

## Novitates gabonenses 77: A new *Eriosema* (Leguminosae-Papilionoideae) from Gabon and adjacent Congo

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**Background** – On-going botanical research in Gabon continues to yield species new to science, in this case a new member of the leguminous genus *Eriosema*.

**Material and methods** – Normal practices of herbarium taxonomy have been applied; material is present in LBV, MO, and WAG.

**Key results** – A new species, *Eriosema batekense* Maesen & G.M. Walters, is described and illustrated. The stems of the new species are not as thin as in *E. youngii*. The tubers are narrow-spindly and straight, vertical in the soil, not napiform as in *E. youngii*. Another similar species, *E. linifolium*, is more robust with thicker stems and rootstock. *E. batekense* occurs on the Batéké Plateaux in Gabon, and has also been collected from the nearby Bafuru Plateau in Congo-Brazzaville. It is restricted to Kalahari sands. The species is assessed to be of Least Concern according to the IUCN criteria.

**Key words** – Batéké Plateaux, *Eriosema*, Gabon, IUCN, Leguminosae, Papilionoideae, taxonomy.

### INTRODUCTION

Almost every botanical mission in Gabon yields species new to science. Witness to this is the series ‘Novitates Gabonenses’, created to present the results of collaborative research and joint expeditions between the national herbarium of Gabon (CENAREST-IPHAMETRA) and the Biosystematics Group in Wageningen. The first article was published in 1990 by Breteler, and this paper is no. 77. All articles are listed on a website (Website Novitates Gabonenses). Recent discoveries published by botanists from a variety of institutions (many published in this series) come from several phytogeographical areas in Gabon including the coastal plain (Dauby et al. 2007, Mackinder & Wieringa 2007, Sosef et al. 2007, Breteler 2010); mountainous areas (Leal 2005, Bissienou & Sosef 2008, Ntore et al. 2009), as well as the continental area (Stone et al. 2006, Goyder 2009).

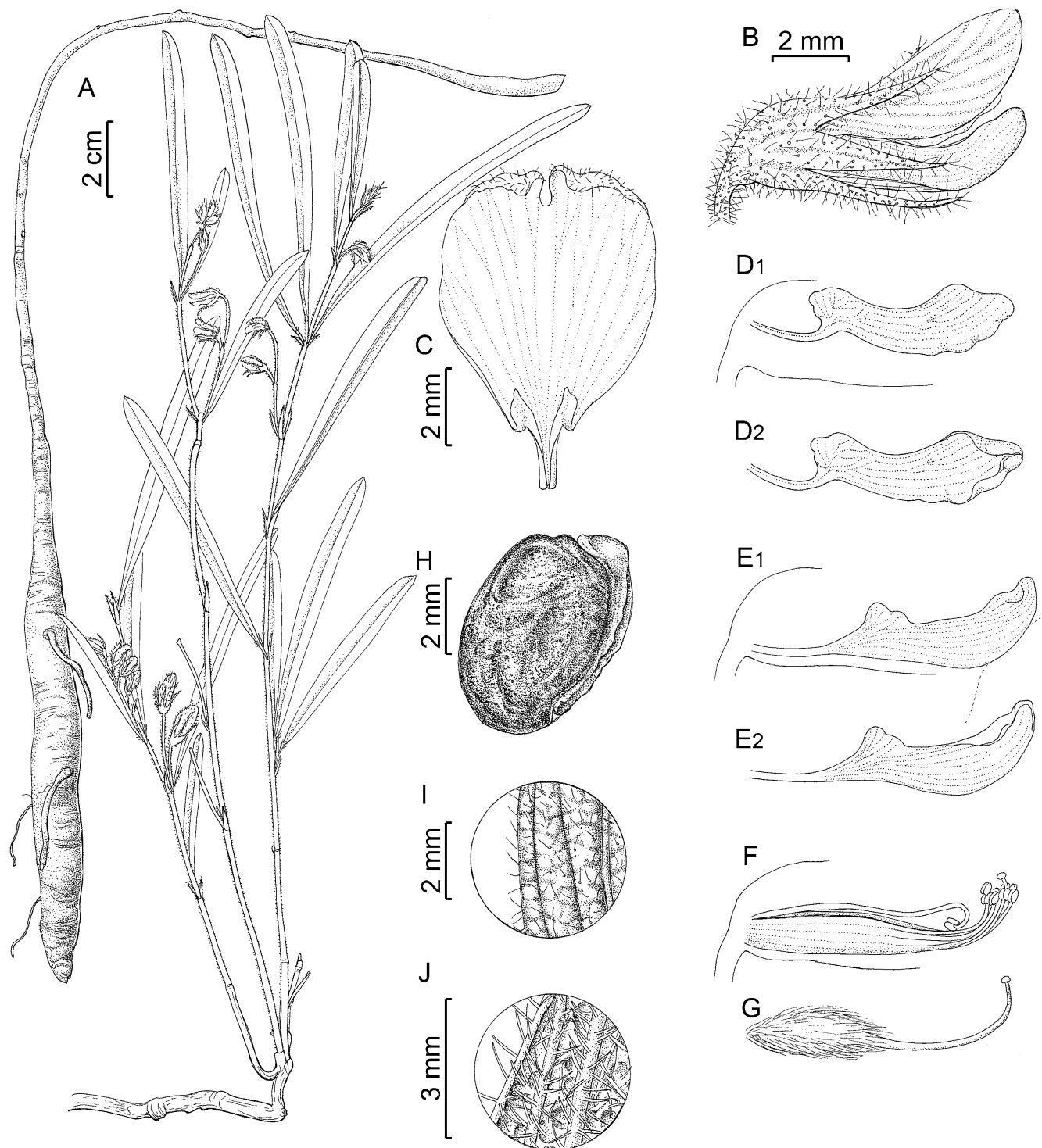
The junior author collected a 1-foliolate *Eriosema* specimen from the Batéké Plateaux that resembled but did not quite match *E. youngii* Baker f. It did match, however, a specimen *J.J. de Wilde et al.* 10023, with both 1-foliolate as well as 3-foliolate leaves, collected in the same area of Gabon, in December 1989. This specimen had been determined by the

