

A new species of *Polyscias* (Araliaceae) from Mayotte, Comoro Islands

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ABSTRACT

Polyscias mayottensis (Araliaceae) is described from the island of Mayotte in the Comoro archipelago. It is closely related to *P. boivinii* of Madagascar: both occur in dry and mesophyllous forest and share several distinctive features. *Polyscias mayottensis* probably evolved after colonization on Mayotte following long-distance dispersal. Recent exploration suggests that at least 500 native vascular plant species occur on Mayotte and perhaps as many as 1,500 species for the entire archipelago, well above previous estimates.

KEY WORDS

Araliaceae,
Polyscias mayottensis,
Polyscias boivinii,
Mayotte,
Comoro Islands.

RÉSUMÉ

Une nouvelle espèce de *Polyscias* (Araliaceae) de Mayotte, Archipel des Comores. *Polyscias mayottensis* (Araliaceae), de l'île de Mayotte dans l'archipel des Comores, est décrit. Cette espèce est proche de *P. boivinii* de Madagascar, toutes deux se rencontrant dans des forêts sèches et mésophiles. *Polyscias mayottensis* a probablement évolué après la colonisation de Mayotte, suite à une dispersion à longue distance. Des explorations récentes suggèrent qu'au moins 500 espèces de plantes vasculaires indigènes se trouvent à Mayotte et peut-être jusqu'à 1,500 pour l'ensemble de l'archipel, bien au-dessus des estimations antérieures.

MOTS CLÉS

Araliaceae,
Polyscias mayottensis,
Polyscias boivinii,
Mayotte,
Archipel des Comores.

Between 1995 and 1998, an intensive inventory of the plants of Mayotte (a French territory in the Comoro archipelago) was conducted by the Service de l'Environnement et de la Forêt of Mayotte, in collaboration with the Laboratoire de Phanérogamie of the Muséum national d'Histoire naturelle in Paris, mainly concentrating on trees and shrubs. This work has substantially increased the number of available specimens from the island, whose flora was previously known almost entirely from material gathered in the nineteenth century (for details of collectors who worked on Mayotte and elsewhere in the Comoros, see DORR 1997).

The recent collections include many species never before recorded on Mayotte, some of which were not known from elsewhere in the Comoros. Several of the species are new to science, including *Labramia mayottensis* Labat, M. Pignal & O. Pascal (Sapotaceae) (LABAT et al. 1997), *Erythrospermum sifarii* Hul, Labat & O. Pascal and *Scolopia maoulidae* Hul, Labat & O. Pascal (Flacourtiaceae) (HUL et al. 1998), a *Norhonia* and two *Chionanthus* (Oleaceae) (LABAT et al. 1999), two species of *Cynometra* (Fabaceae: Caesalpinioideae) (LABAT & PASCAL in press), and the new *Polyscias* described here. A number of additional new taxa will be published during the next few years.

Previous estimates of the number of vascular plants occurring in the Comoro Islands are based almost exclusively on VOELTZKOW's (1917) list, in which he cited 935 species, including 416 that were regarded as native (cf. also LEBRUN 1976; WHITE 1983; MORAT & LOWRY 1997). The recent collecting and inventory work conducted by the second and third authors has, however, documented a total of 414 native species on Mayotte alone, a number that equals VOELTZKOW's estimate for the entire archipelago. This would almost certainly increase further with more intensive collecting of herbaceous taxa, reaching at least 500 species for Mayotte; an additional 350 introduced species are also known from the island (including both cultivated and naturalized plants). Considering that Mayotte (354 km²) accounts for less than 15% of the total land area of the Comoros, and that Grande

Comore and Anjouan are considerably higher (2,361 m and 1,595 m, respectively vs. 660 m for Mayotte) and have a more diverse array of habitats (including high mountain vegetation), the total vascular plant flora of the archipelago can reasonably be estimated to reach 1,500 species or more (PASCAL 1997).

