

HOW MANY SPECIES OF *ETLINGERA* (ZINGIBERACEAE) ARE THERE IN THE PHILIPPINES?

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Based on studies of types and recent collections, the number of species of *Etlintera* Giseke in the Philippines is doubled from eight to 16. Three species (*Etlintera alba*, *E. brevibractea* and *E. sessilanthera*) are reported here for the first time, *E. pandanica* is synonymised with the Bornean *E. fimbriobracteata*, and four new combinations (*E. bulusanensis*, *E. linearifolia*, *E. pubimarginata* and *E. subviridis*) and one new name (*E. pilosa*) are published here. Nine lectotypifications are proposed, of which three represent second-step designations. About two-thirds of the species are currently thought to be endemic, but future fieldwork is likely to result in more species of *Etlintera* in the Philippines, either endemic or as new records from neighbouring islands.

Keywords. A.D.E. Elmer, *Amomum*, distribution, ginger, *Hornstedtia*, Malesia, species richness.

INTRODUCTION

The ginger genus *Etlintera* Giseke is distributed from Bhutan to Fiji, with most species in equatorial Malesia, where it has been revised in Peninsular Malaysia (12 species; Khaw, 2001), Borneo (40 species; Poulsen, 2006), Java (9 species; Poulsen, 2007) and Sulawesi (46 species; Poulsen, 2012). Poulsen (2003) made four combinations (*Etlintera dalican* (Elmer) A.D.Poulsen, *Etlintera pandanica* (Elmer) A.D.Poulsen, *Etlintera purpurea* (Elmer) A.D.Poulsen and *Etlintera sorsogonensis* (Elmer) A.D.Poulsen) in preparation for a *Checklist of the Zingiberaceae of Malesia* (Newman *et al.*, 2004), which includes six species of *Etlintera* in the Philippines. In 2017, Naive described *Etlintera hamiguitanensis*, and in 2018, Naive *et al.* increased the number to eight by publishing the presence of *E. coccinea* (Blume) S.Sakai & Nagam. in the Philippines.

In the process of examining all types of gingers in Malesia, in preparation for previous and ongoing revision, it became clear that more names than those published by Poulsen in 2003 are in need of a combination in *Etlintera*. We also report some discoveries as a result of recent fieldwork.

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MATERIALS AND METHODS

Detailed studies of the morphology were made by examining types of species of all basally flowering genera of Zingiberaceae at 38 herbaria, 28 of which were visited or sent material on loan (A, BM, BO, BORH, BRUN, C, CEB, E, FI, G, HBG, K, KEP, L, M, NY, P, PNH, PUH, S, SAN, SAR, SING, SNP, U, USTH, WAN and Z). The collections of the remaining herbaria were seen as digital images online (BISH, DS [= CAS], F, GH, MICH, MO, NY, PH, UC and US). Photographs on the *Co's Digital Flora of the Philippines* website (Pelser *et al.*, 2011–) inspired new fieldwork conducted by Docot *et al.* Only accepted names and basionyms are given for taxa described outside the Philippines. For full synonymy, see Poulsen (2006, 2012).

RESULTS

Below we list all species of *Etilingera* presently known to occur in the Philippines. We place a number of names in synonymy and add species already known from the neighbouring island of Borneo, doubling the total number of known species to 16.

1. *Etilingera alba* (Blume) A.D.Poulsen, *Etilingera* Sulawesi: 58 (2012). – *Elettaria alba* Blume, Enum. Pl. Javae: 53 (1827). – *Alpinia alba* (Blume) D.Dietr., Syn. Pl. 1: 12 (1839). – *Cardamomum album* (Blume) Kuntze, Revis. Gen. Pl. 2: 686 (1891). – *Amomum album* (Blume) Koord., Meded. Lands Plantentuin 19: 318 (1898). – Types: Indonesia, Sulawesi, near Tondano [20–23 x 1821], *C.G.C. Reinwardt s.n.* (lecto L [L0193641], designated by Poulsen (2012); isolecto L [L0193642]); North Sulawesi Province, Gunung Masarang, Rampun plantation, 1°19'19"N 124°51'41"E, 960 m, fl. 20 ii 2008, *A.D. Poulsen, Marlina Ardiyani & Erik Kaumang* 2621 (epi BO, designated by Poulsen (2012); isoepi E [sheet barcodes: E00531924–6; spirit bottles: E00830553–4]). **Fig. 1A.**

