

Nomenclatural updates of *Aristolochia* subgenus *Pararistolochia* (Aristolochiaceae)

Katja Buchwalder^A, Marie-Stéphanie Samain^B, Garry Sankowsky^{C,D}, Christoph Neinhuis^A and Stefan Wanke^{A,E}

^AInstitut für Botanik, Technische Universität Dresden, Zellescher Weg 20b, D-01062 Dresden, Germany.

^BInstituto de Ecología, A.C., Centro Regional del Bajío, Avenida Lázaro Cárdenas 253, 61600 Pátzcuaro, Michoacán, Mexico.

^CAustralian Tropical Herbarium, James Cook University, Cairns Campus, PO Box 6811, Cairns, Qld 4870, Australia.

^DPO Box 210, Tolga, Qld 4882, Australia.

^ECorresponding author. Email: stefan.wanke@tu-dresden.de

Abstract. *Aristolochia* subgenus *Pararistolochia* is revised and 35 species, distributed in tropical Africa and Australasia, are recognised. Fourteen new combinations and two new names are presented, resulting from the transfer of all taxa of *Pararistolochia* to *Aristolochia*. Additionally, a neotype is designated for *Aristolochia preussii*.

Additional keywords: host plant, new combination, nomenclature, *Ornithoptera*, taxonomy.

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Introduction

The genus *Aristolochia* L. is subdivided into three monophyletic groups congruent with the following subgenera: *Siphisia* Raf., *Pararistolochia* (Hutch. & Dalziel) O.C.Schmidt, and *Aristolochia* (González and Stevenson 2002; Wanke *et al.* 2006). Hutchinson and Dalziel (1927) first described the genus *Pararistolochia*, exclusively containing African species. Both morphological (Huber 1960, 1985; González and Stevenson 2002) and molecular phylogenetic studies (Ohi-Toma *et al.* 2006; Bliss *et al.* 2013) have shown that *Pararistolochia* occurs not only in Africa, but that species from Australasia have to be included as well. Aristolochiaceae are important host plants for various genera of the family Papilionidae (Lepidoptera) (Simonsen *et al.* 2010). In addition, Condamine *et al.* (2012) reconstructed Aristolochiaceae as the ancestral host for Papilionidae, pointing to the importance of the group for studying co-evolution, especially the plant–butterfly interaction. Caterpillars of a dozen Papilionidae genera (*Allanacstria*, *Archon*, *Battus*, *Cressida*, *Euryades*, *Losaria*, *Luehdorfia*, *Ornithoptera*, *Pachliopta*, *Parides*, *Pharmacophagus*, *Troides*) feed on Aristolochiaceae and the majority of the tribe *Troidini* on the genus *Aristolochia* (Parsons 1996a, 1996b; Simonsen *et al.* 2010). The most prominent species known to feed on species of subg. *Pararistolochia* are the world's largest butterflies, *Ornithoptera alexandrae* and *O. goliath* (Straatman and Inoue 1984; Jebb 1993; Parsons 1996a). Each of the 10–13 *Ornithoptera* taxa is popular among collectors for their iridescent bright colours and their size (Parsons 1992). Because of excessive collecting and habitat loss, birdwing

butterflies are listed in CITES (mostly appendix II) and on the IUCN Red List (most listed as *Vulnerable* or *Endangered*). As a consequence, the Commonwealth Scientific and Industrial Research Organisation (CSIRO) and many Australian NGOs have taken initiatives to involve the public in conservation efforts, for example, by planting native butterfly host plants such as *Aristolochia praevenosa* F.Muell. and eliminating introduced species such as *A. elegans* Mast., *A. labiata* Willd., or *A. odoratissima* L. However, Papua New Guinea decided to follow a different strategy. The government declared the butterflies a natural resource and established the Insect Farming & Trading Agency to develop this resource sustainably (Hutton 1985).

Nevertheless, all protection measures require correct identification and accurate species names. This is especially true for the host plants that have received considerably less attention than the butterflies. Indeed, Jebb (1993) highlighted several incorrect identifications within *Aristolochia*, which have entered the literature and caused confusion about host plants. Therefore, it is often unclear on which particular host plant individual birdwing butterflies feed, hampering conservation measures of these prominent flagship taxa. As a consequence of co-evolution, the distribution of the butterflies is strongly linked to the distribution of the host plants (Ehrlich and Raven 1964). In parallel to a full taxonomic revision based on natural relationships within the subgenus *Pararistolochia*, a molecular-based phylogeny study is being performed, for which correct names are also essential. Hence, an update of nomenclature within this group is urgently required.

All species belonging to the subg. *Pararistolochia* are treated here, providing new combinations and new names. The taxonomic affiliation according to different authors has been critically revised and morphological characters used by these authors for their respective classifications are discussed, serving as basis for a molecular phylogeny of subg. *Pararistolochia* and its relationships within Aristolochiaceae.