It is not yet possible to provide an accurate assessment of levels of endemism for the island of Mayotte or for the Comoro archipelago. However, a preliminary estimate made for native trees and shrubs (PASCAL 1997) indicates that between 5% and 10% of the species occurring on Mayotte are restricted to the island, and that ca. 12% do not occur outside the Comoros (i.e., they are endemic to the archipelago). These relatively low values (at least when compared for example to the estimated 80-85% endemism in Madagascar; cf. HUMBERT 1959; KOECHLIN et al. 1974) are nevertheless consistent with the fact that the Comoros are volcanic islands of relatively recent origin (ca. 2.5 m.y. for the youngest, Grande Comore and 8-15 m.y. for Mayotte, the oldest; cf. BATTISTINI 1996), and that they are located near to large potential source areas in both Madagascar and Africa.

The new species of *Polyscias* described here represents only the fifth Araliaceae recorded from the Comoros (BERNARDI 1969, 1971, 1980). *Schefflera myriantha* (Baker) Drake occurs in wet forests on Anjouan, Grande Comore, and in similar habitats in East Africa (Ethiopia to Malawi) and Madagascar, but has not yet been collected on Mayotte, although it could well grow there at higher elevation sites. *Gastonia duplicata* Thouars ex Baill. has been recorded on Anjouan, Grande Comore and Mayotte, as well as Madagascar; it often occupies somewhat disturbed habitats in more humid areas, and is the westernmost member of a genus that also occurs in the Mascarene Islands, the Seychelles, Malesia and Queensland, Australia (PHILIPSON 1970; LOWRY 1990). *Cussonia spicata* Thunb. is known primarily from wet habitats at higher elevation on Anjouan, Grande Comore, Mayotte, and in East Africa (Sudan to South Africa), and is the only member of the genus recorded from outside continental Africa except for *C. holstii* Harms ex

Engl., which also occurs in Yemen (WOOD 1997). *Polyscias felix* Bernardi is a large tree restricted to wet forests between about 500 and 1400 m elevation on Grande Comore and Moheli, and does not appear to be closely related to the distinctive species from Mayotte being described here.

***Polyscias mayottensis* Lowry, O. Pascal & Labat, sp. nov.**

A P. boivinii foliis majoribus (60-80 cm longis), umbellulis 30-45 per axes secundarios, 30-40 floribus, fructibus majoribus ellipticis vel parum oblongis (6.5-)7-8 mm longis et discis brevioribus rotundatis vel depresso conicis 1 mm longis, recedit.

TYPUS.—Pascal & Labat 778, Mayotte, Saziley, partially disturbed dry forest, 12°58'39"S, 45°11'10"E, 60 m, 10 Dec. 1996, fr. (holo-, P! (P127001); iso-, G!, MAYOTTE!, MO!, P! (P127002)).

Hermaphroditic, protandrous, deciduous, unarmed trees 6-10 m tall, 10-30 cm dbh, trunk unbranched below, sparsely branched above, bark dark gray, smooth, somewhat shiny, with slight irregular transverse undulations. Leaves imparipinnately compound, 60-80 cm long; leaflets 15-17, opposite, bright green above, shiny (especially in young foliage), paler olive yellow green beneath, papyraceous to chartaceous, ovate to elliptic, lower ones broadly so and often somewhat concave abaxially, 11-15 × 6-9.5 cm, upper ones progressively smaller, terminal ones 7.5-11 × 2.5-5 cm, glabrous, tissue raised above between secondary veins, tertiary venation fine, evident in dry material, slightly sunken on upper surface, raised below, apex acuminate, margins entire, minutely thickened and revolute, base truncate (to nearly attenuate in the upper leaflets), sometimes weakly oblique in lateral leaflets; petiolules 5-10 mm long (reduced progressively to 1 mm in upper leaflets); rachis weakly articulated at petiolule bases; petiole (9-)12-18 cm long, 4-5 mm in diam., only weakly clasping at the base, without an alate margin.