Amomum lepicarpum Ridl., Leafl. Philipp. Bot. 2: 604 (1909). – *Hornstedtia lepicarpa* (Ridl.) Elmer, Leafl. Philipp. Bot. 8: 2979 (1919). – *Geanthus lepicarpus* (Ridl.) Loes., Nat. Pflanzenfam. ed. 2, 15a: 593 (1930). – Type: Philippines, Visayas, Negros Island, Negros Oriental, Dumaguete, Cuernos de Negros Mts, vi 1908, *A.D.E. Elmer* 10044 (lecto K, first step designated by Turner (2000), second step [K000255025], designated here; isolecto BM, FI, G, GH, HBG, K [K000928038], L, US, Z), **syn. nov.**

Turner (2000) cited the “holotype” at K, but this herbarium harbours two sheets of *A.D.E. Elmer* 10044. One (barcoded K000928038) contains one leaf and loose fruits in a capsule, whereas the other (K000255025) has one leaf, a whole infructescence with peduncle, loose flowers and a handwritten note and is therefore superior.

A soaked and examined flower of the lectotype confirms it is an *Etilingera*, and new collections from Mount Makiling (*R.V.A. Docot* 0093, USTH) and the Cuernos de Negros Mountains (*R.V.A. Docot* 0154, 0156 and 0177; USTH) have measurements within the range of *E. alba*. In the original description, Ridley (1909a) gave measurements of the corolla lobes and labellum, which are much smaller than

