

Short communication

# A morphological re-evaluation of the taxonomic status of the genus *Pellegriniodendron* (Harms) J. Léonard (Leguminosae–Caesalpinioideae–Detarieae) and its inclusion in *Gilbertiodendron* J. Léonard

M. de la Estrella <sup>a,\*</sup>, J.A. Devesa <sup>a</sup>, J.J. Wieringa <sup>b</sup>

<sup>a</sup> *Departamento de Botánica, Ecología y Fisiología Vegetal, Facultad de Ciencias, Campus de Rabanales, Universidad de Córdoba 14071, Córdoba, Spain*

<sup>b</sup> *Netherlands Centre for Biodiversity Naturalis (section NHN), Herbarium Vadense (WAG), Biosystematics Group, Wageningen University, Generaal Foulkesweg 37, 6703 BL Wageningen, The Netherlands*

Received 9 March 2011; received in revised form 8 April 2011; accepted 18 April 2011

## Abstract

The taxonomic status of the genus *Pellegriniodendron* J. Léonard (Leguminosae, Caesalpinioideae), which consists in one tree species endemic to West Central tropical Africa, is re-evaluated. Based on our morphological comparison and on published phylogenetic studies, we conclude that *P. diphyllum* should be included within the genus *Gilbertiodendron* J. Léonard, and the new combination *Gilbertiodendron diphyllum* (Harms) Estrella & Devesa is proposed. A lectotype for *Macrobium reticulatum*, synonym of *G. diphyllum*, is also designated. The species is fully described and illustrated, and a distribution map is also presented.

© 2011 SAAB. Published by Elsevier B.V. All rights reserved.

**Keywords:** Caesalpinioideae; Fabaceae; *Gilbertiodendron*; *Pellegriniodendron*; Taxonomy; Tropical Africa

## 1. Introduction

*Macrobium* Schreb. (Caesalpinioideae: Detarieae), with ± 70–80 spp., is now well established as strictly tropical American. African species previously treated in *Macrobium* are now accommodated in the four genera *Anthonotha* P. Beauv. (17 spp.), *Gilbertiodendron* J. Léonard (25–30 spp.), *Paramacrolobium* J. Léonard (1 sp.) and *Pellegriniodendron* J. Léonard (1 sp.) (Léonard, 1952, 1954, 1955). All of these genera belongs to the *Macrobieae* sensu Bruneau et al. (2001) whereas more recently published phylogenies (Bruneau et al., 2008) considered *Paramacrolobium* as part of the *Brownea* clade whilst *Anthonotha*, *Gilbertiodendron* and *Pellegriniodendron* are placed within the *Berlinia* clade.

*Anthonotha* and two related genera *Englerodendron* Harms (1 sp.) and *Isomacrolobium* Aubréville & Pellegrin (12 spp.),

have been recently revised by Breteler (2006, 2008, 2010 and 2011). *Paramacrolobium* is easily differentiated from the other African genera which were previously recognized within *Macrobium* by the combination of eglandular leaflets and flowers with one large, two medium-sized and two reduced petals (Léonard, 1957). By contrast, the monotypic *Pellegriniodendron* and *Gilbertiodendron* share glandular leaflets and a similar flower structure. Léonard himself (1957: 236) stated that when new and more complete material becomes available new combinations or delimitations would be necessary within the genus *Gilbertiodendron*. Both genera are in need of a thorough revision and *Pellegriniodendron* appear to be nested in *Gilbertiodendron* according with recently published phylogenies (Bruneau et al., 2008) in which *P. diphyllum* appear in the same clade than *G. brachystegioides* and *G. klainei* (with a bootstrap support value of 98) suggesting that they are probably not distinct from each other (Bruneau et al., 2000; Mackinder, 2005).

During our ongoing taxonomic study of the genus *Gilbertiodendron* we have studied most of the available collections of *Pellegriniodendron* and several species of *Gilbertiodendron*. We

\* Corresponding author. Tel.: +34 957 218673; fax: +34 957 218598.

E-mail address: [bv2esgom@uco.es](mailto:bv2esgom@uco.es) (M. de la Estrella).

re-evaluate the circumscriptions of these two genera, based on the generic limits proposed by Léonard (1957).

## 2. Materials and methods

### 2.1. Materials

Key characters proposed by Léonard (1957) for the generic delimitation *Gilbertiodendron* and *Pellegriniodendron* were examined on all available specimens of *P. diphyllum* and seven species of *Gilbertiodendron* (Appendix A). The following herbaria were consulted: B, BM, BR, C, E, G, HBG, HUH, K, L, M, MA, MO, NY, PR, PRE, S, U, UPS, USA, WAG, WU, and Z. Material of additional species examined during the study were not measured but contributed to validating our final conclusion.

