globose-oblong, truncate, retuse at the apex, as wide or wider than long, 7-10 × 10-14 mm, trilobate in section, surrounded by the persistent perianth; seeds flattened, semidiscoid to irregularly discoid, black, shiny (Fig. 6).

**Etymology.** Named after the type locality near Haalenberg (haalenbergensis = from Haalenberg) in SW Namibia.

**Chromosome number.** Unknown.

**Flowering time.** July-September (January), fruits appear in late September-October.

**Habitat.** Deep sandy soils on flats and rocky outcrops of the Succulent Karoo Biome.

**Distribution.** Endemic to the coastal regions of SW Namibia, from Haalenberg near Lüderitz in the north, to Klinghardtberge Mts. in the south (Fig. 5).

**Diagnostic characters and relationships.** This species is easily identified by the presence of 2-3 lorate and spreading leaves, the short, subglobose inflorescence, the widely ovate-lanceolate and white-membranous bracts and the tepals olive-green with white margins. It appears to be akin to *E. tanquana* on the basis of flower morphology, but strongly differs by leaf number, and size of inflorescence, flowers and pedicels (Table 1).

**Observations.** First collected in the surroundings of Haalenberg by M.K. Dinter in 1929 (*Dinter 6612 B, BTU-b*; as *Albuca diphylla* ined.); Haalenberg, quarry 2 km N of the road at 3 km WSW of Haalenberg, deep sand and rocky slopes, ca. 600 m, 31-VII-1988, Müller-Doblies 88047c (BTU, WIND), in bud; 2715BD (Bogenfels): Karas, dune entering outskirts of Klinghardts from the south east, 27º15’47"S, 15º46’45"E, 21-IX-2003, 615 m, C.A. Mannheimer 2443 (WIND!); 2715BD (Bogenfels): Sperrgebiet, hills on northern side of Klinghardt mountains, 27º15’47"S, 15º46’45"E, 13-VIII-2011, 644 m, L. Smook 11370 (WIND!).

*Fig. 6. Ethesia haalenbergensis (Mannheimer 2443, WIND). Scales in mm.*

M. Martínez-Azorín & M.B. Crespo

This species was illustrated as ‘*Ornithogalum prasinum*’ by Mannheimer & al. (2008), whilst the photographs by C. Mannheimer do indeed correspond to *E. haalenbergensis* that by T. Greyling shows *E. prasina*.

No type specimens of *E. haalenbergensis* have been found in WIND, PRE and K, which together with the very poor description in the protologue, made a priori understanding of this species difficult. However, the photograph in the protologue shows features that undoubtedly match the materials studied here (Fig. 6) from sites south to the type locality, which supports the placement of this species in *Ethesia* as proposed by Martínez-Azorín & al. (2011). This situation raises a question that should be addressed by botanical nomenclature authorities, with regard to a requirement for a time limitation for the deposition of types after description of new taxa.

**Additional specimens studied**

**NAMIBIA: Lüderitz:** (2615CB) Haalenberg, 30-VIII-1929 coll., *Dinter 6612 B, BTU-b*; Haalenberg, quarry 2 km N of the road at 3 km WSW of Haalenberg, deep sand and rocky slopes, ca. 600 m, 31-VII-1988, *Müller-Doblies 88047c* (BTU, WIND), in bud; 2715BD (Bogenfels): Karas, dune entering outskirts of Klinghardts from the south east, 27º15’47"S, 15º46’45"E, 21-IX-2003, 615 m, C.A. Mannheimer 2443 (WIND!); 2715BD (Bogenfels): Sperrgebiet, hills on northern side of Klinghardt mountains, 27º15’47"S, 15º46’45"E, 13-VIII-2011, 644 m, L. Smook 11370 (WIND!).
Table 1. Main diagnostic characters of *Ethesia xanthochlora*, *E. tanquana* and *E. haalenbergensis*.

<table>
<thead>
<tr>
<th>Character</th>
<th><em>E. xanthochlora</em></th>
<th><em>E. tanquana</em></th>
<th><em>E. haalenbergensis</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>Plant</td>
<td>40-70 cm</td>
<td>(10)15-28(37) cm</td>
<td>5-6.5 cm</td>
</tr>
<tr>
<td>Bulb</td>
<td>7-12 x 4-10 cm</td>
<td>4-9 x 2.5-6.5 cm</td>
<td>4-7 x 2.3 cm</td>
</tr>
<tr>
<td>Leaves</td>
<td>(7/9)-12(15)</td>
<td>5-11</td>
<td>2-3</td>
</tr>
<tr>
<td></td>
<td>mostly coetaneous with the flowers</td>
<td>completely or mostly withered in full flower</td>
<td>coetaneous with flowers</td>
</tr>
<tr>
<td>Inflorescence</td>
<td>(20)25-58(65) flowers</td>
<td>(7)15-28(3) flowers</td>
<td>(9)11-20(22) flowers</td>
</tr>
<tr>
<td></td>
<td>(8)10-26 x 3-4.5(5.5) cm</td>
<td>(3.5)15-6 x (2.5)3-6(8) cm</td>
<td>2-3.5 x 2.8-3.2 cm</td>
</tr>
<tr>
<td></td>
<td>peduncle (10)13-45 x 1-1.7 cm</td>
<td>peduncle 6-15(20) x 0.7-1.2 cm</td>
<td>2.3-5 x 0.2-0.3 cm</td>
</tr>
<tr>
<td></td>
<td>flower pedicels (0.8)1.2-2.8(3) x 0.3-0.4 cm</td>
<td>flower pedicels (1.8)2.4-4.3(4.8) x 0.2-0.3 cm</td>
<td>flower pedicels 0.6-1.4(1.6) x 0.1 cm</td>
</tr>
<tr>
<td>Fruit pedicels</td>
<td>(1.3)1.5-3(3.5) x 0.4-0.5 cm</td>
<td>fruit pedicels (3)2.4-4.4(5) x 0.2-0.3 cm</td>
<td>fruit pedicels 0.7-1.7 x 0.1 cm</td>
</tr>
<tr>
<td>Bracts</td>
<td>(1.8)2.5-5.8(7) x 0.6-1.4 cm</td>
<td>1.8-3.5 x 0.8-1 cm</td>
<td>0.8-1.5 x 0.6-0.7 cm</td>
</tr>
<tr>
<td>Filaments</td>
<td>8-12 x 2.5-4.2 mm</td>
<td>8.9-5 x 2.2-2.5 mm</td>
<td>4.5-6.5 x 1.5-2.2 mm</td>
</tr>
<tr>
<td>Ovary</td>
<td>6-7 x 4-4.5 mm</td>
<td>6-6.5 x 3.5-4 mm</td>
<td>ca. 3.5 x 2.5 mm</td>
</tr>
<tr>
<td>Capsule</td>
<td>7-8 x 1 mm</td>
<td>5.5-6 x 1 mm</td>
<td>ca. 3 x 0.5 mm</td>
</tr>
<tr>
<td>Seeds</td>
<td>5-6 x 2-3 mm</td>
<td>5-7.5 x 4-6 mm</td>
<td>—</td>
</tr>
<tr>
<td>Flowering time</td>
<td>August-September</td>
<td>August-October</td>
<td>July-September (January)</td>
</tr>
</tbody>
</table>

**Additional specimens studied**

ACKNOWLEDGEMENTS

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REFERENCES