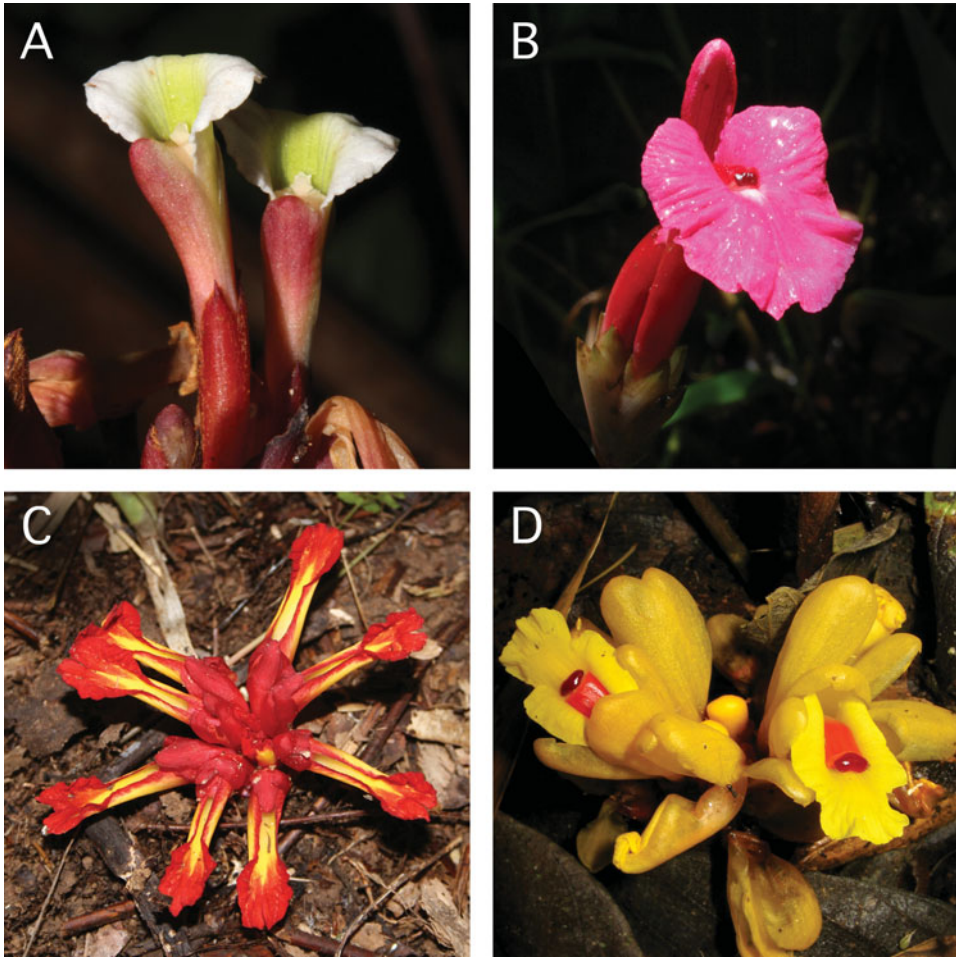


FIG. 1. Selected Philippine *Etilingera*. A, *Etilingera alba* (R.V.A. Docot 0156, Cuernos de Negros Mountains, Negros Oriental); B, *E. brevilabrum* (Samar Island); C, *E. coccinea* (Mount Labo, Camarines Sur); D, *E. dalican* (Davao del Sur). (Photographs: A, R.V.A. Docot; B, H. Funakoshi; C, J.F. Barcelona; D, U. Ferreras.)

those of *Etilingera alba*, and he also described the ovary as “sparingly pubescent”. The dissection of the recent collections, however, revealed that measurements were within the range of variation of *Etilingera alba* in Sulawesi (Poulsen, 2012).

2. *Etilingera brevilabrum* (Valeton) R.M.Sm., Notes Roy. Bot. Gard. Edinburgh 43: 243 (1986). – *Achasma brevilabrum* Valeton, Icon. Bogor. 3: t. 202 (1906). – Type: plant collected in Borneo, cultivated in Hortus Bogoriensis, Bogor, Java, as no. *HB XI B (V)* 144 (lecto L [L0193777], designated by Sakai & Nagamasu (2003); isolecto BO). **Fig. 1B.**

Even though a proper collection documenting this species in the Philippines has not yet been made, an excellent photograph (Fig. 1B) by H. Funakoshi in Samar Island clearly proves its presence in the Philippines. Therefore, *Etlingera brevilabrum* is no longer endemic in Borneo.

3. *Etlingera bulusanensis* (Elmer) A.D.Poulsen. – *Amomum bulusanense* Elmer, Leaflet Philipp. Bot. 8: 2973 (1919). – Type: Philippines, Luzon, Sorsogon, Irosin, Mt Bulusan, iv 1916, 2000 ft, *A.D.E. Elmer* 16395 (lecto BM [BM000798557], designated here; isolecto BISH, BM, BO, C, F, G, GH, HBG, L, MICH, MO, NY, PH, S, U, US, Z), **comb. nov.**

Elmer (1919) emphasised that this species was related to *Amomum pubimarginatum* Elmer (see below; clearly a species of *Etlingera*) from which, he pointed out, it differs in the smaller leaves with a less ciliate margin, longer flowers, a glabrous ovary and distinctly costate fruits lacking apiculations at the apex. The puberulous axis of the floral shoot is indeed also similar on the types of both species. It is, however, a concern that parts of the description of the flower by Elmer (1919) relate more to an *Amomum* Roxb. *sensu lato*. New material from the type locality is needed to clarify all details of the morphology of the flower.

4. *Etlingera coccinea* (Blume) S.Sakai & Nagam., Edinburgh J. Bot. 60: 190 (2003). – *Elettaria coccinea* Blume, Enum. Pl. Javae 53 (1827). – Type: Indonesia, Java, G. Papangdayan, probably 1818 or 1819, *C.G.C. Reinwardt s.n.* (lecto L [accession no. 905339126, barcode L0193260], designated by Sakai & Nagamasu (2003), including only fertile material to the right of the leaf). **Fig. 1C.**

This species has a wide distribution in Sundaland and has been known for some time (e.g. Pelsner *et al.*, 2011–; Naive *et al.*, 2018) to occur also in the Philippines. Sakai & Nagamasu (2003) mistakenly believed that the collectors of the type material were H. Kuhl & J. C. van Hasselt, who collected in West Java in 1820–1821. This mistake was repeated by Naive *et al.* (2018). As explained by Poulsen (2006), the collector is, however, most likely Reinwardt. In addition, a label on the type sheet, presumed to be written by the collector, includes the words: “kapol”, “*Amomum* sp nov”, and “Papangdayan”. The former is a Sundanese generic name for *Amomum sensu lato* and must refer to the elements to the left of the sheet, excluded from the type by Sakai & Nagamasu (2003). Papangdayan (alternatively Gunung Papandajan or Pepandajan) is a volcano in West Java that Reinwardt ascended in 1818 (van Steenis, 1950) or 1819 (von Humboldt, 1859).