Taxonomic history

Nomenclature of *Aristolochia* subg. *Pararistolochia* is rather intricate (Table 1). Hooker (1865) was the first to mention that his newly described African species *Aristolochia goldieana* Hook.f., *A. triactina* Hook.f. and *A. mannii* Hook.f. were clearly distinguishable from other previously described *Aristolochia* species by the three-lobed perianth and the structure of the gynostemium, with 12 lobes in *A. goldieana* and 10 in *A. triactina* and *A. mannii*, whereas five or six were characteristic for other species. Masters (1879) suggested that his newly described *A. promissa* Mast. had close affinities to the species described by Hooker (1865). Shortly afterwards, Bentham and Hooker (1880) described sect. *Polyanthera* Benth. & Hook.f. in which they included the species described by Hooker (1865) and Masters (1879). Six decades after Hooker, Hutchinson and Dalziel (1927, 1928) placed the African *Aristolochia* species possessing a three-lobed perianth and a cucumber-shaped indehiscent fruit in the new genus *Pararistolochia* Hutch. & Dalziel and mentioned that this genus ‘is evidently an ancestral type’ (Hutchinson and Dalziel 1928, p. 22). Schmidt (1935) followed Bentham and Hooker (1880) in recognising the group at infrageneric rank, but instead of a section, a subgeneric rank was assigned, and he adopted the name *Pararistolochia* from Hutchinson and Dalziel (1927). In contrast to Schmidt (1935), Keay (1952), Poncy (1978) and Huber (1960, 1985, 1993) re-established the genus on the basis of the following morphological characters: growth as tropical liana, flattened stem, cauliflorous, indehiscent fruit (cleistocarp), seed

anatomy, as well as the occurrence in dense humid habitats. In contrast, Ma (1992) again adopted subgeneric rank, whereas Parsons (1996a) described several species in the genus *Pararistolochia*. Furthermore, Ma (1992) created three new sections within the subgenus, separating these mainly on the basis of the gynostemium segment number.

Huber (1960) was the first to associate the Australasian *Pararistolochia* species with those of Africa. He pointed out that the New Guinean *A. momandul* K.Schum. also develops a cleistocarp fruit, as do the African species. Jebb (1993) described new *Aristolochia* species from New Guinea and assigned them to the *Aristolochia momandul* group. Parsons (1996a) also recognised the close affinities of the African and Australasian species and pointed out the morphological similarities between the African *Pararistolochia triactina* and the New Guinean *P. meridionaliana* Mich. J. Parsons in bud, flower, fruit and seed. When González and Stevenson (2002) published the first cladistic analysis of the Aristolochioideae on the basis of morphology, they followed the classification of Schmidt (1935), with a subgeneric rank for the monophyletic *Pararistolochia*. Later, the monophyly of *Pararistolochia* was confirmed by molecular-based phylogenetic analyses (Neinhuis *et al.* 2005, Wanke *et al.* 2006, 2007). Ohi-Toma *et al.* (2006) and Bliss *et al.* (2013) showed that the Australasian and African species belonging to *Pararistolochia* are sister groups. On the basis of morphological synapomorphies, both subgeneric and generic rank would be acceptable for *Pararistolochia*. However, recognising *Pararistolochia* as genus would cause paraphyly of *Aristolochia* in its current circumscription (Wanke *et al.* 2006) and would thus require additional taxonomic and nomenclatural changes within the subfamily Aristolochioideae, especially the acceptance of *Siphisia* as an additional genus. As a result, we suggest transferring all *Pararistolochia* species to *Aristolochia*, maintaining *Aristolochia* in its broadest sense because this genus is easily recognisable.

Table 1. Historical and current classifications of *Aristolochia* subgenus *Pararistolochia*

Author and year	Genus	Subgenus	Section	Note
von Mueller 1860–1861, <i>A. praevenosa</i>	<i>Aristolochia</i>			
Bentham and Hooker 1880	<i>Aristolochia</i>		<i>Polyanthera</i>	
Hutchinson and Dalziel 1927	<i>Pararistolochia</i>			
Schmidt 1935	<i>Aristolochia</i>	<i>Pararistolochia</i>		
Poncy 1978	<i>Pararistolochia</i>			
Huber 1960	<i>Pararistolochia</i>			<i>A. momandul</i> shows indehiscent fruits like <i>Pararistolochia</i>
Ma 1992	<i>Aristolochia</i>	<i>Pararistolochia</i>	1. <i>Pararistolochioides</i> 2. <i>Pararistolochia</i> 3. <i>Aristolochioides</i>	
Jebb 1993	<i>Aristolochia</i>			Australasian ‘ <i>momandul</i> group’ should be included in genus <i>Pararistolochia</i>
Parsons 1996a	<i>Pararistolochia</i>			
González and Stevenson 2002	<i>Aristolochia</i>	<i>Pararistolochia</i>		
Wanke <i>et al.</i> 2006	<i>Aristolochia</i>	<i>Pararistolochia</i>		Suggested on the basis of molecular phylogeny
Leal and Nguema 2011	<i>Pararistolochia</i>			