### 2.2. Methods

Relevant quantitative characters were recorded and measured using a Mitutoyo CD-15CD digital calliper (Tokyo, Japan). These characters were used to perform a complete morphological description of the species, along with a distribution map based on available herbarium records. The information provided on uses and vernacular names was extracted from specimen labels and literature.

Characters used by Léonard (1957) and Polhill and Raven (1981) for the generic delimitation between *Pellegriniodendron* and *Gilbertiodendron* were tabulated and compared with the findings of this study.

## 3. Results

### 3.1. Generic delimitation

Several of the characters used by Léonard (1957) and Polhill and Raven (1981) to distinguish between *Pellegriniodendron* and *Gilbertiodendron* were found to be of weak or no value (Table 1).

*Pellegriniodendron* was characterised by the presence of stipels within leaflets (stipels absent in *Gilbertiodendron*) but we found several mature specimens of *Gilbertiodendron unijugum* with “stipels” present at the base of the petiolules and also in seedlings of other species (Fig. 1). Although identified as stipels, these structures could also be regarded as strongly reduced leaflets. Observations made by us on seedlings of *Wieringa & Haegens 2098* showed that the “stipels” of living specimens (see Fig. 1) were comparable in shape and colour with the apical gland of a leaflet. Visits by ants to these structures emphasises their glandular nature. We therefore conclude that the “stipels” in *G. unijugum* and thus in *Pellegriniodendron* could be an additional basal pair of reduced leaflets, where the petiolule and leaf lamina have completely disappeared and only the apical gland remains.

The segregation of *Pellegriniodendron* on leaflet number has never been strong in the first place, since at least one species of *Gilbertiodendron* is unjugate as well. Moreover, in most of the other genera of the ‘Macroblicae’-clade sensu Bruneau et al. (2000, 2001) the number of leaflet pairs also varies from one to many: *Aphanocalyx* (1–57), *Bikinia* (1–36), *Julbernardia* (1–7), *Tetraberlinia* (1–34) (Wieringa, 1999); *Didelotia* (1–35) (Oldeman, 1964); *Isomacrolobium* (1–7) (Breteler, 2011). The petiolule and midrib form is quite variable among the species of *Gilbertiodendron*, and probably of little value in segregating the different species.

Flowers and inflorescences in *Gilbertiodendron* and *Pellegriniodendron* are essentially equal. Flowers in both genera have one large adaxial petal, which is bilobed, plus four reduced petals. In most species flowers have 3 fertile, exerted stamens plus 6 staminodes located in an inner whorl (*G. splendidum* is exceptional in having 9 fertile stamens).

Pods characters have been used in the generic delimitation, with *Gilbertiodendron* defined by the possession of one or more lateral longitudinal nerves. We have, however, found such longitudinal nerves in some pods of *Pellegriniodendron* specimens.

In summary, we conclude that the presence and shape of glands within leaflets differentiates *Pellegriniodendron* from

Table 1  
Generic delimitation of *Gilbertiodendron* and *Pellegriniodendron* as proposed by Léonard (1957). New collections allow us to better describe the characteristics of *Pellegriniodendron diphyllum*. In boldface is showed the unique characters that would support the generic segregation.

<i>Gilbertiodendron</i> *	<i>Pellegriniodendron</i> *	<i>This study</i>
Leaves usually multifoliate	Leaves unijugate	<i>G. unijugum</i> presents only one pair of leaflets
Midrib usually not canaliculated	Midrib canaliculated	Many specimens of <i>Gilbertiodendron</i> presents canaliculated midribs
Without stipels	With stipels	At least there are stipels within <i>G. unijugum</i>
Petiолules not twisted	Petiолules twisted	Some specimens of <i>Gilbertiodendron</i> presents twisted petiолules
Base of leaflets±asymmetric with lamina sides inserted at different level	Base of leaflets±asymmetric with lamina sides inserted at different level	Base of leaflets±asymmetric, some sp presents lamina sides inserted at same level
<b>Marginal leaflets glands</b>	<b>Submarginal leaflets glands</b>	<b>OK</b>
Inflorescence raceme or panicles	Inflorescence raceme or panicles	OK
Petals 1+4	Petals 1+4	OK
Stamens fertile 3 (4, 5 or 9)+6 (0) staminodes	Stamens fertile 3+6 staminodes	OK
Fertile stamens exerted, staminodes intrastaminal tube	Fertile stamens exerted, staminodes intrastaminal tube	OK
Ovary stipe exerted	Ovary stipe exerted	OK
Longitudinal and transversal nerves in pods	Transversal nerves in pods	Longitudinal and transversal nerves in pods of <i>P. diphyllum</i>

\* Generic delimitation based on Léonard (1957) and Polhill and Raven (1981).

Download English Version:

<https://daneshyari.com/en/article/4521068>

Download Persian Version:

<https://daneshyari.com/article/4521068>

[Daneshyari.com](https://daneshyari.com)