5. *Etlingera dalican* (Elmer) A.D.Poulsen, Blumea 48: 524 (2003). – *Hornstedtia dalican* Elmer, Leaflet Philipp. Bot. 8: 2906 (1915). – *Amomum dalican* (Elmer) Merr., Enum. Philipp. Fl. Pl. 1: 238 (1923). – Type: Philippines, Mindanao, Davao del Sur, Todaya, Mt Apo, ix 1909, *A.D.E. Elmer* 11626 (lecto UC, designated by Poulsen (2003); isolecto BM, BO, F, FI, G, GH, HBG, K, L, MO, NY, P, PH, U, US, Z). **Fig. 1D.**

Since Newman *et al.* (2004), eight additional isoelectotypes have been discovered. Elmer (1915) commented that the syntype from the same locality (*A.D.E. Elmer* 11759) did not agree in every detail with his description.

- 6. *Etlingera elatior*** (Jack) R.M.Sm., Notes Roy. Bot. Gard. Edinburgh 43: 244 (1986). – *Alpinia elatior* Jack, Malayan Misc. Descriptions of Malayan Plants 2 (7): 2 (1822). – Type: Indonesia, Nias Island or Ayer Bangy, W coast of Sumatra. *W. Jack s.n.* 1818 (specimen lost).

Some of the first Philippine collections of this species were made in Mindanao at Santa Cruz on 2 June 1905 (*R.S. Williams* 2943, K) and in May 1909 at Mount Apo (*A.D.E. Elmer* 10652; BM, BO, C, FI, G, HBG, L, P, U, Z). Elmer (1915) discussed these two collections (erroneously citing his collection as number 10552), commenting that *Phaeomeria imperialis* Lindl. (invalid name) did not appear to be introduced in the Philippines. Merrill (1923) referred to the same two collections as *Phaeomeria speciosa* (Blume) Koord., which is also a synonym of *Etlingera elatior*. As discussed under this species in Sulawesi by Poulsen (2012: 136), it is questionable whether *Etlingera elatior* is native in the Philippines, as it has been used for centuries and is likely to have naturalised in several forests in Malesia.

- 7. *Etlingera fimbriobracteata*** (K.Schum.) R.M.Sm., Notes Roy. Bot. Gard. Edinburgh 43: 245 (1986). – *Amomum fimbriobracteatum* K. Schum., Bot. Jahrb. Syst. 27: 317 (1899). – Type: Malaysia, Sarawak, Bintulu, Sg. Tubao, viii 1867, *O. Beccari* 3735 (holo FI). **Fig. 2A.**

Etlingera pandanica (Elmer) A.D. Poulsen, Blumea 48: 525 (2003). – *Amomum pandanicarpum* Elmer, Leaf. Philipp. Bot. 8: 2899 (1915). – *Hornstedtia pandanica* (Elmer) Elmer, Leaf. Philipp. Bot. 8: 2979 (1919). – Type: Philippines, Mindanao, Davao del Sur, Todaya, Mt Apo, ix 1909, *A.D.E. Elmer* 10508 (lecto DS [0213627], designated here; isoelecto BISH, BM, BO, F, FI, G, GH, K, L, MO, NY, P, U, US, Z), **syn. nov.**

The possibility that *Etlingera pandanica* was a synonym of *E. fimbriobracteata* was raised by Poulsen (2006), revising the genus in Borneo, and is confirmed here after examination of the flowers of a recent collection (*C.I. Banag* CB16-267, Angat Watershed Forest Reserve, Bulacan, 12 vii 2016; USTH).

Elmer (1915), quoting his field notes, described the “staminodes bent over the outer petal, yellowish white except the dark crimson apex”. Had he not lost all the flowers he collected, he might have altered his description to say that the stamen, bent over the labellum, was yellowish white with a dark crimson apex.

Even though Elmer (1915: 2900) wrote that his 10508 was collected in May and September, all labels examined have the month of May printed on them, and we therefore treated all duplicates as a single gathering of which the one at DS is the best.