Taxonomic synopsis

We reviewed the literature about the species belonging to the subg. *Pararistolochia* and examined and revised ~500 herbarium specimens from 19 herbaria (A, B, BO, BRI, BRLU, CNS, DR, G, K, KEP, L, MO, NHM, NY, PRE, S, SING, WAG, WRSL). Approximately 35% of the known species are being cultivated in the Botanical Garden Dresden and phenotypic variability was observed during multiple field trips performed by the authors. However, it would be premature to provide a full revision before molecular phylogenetic data have shown the monophyly of individual species.

Aristolochia* subgenus *Pararistolochia (Hutch. & Dalziel)
O.C.Schmidt in H.G.A.Engler (Ed.), *Nat. Pflanzenfam.*
2nd edn, 16b: 241 1935

Pararistolochia Hutch. & Dalziel, Fl. W. Trop. Afr. 1 : 75 (1927).

Lectotype: *Pararistolochia triactina* Hook.f. (designated by Parsons 1996a).

Although the genus *Pararistolochia* was validly published by Hutchinson and Dalziel in 1927, a full description was not provided until 1928 (Hutchinson and Dalziel 1928).

This taxon is mainly characterised by having a flattened stem, an actinomorphic, three-lobed perianth, and a longitudinally more or less ribbed berry with a fleshy endocarp (Hutchinson and Dalziel 1927, 1928; Schmidt 1935; Huber 1985). The majority of the species are cauliflorous, except the Australasian species *A. deltantha*, *A. ornithopterae*, *A. laheyana*, *A. sparusifolia*, *A. praevenosa*, *A. momandul* and the African *A. goldieana*, which also flower on young stems. In comparison to species of subg. *Siphisia* and subg. *Aristolochia* that have six anthers, except for *Aristolochia* subsect. *Pentandrae* Duch. displaying five anthers (Schmidt 1935), subg. *Pararistolochia* shows a minimum of six anthers in the Australian species and up to 24

in the African *A. goldieana*. Also the number of stigmatic lobes varies, in at least some species, from 6 to 12, even within a single individual (González and Stevenson 2000). An additional morphological synapomorphy is the presence of a massive exine-ridge formation on the pollen grain (González and Stevenson 2002), although this character has not been confirmed for all species. All species are lianas or slender vines distributed in tropical rainforest, with the exception of *A. ornithopterae*, which grows in 'woodland with a grassy or heathy understorey' (Ross and Halford 2007).

The present treatment includes all 35 species of *Aristolochia* subg. *Pararistolochia*, with 14 African and 21 Australasian species (Fig. 1).

Aristolochia alexandriana (Mich.J.Parsons) Buchwalder & Wanke, *comb. nov.*

Pararistolochia alexandriana Mich.J.Parsons, Bot. J. Linn. Soc. 120(3): 218 (1996).

Type: Papua New Guinea: Northern Province, Ahora Village, north of Popondetta town, supporting trees forming secondary forest up to 10 m tall, ~100 m, 14 Mar. 1988, *M. Parsons 1* (holo: LAE (69994)).

Distribution: Papua New Guinea (Northern Province, Oro Province).

Aristolochia australopithecus (Mich.J.Parsons) Buchwalder & Wanke, *comb. nov.*

Pararistolochia australopithecus Mich.J.Parsons, Bot. J. Linn. Soc. 120(3): 227 (1996).

Type: Australia: Queensland, State Forest Reserve 310, Rainforest, 780 m, 8 Nov. 1977, 17°13'S 145°42'E, *B. Gray 784* (holo: QRS (017289)).

Distribution: Australia (Queensland, Wet Tropics).

