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Annotated checklist and identification keys of the Acalyphoideae (Euphorbiaceae) of Equatorial Guinea (Annobón, Bioko and Río Muni)

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Abstract

This study provides a checklist of the Acalyphoideae (Euphorbiaceae) present in Equatorial Guinea, comprised of 18 genera and 49 taxa. Identification keys have been added for genera and species of the subfamily. The best represented genus is *Macaranga* with ten species. Bibliographical references for Acalyphoideae (Euphorbiaceae) from Equatorial Guinea have been gathered and checked. Eight taxa are recorded for the first time from the country. One species is included based on literature records, because its distribution ranges suggest it may occur in Equatorial Guinea, and two introduced species could be naturalized.

Key words: biodiversity, flora, floristics, tropical Africa

Introduction

The Euphorbiaceae *sensu stricto* are one of the largest and most diverse plant families with over 246 genera and 6300 species. Additionally they are one of the most diversified angiosperm families. The circumscription and the systematic position of this family have been controversial (Webster 1994, Wurdack *et al.* 2005, Xi *et al.* 2012). Today Euphorbiaceae *s.str.* are subdivided into four subfamilies: Cheilosioideae, Acalyphoideae, Crotonoideae and Euphorbioideae (Radcliffe-Smith 2001, APG 2009). Acalyphoideae are the largest subfamily of Euphorbiaceae and have a pantropical distribution. No species are native to Europe. Africa does not appear to be the epicenter for acalyphoids. Divided into 14 tribes, 110 genera and about 1500 species, the best represented genera are *Acalypha* L. (± 430 ssp.), *Macaranga* Thouars (± 240 ssp.) and *Tragia* L. (± 170 ssp.) (Webster 1994, Radcliffe-Smith 2001, Stevens 2001 onwards, Takhtajan 2009), all of them with a large representation in Africa.

Equatorial Guinea is located in Western Central Africa. The insular region includes two islands in the Gulf of Guinea: Bioko (2017 km^2), c. 32 km from the coast of Cameroon and Annobón (17 km^2), c. 400 km from Gabon. The continental mainland, Río Muni (26000 km^2), is located between 1ºN and 2ºN latitude. A compilation of data on location, phytogeography, climate and hydrogeography can be found in Guinea (1946), De Castro & De la Calle (1985), Pérez del Val (1993) or Heras *et al.* (2002). General information is also available online at http://www.floradeguinea.com.

Important floristic works on the Acalyphoideae of Central and West tropical Africa include those of Thiselton-Dyer (1912, 1913), Hutchinson & Dalziel (1928) and Keay (1958) and, more recently, of Akoègninou *et al.* (2006). Other relevant studies of nomenclature, conservation and floristics of neighbouring countries were also considered (Aké Assi 1963, Guinea 1968, Radcliffe-Smith 1987, Lebrun & Stork 2006). A complete account of the Acalyphoideae (Euphorbiaceae) of Equatorial Guinea has never been published. Although the subfamily was included in the general vascular plant catalogue of Guinea (1946), this author added plants that he presumed to be present in Equatorial Guinea.

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Over the last 25 years, the Real Jardín Botánico has carried out intensive fieldwork in Annobón, Bioko and Río Muni. Studies of these new collections and the available historical specimens have permitted the description of new taxa and the preparation of several checklists (Herrero *et al.* 2001, Velayos *et al.* 2001, 2013, Fero *et al.* 2003, Parmentier & Geerinck 2003, Cabezas *et al.* 2004, 2005, 2009, Estrella *et al.* 2005, 2006, Senterre 2005, Davies & Figueiredo 2007, Morales 2011).

The aim of this work is to update the catalogue of Acalyphoideae for the whole of Equatorial Guinea including both bibliographic records and herbarium material. Identification keys have been added to facilitate species identification. This checklist is a first step towards a modern Flora of Equatorial Guinea.

Material and Methods

The checklist is based primarily on herbarium specimens and it has been completed adding identification keys, first for the genus and second for the species from each genus. We have studied more than 280 specimens from BATA, BM, HBG, K and MA including both the historic collections made during British expeditions by Barter, Mann, Tessmann and Vogel, and modern collections obtained by Belgian and Spanish expeditions. For comparative purposes, some selected specimens from neighbouring countries were also studied.

The keys were prepared on the basis of those available in the literature, and have been adapted and tailored for the geographical area covered in this work. The adaptation has been made based on the study of herbarium material from Equatorial Guinea.

Bibliographic references for the subfamily *Acalyphoideae* of Equatorial Guinea were also checked. Most of these were gathered and compiled in the previous phases of our project (Aedo *et al.* 1999). One species was included based only on literature records as its distribution makes its presence in Equatorial Guinea likely. It is quoted with the number between brackets.

The locality names used in this checklist have been brought up-to-date following Velayos *et al.* (2001: 147–149); this source also contains a gazetteer including geographical coordinates.

The checklist is ordered alphabetically by genera and species, with accepted names given in bold. Generic circumscription is in accordance with Govaerts *et al.* (2000), comparing also the actualized web version (Govaerts 2012). We used monographs or regional works such as those by Breteler (1997) or Léonard (1995), when they were available. The authors of scientific names are abbreviated according to Brummitt & Powell (1992). Those abbreviations that were not found in this book were confirmed with the updated version available online (http://www.ipni.org/ipni/query_author.html).

Under each accepted name, a list of synonyms used in the relevant literature and the basionym are included. Specimens are ordered alphabetically by the different regions and provinces: Annobón, Bioko (provinces of Bioko Norte and Bioko Sur) and Río Muni (provinces of Centro Sur, Kie Ntem, Litoral and Wele Nzas). Previous bibliographical records for each taxon were grouped under the three regions. When the taxon is recorded under a synonym, this is indicated as follows: Thiselton-Dyer 1912: 871, sub *Erythrococca oleracea*. In the case of a misidentification, the author´s name is included following the cited species [Mildbraed 1922: 162, sub *D. occidentale* (Müll. Arg.) Pax & K. Hoffm.] A doubtful record is placed at the end of the checklist, followed by appendices, which include an index to scientific names and a list of collections.

A description of geographical distribution follows each species, including worldwide circumscription (e.g. palaeotropical) and its distribution in Africa in accordance with Govaerts (2012) with additional information from monographs or floristic studies of Africa (Radcliffe-Smith 1987, Cable & Cheek 1998: 47, Cheek *et al.* 2000, 2004, 2011, Akoègninou *et al.* 2006, Sosef *et al.* 2006, Figueiredo & Smith 2008). Commentaries on some species are included when necessary.

A summary table is included comparing the checklist of Acalyphoideae (Euphorbiaceae) with the accounts of Acalyphoideae of Cameroon and Gabon (Table 1). This summary table also includes data about the distribution of the species in the three main regions of Equatorial Guinea.

TABLE 1. Comparison of the catalogue of Acalyphoideae (Euphorbiaceae) of Equatorial Guinea with the accounts for neighbouring countries. Acronyms and sources: Ann = Annobón (this study); Bio = Bioko (this study); Mun = Río Muni (this study); Gab = Gabon (Sosef *et al.* 2006 and Govaerts 2012); Cam = Cameroon (Govaerts 2012); Kupé (Cheek *et al.* 2004); Oku (Cheek *et al.* 2000); MtC = Mount Cameroon (Cable & Cheek 1998); Mefou (Cheek *et al.* 2011). Bold type: species expected to occur in Equatorial Guinea (but still not collected), as they are known from neighbouring countries.

Species	Equatorial Guinea			Gab	Cam	Kupe	Oku	MtC	Mefou
	Ann	Bio	Mun						
Acalypha annobonae	+	–	–	–	–	–	–	–	–
Acalypha arvensis* var. *arvensis	–	–	–	–	–	+	–	–	–
Acalypha brachiata	–	–	–	–	+	–	–	–	–
Acalypha brachystachya	–	+	–	+	+	+	+	+	–
Acalypha ceraceopunctata	–	–	–	–	+	–	–	–	–
Acalypha ciliata	–	–	–	+	+	–	–	–	–
Acalypha crenata	–	–	–	–	+	–	–	–	–
Acalypha fimbriata	–	–	–	–	+	–	–	–	–
Acalypha hispida	–	+	+	–	–	–	–	–	–
Acalypha manniana	–	+	–	–	+	+	+	+	–
Acalypha neptunica	–	–	–	–	+	–	–	–	–
Acalypha ornata	–	+	–	–	+	+	+	–	–
Acalypha paniculata	–	+	–	–	+	+	–	+	+
Acalypha psilostachya* var. *psilostachya	–	–	–	–	–	–	+	–	–
Acalypha segetalis	–	–	–	–	+	–	–	–	–
Alchornea cordifolia	–	+	+	+	+	+	–	+	+
Alchornea floribunda	–	+	+	+	+	+	–	+	+
Alchornea hirtella	–	–	+	+	+	+	–	+	–
Alchornea laxiflora	–	–	–	+	+	–	–	+	–
Alchornea mildbraedii	–	–	–	–	+	–	–	–	–
Argomuellera lancifolia	–	–	+	+	–	–	–	–	–
Argomuellera macrophylla	–	–	+	+	+	–	–	–	–
Aubletiana leptostachys	–	–	–	+	+	–	–	–	–
Aubletiana macrostachys	–	–	–	+	–	–	–	–	–
Caperonia latifolia	–	–	–	–	+	–	–	+	–
Caperonia serrata	–	–	–	–	+	–	–	–	–
Chrozophora plicata	–	–	–	–	+	–	–	–	–
Cleidion gabonicum	–	+	–	+	+	–	–	–	–
Crotonogynopsis usambarica	–	–	–	–	+	–	–	+	–
Dalechampia chevalieri	–	–	–	–	+	–	–	–	–
Dalechampia ipomoeifolia	–	+	+	+	+	–	–	–	–
Dalechampia scandens	–	–	–	+	–	–	–	–	–
Discoclaoxylon hexandrum	–	+	–	–	+	+	–	+	–
Discoclaoxylon pedicellare	–	+	–	–	–	–	–	–	–
Discoclaoxylon pubescens	+	–	–	–	–	–	–	–	–
Discoglypremna caloneura	+	+	+	+	+	+	–	+	–
Erythrococca africana	–	–	–	+	–	–	–	+	–
Erythrococca anomala	–	+	+	+	+	+	–	+	–
Erythrococca atrovirens	–	–	+	–	+	+	–	–	+
Erythrococca columnaris	–	–	–	+	–	–	–	–	–
Erythrococca dewevrei	–	–	+	–	+	–	–	–	–
Erythrococca hispida	–	–	–	–	+	+	+	+	–
Erythrococca mannii	–	+	–	–	–	–	–	–	–
Erythrococca membranacea	–	–	–	+	+	+	–	+	+
Erythrococca pallidifolia	–	+	–	–	–	–	–	–	–