- 8. *Etlingera hamiguitanensis*** Naive, Taiwania 62: 341 (2018). – Type: Philippines, Mindanao, Davao Oriental, San Isidro, Barangay La Union, Mount Hamiguitan

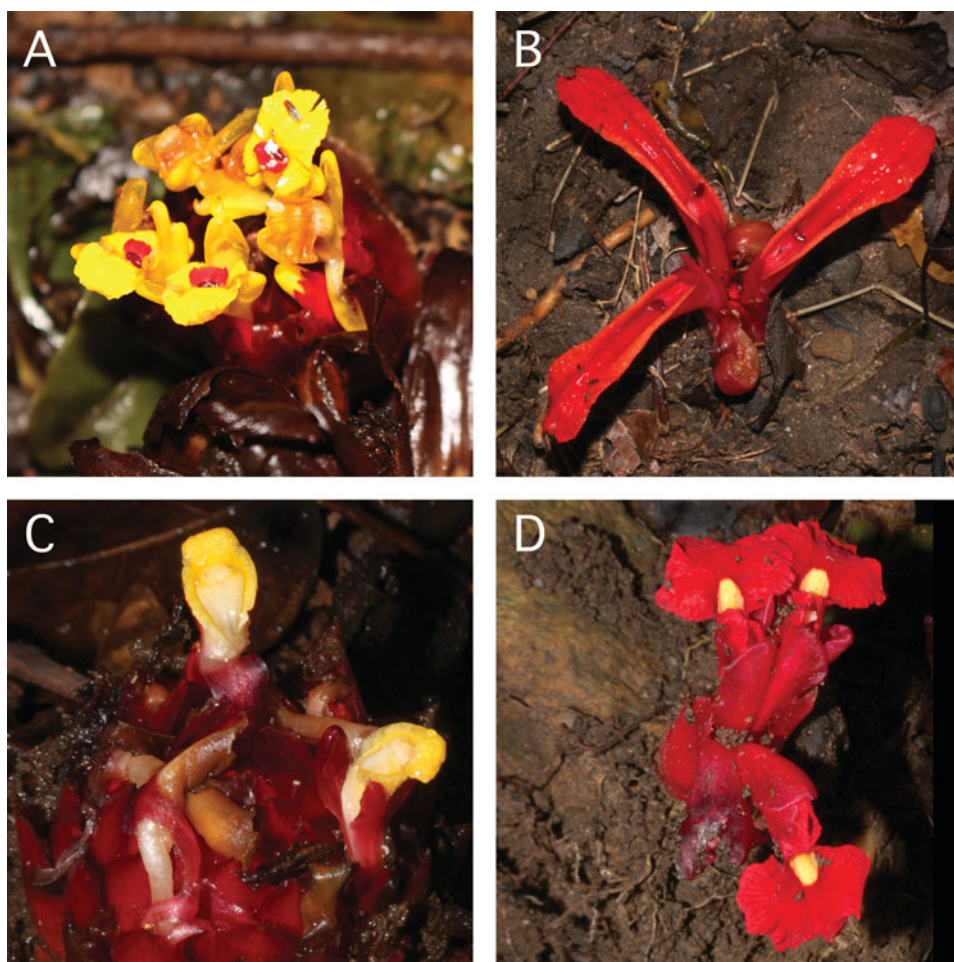


FIG. 2. Selected Philippine *Etlingera*. A, *Etlingera fimbriobracteata* (Central Cebu Protected Landscape, Cebu); B, *E. philippinensis* (S.G.S. Zamudio & R.V.A. Docot SZ18-723, El Nido, Palawan); C, *E. pilosa* (R. V.A. Docot 0158, Cuernos de Negros Mountains, Negros Oriental); D, *E. sessilantha* (R. V.A. Docot 0113, Puerto Princesa, Palawan). (Photographs: A, J.F. Barcelona; B–D, R.V.A. Docot.)

Range Wildlife Sanctuary, 568 m, 21 x 2016, *Naive* 0132016 (holo CMUH n.v., iso PNH n.v.).

This recently described species is closely related to *Etlingera philippinensis*, the variation of which is poorly understood. A close examination may well reveal one or both to be synonyms of species already known elsewhere.