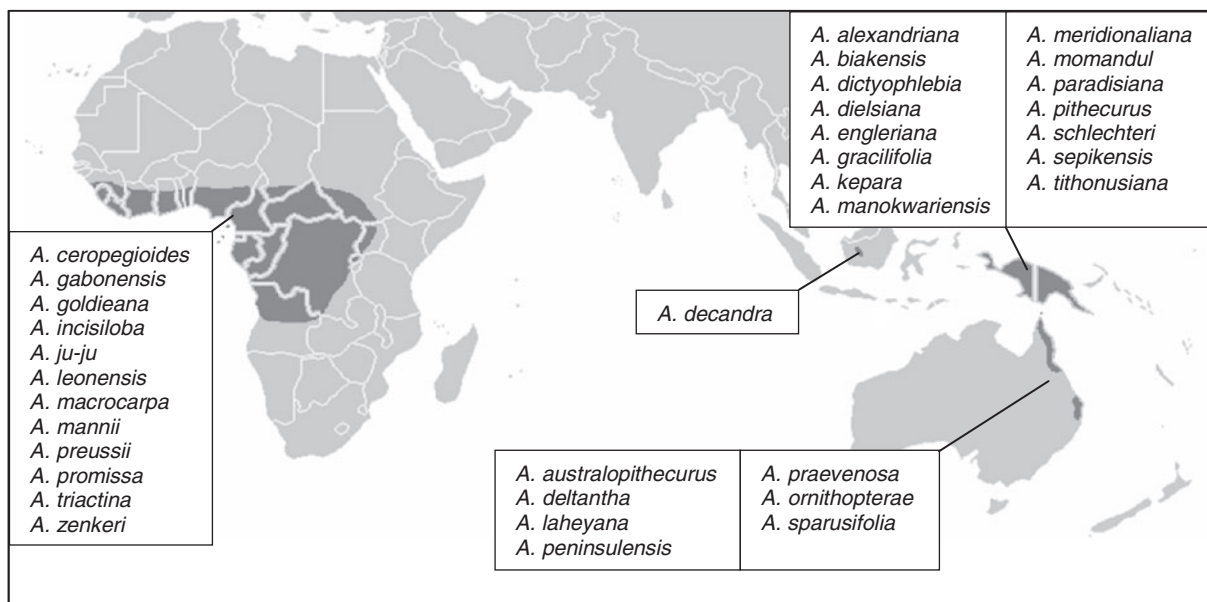


Fig. 1. Map showing the distribution of *Aristolochia* subgenus *Pararistolochia*. The two main centres of distribution are central-western Africa as well as New Guinea and eastern Australia. A single species is reported from Borneo.

Aristolochia biakensis (Mich.J.Parsons) Buchwalder & Wanke, *comb. nov.*

Pararistolochia biakensis Mich.J.Parsons, *Bot. J. Linn. Soc.* 120(3): 232 (1996).

Type: Indonesia: New Guinea, Jappen-Biak Island, Saroei bij Seroei, 27 Jul. 1939, *Aet & Injan 173* (Exp. Ir L.J. van Dijk) (holo: BO (BO1330–2332)).

Distribution: Indonesia (Yapen and Biak Island).

Aristolochia ceropegoides S.Moore, *J. Bot.* 58: 269 (1920)

Pararistolochia ceropegoides (S.Moore) Hutch. & Dalziel, *Bull. Misc. Inform. Kew.* 1928: 24 (1928).

Type: Cameroon: Bilye River, 1919, *G.L. Bates 1235* (holo: BM (BM000528389); iso: MO).

Distribution: Cameroon, Gabon.

Aristolochia decandra Ding Hou, *Blumea* 28: 343 (1983)

Pararistolochia decandra (Ding Hou) Mich.J.Parsons, *Bot. J. Linn. Soc.* 120(3): 206 (1996).

Type: Indonesia: western Borneo, Kalimantan, *H. Winkler 1256* (holo: L (L0360036 !)).

Distribution: Indonesia (Borneo, Kalimantan).

Aristolochia deltantha F.Muell., *Fragm.* 6 (46): 179 (1868)

Aristolochia deltantha F.Muell. var. *deltantha*, *Queensland Agric. J.* 28: 199 (1912);

Pararistolochia deltantha (F. Muell.) Mich.J.Parsons, *Bot. J. Linn. Soc.* 120(3): 206 (1996).

Type: Australia: Queensland, Rockingham's Bay, *Dallachy s. n.* (lecto (designated by Parsons (1996a)): MEL (MEL1553306)).

Distribution: Australia (Queensland, Cape York Peninsula, Wet Tropics).

Aristolochia dictyophlebia Merr. & L.M.Perry, *J. Arnold Arbor.* 29(2): 152 (1948)

Pararistolochia dictyophlebia (Merr. & L.M.Perry) Mich.J.Parsons, *Bot. J. Linn. Soc.* 120(3): 206 (1996).

Type: Papua New Guinea: Ogeramnang, forest hill, 1650 m, Jan. 1937, *Clemens 4901* (holo: A; iso: BRI (AQ0216259 !)).

Distribution: Papua New Guinea (Morobe Province).

Aristolochia dielsiana O.C.Schmidt, *Bot. Jahrb. Syst.* 58: 490 (1923)

Pararistolochia dielsiana (O.C.Schmidt) Mich.J.Parsons, *Bot. J. Linn. Soc.* 120(3): 206 (1996).

Type: Papua New Guinea: East Sepik Province, Etappenberg (Base Mountain), *Ledermann 9169* (holo: B, destroyed?).

Distribution: Papua New Guinea (East Sepik Province).

Aristolochia engleriana O.C.Schmidt, *Repert. Spec. Nov. Regni Veg.* 23: 288 (1927)

Pararistolochia engleriana (O.C.Schmidt) Mich.J.Parsons, *Bot. J. Linn. Soc.* 120(3): 206 (1996); *Aristolochia ledermannii*

O.C.Schmidt, *Bot. Jahrb. Syst.* 58: 489 (1923), *nom. illeg., non Engler* (1912 (1911)).