..... continued on the next page

Species	Equatorial Guinea								
	Ann	Bio	Mun	Gab	Cam	Kupe	Oku	MtC	Mefou
Erythrococca patula	–	–	–	–	+	–	–	–	–
Erythrococca rivularis	–	–	+	–	+	–	–	–	–
Erythrococca welwitschiana	–	–	+	+	+	–	–	–	+
Macaranga angolensis	–	–	–	–	+	–	–	–	+
Macaranga assas	–	–	–	–	+	–	–	–	–
Macaranga barteri	–	–	+	+	+	–	–	–	–
Macaranga capensis	–	–	–	+	–	–	–	–	–
Macaranga ebolowana	–	–	–	–	+	–	–	–	–
Macaranga gabunica	–	–	+	+	–	–	–	–	–
Macaranga heudelotii	–	–	–	+	–	–	–	–	–
Macaranga hurifolia	–	–	+	+	+	+	–	–	–
Macaranga klaineana	–	–	+	+	–	–	–	–	–
Macaranga le-testui	–	–	–	+	–	–	–	–	–
Macaranga magnistipulosa	–	–	+	–	–	–	–	–	–
Macaranga monandra	–	+	+	+	+	+	–	+	+
Macaranga occidentalis	–	+	–	–	+	+	+	+	–
Macaranga paxii	–	–	–	–	+	–	–	–	–
Macaranga pierreana	–	–	–	+	–	–	–	–	–
Macaranga poggei	–	–	–	+	–	–	–	–	–
Macaranga saccifera	–	–	+	+	–	–	–	–	+
Macaranga schweinfurthii	–	–	–	+	+	–	–	+	+
Macaranga spinosa	–	+	+	+	+	+	–	+	+
Macaranga staudtii	–	–	+	+	+	–	–	–	–
Macaranga tchibangensis	–	–	–	+	–	–	–	–	–
Mallotus oppositifolius	–	+	+	+	+	+	–	+	+
Mallotus subulatus	–	+	–	+	+	+	–	+	–
Mareya brevipes	–	–	+	+	+	–	–	–	–
Mareya micrantha	–	+	+	+	+	+	–	+	–
Mareyopsis longifolia	–	–	+	+	+	+	–	+	–
Mareyopsis oligogyna	–	–	–	+	–	–	–	–	–
Micrococca mercurialis	–	–	+	+	+	+	–	–	–
Necepsia afzelii* subsp. *zenkeri	–	–	–	+	+	–	–	+	–
Plukenetia conophora	–	+	+	+	+	+	–	+	–
Pseudagrostistachys africana subsp. *africana*	–	+	+	–	–	+	–	+	+
Pycnocoma chevalieri	–	–	–	+	–	–	–	–	–
Pycnocoma cornuta	–	–	–	+	–	+	–	–	–
Pycnocoma macrophylla	–	+	+	+	+	+	–	+	–
Pycnocoma minor	–	–	+	+	–	–	–	–	–
Pycnocoma thollonii	–	–	–	+	–	–	–	–	–
Ricinus communis	–	+	–	+	–	+	+	–	–
Tragia benthamii	–	+	+	+	+	+	+	+	–
Tragia brevipes	–	–	–	–	+	–	–	–	–
Tragia laminularis	–	–	–	+	–	–	–	–	–
Tragia mildbraediana	–	–	–	–	+	–	–	–	–
Tragia plukenetii	–	–	–	–	+	–	–	–	–
Tragia preussii	–	–	+	+	+	+	–	+	–
Tragia aff. *tenuifolia*	–	+	+	+	+	–	–	–	+
Tragia vogelii	–	–	–	–	+	–	–	–	–
Tragia volubilis	–	+	+	+	+	–	–	–	+
Total	3	27	36	54	63	28	7	30	15

Results

The checklist and identification keys

Acalyphoideae

1. Leaves opposite ..... *Mallotus*
- Leaves alternate ..... 2.
2. Climbers, frequently with twining stems ..... 3.
- Trees, shrubs or annual herbs ..... 5.
3. Inflorescence surrounded by 2 involucral bracts ..... *Dalechampia*
- Inflorescence not involucrate ..... 4.
4. Indument simple, often stinging; stamens 3; ovary 3-celled ..... *Tragia*
- Glabrous, without stinging hairs; stamens ± 40; ovary 4-celled ..... *Plukenetia*
5. Petioles short (≤2 cm) ..... 6.
- Petioles long (>2 cm) ..... 9.
6. Leaves entire or subentire ..... *Pycnocoma*
- Leaves serrate, glandular-crenate or dentate ..... 7.
7. Leaves with knotted vein glands near base ..... *Cleidion*
- Leaves without knotted vein glands near base ..... 8.
8. Male pedicel articulate near the base; female calyx 2(–4)-lobed ..... *Erythrococca*
- Male pedicel not articulate near the base; female calyx 5–6(–9)-lobed ..... *Argomuellera*
9. Petals present ..... *Pseudagrostistachys*
- Petals absent ..... 10.
10. Anthers cylindrical or vermiform; female flowers subtended by accrescent bracts; styles laciniate with filiform segments, often red ..... *Acalypha*
- Anthers not cylindrical nor vermiform; female flowers not subtended by accrescent bracts; styles not laciniate… 11.
11. Leaves palmately lobed, palmatifid or palmatipartite ..... 12.
- Leaves not lobed or divided ..... 13.
12. Leaves gland-dotted beneath; filaments unbranched ..... *Macaranga*
- Leaves not gland-dotted beneath; filaments branched ..... *Ricinus*
13. Leaves gland-dotted beneath; fruit a drupe ..... *Macaranga*
- Leaves not gland-dotted beneath; fruit a capsule ..... 14.
14. Annual herbs ..... *Micrococca*
- Shrubs or trees ..... 15.
15. Inflorescences with male and female flowers; styles plumulose ..... *Mareya*
- Inflorescences unisexual; styles not plumulose ..... 16.
16. Male flowers without interstaminal glands; styles 5–25 mm long ..... *Alchornea*
- Male flowers with interstaminal glands; styles less than 4 mm long ..... 17.
17. Leaves with basal glands ..... 18.
- Leaves without basal glands ..... 19.
18. Inflorescences axillary; fruit dehiscent ..... *Discoclaoxylon*
- Inflorescences cauline; fruit indehiscent ..... *Mareyopsis*
19. Inflorescences axillary; stamens ± 40 ..... *Plukenetia*
- Inflorescences terminal; stamens 7–8 ..... *Discoglypremna*

1. *Acalypha* L.

1. Male and female flowers on the same inflorescence ..... *Acalypha brachystachya*
- Male and female flowers usually on separate inflorescences ..... 2.
2. Female inflorescences usually terminal and paniculate ..... *Acalypha paniculata*
- Female inflorescences terminal or axillary, spicate or racemose ..... 3.
3. Leaves lanceolate to triangular-lanceolate; female inflorescences up to 4(–5) cm long ..... … *Acalypha annobonae*
- Leaves ± ovate; female inflorescences 5–30 cm long ..... 4.
4. Female inflorescences axillary; female bracts entire; flowers with massed red styles ..... *Acalypha hispida*
- Female inflorescences terminal; female bracts dentate or multifid; flowers without massed red styles ..... 5.
5. Male bracts 1(–4) mm long; female bracts dentate, covered with gland-tipped hairs ..... *Acalypha ornata*
- Male bracts ± 0.5 mm long; female bracts multifid, eglandular ..... *Acalypha manniana*

1.1. ***Acalypha annobonae*** Pax & K. Hoffm.
Annobón: Quioveo, *Mildbraed 6538* (HBG, original material); ridge W of Crater Lake, *Wrigley & Melville 55* (BM, K, MA).

Previously reported from Annobón (Mildbraed 1922: 162, sub *Acalypha sp.*, Pax & Hoffmann 1924: 50, Mildbraed 1937: 700, Exell 1944: 299, 1963: 113, 1973: 352, Guinea 1946: 312, Govaerts 2012). This species is endemic to Annobón Island.

1.2. ***Acalypha brachystachya*** Hornem.
Bioko Sur: Gran Caldera de Luba, río Riaco, *Galán & Barberá 4596PG* (MA), *4738PG* (MA).

Previously reported from Río Muni (Guinea 1946: 142). In Africa, this species has been reported from Angola, Cameroon, D.R. Congo, Ethiopia, Gabon, Kenya, Malawi, Mozambique, Ruanda, Tanzania and Uganda (Keay 1958: 409, Radcliffe-Smith 1987: 203, Cable & Cheek 1998: 47, Cheek *et al.* 2000: 131, 2004: 283, Sosef *et al.* 2006: 158, Govaerts 2012).

1.3. ***Acalypha hispida*** Burm.f.
Bioko Norte: Malabo–Basacato, estrada km 27–28, *Carvalho 4328* (MA). Litoral: Jandje, *Eneme 540* (BATA). Unknown locality: *Lope del Val s.n.* (MA-500429).

Not previously recorded from Equatorial Guinea. The origin of this species is not known with certainty, but possibly it comes from the Bismarck Archipelago (Radcliffe-Smith 1987: 212) or Malaysia (Akoègninou *et al.* 2006: 547). It has been introduced throughout the tropics countries for ornamental purposes. In Africa, it has been reported from Benin and Tanzania (Radcliffe-Smith 1987: 212, Akoègninou *et al.* 2006: 547).

1.4. ***Acalypha manniana*** Müll. Arg.
Bioko Sur: Moka, plateau area, *Boughey 65* (K); Musola–Moka, estrada km 13, *Carvalho 2758* (K, MA); entre el cruce y Moka, *Fernández Casas 11462* (K, MA); Moka, camino de Ureca, *Fernández Casas 11746* (K, MA); entre Moka y el lago Biaó, *Fernández Casas 11912* (K, MA); Belebú–Balachá, *Fernández Casas 12170* (MA); entre Moka y el lago Biaó, *Fernández Casas et al. 10387* (MA), *10398* (K, MA); cerca y al sur de Moka, en el camino de las Cascadas, *Fernández Casas et al. 10434* (MA); trocha del Servicio Agronómico de Musola, *Guinea 1104* (K); Musola, trocha, *Guinea 1106* (MA); km 17 de la carretera de Musola, *Guinea 1611* (MA), *1613* (MA), *1614* (K); finca de D. Marcelino Puente, *Guinea 1720* (MA), *1721* (MA); Moka, *Wrigley 510* (K).

Previously recorded from Bioko (Keay 1958: 409, Exell 1973: 352, Radcliffe-Smith 1987: 189, Cable & Cheek 1998: 47, Govaerts 2012). This tropical African species has been reported from Benin, Burundi, Cameroon, D.R. Congo, Ghana, Nigeria, Ruanda and Uganda (Keay 1958: 409, Radcliffe-Smith 1987: 189, Cable & Cheek 1998: 47, Cheek *et al.* 2000: 131, 2004: 283, Govaerts 2012).

1.5. ***Acalypha ornata*** Hochst. ex A. Rich.
Bioko Sur: entre Luba y Moka, *Castroviejo 9199* (MA).

Previously recorded from Bioko (Guinea 1946: 312, Exell 1973: 352) and Río Muni (Guinea 1946: 159, 312). This tropical and South African species has been reported from Angola, Burundi, Botswana, Cameroon, the Central African Republic, Congo-Brazzaville, D.R. Congo, Eritrea, Ethiopia, Kenya, Malawi, Mozambique, Namibia, Nigeria, Ruanda, South Africa, Sudan, Swaziland, Tanzania, Uganda, Zambia and Zimbabwe (Keay 1958: 409, Radcliffe-Smith 1987: 192, Govaerts *et al.* 2000: 79, Cheek *et al.* 2000: 131, 2004: 283, Figueiredo & Smith 2008: 70, Govaerts 2012).

1.6. ***Acalypha paniculata*** Miq.
Acalypha racemosa Wall. ex Baillon, *nom. nud.*
Bioko: *Barter s.n.* (K). Bioko Norte: Malabo–Riaba, estrada km 62, *Carvalho 3241* (MA). Bioko Sur: Luba, finca Teixeira, *Carvalho 2525* (MA).

Previously recorded from Bioko (Thiselton-Dyer 1912: 887, Mildbraed 1922: 185, Pax & Hoffmann 1924: 16, Hutchinson & Dalziel 1928: 302, Guinea 1946: 312, Cufodontis 1956: 426, Keay 1958: 409, Exell 1973: 352, sub *A. racemosa*, Govaerts 2012) and Río Muni (Guinea 1946: 151, 159, 312). This species is recorded from tropical Africa through the Arabian Peninsula to South India, Sri Lanka and Western Malesia. In Africa, it has been reported from Angola, Benin, Burundi, Cameroon, the Central African Republic, Chad, Congo-Brazzaville, D.R. Congo, Eritrea, Ghana, Ivory Coast, Kenya, Malawi, Mozambique, Nigeria, Ruanda, Sudan, Togo, Tanzania, Uganda and Zimbabwe (Keay 1958: 409, Radcliffe-Smith 1987: 187, Cable & Cheek 1998: 47, Cheek *et al.* 2004: 283, 2011: 146, Akoègninou *et al.* 2006: 548, Figueiredo & Smith 2008: 70, Govaerts 2012).

2. *Alchornea* Sw.

1. Leaves cordate; petioles 5–14 cm long; ovary 2-locular; styles 2; fruit stellate-pubescent ..... *Alchornea cordifolia*
- Leaves not cordate; petioles 0.5–3 cm long; ovary 3-locular; styles 3; fruit not stellate-pubescent 2
2. Leaves oblanceolate to oblong-lanceolate, repand-denticulate, 14–31 × 6–12 cm, with 12–19 pairs of lateral nerves; male panicles axillary; female inflorescences 11–40 cm long..... *Alchornea floribunda*
- Leaves elliptic to oblanceolate, crenate or entire, 7–13 × 2.5–6 cm, with 7–10 pairs of lateral nerves; male panicles terminal or axillary, occasionally cauline; female inflorescences up to 8 cm long ..... *Alchornea hirtella*

2.1. ***Alchornea cordifolia*** (Schumach. & Thonn.) Müll. Arg.

Alchornea cordata Benth.

Schousboea cordifolia Schumach. & Thonn.