first author in 2007 as “sp. nov.”, related to *E. linifolium* Baker f. or *E. youngii* (= *E. tenue* Hepper). The new species does not match any taxon in the partial *Eriosema* monograph by Jacques-Félix (1971) and earlier reference works (Pellegriin 1949, Hauman 1954, Hepper 1958). The *J.J. de Wilde et al.* 10023 specimen was quoted in the Checklist of Gabonese Vascular Plants (Sosef et al. 2006) without specific epithet.

*Eriosema* is a genus of c. 150 species in subtribe Cajaniinae of the tribe Phaseoleae in the Leguminosae-Papilionoideae, with 100–110 spp. in Africa and Madagascar, c. forty spp. from Mexico to Argentina, and two species in SE Asia and Australia (Schrire 2005). The species described here is the tenth one recorded in Gabon.

### MATERIAL AND METHODS

Specimens present in WAG and MO were available for description, and related species were inspected from BR, K, MO and WAG using normal practices of herbarium taxonomy. Dimensions are from dried material, or from flowers preserved on alcohol or boiled in water where appropriate.



**Figure 1** – *Eriosema batekense*: A, plant habit with tuber; B, flower; C, standard; D, wing petal; E, keel petal; F, staminal tube with ovary; G, ovary, style and stigma; H, seed with strophiole; I, Detail of upper surface of leaflet; J, detail of lower surface of leaflet (based on G. Walters *et al.* 2145). Drawn by B. Alongi.

## RESULTS

***Eriosema batekense* Maesen & G.M. Walters, sp. nov.**

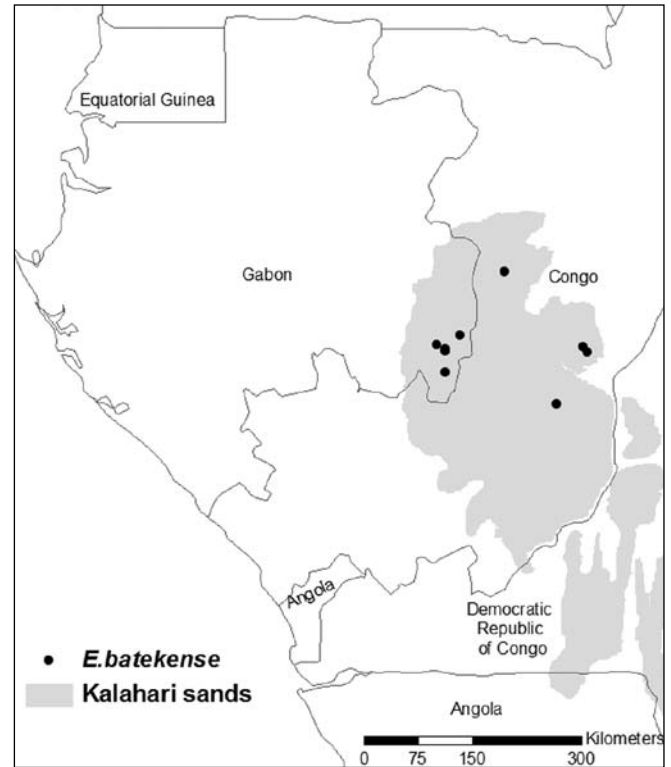
Herba perennis differt ab *E. youngii* tubere verticali elongato non napiformi, foliis interdum trifoliolatis non solum unifoliolatis, foliolis supra magis bullatis, infra magis reticulatis et venis elevatis. – Type: Gabon, Batéké Plateaux, *Hymenocardia acida* savanna on Kalahari sand substrate, Ekouyi village (savanna burned approximately four months ago), 1°46'16.6"S 13°59'35.8"E, alt. 400 m, 13 Jan. 2010, G. Walters et al. 2145, fl & fr (holo-: WAG; iso-: LBV, MO).