9. *Etlingera linearifolia* (Elmer) A.D.Poulsen. – *Amomum linearifolium* Elmer, *Leafl. Philipp. Bot.* 8: 2975 (1919). – Type: Philippines, Luzon, Sorsogon, Irosin, Mt

Bulusan, 1000 ft, x 1916, *A.D.E. Elmer* 16926 (BM [BM001217421], designated here; isolecto BISH, BM, BO, C, F, FI, G, GH, HBG, K, L, NY, P, S, U, US, Z), **comb. nov.**

The densely sericeous axis of the inflorescence, and the rigid, striate bracts on peduncle and spike, make this convincingly an *Etlingera*. The narrow leaves recall the description of *Etlingera stenophylla* (K.Schum.) A.D.Poulsen from the Matinang Mountains, Sulawesi. The type of this species seems unfortunately to have been lost (Poulsen, 2012). New collections of both species from their type localities would be very useful.

At BM, two sheets of *A.D.E. Elmer* 16926 are present, and we designate sheet [BM001217421], where three fertile shoots are still physically connected to the rhizome and base of the leafy shoot.

10. *Etlingera philippinensis* (Ridl.) R.M.Sm., Notes Roy. Bot. Gard. Edinburgh 43: 248 (1986). – *Hornstedtia philippinensis* Ridl., Publ. Bur. Sci. Gov. Lab. 35: 86 (1905). – *Amomum philippinense* (Ridl.) Merr., Enum. Philipp. Fl. Pl. 1: 240 (1923). – *Achasma philippinensis* (Ridl.) B.L.Burt & R.M.Sm., Notes Roy. Bot. Gard. Edinburgh 31: 307 (1972). – Type: Philippines, Mindanao, Davao, iii 1904, *E.B. Copeland* 416 (lecto, first step designated by Burt & Smith (1972) but herbarium not specified, second step SING [barcode 0044057], designated here; isolecto G, K, P; all fruits to be excluded). **Fig. 2B.**

Ridley (1905) first described the fruits as stout, elliptic, one inch long and covered with short processes, and noted that they resembled more those of an *Amomum*. Four years later, Ridley (1909b) realised that the type material included fruits of *Amomum propinquum* (synonym of *Meistera propinqua* (Ridl.) Škorničk. & M.F.Newman) and that the fruits of *Hornstedtia philippinensis* had not yet been collected. In 1915, Elmer commented that the fruits remained unknown, but in 1919 he had been able to find them up to six inches below ground and described them as obovoidly globose, one inch across and smooth apart from a few “blunt excrescences” similar to *Etlingera megalochilos* (Griff.) A.D.Poulsen, exactly as Ridley (1909b) had predicted they would look.

We studied both syntypes and agree with Ridley (1909b) that the fruits of *E.B. Copeland* 416 (G, K, P, SING) appear to be of *Meistera propinqua*. The 3–5 inflorescences in each of these sets are typical of an *Etlingera* with an *Achasma*-type labellum. The fruits of the other syntype, *W.W. Clark* 1704 (SING), Masbate, v–vi 1904, however, contains an ellipsoid infructescence with long-pedicellate and loosely spiny fruits, which is clearly of an *Etlingera* related to *E. alba*. On the same sheet is part of a leafy shoot that is not attached to the infructescence and is unlikely to represent the leaves of the *Etlingera* in *Copeland* 416, which unfortunately only includes fertile shoots and no leaves.

As noted by Turner (2000), Burt & Smith (1972) referred to *Copeland* 416 as the lectotype of this species but they had not seen it, nor did they indicate in which

herbarium this was to be found, whereas we have examined material at four herbaria and find the sheet at SING marginally superior to the others.

11. *Etilingera pilosa* A.D.Poulsen & Docot. – *Amomum lepicalpum* var. *pubescens* Ridl., Leaf. Philipp. Bot. 2: 605 (1909). – *Hornstedtia pubescens* (Ridl.) Elmer, Leaf. Philipp. Bot. 8: 2979 (1919). – *Amomum pubescens* (Ridl.) Merr., Enum. Philipp. Fl. Pl. 1: 240 (1923). – Type: Philippines, Visayas, Negros Island, Negros Oriental, Dumaguete, Cuernos de Negros Mts, 3500 ft, vi 1908, *A.D.E. Elmer* 10384 (lecto K, first step effectively designated by Turner (2000), second step [barcode K00255023], designated here; islecto BISH, BM, BO, E, G, HBG, K, L, NY, US, Z), **nom. nov.** **Fig. 2C.**

A combination of this name in *Etilingera* cannot be made, because *Etilingera pubescens* (B.L.Burt & R.M.Sm.) R.M.Sm. already exists for a different species in Borneo.