Inflorescence terminal, usually borne prior to development of the leaves, whitish furfuraceous stellate pubescent throughout, primary axis erect,

ca. 5-10 cm long; secondary axes 5-8, horizontal to slightly declined, sometimes upturned distally, 50-70 cm long, with ca. 30-45 umbellules borne ± evenly throughout their length; peduncles 8-22 mm long, stout, each with a triangular, strongly adaxially concave bract ca. 6-8 mm long borne at the base and one about midway along the peduncle, early caducous, leaving an evident scar; umbellules with ca. 30-40 flowers; involucre usually inconspicuous, of 4-7 often early caducous, triangular bractlets; pedicels 2-4 mm long, slender, thickening somewhat to 0.7 mm in diam. in fruit, light olive green, densely furfuraceous stellate pubescent, with an evident cupuliform articulation below the ovary. Calyx a low rim, entire or occasionally with a few small teeth or irregularly undulate. Corolla globose in bud, ca. 2-3 mm in diam. before anthesis; petals 5, triangular-ovate, 3 mm long, greenish, spreading to slightly reflexed at anthesis. Stamens 5, ascending at anthesis; filaments 3.5 mm long; anthers light yellow, 1.5 mm long. Ovary 2-carpellate, dark green, with scattered stellate pubescence, turbinate in bud and flower, ca. 3-4 mm high in male phase, expanding only slightly in female phase; style a short boss ca. 0.2-0.4 mm high, borne on a broadly rounded-conic, yellow-green disk, surmounted by 2 poorly differentiated stigmatic surfaces. Fruit a drupe, ellipsoid to slightly oblong, weakly compressed laterally, green (when immature?), (6.5-)7-8 mm long, 3.5-4 mm wide, apex rounded-obtuse, disk somewhat depressed-conic, ca. 1 mm high, base narrowly obtuse, sparsely stellate pubescent, ribs 10, inconspicuous when fresh, evident when dry; pyrenes 2, each 1-seeded.—Figs. 1, 2.

PARATYPES.—MAYOTTE: Labat & Pascal 2928, Forêt de Sohoa, 12°48'10"S, 45°05'55"E, 20 m, 1 Dec. 1997, fl. (K, MAYOTTE, MO, P); Labat & Pascal 2935, G.R. Saziley, sentier de crête vers la plage de Majicavo, 12°58'39"S, 45°11'10"E, 60 m, 4 Dec. 1997, fl. (G, K, MAYOTTE, MO, P), same individual as the type collection; Pascal 907, Hachiroungou, 500 m, 4 Mar. 1997 (P); Pascal 969, Saziley, crête, 160 m, 29 Sep. 1997, y. infl. (P); Pascal 979, same locality, 8 Oct. 1997, y. infl. (MO, P); Soumille 984, Mlima Combani, 14 Oct. 1997, fl. (MO, P).

Polyscias mayottensis appears to be endemic to the island of Mayotte, where it has been recorded