Bioko: *Barter s.n.* (K); *Mann 81* (K); *Vogel 73* (K). Bioko Norte: Musola–Malabo, *Carvalho 2788* (MA); Malabo–Cupapa, estrada kms 22–23, na direcçao do Pico Basilé, *Carvalho 3973* (MA); cerca de Rebola, km 20–21, *Fernández Casas 11298* (MA); Malabo–Luba, km 32, *Fernández Casas 11317* (MA); Malabo–Luba, km 9, Patio Libano Serra, *Gómez Marín et al. 67* (MA); Bahía de Venus, *Guinea 215* (MA). Bioko Sur: Malabo–Luba, estrada km 40, *Carvalho 2116* (BM, K, MA); Luba–Veiga y Avendaño, en el límite entre Batete y Luba, *Fernández Casas 12017* (MA). Centro Sur: Acurenam, Mbeayop, *Aedo, Pérez Viso & Velayos 5407* (MA); Parc National de Monte Alén, *Ngomo 134* (BATA); Parque Nacional de Monte Alén, Moka, senda que sube al repetidor de televisión, *Pérez Viso 107* (MA); Parque Nacional de Monte Alén, Engong, *Pérez Viso 343bis* (MA); Parque Nacional de Monte Alén, Engong, camino hacia Lovayat, *Pérez Viso 836* (MA); Niefang, explotación forestal de Matroguisa, *Pérez Viso 2290* (MA); Oyac Esom, *Pérez Viso 3451* (MA). Kie Ntem: camino que va desde Nsoc Nsomo a Bata, a unos 3 km de Nsoc Nsomo, Mocomo, *Cabezas et al. 1277* (MA), *1285* (MA); Akam, *Fero & Esono 68* (MA), *88* (MA); Akam, carretera hacia Nsok–Nsomo, *Fero & Esono 114* (MA). Litoral: Utonde, camino que va de la orilla del río a la carretera de Bata, *Barbera et al. 262* (MA); Bata–Pembe, estrada kms 18–19, *Carvalho 5189* (BATA, MA); Bata, km 26 carretera Bata–Movo, *Castelo, Cabeza & Juste s.n.* (MA-319721); Ndote, *Eneme Fr. 246* (BATA); Benito, *Guinea 276-553* (MA); Ecuco, *Guinea 575-164* (MA); Ecuco, campo aviación, *Guinea 583* (MA); Ndote Nord, env. du village Jandje, *Lisowski M-51* (BATA); Bata, cerca del puerto, *Pérez Viso 1457* (MA); Bata–Kogo, km 67, *Pérez Viso 1841* (MA); desembocadura del río Campo, *Pérez Viso 2140* (MA), *2141* (MA); Corisco, *Velayos et al. 9960* (MA). Wele Nzas: explotación maderera de Añisok–Mongola, *Pérez Viso 3749* (MA); Nkolentangan, *Tessmann 167* (K). Unknown locality: *Lope del Val s.n.* (MA-714013).

Previously recorded from Bioko (Thiselton-Dyer 1912: 915, sub *A. cordata*, Pax & Hoffmann 1914: 231, Mildbraed 1922: 185, sub *A. cordata*, Keay 1958: 403, Exell 1973: 352, Fernández Casas 1994: 37, Govaerts 2012) and Río Muni (Thiselton-Dyer 1912: 916, sub *A. cordata*, Pax & Hoffmann 1914: 232, Guinea 1946: 64, 142, 145, 148, 156, Govaerts 2012). This species has been reported from Angola, Benin, Burundi, Cameroon, the Central African Republic, Congo-Brazzaville, D.R. Congo, Gambia, Gabon, Ghana, Guinea Bissau, Guinea, Ivory Coast, Kenya, Liberia, Mali, Nigeria, Ruanda, São Tomé and Príncipe, Senegal, Sierra Leone, Sudan, Tanzania, Togo and Uganda (Keay 1958: 403, Radcliffe-Smith 1987: 253, Cable & Cheek 1998: 47, Cheek *et al.* 2004: 283, 2011: 146, Akoègninou *et al.* 2006: 549, Sosef 2006: 159, Figueiredo & Smith 2008: 70, Figueiredo *et al.* 2011: 53, Govaerts 2012).

2.2. ***Alchornea floribunda*** Müll. Arg.

Bioko: Rilaja, *Fernández Casas et al. 10066* (MA); *Mann 306* (K, original material). Bioko Norte: Malabo–Pico Basilé, estrada km 3–4, *Carvalho 2164* (MA); Malabo–Pico Basilé, estrada para o pico km 8–9, *Carvalho 2858* (MA); cerca de Rebola, km 20–21, *Fernández Casas 11281* (MA). Bioko Sur: entre el cruce y Moka, *Fernández Casas 11461* (MA); cerca del lago Loreto, *Fernández Casas 11870* (MA); entre Moka y el lago Biaó, *Fernández Casas 11907* (MA); Gran Caldera de Luba, campamento Ureca, *Galán & Barberá 4666PG* (MA); Moka, *Wrigley 649* (BM, K). Centro Sur: Monte Alén, subida al mirador, *Cabezas 120* (MA); Parque Nacional de Monte Alén, carretera que sube desde el hotel de Monte Alén hasta el repetidor de televisión, *Pérez Viso 61* (MA); Parque Nacional de Monte Alén, Esamalang, *Pérez Viso 1176* (MA); Niefang, explotación forestal de Matroguisa, *Pérez Viso 2325* (MA); Niefang, Bindeng, *Pérez Viso 2379* (MA), *2405* (MA); Nfing Ntagan, poblado en la carretera forestal de Niefang a Bata, a continuación de Mosumu, *Pérez Viso 2753bis* (MA); Bisun, carretera de Niefang a Evinayong, *Pérez Viso 3411* (MA); Monte Alén, subida al mirador, *Velayos 9286 & Pérez Viso* (MA). Kie Ntem: alrededores del poblado de Obot Nku-Eseng, a 7 km de Nsok Nsomo, *Barberá et al. 156* (MA); Nfek-ayong (Micomiseng), *Obama 777* (BATA). Wele Nzas: Eviam, carretera forestal de Bata a Niefang, *Pérez Viso 2619* (MA); Nvua–Nnvam Oveng, Añisok, *Pérez Viso 2999* (MA); Ebo–Ngoo Nsomo, carretera forestal Añisok Mongola–Niefang, *Pérez Viso 3170* (MA); Mbut, km 30 de la carretera de Enkue, *Pérez Viso 3681* (MA). Unknown locality: *Lope del Val s.n.* (MA-715172); Mount John, River Kongui, *Mann 1801* (K).

Previously recorded from Bioko (Thiselton-Dyer 1912: 916, Pax & Hoffmann 1914: 241, Mildbraed 1922: 185, Hutchinson & Dalziel 1928: 303, Guinea 1946: 311, Keay 1958: 403, Exell 1973: 352, Cable & Cheek 1998: 47, Govaerts 2012) and Río Muni (Thiselton-Dyer 1912: 916, Pax & Hoffmann 1914: 241, Keay 1958: 403, Govaerts 2012). Distributed in West, Central, North-East and South-East tropical Africa, this species has also been reported from Angola, Cameroon, the Central African Republic, Congo-Brazzaville, D.R. Congo, Gabon, Ghana, Ivory Coast, Liberia, Mali, Nigeria, Sierra Leone, Sudan and Uganda (Keay 1958: 403, Radcliffe-Smith 1987: 255, Cable & Cheek 1998: 47, Cheek *et al.* 2004: 284, 2011: 146, Sosef *et al.* 2006: 159, Figueiredo & Smith 2008: 70, Govaerts 2012).

2.3. ***Alchornea hirtella*** Benth.

Alchornea hirtella f. *comoensis* (Beille) Pax & K. Hoffm.

Centro Sur: Parque Nacional de Monte Alén, Esamalang, *Pérez Viso 584* (MA); Parque Nacional de Monte Alén, Engong, camino hacia Lovayat, *Pérez Viso 853* (MA); Parque Nacional de Monte Alén, Bong, senda que va hacia el lago Atok, *Pérez Viso 1310* (MA); Parque Nacional de Monte Alén, Engong, senda que va a una gran roca que se ve desde el pueblo, *Pérez Viso 2682* (MA). Litoral: Corisco, *Velayos et al. 9968* (MA). Wele Nzas: Eviam, *Pérez Viso 1745* (MA); Eviam, Aconibe–Acurenam, *Pérez Viso 1761* (MA); pista forestal, entre Eviam y Aconibe, *Pérez Viso 2091* (MA).

Previously recorded from Río Muni (Pax & Hoffmann 1914: 241, sub *A. hirtella* f. *comoensis*, Guinea 1946: 154, 311, Keay 1958: 403, Govaerts 2012, sub *A. hirtella* f. *comoensis*). This tropical and South African species has been reported from Angola, Burundi, Cameroon, Congo-Brazzaville, D.R. Congo, Gabon, Ghana, Guinea Bissau, Guinea, Ivory Coast, Kenya, Liberia, Malawi, Mozambique, Nigeria, Rwanda, Senegal, São Tomé and Príncipe, Sierra Leone, South Africa, Tanzania, Uganda and Zambia (Keay 1958: 403, Radcliffe-Smith 1987: 256, Cable & Cheek 1998: 48, Cheek *et al.* 2004: 284, Sosef *et al.* 2006: 159, Figueiredo & Smith 2008: 70, Figueiredo *et al.* 2011: 53, Govaerts 2012).

3. *Argomuellera* Pax

1. Stamens 15–25 ..... *Argomuellera lancifolia*
- Stamens (25–)30–75(–80) ..... *Argomuellera macrophylla*

3.1. ***Argomuellera lancifolia*** (Pax) Pax

Neopycnocoma lancifolia Pax

Wetriaria lancifolia (Pax) Pax

Centro Sur: Abang, Niefang, *Pérez Viso 4217* (MA). Wele Nzas: Nkolentangan, *Tessmann 359* (K, original material).

Previously recorded from Río Muni (Thiselton-Dyer 1913: 962, sub *Neopycnocoma lancifolia*, Pax & Hoffmann 1914: 52, sub *Wetriaria lancifolia*, Léonard 1996b: 26, Govaerts 2012). This species has also been reported from neighbouring Gabon (Sosef *et al.* 2006: 160, Govaerts 2012).

3.2. *Argomuellera macrophylla* Pax
Wetriaria macrophylla (Pax) Pax

Centro Sur: Parque Nacional de Monte Alén, Santa Cruz, *Pérez Viso 1197* (MA). Litoral: Bebai, Campogebiet, *Tessmann 563* (K), *624* (K).

Previously recorded from Río Muni (Thiselton-Dyer 1912: 926, Pax & Hoffmann 1914: 50, sub *Wetriaria macrophylla*, Govaerts 2012) and Equatorial Guinea (Hutchinson & Dalziel 1928: 304, Keay 1958: 405, Léonard 1996b: 30). This species has also been reported from Angola, Burundi, Cameroon, Congo-Brazzaville, D.R. Congo, Ethiopia, Gabon, Ghana, Guinea, Ivory Coast, Kenya, Liberia, Malawi, Mozambique, Nigeria, Ruanda, Sierra Leone, Sudan, Tanzania, Uganda, Zambia and Zimbabwe (Keay 1958: 405, Radcliffe-Smith 1987: 227, Sosef *et al.* 2006: 160, Figueiredo & Smith 2008: 70, Léonard 1996b: 30, Govaerts 2012).

4. *Cleidion* Blume

4.1. *Cleidion gabonicum* Baill.

Bioko Norte: Malabo–Baney, Montes Basaca, *Carvalho 4366* (MA); Malabo–Baney, entre Baney e os Montes Basaca, *Carvalho 4393* (MA).

Not previously reported from Equatorial Guinea. This species is distributed in West–Central tropical Africa and has been reported from Cameroon, Gabon, Ghana, Ivory Coast and Nigeria (Keay 1958: 406, Léonard 1972: 299, Govaerts 2012).

5. *Dalechampia* L.

5.1. *Dalechampia ipomoeifolia* Benth.

Bioko Norte: Malabo–Sampaca, estrada km 4–5, *Carvalho 2567* (MA). Centro Sur: montagne près de Bikurga, *Lisowski M-1377* (BATA). Litoral: Bata–Pembe, estrada km 33, *Carvalho 4835* (MA); Bata–Pembe–Entuba, estrada km 20–21, *Carvalho 5235* (BATA, MA); carretera de Mbini–Bata, puente Sendje sobre el río Wele o Woro, *Fero et al. 303* (MA). Wele Nzas: région d´Anisok, au-dessus du village Nzuamayong, inselberg Akuom, *Lisowski M-650* (BATA).