Type: Papua New Guinea: East Sepik Province, Schraderberg (Schrader Mountain), *Ledermann 12055* (holo: B, destroyed?).

Distribution: Papua New Guinea (East Sepik Province).

Aristolochia gabonensis Buchwalder & Wanke, *nom. nov.*

Pararistolochia fimbriata M.L.Leal & D.Nguema, *Fl. Gabon* 42: 9 (2011).

Type: Mondah forest, 10 km N of Libreville, Gabon, 2009, *D. Nguema et al. 1050* (holo: MO; iso: LBV, WAG) (non *Aristolochia fimbriata* Cham. & Schltdl., *Linnaea* 7: 210 (1832)

Distribution: Gabon.

Etymology: named after the West African country of Gabon, to which the species is endemic.

Aristolochia goldieana Hook. f., *Trans. Linn. Soc. London* 25: 185, t. 14 (1865)

Pararistolochia goldieana (Hook. f.) Hutch. & Dalziel, *Fl. W. Trop. Afr.* 1: 77 (1927).

Type: Nigeria, *Thompson s.n.* (holo: K).

Distribution: Cameroon, Guinea, Nigeria, Sierra Leone.

Aristolochia gracilifolia O.C.Schmidt, *Bot. Jahrb. Syst.* 58: 490 (1923)

Pararistolochia gracilifolia (O. C. Schmidt) Mich. J.Parsons, *Bot. J. Linn. Soc.* 120(3): 206 (1996).

Type: Papua New Guinea: West Sepik, Relsspitze (Rocky Peak), *Ledermann 12458* (holo: B destroyed?).

Distribution: Papua New Guinea (West Sepik Province, Sandaun Province).

Aristolochia incisiloba Jongkind, *Bull. Jard. Bot. Nat. Belg.* 60: 147 (1990)

Pararistolochia incisiloba (Jongkind) Leal & Nguema, *Fl. Gabon* 42: 9 (2011).

Type: Gabon: Chaillu Mts., Songou Mt, between Dibandi and Mouyanama, ~20 km E of Mimongo, 1°37'S, 11°46'E, primary forest, 120-m altitude, Nov. 1983, *A.M. Louis, F.J. Bretelet, J. de Bruijn 975* (holo: WAG (0132108 !); iso: LBV, MO).

Distribution: Gabon.

Aristolochia ju-ju S.Moore, *J. Bot.* 58: 269 (1920)

Pararistolochia ju-ju (S. Moore) Hutch. & Dalziel, *Fl. W. Trop. Afr.* 1: 77 (1927).

Type: Nigeria: Degema Division, 1916, *P.A. Talbot 3766* (holo: BM (BM000528396 !)).

Distribution: Nigeria.

Note: this species is possibly synonymous with *Aristolochia mannii* Hook.f. However, more specimens are needed to draw a final conclusion.

Aristolochia kepara (Mich.J.Parsons) Buchwalder & Wanke, *comb. nov.*

Pararistolochia kepara Mich.J.Parsons, *Bot. J. Linn. Soc.* 120(3): 219 (1996).

Type: Papua New Guinea: Northern Province, near Kamondo Village near Kopkoda, 1 km UTM grid square EL 8714, on supporting tree in primary forest, ~400-m elev., 18 May 1991, *M. Parsons 17* (holo: LAE (69995); iso: K).

Distribution: Papua New Guinea (Northern Province, Oro Province).

Aristolochia laheyana (Mich.J.Parsons) Buchwalder & Wanke, *comb. nov.*

Aristolochia deltantha var. *laheyana* F.M.Bailey *Queensland Agric. J.* 28: 199 (1912); *Pararistolochia laheyana* (F.M.Bailey) Mich. J.Parsons, *Bot. J. Linn. Soc.* 120(3): 206 (1996).

Type: Australia: Queensland, MacPherson Range, *C.T.White s.n.* (holo: BRI (AQ0333077))

Distribution: Australia (Queensland, Border Range to New South Wales).

Aristolochia leonensis Mast., *Bot. J. Linn. Soc.*, 30: 95 (1895)

Pararistolochia leonensis (Mast.) Hutch. & Dalziel, *Fl. W. Trop. Afr.* 1: 77. 1927.

Type: Sierra Leone: env. Kassa, 30 Mar. 1892, *Scott-Elliot 5062* (holo: K)

Distribution: Guinea, Ivory Coast, Liberia, Sierra Leone.

Aristolochia macrocarpa Duch., in A.L.P.P. Candolle, *Prodr.* 15(1): 497. 1864

Pararistolochia macrocarpa (Duch.) Poncy, *Adansonia*, sér. 2 17(3–4): 488 (1978); *Pararistolochia macrocarpa* (Duch) Poncy var. *macrocarpa* Poncy, *Adansonia*, sér. 2 17(3–4): 488 (1978).