Ridley (1909a) speculated that *A.D.E. Elmer* 10384 may represent a distinct species, and Elmer (1919) agreed and recognised it at species rank due to its much larger size and numerous other characters that he did not mention. Unfortunately, the flowers were in a bad state, and new material is needed from the type locality. The fruits, however, are still convincingly those of *Etilingera*, and the fruiting head is much more compact and certainly represents a different species than *E. alba* in accordance with Elmer's judgement (1919). Recent collections from the type locality (*R.V.A. Docot* 0158 and 0171) match the type and reveal that the flowers are yellow (Fig. 2C). A full description is beyond the scope of the present study and will be published in a forthcoming revision when more is known of the variation and distribution of this and the other Philippine species.

There are three sheets at Kew: K00255022 has a folded leaf only; K00255023 includes the upper part of infructescence, loose flowers, and the handwritten label; and K000308961 is similar to the former. We designate the sheet with the fertile material as lectotype here.

12. *Etilingera pubimarginata* (Elmer) A.D.Poulsen. – *Amomum pubimarginatum* Elmer, Leaf. Philipp. Bot. 8: 2900 (1915). – *Geanthus pubimarginatus* (Elmer) Loes., Nat. Pflanzenfam. ed. 2, 15a: 593 (1930). – Type: Philippines, Mindanao, Davao del Sur, Todaya, Mt Apo, south of Sibulan River, 4250 ft, v 1909, *A.D.E. Elmer* 10546 (lecto BM [BM000630037], designated here; islecto BISH, BM, BO, F, G, K, L, MO, NY, US), **comb. nov.**

The striate, rigid and somewhat spreading bracts as well as the densely pubescent fruits with a few wart-like spines at the apex clearly resemble some species of *Etilingera* in Sulawesi (Poulsen, 2012). The epithet refers to the densely ciliate leaf margin, which is also a character commonly found in species of the genus.

13. *Etilingera purpurea* (Elmer) A.D.Poulsen, Blumea 48: 525 (2003). – *Hornstedtia purpurea* Elmer, Leaf. Philipp. Bot. 8: 2984 (1919). – *Amomum purpureum* (Elmer) Merr., Enum. Philipp. Fl. Pl. 1: 240 (1923). – Type: Philippines, Luzon, Sorsogon,

Irosin, (Mt Bulusan, 1500 ft, viii 1916, *A.D.E. Elmer* 16819 (lecto L [L0193648], designated by Poulsen (2003), isolecto BISH, BM, BO, C, F, FI, G, GH, HBG, K, MO, NY, P, S, U, UC, US, Z).

Poulsen (2003) placed this in *Etlingera* due to the fruit typical morphology of the genus. It is unique compared to all other species of the genus presently known from the Philippines in its 2 cm long membranous ligule and the leaves being purple beneath, no matter what their age.

14. *Etlingera sessilantha* R.M.Sm., Notes Roy. Bot. Gard. Edinburgh 43: 240 (1986). – Type: Malaysia, Sarawak, G. Mulu NP, Camp 5, Melinau Gorge, S of Sg. Melinau, 4°5'N 114°54'E, 200 m, 29 i 1978, *C. Hansen* 201 (holo C, including spirit collection no. 15166). **Fig. 2D.**

Photographs on *Co's Digital Flora of the Philippines* (Pelser *et al.*, 2011–) taken by Jonah van Beijnen in 2015 indicate the presence of this species in Palawan, Philippines, and a recent collection (*R. V.A. Docot* 0113, 3 x 2017; NY, PNH, USTH) confirms it. The material is a perfect match with the collections, including the type, from northern Borneo (Poulsen, 2006).

15. *Etlingera sorsogonensis* (Elmer) A.D.Poulsen, *Blumea* 48: 526 (2003). – *Hornstedtia sorsogonensis* Elmer, *Leafl. Philipp. Bot.* 8: 2985 (1919). – Type: Philippines, Luzon, Sorsogon, Irosin, Mt Bulusan, 1000 ft, viii 1916, *A.D.E. Elmer* 16925 (lecto G [G00008004], designated here; isolecto BM, BO, C, F, FI, G, GH, HBG, K, MO, NY, P, U, UC, US, Z).