Previously recorded from Río Muni (Thiselton-Dyer 1912: 953, Guinea 1946: 313, Keay 1958: 413, Govaerts 2012). This species has also been reported from Cameroon, the Central African Republic, Congo-Brazzaville, D.R. Congo, Gabon, Ghana, Ivory Coast, Liberia, Nigeria, Sierra Leone, Togo, Tanzania and Uganda (Keay 1958: 412, Radcliffe-Smith 1987: 286, Sosef 2006: 163, Govaerts 2012).

6. *Discoclaoxylon* Pax & K. Hoffm.

1. Leaves narrowly elliptic, up to 6(–6.5) cm wide, shallowly denticulate, gradually narrowed at the base..... ..... *Discoclaoxylon pedicellare*
- Leaves elliptic, more than 6 cm wide, serrate, cuneate to rounded at the base 2

2. Stamens (3–)6–8; female pedicels 0.1–0.2 mm long, extending to 2 mm in fruit..... *Discoclaoxylon hexandrum*
- Stamens (10–)12; female pedicels 1–3 mm long, extending to 5 mm in fruit..... *Discoclaoxylon pubescens*

6.1. *Discoclaoxylon hexandrum* (Müll. Arg.) Pax & K. Hoffm.
Claoxylon hexandrum Müll. Arg.
Claoxylon preussii Pax

Bioko: *Fernández Casas 11872* (MA), *Mann 186* (K, original material). Bioko Norte: Malabo–Pico Basilé, estrada kms 3–4, *Carvalho 4233* (MA). Bioko Sur: Malabo–Luba, estrada km 55–56, *Carvalho 3743* (K, MA); Moka–Musola, estrada kms 8–9, *Carvalho 3752* (MA); Musola–Moka–Granja Agronómica, estrada kms 10–11 a contar do cruzamento Luba–Malabo–Moka, *Carvalho 3816* (MA); cerca del lago Loreto, *Fernández Casas 11867* (MA); borde de la playa de Ureka, *Guinea 2430* (MA); alrededores de Ureka, *Guinea 2431* (MA); Balacha S trail, pt. 133–pt. 134, *Luke et al. 11760* (MA).

Previously recorded from Bioko (Thiselton-Dyer 1912: 876, sub *Claoxylon hexandrum*, Pax & Hoffmann 1914: 139, Mildbraed 1922: 185, Hutchinson & Dalziel 1928: 301, sub *C. hexandrum*, Guinea 1946: 311, Keay 1958: 401, sub *C. hexandrum*, Exell 1973: 352, Govaerts 2012) and Río Muni (Guinea 1946: 154, sub *Claoxylon preussii*). This West, West-Central and Tropical East African species has been reported from Cameroon, the Central African Republic, Congo-Brazzaville, Ghana, D.R. Congo, Ivory Coast, Liberia, Nigeria, Sierra Leone and Uganda (Keay 1958: 401, Radcliffe-Smith 1987: 280, Cable & Cheek 1998: 49, Cheek *et al.* 2004: 286, Govaerts 2012).

6.2. *Discoclaoxylon pedicellare* (Müll. Arg.) Pax & K. Hoffm.
Claoxylon pedicellare Müll. Arg.

Bioko: *Mann s.n.* (K, original material).

Previously recorded from Bioko (Thiselton-Dyer 1912: 874, sub *Claoxylon pedicellare*, Pax & Hoffmann 1914: 139, Mildbraed 1922: 185, Hutchinson & Dalziel 1928: 301, sub *C. pedicellare*, Guinea 1946: 311, Keay 1958: 401, sub *C. pedicellare*, Exell 1973: 352, Govaerts 2012). Only known from Bioko. This species is very close to *D. hexandrum*.

6.3. *Discoclaoxylon pubescens* (Pax & K. Hoffm.) Exell
Discoclaoxylon occidentale var. *pubescens* Pax & K. Hoffm.

Annobón: Nordkrater, *Mildbraed 6492* (HBG); Quioveo, *Mildbraed 6555* (HBG, lectotype); subida al pico Quioveo, *Velayos et al. 11648* (MA); subida a Santa Mina desde la aldea de San Pedro, cerca de la cuerda del macizo de Santa Mina, *Velayos et al. 11690* (MA); highest part of crater, *Wrigley & Melville 96* (BM, K, MA).

Previously recorded from Annobón (Mildbraed 1922: 162, sub *D. occidentale* (Müll. Arg.) Pax & Hoffm., Pax & Hoffmann 1924: 182, sub *D. occidentale* var. *pubescens*, Exell 1944: 299, sub *D. occidentale* var. *pubescens*, 1963: 112, 1973: 353, Guinea 1968: 134, Govaerts 2012, Barberá *et al.* 2013). Endemic to Annobón Island.

7. *Discoglypremna* Prain

7.1. *Discoglypremna caloneura* (Pax) Prain
Alchornea caloneura Pax
Discoglypremna caloneura var. *membranacea* Pax

Annobón: valle de Anganchi, *Aedo et al. 18068* (MA); borde del lago A Pot, *Fero et al. 229* (MA); camino de Palé a Santa Cruz (Awal), junto al arroyo Jada, *Fero et al. 262* (MA); centro, *Wrigley 288* (BM). Bioko Norte: Malabo–Cupapa, estrada km 25, *Carvalho 2226* (BATA, BM, MA); Luba–Malabo, estrada km 14–15, *Carvalho 2854* (MA); Luba–Malabo, estrada km 38, *Carvalho 2856* (MA); Malabo–Cupapa, estrada kms 11–12, *Carvalho 4017* (MA). Wele Nzas: Nkolentangan, *Tessmann 97* (K).

Previously recorded from Annobón (Mildbraed 1922: 162, sub var. *membranacea*, Exell 1944: 300, 1973: 353, Léonard 1995: 207), Bioko (Léonard 1995: 207, Cable & Cheek 1998: 49, Govaerts 2012) and Río Muni (Thiselton-Dyer 1912: 932, Pax & Hoffmann 1914: 19, Hutchinson & Dalziel 1928: 305, Guinea 1946: 310, Keay 1958: 403, Léonard 1995: 207). This West, West-Central and Tropical East African species has

been reported from Angola, Benin, Cameroon, the Central African Republic, Congo-Brazzaville, D.R. Congo, Gabon, Ghana, Guinea, Ivory Coast, Liberia, Nigeria, São Tomé and Príncipe, Sierra Leone, Togo and Uganda (Keay 1958: 403, Radcliffe-Smith 1987: 223, Cable & Cheek 1998: 49, Cheek *et al.* 2004: 286, Akoègninou *et al.* 2006: 556, Sosef *et al.* 2006: 164, Figueiredo & Smith 2008: 71, Figueiredo *et al.* 2011: 54, Govaerts 2012).

8. *Erythrococca* Benth.

1. Branchlets armed with a pair of sharp stipular spines at the base of each leaf..... *Erythrococca anomala*
- Branchlets not spiny.....2.
2. Leaves densely pilose ..... *Erythrococca dewevrei*
- Leaves glabrous or glabrescent or with hairs in the nerves and spreading hairs beneath.....3.
3. Branchlets and petioles puberulous .....4.
- Branchlets and petioles glabrous or with spreading hairs.....5.
4. Leaves ovate–lanceolate, 10–25 × 7–12 cm, crenate-dentate in the distal part; styles not columnar; stigmas divaricate, longer than the style.....*Erythrococca rivularis*
- Leaves oblong to elliptic–obovate, 10–15 × 5–6 cm, remotely toothed in the distal part; styles columnar; stigmas very small, not divaricate, much shorter than the style.....*Erythrococca welwitschiana*
5. Leaves glabrous (hairs in young leaves only); stigmas sessile ..... *Erythrococca mannii*
- Leaves puberulous beneath at least in the nerves; stigmas on a short style.....6.
6. Leaves with appressed hairs between the nerves beneath, and puberulous on the nerves ..... *Erythrococca atrovirens*
- Leaves glabrous beneath, but puberulous on the nerves..... *Erythrococca pallidifolia*

8.1. ***Erythrococca anomala*** (Juss. ex Poir.) Prain
Adelia anomala Juss. ex Poir.
Erythrococca aculeata Benth.

Bioko Norte: Basilé, finca de Eloy Estrada, *Carvalho 2469* (MA); Malabo–Aeroporto, estrada km 2, *Carvalho 2715* (K, MA).

Previously recorded from Bioko (Pax & Hoffmann 1914: 91, Mildbraed 1922: 185, Keay 1958: 401, Exell 1973: 353, Cable & Cheek 1998: 50, Govaerts 2012) and Río Muni (Guinea 1946: 156, sub *E. aculeata*). This West and West-Central African species has been reported from Benin, Cameroon, the Central African Republic, Congo-Brazzaville, D.R. Congo, Gabon, Gambia, Ghana, Guinea Bissau, Guinea, Ivory Coast, Liberia, Nigeria, Sierra Leone and Togo (Keay 1958: 401, Cable & Cheek 1998: 50, Cheek *et al.* 2004: 288, Akoègninou *et al.* 2006: 558, Sosef *et al.* 2006: 164, Govaerts 2012).

8.2. ***Erythrococca atrovirens*** (Pax) Prain
Athroandra atrovirens var. *flaccida* (Pax) Pax & K. Hoffm.
Claoxylon atrovirens Pax
Erythrococca atrovirens var. *flaccida* (Pax) Radcl.-Sm.
Erythrococca oleracea (Prain) Prain

Centro Sur: Parque Nacional de Monte Alén, Engong, senda que va a una gran roca que se ve desde el pueblo, *Pérez Viso 2666* (MA), *2692* (MA). Litoral: Bata–Micomiseng–Midjimiton, estrada km 157, *Carvalho 6510* (MA). Wele Nzas: Ebo–Ngoo Nsomo, carretera forestal Añisok Mongola–Niefang, *Pérez Viso 3189* (MA).

Previously recorded from Río Muni (Thiselton-Dyer 1912: 871, sub *E. oleracea*, Pax & Hoffmann 1914: 83, sub *Athroandra atrovirens* var. *flaccida*, Radcliffe-Smith 1987: 279, sub *E. atrovirens* var. *flaccida*, Govaerts 2012, sub *E. atrovirens* var. *flaccida*). This species has been reported from Burundi, Cameroon, the Central African Republic, D.R. Congo, Kenya, Sudan, Tanzania, Uganda and Zambia (Radcliffe-Smith 1987: 278, Cheek *et al.* 2004: 288, 2011: 148, Govaerts 2012).

Very similar to *E. pallidifolia* but this species has leaves with apressed hairs beneath, puberulous on the nerves, instead of the glabrous leaves, puberulous only on the nerves of the undersurface characteristic of *E. pallidifolia*. Furthermore, *E. atrovirens* has only been recorded from the continent, not in Bioko.

8.3. *Erythrococca dewevrei* (Pax) Prain
Claoxylon dewevrei Pax

Centro Sur: Parque Nacional de Monte Alén, Santa Cruz, *Pérez Viso 1215* (MA).

Not previously recorded from Equatorial Guinea. This species has only been reported from neighbouring Cameroon and D.R. Congo (Prain 1911, Govaerts 2012).

According to Prain (1911: 626), this species is very close to *E. hispida* from which it differs in the pubescence of the leaves. *E. dewevrei* has leaves which are densely tomentose beneath with hispid nerves, and are not minutely verrucous as in *E. hispida*. The identification of *Pérez Viso 1215* is based in these features. However, this specimen has longer leaves, up to 16 cm, which does not fit with the description of *E. dewevrei* by Prain (to 12 cm long). More material and further studies are needed to clarify its identification.

8.4. *Erythrococca mannii* (Hook.f.) Prain
Athroandra mannii (Hook.f.) Pax & K. Hoffm.
Claoxylon mannii Hook.f.

Bioko Norte: Pico Basilé (Clarence Peak), *Mann 633* (K, original material).

Previously recorded from Bioko (Hooker 1862: 20–21, sub *Claoxylon mannii*, 1864: 215, sub *C. mannii*, Prain 1911: 620, Thiselton-Dyer 1912: 866, Pax & Hoffmann 1914: 79, sub *Athroandra mannii*, Mildbraed 1922: 185, Hutchinson & Dalziel 1928: 301, Guinea 1946: 311, sub *A. mannii*, Keay 1958: 401, Exell 1973: 353, Govaerts 2012). Endemic to Bioko. Only known from the type.

8.5. *Erythrococca pallidifolia* (Pax & K. Hoffm.) Keay
Athroandra pallidifolia Pax & K. Hoffm.