Type: in Africa occidentalis tropicae regione dicta Gabon, 1854, *Aubry-Lecomte s.n.* (holo: P (P00487096 !); iso: MPU (MPU018708))

Aristolochia soyauxiana Oliv., *Hook. Ic. Pl.* 15: 8, 1410 (1884); *Pararistolochia soyauxiana* (Oliv.) Hutch. & Dalziel, *Kew. Bull.* 23 (1928); *Pararistolochia macrocarpa* Duch. var. *soyauxiana* (Oliv.) Poncy, *Adansonia*, sér. 2 17(3–4): 488 (1978).

Type: Gaboon river, 27 Nov. 1881, *H. Soyaux 317* (iso: P (P00487098 !)).

Aristolochia staudtii Engl., *Bot. Jahrb. Syst.* 24: 491 (1898); *Pararistolochia staudtii* (Engl.) Hutch. & Dalziel, *Kew. Bull.* 1928: 24 (1928).

Type: Cameroon: Lolodorf, Mar. 1896, *G. Staudt 186* (holo: B destroyed?; iso: P (P00487095 !)).

Aristolochia flos-avis A. Chev., *J. Bot.* (Morot) 22: 129 (1909); *Pararistolochia flos-avis* (A.Chev.) Hutch. & Dalziel, *Fl. W. Trop. Afr.* 1: 77 (1927).

Type: Côte d'Ivoire: 4 Apr. 1909, *A. Chevalier 21145* (holo: P? n.v.).

Aristolochia tessmannii Engl., *Bot. Jahrb. Syst.* 46: 413 (1911).

Type: Spanish Guinea: Bebai im Campogebiet, Dec. 1908; *Tessmann 717*. Cameroon: Bipindi, im Urwald, May 1899,

Zenker 2056; in der Njabilandschaft, Mar. 1900, *Zenker 2261* (syntypes: HBG).

Aristolochia tribrachiata S. Moore, *Cat. Pl. Oban 92* (1913); *Pararistolochia tribrachiata* (S.Moore) Hutch. & Dalziel, *Fl. W. Trop. Afr.* 1: 77 (1927).

Type: Nigeria, Oban, *Talbot 1542* (holo: BM (BM000528392); iso: K (K000350282)).

Distribution: Angola (Province Cabinda), Cameroon, Central African Republic, Democratic Republic of the Congo, Gabon, Ghana, Equatorial Guinea, Ivory Coast, Liberia, Nigeria, Republic of the Congo.

Aristolochia mannii Hook. f., *Trans. Linn. Soc. London* 25: 186 (1865)

Pararistolochia mannii (Hook. f.) Keay, *Kew. Bull.* 1952: 159 (1952).

Type: Nigeria: Old Calabar, Feb. 1883, *Mann 2323* (holo: K (K000350284 !); iso: P (P00482858 !)).

Distribution: Benin, Republic of the Congo, Ivory Coast, Nigeria.

Aristolochia manokwariensis (Mich.J.Parsons) Buchwalder & Wanke, *comb. nov.*

Pararistolochia manokwariensis Mich.J.Parsons, *Bot. J. Linn. Soc.* 120(3): 220 (1996).

Type: Indonesia: Irian Jaya, Wamaré to Mokwam foot track, open primary hill forest, ~500-m elev., 22 Nov. 1992, *M.Parsons 002* (holo: BO; iso: K).

Distribution: Indonesia (Irian Jaya, Manokwari).

Aristolochia meridionaliana (Mich.J.Parsons) Buchwalder & Wanke, *comb. nov.*

Pararistolochia meridionaliana Mich.J.Parsons, *Bot. J. Linn. Soc.* 120(3): 214 (1996).

Type: Papua New Guinea: Central Province, along Hiritano Highway in disturbed forest by the roadside, *Hopkins & M.Parsons 913* (holo: LAE (69991); iso: K, UPNG (13444)).

Distribution: Papua New Guinea (Central Province).

Aristolochia meridionaliana* subsp. *milnensis

(Mich.J.Parsons) Buchwalder & Wanke, *comb. nov.*

Pararistolochia meridionaliana subsp. *milnensis* Mich.J.Parsons, *Bot. J. Linn. Soc.* 120(3): 218 (1996).

Type: Papua New Guinea: Milne Bay Province, Pini Range, near Alotau, Milne Bay, ~150-m elev., 1 Jun. 1991, *M.Parsons 23* (holo: LAE (69993)).

Distribution: Papua New Guinea (Milne Bay Province).

Aristolochia meridionaliana* subsp. *popondettensis

(Mich.J.Parsons) Buchwalder & Wanke, *comb. nov.*

Pararistolochia meridionaliana subsp. *popondettensis* Mich. J.Parsons, *Bot. J. Linn. Soc.* 120(3): 216 (1996).