Poulsen (2003) placed this in *Etlingera* because the fruits, as already noted by Elmer (1919), are similar to those of *E. purpurea* and *E. pandanicarpa*. Most collections consist of one leaf and a few fruits derived from the collector tearing one infructescence into bits, which is so typical of Elmer's multiple sheets. The leaf of the collection at G is best, because it is nicely pressed, with an intact apex.

16. *Etlingera subviridis* (Elmer) A.D.Poulsen. – *Hornstedtia subviridis* Elmer, *Leafl. Philipp. Bot.* 8: 2987 (1919). – Type: Philippines, Luzon, Sorsogon, Irosin, Mt Bulusan, 1000 ft, vi 1916, *A.D.E. Elmer* 16437 (lecto NY [00320260], designated here; isolecto BISH, C, DS, F, FI, G, GH, HBG, K, L, MICH, MO, P, PH, S, U, Z), **comb. nov.**

This species shares many characters with *Etlingera alba* (synonym *Amomum lepicarpum*), but as Elmer (1919) noted, it grows in denser clumps, and the leafy shoots are shorter (1.75–2.75 versus 3–5 m), with smaller (40–50 × 6 cm versus 60 × 10 cm), greenish (subviridis) leaves. Elmer also found that the fruits exhibited minor differences. Unfortunately, the flowers were in too bad condition to allow detailed measurements. Further collections at Mount Bulusan are urgently needed to fully understand if this is simply based on a small individual of the same species perhaps growing in an atypical habitat. One should bear in mind that in Sulawesi, Poulsen (2012) did recognise two

TABLE 1. The 16 species of *Etlingera* currently known in the Philippines, and their distribution and history of presence

Species	Distribution outside the Philippines	First published presence in the Philippines (any name)	First placed in <i>Etlingera</i>
<i>E. alba</i>	Sulawesi, Moluccas, New Guinea	Here	Poulsen (2012)
<i>E. brevilabrum</i>	Borneo	Here	Smith (1986a)
<i>E. bulusanensis</i>	Endemic	Elmer (1919)	Here
<i>E. coccinea</i>	Borneo, Java, Malay Peninsula, Sumatra	Naive <i>et al.</i> (2018)	Sakai & Nagamasu (2003)
<i>E. dalican</i>	Endemic	Elmer (1915)	Poulsen (2003)
<i>E. elatior</i>	Widespread and cultivated	Elmer (1915)	Smith (1986a)
<i>E. fimbriobracteata</i>	Borneo	Here; discussed by Poulsen (2006)	Smith (1986a)
<i>E. hamiguitanensis</i>	Endemic	Naive (2017)	Naive (2017)
<i>E. linearifolia</i>	Endemic	Elmer (1919)	Here
<i>E. philippinensis</i>	Endemic	Ridley (1905)	Smith (1986a)
<i>E. pilosa</i>	Endemic	Ridley (1909a)	Here
<i>E. pubimarginata</i>	Endemic	Elmer (1915)	Here
<i>E. purpurea</i>	Endemic	Elmer (1919)	Poulsen (2003)
<i>E. sessilantha</i>	Borneo	Here	Smith (1986b)
<i>E. sorsogonensis</i>	Endemic	Elmer (1919)	Poulsen (2003)
<i>E. subviridis</i>	Endemic	Elmer (1919)	Here

species, which shared many similarities with *Etlingera alba* (including long-pedicellate, spiny fruits) but were generally smaller in several vegetative characters; however, floral characters justified recognition of these separate species.

DISCUSSION

The increased fieldwork activities in the Philippines focused on gingers in recent years will no doubt result in an increase in the number of species of *Etlingera* known in the country. It is likely that more species already known from Sulawesi and especially Borneo will be discovered in the Philippines. Presently, the proportion of endemism is around 63% (Table 1). It is important to consider if names already published from Malaysia and Sulawesi may apply before rushing to publish new species, especially if the description is based on only one collection. In addition, a big task lies ahead to fully understand the variation and distribution of those taxa already known to occur in the Philippines, and the priority for future fieldwork should be to collect better material at the type localities, especially Mount Bulusan.

Khaw (2001) and Poulsen (2006, 2012) emphasised the importance of fruit morphology in distinguishing species of *Etlingera*. When collecting gingers, securing the flowers and preserving them in alcohol is essential, but during future exploration

of gingers in the Philippines, it is also extremely useful to pickle infructescences and fruits to enable comprehensive and accurate descriptions, especially for any potential new taxa described.

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