Bioko: *Fernández Casas & Carvalho 10377* (K, MA), *11924* (K, MA). Bioko Norte: Malabo–Belebú Balachá, caminho de Ureca, andados cêrca de 5–6 km, *Carvalho 4207* (MA). Bioko Sur: camino de Moka Malabo hacia el lago Biaó, *Cabezas et al. 1089* (MA); Finca Puente, *Guinea 1805* (MA); Moka, camino de Ureca, *Fernández Casas 11754* (K, MA); Lago Biao–Moka, camino para Moka, *Carvalho 2314* (MA); Malabo–Lago Loreto, estrada km 64–65, *Carvalho 4197* (MA); Biao Peak trail, pt. 128-pt. 130, *Luke et al. 11866* (MA), *11867* (MA); Moka, *Wrigley 621* (K).

Previously recorded from Bioko (Pax & Hoffmann 1914: 84, sub *Athroandra pallidifolia*, Mildbraed 1922: 185, sub *A. pallidifolia*, Guinea 1946: 311, sub *A. pallidifolia*, Keay 1958: 401, Exell 1973: 353, Govaerts 2012).

This species is very similar to *E. mannii* and both of them are endemic to Bioko. We identified these specimens as *E. pallidifolia* because of their puberulous branchlets, petioles and leaves, at least when young, and their distinct style (Prain 1911: 620, Keay 1958: 401).

8.6. *Erythrococca rivularis* (Müll. Arg.) Prain
Athroandra rivularis (Müll. Arg.) Pax & K. Hoffm.
Claoxylon rivulare Müll. Arg.

Litoral: Mount John River, Kongui, *Mann 1785* (K, original material).

Previously recorded from Río Muni (Prain 1911: 622, Thiselton-Dyer 1912: 868, Pax & Hoffmann 1914: 81, sub *Athroandra rivularis*, Govaerts 2012) and Equatorial Guinea (Guinea 1946: 311, sub *A. rivularis*). This species has only been reported from the neighbouring Cameroon (Govaerts 2012).

8.7. Erythrococca welwitschiana (Müll. Arg.) Prain
Athroandra welwitschiana (Müll. Arg.) Pax & K. Hoffm.
Claoxylon welwitschianum Müll. Arg.

Kie Ntem: Nfuiñ, a 29 km de Nsoc Nsomo por la pista que va hacia Bata, *Cabezas et al. 1368* (MA). Litoral: Bebai Campogebiet, *Tessmann 555* (K). Wele Nzas: Nkolentangan, *Tessmann 296* (K).

Previously recorded from Río Muni (Prain 1911: 622, Thiselton-Dyer 1912: 868, Pax & Hoffmann 1914: 82, sub *Athroandra welwitschiana*, Govaerts 2012). This species has been reported from Angola, the Central

African Republic, Cameroon, Congo-Brazzaville, D.R. Congo, Gabon and Nigeria (Keay 1958: 401, Sosef *et al.* 2006: 164, Figueiredo & Smith 2008: 71, Cheek *et al.* 2011: 148, Govaerts 2012).

9. *Macaranga* Thouars

1. Stipules prominent, persistent, saccate ..... *Macaranga saccifera*
- Stipules deciduous, visible only on the young growth, not saccate ..... 2.
2. Leaves 3–5-lobed, palmately 5–9-veined from the base, usually cordate ..... 3.
- Leaves not lobed, pinnately veined or sometimes 3-veined at the base, rarely cordate ..... 4.
3. Leaves sparsely pilose below, epunctate ..... *Macaranga magnistipulosa*
- Leaves with short rigid hairs below, uniformly granular-punctate ..... *Macaranga occidentalis*
4. Leaves broadly ovate, base rounded, truncate or cordate, leaves often 3- or more veined at the base ..... 5.
- Leaves elliptic to obovate, pinnately veined ..... 8.
5. Leaves margin entire ..... *Macaranga gabunica*
- Leaves margin toothed ..... 6.
6. Leaf base deeply cordate (often overlapping) ..... *Macaranga occidentalis*
- Leaf base rounded, truncate or only slightly cordate ..... 7.
7. Lower surface of mature leaves with obvious indument (at least on veins and veinlets) ..... *Macaranga hurifolia*
- Lower surface of mature leaves essentially glabrous ..... *Macaranga monandra*
8. Leaf margin regularly repand-dentate ..... *Macaranga monandra*
- Leaf margin entire or irregularly undulate ..... 9.
9. Secondary veins 4–5 pairs ..... 10.
- Secondary veins more than 6 pairs ..... 11.
10. Leaves elliptic, apex acuminate to caudate ..... *Macaranga klaineana*
- Leaves mostly obovate, apex truncate, rounded or shortly and obtusely cuspidate ..... *Macaranga staudtii*
11. Bracts well developed, 2–10 mm long, more or less enclosing the male flower, persistent ..... *Macaranga barteri*
- Bracts less than 2 mm long, not enclosing the male flower, deciduous ..... *Macaranga spinosa*

9.1. ***Macaranga barteri*** Müll. Arg.

Kie Ntem: Ngomgom, poblado de la pista que va de Nsoc Nsomo a Bata, *Barberá et al. 102* (MA). Wele Nzas: Nkolentangan, *Tessmann 9* (K).

Previously recorded from Río Muni (Thiselton-Dyer 1912: 942, Pax & Hoffmann 1914: 329, Guinea 1946: 311, Keay 1958: 407, 408, Govaerts 2012). This African species has also been reported from Benin, Cameroon, the Central African Republic, D.R. Congo, Gabon, Ghana, Guinea, Ivory Coast, Liberia, Nigeria, Sierra Leone, Togo, Uganda and Zaire (Keay 1958: 407, Radcliffe-Smith 1987: 251, Akoègninou *et al.* 2006: 570, Sosef *et al.* 2006: 166, Whitmore 2008: 86, Govaerts 2012).

9.2. ***Macaranga gabunica*** Prain

Litoral: Estuaire du Río Muni, village Mayang, au bord de la rivière Mitong, *Lisowski M-827* (BATA).

Not previously reported from Equatorial Guinea. This species has only been reported from D.R. Congo and Gabon (Sosef *et al.* 2006: 166, Whitmore 2008: 134, Govaerts 2012).

9.3. ***Macaranga hurifolia*** Beille

Centro Sur: Evinayong, *Guinea 124* (MA), *125* (MA), *126* (MA).

Not previously reported from Equatorial Guinea. This species is distributed in West and Central Africa, and has been reported from Cameroon, the Central African Republic, Gabon, Ghana, Ivory Coast, Liberia, Nigeria, Sierra Leone and Togo (Keay 1958: 407, Cheek *et al.* 2004: 289, Sosef *et al.* 2006: 166, Whitmore 2008: 155, Govaerts 2012).

9.4. ***Macaranga klaineana*** Pierre ex Prain

Litoral: Bata–Senye–Rio Benito, estrada km 22, *Carvalho 4975* (MA); Bata–Bome, *Carvalho 5409* (MA).

Not previously reported from Equatorial Guinea. This species has only been reported from neighboring Gabon (Sosef *et al.* 2006: 166, Whitmore 2008: 166, Govaerts 2012).

9.5. *Macaranga magnistipulosa* Pax

Wele Nzas: Nkolentangan, Anang, *Tessmann 249* (K, original material).

Previously recorded from Río Muni (Thiselton-Dyer 1912: 938, Pax & Hoffmann 1914: 316, Whitmore 2008: 179, Govaerts 2012) and Equatorial Guinea (Guinea 1946: 311). This species is only known from the type. According to Whitmore (2008: 179), the type appears to have been destroyed at Berlin and no material has been found at Kew, Paris or Brussels. Surprisingly we have seen *Tessmann 249* in the Kew herbarium.

9.6. *Macaranga monandra* Müll. Arg.

Bioko: *Fernández Casas 11595* (K, MA); cerca de Bososo, *Fernández Casas et al. 10135* (K, MA); *Lope del Val s.n.* (MA-725803). Bioko Norte: camino Basilé [pico Basilé], *Lope del Val s.n.* (MA-835306); pico Basilé, *Guinea & Lope del Val 218* (MA), *219* (MA). Bioko Sur: Balacha S trail, pt. 135–pt. 136, *Luke et al. 11835* (MA). Centro Sur: Niefang, orillas del río Woro, *Esono & Ndong 378* (BATA); Parque Nacional de Monte Alén, carretera que va desde Moka hasta Engong, *Pérez Viso 390* (MA); Parque Nacional de Monte Alén, río Vog-yii, *Pérez Viso 3201* (MA); Bicaba, carretera de Niefang a Monte Alén, *Pérez Viso 3464* (MA). Kie Ntem: Ngomgom, poblado de la pista que va de Nsoc Nsomo a Bata, *Barberá et al. 62* (MA); camino que va desde Nsoc Nsomo a Bata, a unos 3 km de Nsoc Nsomo, Mocomo, *Cabezas et al. 1246* (MA). Litoral: carretera de Mbini–Bata, a 10 km del cruce Akoakam, *Fero et al. 293* (MA); Ndote Sud, *Lisowski M-1133* (BATA); Sendje, *Pérez Viso 1617* (MA); carretera de Mbini, antigua trocha forestal, *Pérez Viso 3335* (MA). Río Muni: *Tessmann 600* (K). Unknown locality: *Guinea 1213* (MA-715222); Boriyonica, *Guinea s.n.* (MA-715223).

Previously recorded from Río Muni (Pax & Hoffmann 1914: 328, Keay 1958: 407, Govaerts 2012). This African species has also been reported from Angola, Burundi, Cameroon, the Central African Republic, D.R. Congo, Gabon, Nigeria, São Tomé and Príncipe, Tanzania, Uganda and Zaire (Keay 1958: 407, Radcliffe-Smith 1987: 249, Cable & Cheek 1998: 51, Cheek *et al.* 2004: 289, 2011: 149, Sosef *et al.* 2006: 166, Figueiredo & Smith 2008: 73, Whitmore 2008: 188, Figueiredo *et al.* 2011: 54, Govaerts 2012).

9.7. *Macaranga occidentalis* (Müll. Arg.) Müll. Arg.
Mappa occidentalis Müll. Arg.

Bioko: *Mann 303* (K, original material). Bioko Norte: Malabo–pico Basilé, estrada km 9–10, *Carvalho 3461* (K, MA); pico Basilé, *Guinea & Lope del Val 208* (MA); pico Basilé, *Lope del Val s.n.* (MA-705241). Bioko Sur: Moka, *Boughey 27* (K); camino de Moka–Malabo hacia el lago Biaó, *Cabezas et al. 1079* (MA); entre Luba y Moka, *Castroviejo 9188* (MA); Moka, *Exell 850* (BM); Belebú Balachá, *Fernández Casas 12137* (MA); Balacha S trail, pt. 128-pt. 133, *Luke et al. 11747* (MA); Moka, *Melville 607* (K).

Previously recorded from Bioko (Mildbraed 1922: 185, Thiselton-Dyer 1912: 937, Pax & Hoffmann 1914: 315, Hutchinson & Dalziel 1928: 306, Guinea 1946: 312, Adams 1957: 482, Keay 1958: 407, Exell 1973: 353, Whitmore 2008: 197, Govaerts 2012). This species distributed in West and Central Africa, has been reported from Cameroon and Nigeria (Keay 1958: 407, Cable & Cheek 1998: 51, Cheek *et al.* 2000: 132, 2004: 289, Whitmore 2008: 198).

9.8. *Macaranga saccifera* Pax

Wele Nzas: Ngong Mocomo, vers inselberg Acoak Banga, *Lejoly & Elad 98/035* (BATA).

Not previously reported from Equatorial Guinea. This West and Central African species has been reported from Angola, Cameroon, the Central African Republic, Congo-Brazzaville, D.R. Congo and Gabon (Sosef *et al.* 2006: 167, Figueiredo & Smith 2008: 73, Whitmore 2008: 232, Cheek *et al.* 2011: 149, Govaerts 2012).

9.9. *Macaranga spinosa* Müll. Arg.

Bioko: *Mann 1160* (K). Bioko Norte: Malabo–Cupapa, estrada km 20–21, *Carvalho 3505* (MA); Baney, *Fernández Casas et al. 10129* (MA). Bioko Sur: Belebú Balachá, arredores da povoaçao, *Carvalho 2280* (K, MA). Kie Ntem: a 5 km de Nsoc Nsomo por la pista que va hacia Bata, *Cabezas et al. 1298* (MA); Akam, camino a Oyò, *Fero 161 & Esono* (MA).