Type: Papua New Guinea: Northern Province, Hegata Village, immediately out of Popondetta, 100-m elev., 16 Mar. 1988, *Parsons 2* (holo: LAE (69992)).

Distribution: Papua New Guinea (Northern Province, Oro Province).

Aristolochia momandul K.Schum, in K.Schumann & M.Hollrung, *Fl. Kais. Wilh. Land.*: 105 (1889)

Pararistolochia momandul (K.Schum.) Mich.J.Parsons, *Bot. J. Linn. Soc.* 120(3): 207 (1996).

Type: Papua New Guinea: Madang, Astrolabe Bay, Konstantinhafen, *Hollrung 520* (holo: B, destroyed?; iso: BO (BO108760 !), WRSL).

Distribution: Papua New Guinea (Madang Province, Morobe Province).

Aristolochia ornithopterae Buchwalder & Wanke, *nom. nov.*

Pararistolochia linearifolia Mich.J.Parsons, *Bot. J. Linn. Soc.* 120(3): 235 (1996).

Type: Australia: Queensland, Moa Island, 14 Feb. 1989, *B.Gray 5006* (holo: QRS 091513 !) (non *Aristolochia linearifolia* Griseb., *Cat. Pl. Cub.* 115 (1866)).

Distribution: Australia (Queensland, Cape York Peninsula).

Etymology: named after the Cape York Birdwing butterflies, that often exclusively feed on *Aristolochia* species.

Aristolochia paradisiana (Mich.J.Parsons) Buchwalder & Wanke, *comb. nov.*

Pararistolochia paradisiana Mich.J.Parsons, *Bot. J. Linn. Soc.* 120(3): 223 (1996).

Type: Papua New Guinea: East Sepik Province, Lonem Village, near Maprik, growing in mature, well spaced secondary forest, ~200 m, 28 Mar. 1988, *M.Parsons 4* (holo: LAE (69996); iso: A, K, CANB, UPNG).

Distribution: Papua New Guinea (East Sepik Province).

Aristolochia peninsulensis (Mich.J.Parsons) Buchwalder & Wanke, *comb. nov.*

Pararistolochia peninsulensis Mich.J.Parsons, *Bot. J. Linn. Soc.* 120(3): 234 (1996).

Type: Australia: Queensland, Iron Range, rainforest, 40 m, 20 Nov. 1985, *B. Gray 4239* (holo: QRS (080850)).

Distribution: Australia (Queensland, Cape York Peninsula).

Aristolochia pithecurus Ridl., *J. Bot.* 52: 296 (1914)

Pararistolochia pithecurus (Ridl.) Mich.J.Parsons, *Bot. J. Linn. Soc.* 120(3): 207 (1996).

Type: Papua New Guinea: Central Province, Sogeri region, Mount Koroko, 2500 ft, *Forbes 621* (holo: BM; iso: L (0360038 !), WRSL).

Distribution: Papua New Guinea (Central Province).

Aristolochia praevenosa F.Muell., *Fragm.* 2: 166 (1861)

Pararistolochia praevenosa (F.Muell.) Mich.J.Parsons, *Bot. J. Linn. Soc.* 120(3): 207 (1996).

Type: Australia: Queensland, Clarence River, *Beckler s.n.* (lecto (designated by Parsons (1996a)): MEL (MEL1553302)).

Distribution: Australia (Queensland, Wet Tropics, Border Range to New South Wales).

Aristolochia preussii Engl., *Bot. Jahrb. Syst.* 24: 492 (1898)

Pararistolochia preussii (Engl.) Hutch. & Dalziel, *Bull. Misc. Inform. Kew* 1928: 24 (1928).

Type: Cameroon: between Barombi and Kumba, 1046 ft, *Preuss 108* (holo: B, destroyed?). *Neotype* (designated here): *Brenan 9484* (P (P00482859) Cameroun: Divison Kumba, Banga, Bakundu Forest Reserve, 18 Mar. 1948).

Distribution: Cameroon, Equatorial Guinea, Gabon.

Note: we neotypify with the specimen *Brenan 9484* (P00482859), which was already verified by Keay as a representative specimen of the species.

Aristolochia promissa Mast., *Gard. Chron.* 11: 494 (1879)

Pararistolochia promissa (Mast.) Keay, *Kew Bull.* 1952: 160, t. 1 (1952).

Type: Cameroon: Victoria, *Kalbreyer 7* (holo: K).

Aristolochia flagellata Stapf, *Bull. Misc. Inform. Kew* 1906: 80 (1906).

Type: Gold Coast: Aburi Gardens, *W.H.Johnson 487, 1060* (syntypes: K).