**Erect herb**, reaching 25–50 cm, from a vertical narrow-spindly tuber. Glands smaller than usual in the genus, just visible as minute black dots on the leaflets below, and as sparse yellowish dots on the calyx. **Branches** 1 mm in diam., with spreading, long, often bulbous-based, brown hairs, glabrescent. **Stipules** lanceolate, c. 4–9 × 1 mm, with a broad base, striate, ascending brown-pubescent, caducous. **Leaves** 1-, sometimes 2- or 3-foliolate; petiole 3–6 mm long, with white to brown hairs, semi-ascending, rachis c. 1 mm long; petiolules 1–1.5 mm long, dark brown hairy; leaflets linear, above green, slightly bullate, thinly pubescent, midrib brown, lower surface grey-green, greyish pubescent, midrib and lateral veins prominent, brown, base cuneate to rounded, apex acute, with a mucro c. 1/3 mm long, terminal leaflet the largest one, 7–10 cm long, 4–8 mm wide, lateral leaflets if present up to 6 cm long, 3–5 mm wide, stipellae not seen. **Inflorescences** axillary racemes, 1 to 4 cm long, with (1–)2–4(–6) flowers. **Bracts** narrowly ovate, c. 4 mm long, striate and hairy; bracteoles rounded to ovate, striate, attenuate, up to 3–6 mm long, 2–5 mm wide, densely appressed brown-pubescent, with a clear midrib. **Flowers** small, c. 8 mm long; calyx tube c. 2 mm long, lobes lanceolate-attenuate, 3–4 mm, lowest one longest. **Corolla** red and yellow, standard obovate, blade c. 7 × 5 mm, adaxial side short-hairy, base clawed, claw c. 2 mm long, with margins thickened, red with red or maroon stripes; wings elongate-obovate, yellow, blade c. 6 × 2 mm, auricled at the base, claw c. 1.5 mm; keel petals adnate towards the apex, yellow, blade c. 5 × 2.5 mm, claw c. 2 mm. **Stamens** white, 9 adnate, vexillar stamen free, filament tube c. 4 mm long, free part curved upward, c. 3 mm, anthers elongate. **Ovary** ovate, c. 4 × 2 mm, long-hairy, containing 2 ovules, style c. 3 mm, curved upward, almost entirely glabrous, stigma terminal. **Pod** oblong-elliptic, c. 14–17 × 6–8 mm, tapering towards the ends, densely covered with c. 1 mm long grey hairs. **Seeds** ellipsoid, (1 or) 2 per pod, c. 6 × 4 × 3 mm, cream-coloured when young, strophiole oblique, thickest at the narrow end of the seed and stretching the entire seeds length. Figs 1 & 4.

**Distribution** – Endemic to the Batéké Plateaux of Gabon, prov. Haut-Ogooué, and Republic of the Congo. Figs 2 & 3.

**Habitat & ecology** – *Hymenocardia* savanna on Kalahari sands, alt. c. 400–600 m. Might flower and fruit year round (Walters 2010, Appendix 4, p. 250): found in Jan. (fl, fr), Mar., May (fl, fr), Jul. (fl), Sep. (fl), Oct. (fl, fr), Nov., Dec. (fl), in both burned and unburned areas. The plants are almost always quite abundant, but depauperate in flowers.

**Etymology** – The new species *E. batekense* seems to be restricted to the Batéké Plateaux of Gabon and Congo, hence the specific epithet.