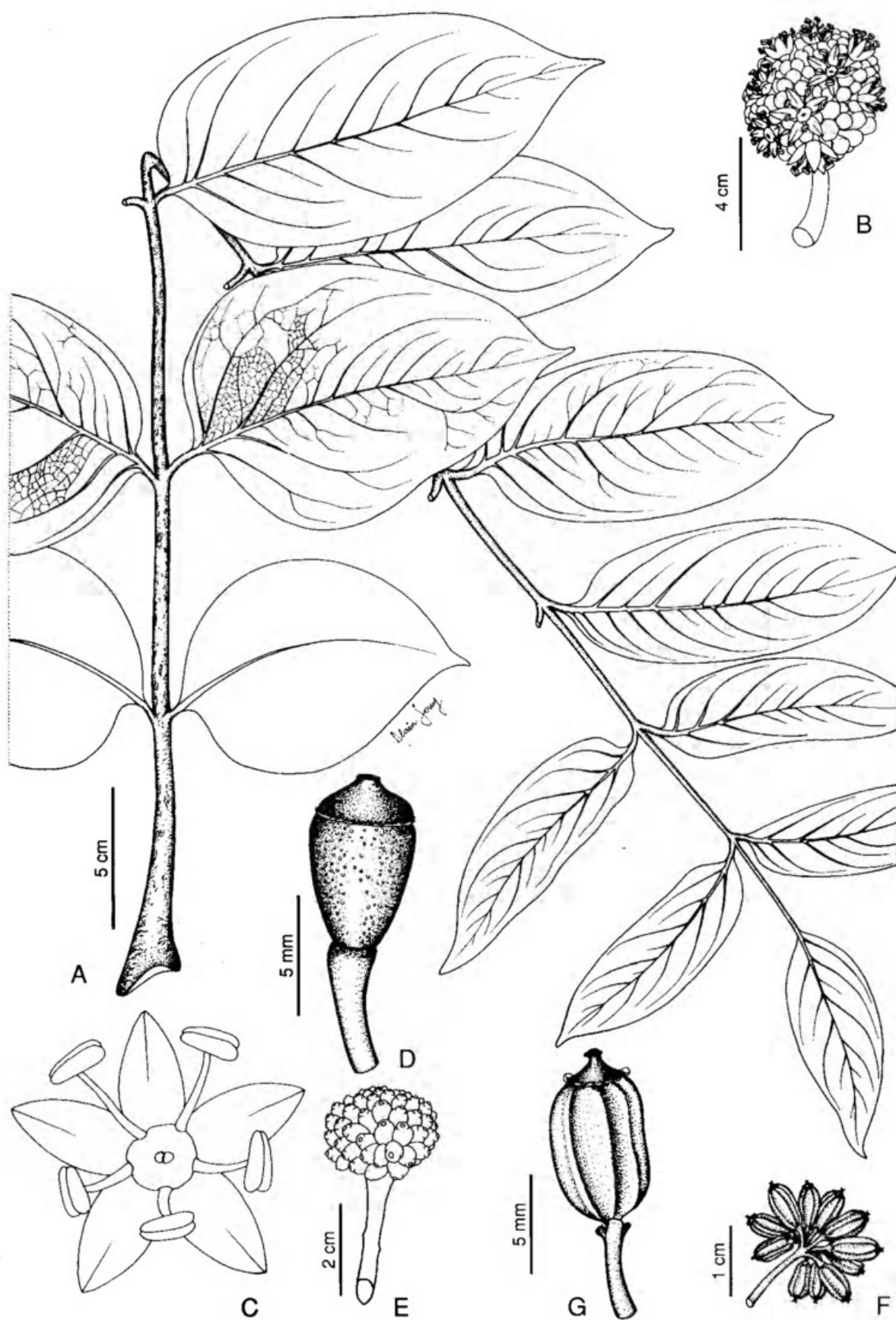


Fig. 1.—*Polyscias mayottensis*: A, leaf; B, umbellule of flowers at anthesis (male phase); C, individual flower at anthesis; D, immature fruit; E, umbellule of immature fruits; F, umbellule of nearly mature fruits; G, nearly mature fruit. (A, Labat & Pascal 2928; B-E, Labat & Pascal 2935; F, G, Pascal & Labat 778).



Fig. 2.—*Polyscias mayottensis*: **A**, branch with inflorescence and young leaves (Labat & Pascal 2928); **B**, nearly mature fruits (Pascal & Labat 778).—Photos J.-N. LABAT.

in several remnant stands of both mesophyllous forest and dry forest, which along with humid forest comprise the three primary vegetation types present on the island. The new species is most frequently encountered in mesophyllous forest, a transition formation that is thought to have originally occupied most of the western slope and the southern third of Mayotte, but is now restricted to three small stands: Mt. Hachiroungou in the northwest, Sohoa in the west, and Dapani in the foothills of Choungui in the south. Together these areas cover less than 2% of the total surface of the island (PASCAL 1997). *Polyscias mayottensis* is relatively abundant in this vegetation type, especially on the steep slopes of Mt. Hachiroungou between ca. 400 and 500 m, where the relatively low, irregular canopy reaches about 15 m in height. The new species also occurs on the Sohoa plateau, which averages about 200 m altitude, where the forest has a more closed canopy. In both areas, *P. mayottensis* occurs with *Gastonia duplicata*, as well as several other characteristic species, including *Grisolea myrianthea* Baill., *Trophis montana* (Leandri) C.C. Berg, *Tannodia cordifolia* Baill., *Strychnos mitis* S. Moore, and *Ravensara areolata* Kosterm. *Polyscias mayottensis* has not been observed at Dapani (although it could be expec-

ted to occur there), nor has it been seen in any of Mayotte's remaining humid forests, which are now restricted to the main peaks and ridges between about 300 m and the highest point of the island at 660 m.