Aristolochia talbotii S.Moore, *Cat. Pl. Oban* 17: 93 (1913); *Pararistolochia talbotii* (S.Moore) Keay, *Kew Bull.* 1952: 161 (1952); *Aristolochia talbotii* S.Moore var. *longissima* S.Moore, *Cat Pl. Oban* 17: 94 (1913).

Type: Nigeria: Oban, *Talbot 128, Talbot 2310, Talbot 1642* (syntypes: BM (BM 000528393 !), K (K000350286 !)).

Aristolochia tenuicauda S.Moore, *Cat. Pl. Oban* 17: 94 (1913); *Pararistolochia tenuicauda* (S.Moore) Keay, *Kew Bull.* 1952: 160 (1952).

Type: Nigeria: Oban, *Talbot 2318* (BM (BM000528395)).

Aristolochia congolana Hauman, *nom. inval.*, *Fl. Congo Belge* 1: 384 (1948), *nom. inval.*

Distribution: Cameroon, Central African Republic, Republic of the Congo, Democratic Republic of the Congo, Gabon, Ivory Coast, Nigeria.

Aristolochia schlechteri Lauterb., *Nachtr. Fl. Schutzgeb. Südsee* 260 (1905)

Pararistolochia schlechteri (Lauterb.) Mich.J.Parsons, *Bot. J. Linn. Soc.* 120(3): 207 (1996).

Type: Papua New Guinea: Madang Province, near Madang, Ramu River Valley, *Schlechter 14156* (holo: WRSL).

Distribution: Papua New Guinea (Madang Province).

Aristolochia sepikensis (Mich.J.Parsons) Buchwalder & Wanke, *comb. nov.*

Pararistolochia sepikensis Mich.J.Parsons, *Bot. J. Linn. Soc.* 120(3): 231 (1996).

Type: Papua New Guinea: West Sepik, Bewani Subprovince, Mount Yungat, northern slopes Bewani Mountains, strangler in

lower montane forest, 700 m, 20 Sep. 1982, *K. Karenga* (holo: A (56530); iso: K, LAE ?).

Distribution: Papua New Guinea (Sandaum Province, West Sepik Province).

Aristolochia sparusifolia (Mich.J.Parsons) Buchwalder & Wanke, *comb. nov.*

Pararistolochia sparusifolia Mich.J.Parsons, *Bot. J. Linn. Soc.* 120(3): 228 (1996).

Type: Australia: Queensland, State Forest Reserve 143, Bushy Logging Area, Mount Lewis, 800 m, 2 Dec. 1982, *B. Gray* 2876 (holo: QRS (072007); iso: BRI (AQ046291)).

Distribution: Australia (Queensland, Wet Tropics).

Aristolochia tithonusiana (Mich.J.Parsons) Buchwalder & Wanke, *comb. nov.*

Pararistolochia tithonusiana Mich.J.Parsons, *Bot. J. Linn. Soc.* 120(3): 222 (1996).

Type: Indonesia: Irian Jaya, Wamaré to Mokwam foot track, open lower montane primary forest, ~1500 m, 22 Nov. 1992, *M. Parsons* 005 (holo: BO).

Distribution: Indonesia (Irian Jaya, Manokwari).

Aristolochia triactina Hook. f., *Trans. Linn. Soc. London* 25: 186. 1865

Pararistolochia triactina (Hook. f.) Hutch. & Dalziel, *Fl. W. Trop. Afr.* 1: 77, f. 21 (1927).

Type: Gabon: 1°N, 1862, *Mann* 1851 (holo: K (K000350283 !); iso: P (P00482857 !)).

Aristolochia stuhlmannii Engl. *Pflanzenw. Ost-Afrikas* 2: 169 (1895).

Type: Uganda: Emin Pascha expedition, 1890–1891, *Stuhlmann* s.n. (holo: B destroyed?).

Aristolochia schweinfurthii Engl., *Bot. Jahrb. Syst.* 24: 492 (1898); *Pararistolochia schweinfurthii* (Engl.) Hutch. & Dalziel, *Kew Bull.* 1928: 24 (1928).

Type: eastern Sudan: Monbuttu-Land, Apr. 1870, *Schweinfurth* 3507 (holo: B destroyed?; iso: K (K000350263 !)).

Distribution: Angola, Cameroon, Central African Republic, Democratic Republic of the Congo, Equatorial Guinea, Gabon, Ruanda, Sudan, Uganda.

Aristolochia zenkeri Engl., *Bot. Jahrb. Syst.* 24: 490 (1898)

Pararistolochia zenkeri (Engl.) Hutch. & Dalziel, *Bull. Misc. Inform. Kew* 1928: 24 (1928).

Type: Cameroun: Bipinde, Dec. 1896, *Zenker* 1226 (holo: B destroyed?; iso: BM (BM000528397 !), HBG (HBG502751)).

Distribution: Angola, Cameroon, Democratic Republic of the Congo, Ivory Coast, Nigeria, Republic of the Congo.

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