**Figure 2** – Distribution map of *Eriosema batekense* and repartition of the Kalahari sands.

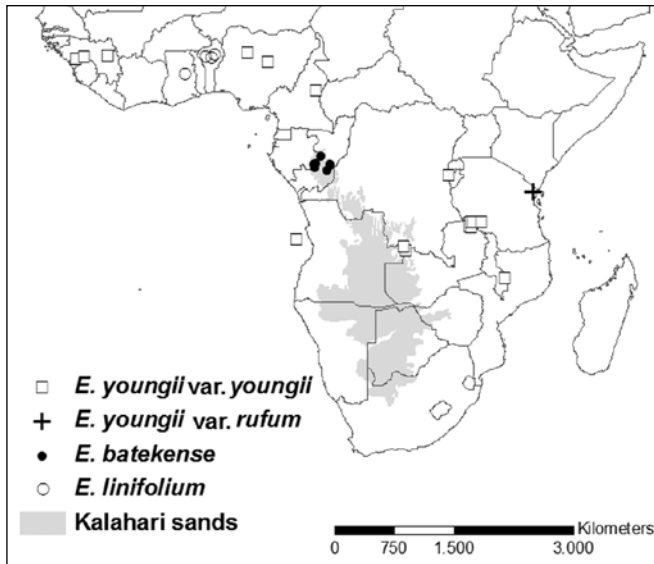
**Notes** – Both the *J.J. de Wilde et al.* 10023 and all *G. Walters* specimens are from Kalahari sands, but the *G. Walters* 1891 and 2145 1-foliolate specimens are from sands even poorer in nutrients than for the *J.J. de Wilde* specimen. The stems of the new species are not as thin as in *E. youngii*. The tubers are narrow-spindly and straight, vertical in the soil, not napiform as in *E. youngii*. Leaflet surfaces differ: bullate and clearly pubescent with spreading hairs above, uniformly hairy below in *E. batekense*, and flat with slightly protruding veins, thinly short-hairy above and long-hairy on the midrib below in *E. youngii*.

*Eriosema youngii* is not common, but of relatively wide occurrence from West to East Africa (fig. 3). It is found in Cameroon, but not yet in Gabon. The new species *E. batekense* is so far restricted to the Batéké plateaux of Gabon and Congo.

The strictly West-African *Eriosema linifolium* Baker f. (fig. 3) is also morphologically similar, but grows from a woody rootstock, can be a much more robust plant, the 1–3 leaflets are sessile, greyer below, the veins are not raised below, and the racemes can be long-peduncled, and multi-flowered. It also grows in more humid (wooded) savannas.

Photographs of this new species have been published (Vande Weghe 2008: 118, photograph 179). Figure 4 illustrates the habit and some details of the plant, taken on 26 Sept. 2006 near the holotype locality.

The Batéké Plateaux have yielded fewer species new to science than other national parks in Gabon (Wieringa & Sosef submitted), but this is probably due to the vegetation history of the area (Born et al. 2008) and the flora's link to the Congolian and other floras (Walters et al. 2006, Walters



**Figure 3** – Distribution map of *Eriosema batekense*, *E. youngii* and *E. linifolium*.

et al. unpubl. res.). More than thirty new records have been published from this border area in the last ten years (Sosef et al. 2006, Walters et al. unpubl. res.). In recent work, the flora of the Gabon portion of the Batéké Plateaux has been re-evaluated and found to contain at least six endemic species (Walters et al. submitted).

**Conservation assessment** – *E. batekense* has an Extent of Occurrence of 21,613 km<sup>2</sup> and an Area of Occupancy (AOO) of 73 km<sup>2</sup> (occupying eight grid cells with cell size 3 km). There is no evidence to suggest population decline, fragmentation, or fluctuation. Reproduction is throughout the year and populations encountered in 2006–2010 were large and abundant. Despite this taxon being endemic to the northern Kalahari sands, and having a small AOO, the second author suggests an assessment of Least Concern (IUCN 2010).

**Additional specimens examined** – **Gabon:** Batéké Plateaux, 7 km S of Léconi, opposite the Cirque de Léconi, 1°39'S 14°17'E, alt. 500 m, 8 Dec. 1986, *J.J. de Wilde et al.* 10023, fl. (WAG, no dups.); Plateaux Batéké National Park, 2°07'17"S 14°03'31"E, alt. 400 m, 4 Oct. 2003, *G. Walters & Moussavou* 1316 (MO); Savannah above canyon at Ekouyi, 18 Jul. 2006, *G. Walters* 1824 (MO); Haut-Ogooué, 7 km W of Ekouyi along road to Plateaux Batéké National Park, 1°50'54"S 14°05'24"E, 5 Sept. 2006, *G. Walters* 1846 (MO, incl. immature pod; LBV); prov. Haut-Ogooué, Batéké Plateaux,



**Figure 4** – *Eriosema batekense*: A, part of habit with flowers; B, inflorescence. Photographs by Jean-Pierre Vande Weghe.

1°49'41''S 14°05'50''E, alt. 600 m, 25 May 2007, G. Walters et al. 1891, fl, fr (MO).

**Republic of the Congo:** Bafuru Plateau, Léfini Animal Reserve, 2°31'S 15°29'E, alt. 400–500 m, 12 Oct. 1991, Thomas & Harris 8546, fl, fr (MO); Gamboma, a few km of the Nkeni river ferry on the Ngo road, *Descoings* 6708 (MPU, teste O. Lachenaud); environment of Gamboma, km 9 Baya–Tsou, *Descoings* 7037 (MPU, teste O. Lachenaud); Ewo, *Descoings* 9232 (MPU, teste O. Lachenaud).

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