Previously recorded from Bioko (Thiselton-Dyer 1912: 944, Pax & Hoffmann 1914: 33, Mildbraed 1922: 185, Hutchinson & Dalziel 1928: 306, Guinea 1946: 312, Keay 1958: 408, Exell 1973: 353, Cable & Cheek 1998: 51, Whitmore 2008: 243, Govaerts 2012) and Río Muni (Thiselton-Dyer 1912: 944, Pax & Hoffmann 1914: 331, Hutchinson & Dalziel 1928: 306, Guinea 1946: 312, Keay 1958: 408, Govaerts 2012). Distributed in tropical Africa, this species has been reported from Angola, Benin, Burundi, the Central African Republic, Congo-Brazzaville, D.R. Congo, Gabon, Ivory Coast, Liberia, Nigeria, Tanzania and Uganda (Keay 1958: 408, Radcliffe-Smith 1987: 250, Cable & Cheek 1998: 51, Cheek *et al.* 2004: 290, 2011: 149, Akoègninou *et al.* 2006: 571, Sosef *et al.* 2006: 167, Figueiredo & Smith 2008: 73, Whitmore 2008: 243, Govaerts 2012).

9.10. *Macaranga staudtii* Pax

Litoral: aire protegée de Ndote, route forestière Engong–Jandje, *Lejoly & Van Asbroeck 7* (BATA).

Not previously reported from Equatorial Guinea. Distributed in West and Central Africa, this species has been reported from Benin, Cameroon, the Central African Republic, Gabon and Nigeria (Keay 1958: 407, Akoègninou *et al.* 2006: 571, Sosef *et al.* 2006: 167, Figueiredo & Smith 2008: 73, Whitmore 2008: 244, Govaerts 2012).

10. *Mallotus* Lour.

1. Leaves golden-glandular beneath; stipules small, deciduous; fruits smooth..... … *Mallotus oppositifolius*
- Leaves not golden-glandular beneath; stipules persistent, rigid subulate; fruit bristly ..... *Mallotus subulatus*

10.1. *Mallotus oppositifolius* (Geiseler) Müll. Arg.

Croton oppositifolius Geiseler

Mallotus oppositifolius f. *dentatus* (Schumach. & Thonn.) Pax & K. Hoffm.

Bioko Norte: Riaba–Malabo, estrada km 3, *Carvalho 2459* (K, MA); Malabo–Riaba, estrada km 57, *Carvalho 2898* (MA); Malabo–Riaba, estrada km 57, *Carvalho 2926* (MA). Litoral: Bebai Campogebiet, *Tessmann 616* (K).

Previously recorded from Río Muni (Pax & Hoffmann 1914: 159, sub f. *dentatus*, Guinea 1946: 154). This tropical African species has been reported from Angola, Benin, Burkina Faso, Burundi, Cameroon, the Central African Republic, Congo-Brazzaville, D.R. Congo, Ethiopia, Gabon, Gambia, Ghana, Guinea, Ivory Coast, Kenya, Liberia, Madagascar, Malawi, Mozambique, Nigeria, Senegal, Sierra Leone, Sudan, Tanzania, Togo, Uganda, Zambia and Zimbabwe (Keay 1958: 402, Radcliffe-Smith 1987: 236, Cable & Cheek 1998: 52, Cheek *et al.* 2004: 290, 2011: 150, Akoègninou *et al.* 2006: 571, Sosef *et al.* 2006: 168, Sierra *et al.* 2007: 85, Figueiredo & Smith 2008: 73, Govaerts 2012).

10.2. *Mallotus subulatus* Müll. Arg.

Bioko: *Mann 260* (K, lectotype); *Vogel 194* (K). Bioko Norte: Malabo–Luba, patio Vaz Serra km 47, *Carvalho 2119* (MA); Malabo–Luba, cerca de Sampaca km 4, *Carvalho 2381* (K, MA); Malabo–Aeroporto, estrada km 6, *Carvalho 2436* (K, MA), *2509* (BM, K, MA); Malabo–Riaba, entrada 58, *Carvalho 2935* (MA); entre Malabo y el aeropuerto, junto al km 6 de la autopista, *Fernández Casas et al. 10256* (MA); entre Malabo y el aeropuerto, km 6, *Fernández Casas 11246* (MA); cerca de Rebola, *Fernández Casas 11260* (K, MA). Bioko Sur: camino de Riaba, cerca de Babtabare, *Fernández Casas 10237* (K, MA).

Previously recorded from Bioko (Thiselton-Dyer 1912: 928, Pax & Hoffmann 1914: 154, Mildbraed 1922: 185, Hutchinson & Dalziel 1928: 305, Guinea 1946: 311, Keay 1958: 402, Exell 1973: 354, Cable &

Cheek 1998: 52, Govaerts 2012) and Río Muni (Pax & Hoffmann 1914: 154, Guinea 1946: 154, 156, Keay 1958: 402, Govaerts 2012). This West and West-Central tropical African species has been reported from Cameroon, the Central African Republic, Congo-Brazzaville, Ghana, Ivory Coast, Liberia, Nigeria, Sierra Leone and Togo (Keay 1958: 402, Cable & Cheek 1998: 52, Cheek *et al.* 2004: 290, Sosef *et al.* 2006: 168, Sierra *et al.* 2007: 95, Govaerts 2012).

11. *Mareya* Baill.

1. Leaves with 7–15 pairs of lateral nerves; stamens 30–40; pedicel of female flowers 2.5–9 mm long; capsule 6–8 mm long and 11–13 mm wide..... *Mareya brevipes*
- Leaves with 5–9 pairs of lateral nerves; stamens 9–18 (–24); pedicel of female flowers 0.5–0.7 mm long; capsule 2.5–4 mm long and 4–6 mm wide ..... *Mareya micrantha*

11.1. ***Mareya brevipes*** Pax

Centro Sur: Niefang, explotación forestal de Matroguisa, *Pérez Viso 2347* (MA), *2349* (MA). Kie Ntem: Ngomgom, poblado de la pista que va de Nsoc Nsomo a Bata, *Barberá et al. 76* (MA); alrededores del poblado de Obot Nku–Eseng, a 7 km de Nsok Nsomo, *Barberá et al. 154* (MA). Litoral: Bata–Mongo (Alosa), estrada kms 64–65, *Carvalho 5540* (BATA, BM, MA); Bebai, Campogebiet, *Tessmann 723* (K). Wele Nzas: Oveng Esandong, km 61 carretera Nkue–Mongomo, *Pérez Viso 3101* (MA).

Previously recorded from Río Muni (Thiselton-Dyer 1912: 910, Radcliffe-Smith 1987: 216, Léonard 1996a: 8, Govaerts 2012). This tropical African species has been reported from Cameroon, the Central African Republic, Congo-Brazzaville, D.R. Congo, Gabon, and Uganda (Radcliffe-Smith 1987: 216, Léonard 1996a: 8, Sosef *et al.* 2006: 169, Govaerts 2012).

11.2. ***Mareya micrantha*** (Benth.) Müll. Arg.

Acalypha micrantha Benth.
Mareya micrantha subsp. *micrantha*
Mareya spicata Baill.
Mareya spicata var. *leonensis* (Benth.) Pax & K. Hoffm.
Mareya spicata var. *micrantha* (Benth.) Pax & K. Hoffm.

Bioko: *Mann 209* (K), *235* (K), *435* (K); *Vogel 210* (K, original material). Bioko Norte: Banapá, *Guinea 1211* (MA), *1212* (MA); Malabo–Luba, estrada km 22, *Carvalho 2176* (K, MA); Malabo–Rebola, estrada km 7, *Carvalho 2928* (K, MA); Malabo–Ela Nguema (zona de Noba Uan), *Carvalho 3457* (BM, K, MA). Bioko Sur: Malabo–Riaba, cerca de Bilelipa, *Fernández Casas 11554* (K, MA).

Previously recorded from Bioko (Hooker 1849: 505, sub *Acalypha micrantha*, Thiselton-Dyer 1912: 911–912, sub *M. spicata* and *M. micrantha*, Mildbraed 1922: 185, sub *M. spicata* var. *leonensis* and *M. spicata* var. *micrantha*, Hutchinson & Dalziel 1928: 303, sub *M. micrantha* and *M. spicata*, Guinea 1946: 310, sub *M. spicata* and *M. micrantha*, Keay 1958: 404, Exell 1973: 354, sub subsp. *micrantha*, Léonard 1996a: 11, Cable & Cheek 1998: 52, Govaerts 2012) and Río Muni (Thiselton-Dyer 1912: 911, Hutchinson & Dalziel 1928: 303, Guinea 1946: 158, 310, sub *M. spicata* and *M. micrantha*, Keay 1958: 404, Léonard 1996a: 11, Govaerts 2012). This West and West-Central tropical African species has been reported from Angola, Cameroon, Congo-Brazzaville, D.R. Congo, Gabon, Ghana, Guinea Bissau, Guinea, Ivory Coast, Liberia, Nigeria, Sierra Leone and Togo (Keay 1958: 404, Léonard 1996a: 11, Cable & Cheek 1998: 52, Cheek *et al.* 2004: 290, Sosef *et al.* 2006: 169, Figueiredo & Smith 2008: 73, Govaerts 2012).

12. *Mareyopsis* Pax & K. Hoffm.

12.1. ***Mareyopsis longifolia*** (Pax) Pax & K. Hoffm.

Mareya longifolia Pax

Litoral: Bata–Niefang, estrada km 35, entrada a la zona de Adjape, por Ríos Sama e Comaya, *Carvalho 5692* (MA); Bata–Mbini, estrada km 27 en la carretera hacia Senge, *Carvalho 6092* (MA); Bata–Senge, estrada km 27, antigua explotación de Exfosa, *Carvalho 6123* (MA).

Not previously reported from Equatorial Guinea. This West Central African species has been reported from Cameroon, Congo-Brazzaville, D.R. Congo, Gabon and Nigeria (Léonard 1996a: 18, Cable & Cheek 1998: 52, Cheek *et al.* 2004: 291, Sosef *et al.* 2006: 169, Govaerts 2012).

13. *Micrococca* Benth.

13.1. ***Micrococca mercurialis*** (L.) Benth.
Tragia mercurialis L.

Kie Ntem: camino que va desde Nsoc Nsomo a Bata, a unos 3 km de Nsoc Nsomo, Mocomo, *Cabezas et al. 1293* (MA). Litoral: Bata–Mbini, estrada kms 7–8, *Carvalho 4923* (MA); Bata–Pembe, estrada kms 26–27, chamada Entura en margens de Río Ué, *Carvalho 5184* (MA).

Previously recorded from Río Muni (Thiselton-Dyer 1912: 879, Pax & Hoffmann 1914: 135, Govaerts 2012). This species has been reported from tropical and South Africa, the Arabian Peninsula, and from India to the Malay Peninsula. In Africa, it has been reported from Angola, Benin, Botswana, Cameroon, the Central African Republic, Congo-Brazzaville, D.R. Congo, Ethiopia, Gabon, Ghana, Guinea, Ivory Coast, Kenya, Liberia, Malawi, Madagascar, Mauritania, Mozambique, Nigeria, Senegal, Sierra Leone, Sudan, Tanzania, Togo, Uganda, Zambia and Zimbabwe (Keay 1958: 402, Radcliffe-Smith 1987: 261, Cheek *et al.* 2004: 291, Akoègninou *et al.* 2006: 573, Sosef *et al.* 2006: 170, Figueiredo & Smith 2008: 73, Govaerts 2012).

14. *Plukenetia* L.

14.1. ***Plukenetia conophora*** Müll. Arg.
Tetracarpidium conophorum (Müll. Arg.) Hutch. & Dalziel

Bioko: *Fernández Casas 12063 & Carvalho* (MA). Bioko Norte: Malabo–Luba, estrada km 31, *Carvalho 2750* (MA); Malabo–Biao Grande, estrada km 22–23, *Carvalho 3515* (MA); Malabo–Cupapa, estrada kms 20–21, *Carvalho 4085* (MA); Malabo–Cupapa, estrada km 19, *Carvalho 4133* (K, MA); cerca de Rebola, km 20–21, *Fernández Casas 11275* (MA); cerca de Riaba, *Fernández Casas 11682* (MA). Litoral: Bata–Bolondo, kms 5–6, *Carvalho 4757* (MA); Bata–Senye, estrada kms 30–31, *Carvalho 5153* (MA); Bata–Senge, estrada km 27, zona forestal de Iboga, antigua explotación forestal de Exfosa, *Carvalho 6407* (MA).