Polyscias mayottensis also occurs in dry forest vegetation, which covers about a third of the land area of Mayotte, primarily in the coastal zone (0-100 m elevation) throughout the island and neighboring islets in areas with an average annual precipitation between 800 and 1200 mm and a pronounced dry season. *Polyscias mayottensis* is much less common in this formation (although not rare), and is most often associated with vegetation that is partially open, either from natural or anthropogenic causes. The new species has been found a few times in remnant stands of dry forest in the southern part of the island, including in the area around Saziley Point in the extreme southwest, where the type collection was made. However, *P. mayottensis* was not observed during inventory work conducted in the "large" fragments (5-20 ha) of intact dry forest at Saziley Point, where a low forest dominated by *Commiphora arafy* H. Perr., *Poupartia gummifera* Sprague and *Mimusops comorensis* Engl. occurs, along with thicket vegetation characterized by

Phyllarthron comorense A. DC., *Ochna ciliata* Lam. and *Diospyros natalensis* (Harv.) Brenan. On the other hand, isolated individuals of *P. mayottensis* have been observed in areas with a partially degraded, secondary mosaic of short and tall thicket dominated by *Lantana camara* L., which now covers most of the dry parts of Mayotte. The new species is also present in open *Grewia picta* Baill. - *Commiphora arafy* thickets, which are restricted to littoral talus areas and rocky points.

Polyscias mayottensis appears to be most closely related to the Malagasy species *P. boivinii* (Seem.) Bernardi, probably having diverged from it or a common ancestor on Madagascar following

long-distance dispersal and colonization on Mayotte. These two species share several obvious and distinctive features, including the shape, texture and venation of their leaflets, and the basic structure and organization of their inflorescences. They can, however, be distinguished by several other important characters, as indicated in Table 1. In general, individuals of *Polyscias mayottensis* are considerably more robust than those of *P. boivinii*, with more expansive and developed inflorescences containing a greater number of umbellules per secondary axis and more flowers per umbellule. This may be a case of the well known phenomenon in which derived insular taxa are larger and more well developed than their "mainland" relatives (CARLQUIST 1974).

Table 1.—Comparison of morphological features in *Polyscias mayottensis* and *P. boivinii*.

	<i>P. mayottensis</i>	<i>P. boivinii</i>
Leaf length	60-80 cm	20-40(-50) cm
Petiole diam. (mature lvs.)	4-5 mm	1.8-2.5(-3.3) mm
Umbellules per 2° axis	30-45	20-30
Flowers per umbellule	30-40	10-25
Fruit height, shape	(6.5-)7-8 mm, elliptic to slightly oblong	5.5-6.5 mm, ovate
Disk height, shape	1 mm, rounded to slightly oblong	1.5-2 mm, narrowly conic, beak-like

Both *Polyscias mayottensis* and *P. boivinii* share several features with two other Malagasy members of the genus (*P. baehniiana* (Bernardi) Bernardi and *P. floccosa* (Drake) Bernardi), including for example farinose stellate pubescence, a bicarpellate gynoecium and deciduousness, and together they probably form a monophyletic group. The three species on Madagascar occur primarily in the dry and subarid bioclimatic zones (CORNET 1974), which further distinguishes them from other Malagasy members of the genus. Of these three taxa, *P. boivinii* has the widest range, extending from the north throughout the west and the Sambirano region (including Nosy Be), as far south as Sakaraha near Toliara (Tuléar), whereas *P. baehniiana* occurs mostly in the Center-South, and *P. floccosa* is re-

stricted to the area around Antsiranana (Diego Suarez) in the extreme north of the island (BERNARDI 1971). It is thus perhaps not surprising that *P. boivinii* appears to be the closest relative of *P. mayottensis*.

The two species of *Polyscias* present in the Comoro Islands likely represent the result of separate colonization events from very different ancestral stock. *Polyscias felicis* most closely resembles *P. carolorum* Bernardi of eastern Madagascar and *P. repanda* (DC.) Baker of Réunion Island, and together they probably form a monophyletic group. These species share several characters, including a 5(-7)-carpellate gynoecium and an unarticulated pedicel (the latter is an uncommon feature in the genus), and

they are all found in wet forest habitats, in sharp contrast to *P. mayottensis*, *P. boivinii*, and their presumed relatives.

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