Previously recorded from Bioko (Thiselton-Dyer 1912: 950, Mildbraed 1922: 186, Hutchinson & Dalziel 1928: 307, sub *Tetracarpidium conophorum*, Guinea 1946: 311, sub *T. conophorum*, Keay 1958: 410, sub *T. conophorum*, Exell 1973: 354, sub *T. conophorum*, Cable & Cheek 1998: 54, Govaerts 2012) and Río Muni (Thiselton-Dyer 1912: 950, Hutchinson & Dalziel 1928: 307, sub *T. conophorum*, Guinea 1946: 311, sub *T. conophorum*, Keay 1958: 410, sub *T. conophorum*, Govaerts 2012). This West and West-Central tropical African species has been reported from Benin, Cameroon, the Central African Republic, Congo-Brazzaville, D.R. Congo, Gabon, Nigeria and Sierra Leone (Keay 1958: 410, Cable & Cheek 1998: 54, Cheek *et al.* 2004: 292, Sosef *et al.* 2006: 173, Govaerts 2012).

15. *Pseudagrostistachys* Pax & K. Hoffm.

15.1. ***Pseudagrostistachys africana*** (Müll. Arg.) Pax & K. Hoffm. subsp. ***africana***
Agrostistachys africana Müll. Arg.

Bioko: *Mann 582* (K, original material). Bioko Sur: Hormiga camp pt. 346 to north camp pt. 347, *Luke 13278* (MA). Centro Sur: Parc National de Monte Alén, *Ngomo 234* (BATA).

Previously recorded from Bioko (Pax & Hoffmann 1912: 98, Mildbraed 1922: 186, Hutchinson & Dalziel 1928: 298, Guinea 1946: 309, Keay 1958: 399, Exell 1973: 354, Cable & Cheek 1998: 53, Cheek *et al.* 2004: 292, Govaerts 2012). This species has been reported from Congo-Brazzaville, Ghana, Nigeria and São Tomé and Príncipe (Keay 1958: 399, Cable & Cheek 1998: 53, Cheek *et al.* 2004: 292, 2011: 151, Figueiredo *et al.* 2011: 54, Govaerts 2012).

16. *Pycnocoma* Benth.

1. Leaves sessile or subsessile ..... *Pycnocoma macrophylla*
- Leaves petiolate ..... *Pycnocoma minor*

16.1. ***Pycnocoma macrophylla*** Benth.

Pycnocoma brachystachya Pax

Bioko: *Vogel 18* (K, original material). Bioko Sur: playa de Moaba, camino de subida hacia Moka, cerca de la playa, *Cabezas et al. 990* (MA); Moka to Areha beach, pt. 167 (Kika R)-pt. 168 (Areha R), *Luke & Fermin 12092* (MA).

Previously recorded from Bioko (Thiselton-Dyer 1912: 959, Mildbraed 1922: 186, sub var. *genuina*, Hutchinson & Dalziel 1928: 307, Keay 1958: 405, Exell 1973: 354, sub var. *macrophylla*, Léonard 1996c: 56–57, Cable & Cheek 1998: 54, Govaerts 2012) and Río Muni (Guinea 1946: 156, sub *P. brachystachya*, 310). This African species has been reported from Cameroon, the Central African Republic, Congo-Brazzaville, Gabon, Ghana, Ivory Coast and Nigeria (Keay 1958: 405, Léonard 1996c: 57, Sosef *et al.* 2006: 172, Cable & Cheek 1998: 54, Cheek *et al.* 2004: 293, Govaerts 2012).

16.2. ***Pycnocoma minor*** Müll. Arg.

Litoral: Corisco Bay, *Mann 1841* (K, original material).

Previously recorded from Río Muni (Thiselton-Dyer 1913: 961, Pax & Hoffmann 1914: 59, Govaerts 2012). This West Central African species has been reported from the Central African Republic, Congo-Brazzaville and Gabon (Sosef *et al.* 2006: 172, Govaerts 2012).

17. *Ricinus* L.

17.1. ***Ricinus communis*** L.

Bioko: *Fernández Casas & Carvalho 12216* (MA). Bioko Norte: Malabo, inmediaciones de la embajada española, *Gómez Marín & al. 14* (MA).

Previously recorded from Annobón (Exell 1963: 113, 1973: 354). This species is native to NE Africa and it has been cultivated and naturalized throughout the tropics, subtropics and warm temperate regions mainly as ornamental, but also for medicinal, industrial and domestic uses of the seed oil (Radcliffe-Smith 1987: 323, 2001: 202).

18. *Tragia* L.

1. Female pedicel extending to 5 cm in fruit; female calyx lobes entire ..... *Tragia volubilis*
- Female pedicel not extending beyond 0.5 cm in fruit; female calyx lobes pinnatifid ..... 2.
2. Calyx lobes of female flowers with a foliaceous undivided apex ..... *Tragia* aff. *tenuifolia*
- Calyx lobes of female flowers without a foliaceous apex, deeply pectinate ..... 3.
3. Leaves subentire ..... *Tragia preussi*
- Leaves sharply serrate ..... *Tragia benthamii*

18.1. *Tragia benthamii* Baker
Tragia cordifolia Benth.

Bioko Norte: Malabo–Bahía de Venus, *Carvalho 4142* (MA); Clarence Bei [Malabo], *Vogel 26* (K, original material). Centro Sur: Parc Nacional de Monte Alén, *Ngomo 263* (BATA). Litoral: Bata–Mongo–zona forestal de Alosa, estrada km 57–58, entre Mongo e Serraçao de Alosa, *Carvalho 5420* (BATA, MA).

Previously recorded from Bioko (Thiselton-Dyer 1913: 985, Mildbraed 1922: 186, Hutchinson & Dalziel 1928: 308, 309, Guinea 1946: 313, Keay 1958: 412, Exell 1973: 354, Govaerts 2012) and Río Muni (Thiselton-Dyer 1913: 985, Guinea 1946: 313, sub *T. cordifolia*, Govaerts 2012). This tropical and South African species has been reported from Angola, Benin, Botswana, Cameroon, the Central African Republic, Congo-Brazzaville, D.R. Congo, Ethiopia, Gabon, Ghana, Ivory Coast, Malawi, Mozambique, Nigeria, Sudan, Togo, Uganda, Zambia and Zimbabwe (Keay 1958: 412, Radcliffe-Smith 1987: 303, Cable & Cheek 1998: 54, Cheek *et al.* 2000: 133, 2004: 294, Akoègninou *et al.* 2006: 580, Sosef *et al.* 2006: 174, Figueiredo & Smith 2008: 74, Govaerts 2012).

(18.2.) *Tragia preussii* Pax
Tragia winkleri Pax

This species has been reported previously from Río Muni without any precise voucher (Guinea 1946: 155, sub *T. winkleri*). We have not found any herbarium material of *T. preussii* from Equatorial Guinea in BM, K, MA, LISC, LISU or BATA. This species from West and Central tropical African has been reported from neighbouring Cameroon and Gabon and also from Benin, the Central African Republic, D.R. Congo, Nigeria and Togo (Keay 1958: 412, Cable & Cheek 1998: 54, Cheek *et al.* 2004: 294, Akoègninou *et al.* 2006: 581, Sosef *et al.* 2006: 174, Govaerts 2012). The distribution range of this species suggests it may occur in Equatorial Guinea.

18.3. *Tragia* aff. *tenuifolia* Benth.

Bioko Norte: Malabo–Aeroporto, estrada km 6, *Carvalho 2510* (MA); entre Malabo y el aeropuerto, junto al km 6 de la autopista, *Fernández Casas et al. 10254* (MA). Bioko Sur: Malabo–Luba–Riaba, estrada kms 62–63, *Carvalho 4121* (MA); entre el cruce de Moka y Riaba, km 1–2, *Fernández Casas 11576* (K, MA); Servicio Agronómico de Musola, *Guinea 1426* (MA), *Guinea 1426bis* (MA). Litoral: Bata–Bome, longo do Rio Boara, *Carvalho 4867* (BATA, MA).

The specimens identified as *T.* aff. *tenuifolia* are characterized by calyx lobes with 2–3 lobules on each side. However, this material seems to be somewhat heterogeneous and can be arranged in two different groups: a) *Fernández Casas 10254* and *Carvalho 2510* have the foliaceous apical portion of the calyx wider, and leaves, stems and inflorescences distinctly pubescent, covered with long yellowish hairs; b) *Carvalho 4121*, *Guinea 1426, Guinea 1426bis*, *Carvalho 4867* and *Fernández Casas 11576* have a narrower calyx apex and sparse hairs on leaves, inflorescences and stems.

Tragia tenuifolia and closer species form a group of unsatisfactorily delimited species. According to Keay (1958: 411) *T. tenuifolia* has 4–6 calyx lobules on each side of the calyx lobes, while Radcliffe-Smith (1987: 295) attributed 3–4 lobules to this species. Both authors mentioned that the leaves are mainly pubescent on the nerves. Additionally, in West tropical Africa two other species are usually recorded: *T. laminularis* Müll. Arg. (described from Gabon) and *T. mildbraediana* Pax & K. Hoffm. (described from Cameroon). Keay (1958: 411) pointed out that *T. laminularis* has an entire foliaceous apical portion of the calyx with or without one lobule on each side. Pax & Hoffmann (1919: 99) indicated that this species has densely setose petioles and peduncles. According to Pax & Hoffmann (1919: 96), *T. mildbraediana* is an intermediate species between *T. tenuifolia* and *T. laminularis*, usually with 1–2 lobules on each side of calyx. Our specimens from Equatorial Guinea do not fit exactly with any of these species. In the meantime, until a modern taxonomic revision is available, we identify the previously mentioned samples provisionally as *T.* aff. *tenuifolia*.

Only one of those species, *T. tenuifolia*, has been previously recorded from Equatorial Guinea (Govaerts 2012).

18.4. *Tragia volubilis* L.

Bioko: *Mann 75* (K). Bioko Norte: Malabo–Rebola, estrada km 4–5, *Carvalho 3416* (MA). Centro Sur: Niefang, explotación forestal de Matroguisa, *Pérez Viso 2289* (MA).

Previously recorded from Bioko (Thiselton-Dyer 1913: 970, Mildbraed 1922: 186, Hutchinson & Dalziel 1928: 308, Guinea 1946: 313, Keay 1958: 411, Exell 1973: 354, Govaerts 2012) and Río Muni (Guinea 1946: 313). This species is considered to be introduced into tropical Africa from America (Radcliffe-Smith 1987: 295). It has also been reported from Angola, Cameroon, the Central African Republic, Congo-Brazzaville, D.R. Congo, Gabon, Ghana, Ivory Coast, Nigeria, Sierra Leone, Sudan, Togo and Uganda (Keay 1958: 411, Radcliffe-Smith 1987: 295, Sosef *et al.* 2006: 174, Figueiredo & Smith 2008: 75, Cheek *et al.* 2011: 152, Govaerts 2012).

DOUBTFUL RECORDS

Erythrococca polyandra (Pax & K. Hoffm.) Prain

Previously recorded from Río Muni (Pax & Hoffmann 1914: 96). We have not found any herbarium material of *E. polyandra* from Equatorial Guinea in BATA, BM, K, LISU or MA. Pax & Hoffmann (1914: 96) recorded the specimen *Soyaux 29* from the "Chinchoxo". We have not found any locality in Equatorial Guinea with a similar name. On the other hand, it has not been documented that Soyaux collected in this country. Although this collector worked in Gabon at the end of the nineteenth century (Index of Botanists 2011), no locality with this name has been found in this country either. This species has only been reported from Mozambique, Tanzania and Zimbabwe (Radcliffe-Smith 1987: 277). The distribution range of the species makes its presence in Equatorial Guinea unlikely.

Conclusion

The total number of taxa listed here for Equatorial Guinea is 49, two of them introduced. The list of species is based on herbarium material, with the exception of one report from the literature; the distribution range of this species suggests that it may occur in Equatorial Guinea. Eight species are reported for the first time for the country. The reports are mainly from Río Muni, one of the least explored territories of the country and probably of West and Central Africa (Aedo *et al.* 2001). Comparing with Govaerts (2012), our work increases the catalogue of Acalyphoideae for Equatorial Guinea by 40 %. Although we show an increase in species of Acalyphoideae, many plants already reported from Cameroon and Gabon have still not been found in Equatorial Guinea (Table 1), reflecting the need for further exploration, especially of less well-known areas, such as the south-eastern region of Río Muni.

Rainforests of West Africa are estimated to contain about 50% of the total number of African plants species (Sayer *et al.* 1992), and this is reflected in the higher values of diversity, endemism and floristic richness obtained in different floristic studies in the Gulf of Guinea area (Cable & Cheek 1998, Cheek *et al.* 2000, 2004, 2011, Fero *et al.* 2003, Parmentier & Geerinck 2003, Cabezas *et al.* 2004, 2005, 2009, Estrella *et al.* 2005, 2006, 2010, Akoègninou *et al.* 2006, Sosef *et al.* 2006, Figueiredo *et al.* 2011, Morales 2011). Our results support previous data in indicating that Equatorial Guinea, despite its small area, is one of the most undisturbed primary rainforest regions of continental Africa (Hamilton 1994).

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Appendix

INDEX TO SCIENTIFIC NAMES

Accepted names are in boldface. Synonyms are in *italics*. Doubtful records are in normal type.

Acalypha L.
annobonae Pax & K. Hoffm. **6**
brachystachya Hornem. **6**
hispida Burm.f. **6**
manniana Müll. Arg. **6**
micrantha Benth. **16**
ornata Hochst. ex A. Rich. **6**
paniculata Miq. **6**
racemosa Wall. ex Baillon **6**
Adelia L.
anomala Juss. ex Poir. **11**
Agrostistachys Dalzell
africana Müll. Arg. **17**
Alchornea Sw.
caloneura Pax **10**
cordata Benth. **7**
cordifolia (Schumach. & Thonn.) Müll. Arg. **7**
floribunda Müll. Arg. **8**
hirtella Benth. **8**
f. *comoensis* (Beille) Pax & K. Hoffm. **8**
Argomuellera Pax
lancifolia (Pax) Pax **8**
macrophylla Pax **9**
Athroandra Benth.
atrovirens (Pax) Pax & K. Hoffm.
var. *flaccida* (Pax) Pax & K. Hoffm. **11**
mannii (Hook.f.) Pax & K. Hoffm. **12**
pallidifolia Pax & K. Hoffm. **12**
rivularis (Müll. Arg.) Pax & K. Hoffm. **12**
welwitschiana (Müll. Arg.) Pax & K. Hoffm. **12**
Claoxylon A. Juss.
atrovirens Pax **11**
dewevrei Pax **12**
hexandrum Müll. Arg. **10**
mannii Hook.f. **12**
pedicellare Müll. Arg. **10**
preussii Pax **10**
rivulare Müll. Arg. **12**
welwitschianum Müll. Arg. **12**
Cleidion Blume
gabonicum Baill. **9**
Croton L.
oppositifolius Geiseler **15**
Dalechampia L.
ipomoeifolia Benth. **9**
Discoclaoxylon L.
hexandrum (Müll. Arg.) Pax & K. Hoffm. **10**
occidentale (Müll. Arg.) Pax & K. Hoffm.
var. *pubescens* Pax & K. Hoffm. **10**
pedicellare (Müll. Arg.) Pax & K. Hoffm. **10**
pubescens (Pax & K. Hoffm.) Exell **10**
Discoglypremna Prain
caloneura (Pax) Prain **10**
var. *membranacea* Pax **10**
Erythrococca Benth.
aculeata Benth. **11**
anomala (Juss. ex Poir.) Prain **11**
atrovirens (Pax) Prain **11**
var. *flaccida* (Pax) Radcl.-Sm. **11**
dewevrei (Pax) Prain **12**
mannii (Hook.f.) Prain **12**
oleracea (Pax) Prain **11**
pallidifolia (Pax & K. Hoffm.) Keay **12**
polyandra (Pax & K. Hoffm.) Prain **20**
rivularis (Müll. Arg.) Prain **12**
welwitschiana (Müll. Arg.) Prain **12**
Macaranga Thouars
barteri Müll. Arg. **13**
gabunica Prain **13**
hurifolia Beille **13**
klaineana Pierre ex Prain **13**
magnistipulosa Pax **14**
monandra Müll. Arg. **14**
occidentalis (Müll. Arg.) Müll. Arg. **14**
saccifera Pax **14**
spinosa Müll. Arg. **15**
staudtii Pax **15**
Mallotus Lour.
oppositifolius (Geiseler) Müll. Arg. **15**
f. *dentatus* (Schumach. & Thonn.) Pax & K. Hoffm. **15**
subulatus Müll. Arg. **15**
Mappa A. Juss.
occidentalis Müll. Arg. **14**
Mareya Baill.
brevipes Pax **16**
longifolia Pax **16**
micrantha (Benth.) Müll. Arg. **16**
subsp. *micrantha* **16**
spicata Baill. **16**
var. *leonensis* (Benth.) Pax & K. Hoffm. **16**
var. *micrantha* (Benth.) Pax & K. Hoffm. **16**
Mareyopsis Pax & K. Hoffm.
longifolia (Pax) Pax & K. Hoffm. **16**
Micrococca Benth.
mercurialis (L.) Benth. **17**
Neopycnocoma Pax
lancifolia Pax **8**
Plukenetia L.
conophora Müll. Arg. **17**
Pseudagrostistachys Pax & K. Hoffm.
africana (Müll. Arg.) Pax & K. Hoffm.
subsp. **africana** **17**
Pycnocoma Benth.
brachystachya Pax **18**
macrophylla Benth. **18**
minor Müll. Arg. **18**
Ricinus L.
communis L. **18**
Schousboea Willd.
cordifolia Schumach. & Thonn. **7**
Tetracarpidium Pax
conophorum (Müll. Arg.) Hutch. & Dalziel **17**
Tragia L.
aff. tenuifolia Benth. **19**
benthamii Baker **19**
cordifolia Benth. **19**
mercurialis L. **17**
preussii Pax **19**
volubilis L. **20**
winkleri Pax **19**
Wetriaria Pax
lancifolia (Pax) Pax **8**
macrophylla (Pax) Pax **9**

LIST OF COLLECTIONS

The species is indicated by a number in parenthesis corresponding to the number in the checklist.
Aedo 18068 (7.1). *Aedo, Pérez Viso & Velayos 5407* (2.1). *Barberá 62* (9.6), *76* (11.1), *102* (9.1), *154* (11.1), *156* (2.2), *262* (2.1). *Barter s.n.* (1.6), *s.n.* (2.1). *Boughey 27* (9.7), *65* (1.4). *Cabezas 120* (2.2), *990* (16.1), *1079* (9.7), *1089* (8.5), *1246* (9.6), *1277* (2.1), *1285* (2.1), *1293* (13.1), *1298* (9.9), *1368* (8.7). *Carvalho 2116* (2.1), *2119* (10.2), *2164* (2.2), *2176* (11.2), *2226* (7.1), *2280* (9.9), *2314* (8.5), *2381* (10.2), *2436* (10.2), *2459* (10.1), *2469* (8.1), *2509* (10.2), *2510* (18.3), *2525* (1.6), *2567* (5.1), *2715* (8.1), *2750* (14.1), *2758* (1.4), *2788* (2.1), *2854* (7.1), *2856* (7.1), *2858* (2.2), *2898* (10.1), *2926* (10.1), *2928* (11.2), *2935* (10.2), *3241* (1.6), *3416* (18.4), *3457* (11.2), *3461* (9.7), *3505* (9.9), *3515* (14.1), *3743* (6.1), *3752* (6.1), *3816* (6.1), *3973* (2.1), *4017* (7.1), *4085* (14.1), *4121* (18.3), *4133* (14.1), *4142* (18.1), *4197* (8.5), *4207* (8.5), *4233* (6.1), *4328* (1.3), *4366* (4.1), *4393* (4.1), *4757* (14.1), *4835* (5.1), *4867* (18.3), *4923* (13.1), *4975* (9.4), *5153* (14.1), *5184* (13.1), *5189* (2.1), *5235* (5.1), *5409* (9.4), *5420* (18.1), *5540* (11.1), *5692* (12.1), *6092* (12.1), *6123* (12.1), *6407* (14.1), *6510* (8.2). *Eneme 246* (2.1), *540* (1.3). *Castelo, Cabeza & Juste s.n.* (2.1). *Castroviejo 9188* (9.7), *9199* (1.5). *Esono & Ndong 378* (9.6). *Exell 850* (9.7). *Fernández Casas 10066* (2.2), *10129* (9.9), *10135* (9.6), *10237* (10.2), *10254* (18.3), *10256* (10.2), *10377* (8.5), *10387* (1.4), *10398* (1.4), *10434* (1.4), *11246* (10.2), *11260* (10.2), *11275* (14.1), *11281* (2.2), *11298* (2.1), *11317* (2.1), *11461* (2.2), *11462* (1.4), *11554* (11.2), *11576* (18.3), *11595* (9.6), *11682* (14.1), *11746* (1.4), *11754* (8.5), *11867* (6.1), *11870* (2.2), *11872* (6.1), *11907* (2.2), *11912* (1.4), *11924* (8.5), *12017* (2.1), *12063* (14.1), *12137* (9.7), *12170* (1.4), *12216* (17.1). *Fero 68* (2.1), *88* (2.1), *114* (2.1), *161* (9.9), *229* (7.1), *262* (7.1), *293* (9.6), *303* (5.1). *Galán & Barberá 4596PG* (1.2), *4666PG* (2.2), *4738PG* (1.2). *Gómez Marín 14* (17.1), *67* (2.1). *Guinea s.n.* (9.6), *124* (9.3), *125* (9.3), *126* (9.3), *215* (2.1), *276–553* (2.1), *575–164* (2.1), *583* (2.1), *1104* (1.4), *1106* (1.4), *1211* (11.2), *1212* (11.2), *1213* (9.6), *1426* (18.3), *1426bis* (18.3), *1611* (1.4), *1613* (1.4), *1614* (1.4), *1720* (1.4), *1721* (1.4), *1805* (8.5), *2430* (6.1), *2431* (6.1). *Guinea & Lope del Val 208* (9.7), *218* (9.6), *219* (9.6). *Lejoly & Elad 98/035* (9.8). *Lejoly & van Asbroeck 7* (9.10). *Lisowski M-51* (2.1), *M-650* (5.1), *M-827* (9.2), *M-1133* (9.6), *M-1377* (5.1). *Lope del Val s.n.* (1.3), *s.n.* (2.1), *s.n.* (2.2), *s.n.* (9.6), *s.n.* (9.6), *s.n.* (9.7). *Luke 11747* (9.7), *11760* (6.1), *11835* (9.6), *11866* (8.5), *11867* (8.5), *13278* (15.1). *Luke & Fermin 12092* (16.1). *Mann s.n.* (6.2), *75* (18.4), *81* (2.1), *186* (6.1), *235* (11.2), *260* (10.2), *209* (11.2), *303* (9.7), *306* (2.2), *435* (11.2), *582* (15.1), *633* (8.4), *1160* (9.9), *1785* (8.6), *1801* (2.2), *1841* (16.2). *Melville 607* (9.7). *Mildbraed 6492* (6.3), *6538* (1.1), *6555* (6.3). *Ngomo 134* (2.1), *234* (15.1), *263* (18.1). *Obama 777* (2.2). *Pérez Viso 61* (2.2), *107* (2.1), *343bis* (2.1), *390* (9.6), *584* (2.3), *836* (2.1), *853* (2.3), *1176* (2.2), *1197* (3.2), *1215* (8.3), *1310* (2.3), *1457* (2.1), *1617* (9.6), *1745* (2.3), *1761* (2.3), *1841* (2.1), *2091* (2.3), *2140* (2.1), *2141* (2.1), *2289* (18.4), *2290* (2.1), *2325* (2.2), *2347* (11.1), *2349* (11.1), *2379* (2.2), *2405* (2.2), *2753bis* (2.2), *2619* (2.2), *2666* (8.2), *2682* (2.3), *2692* (8.2), *2999* (2.2), *3101* (11.1), *3170* (2.2), *3189* (8.2), *3201* (9.6), *3335* (9.6), *3411* (2.2), *3451* (2.1), *3464* (9.6), *3681* (2.2), *3749* (2.1), *4217* (3.1). *Tessmann 9* (9.1), *97* (7.1), *167* (2.1), *249* (9.5), *296* (8.7), *555* (8.7), *359* (3.1), *563* (3.2), *600* (9.6), *616* (10.1), *624* (3.2), *723* (11.1). *Velayos 9286* (2.2), *9960* (2.1), *9968* (2.3), *11648* (6.3), *11690* (6.3). *Vogel 18* (16.1), *26* (18.1), *73* (2.1), *194* (10.2). *Wrigley 288* (7.1), *510* (1.4), *621* (8.5), *649* (2.2). *Wrigley & Melville 55* (1.1), *96* (6.3).