A New Species of *Zinowiewia* (Celastraceae), and Notes on the Genus in Ecuador

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ABSTRACT. *Zinowiewia* is a small neotropical genus of 17 species. Two species are reported to occur in Ecuador: *Zinowiewia australis* Lundell and the new *Zinowiewia madsenii* C. Ulloa & P. M. Jørgensen. A key to the Ecuadorian species, descriptions, and an illustration of the new species are provided.

Turczaninow (1858) described *Wimmeria integerrima*, questioning its generic position. A year later he recognized this species as belonging to a new distinct neotropical genus, *Zinowiewia* Turczaninow (Turczaninow, 1859). The genus remained monotypic until Lundell (1938) described six new species. The following year he published a revision of the genus containing seven species (Lundell, 1939a), and shortly after he added two new species (Lundell, 1939b, 1940).

Between 1964 and 1988 five species from Mexico and Central America were described (Lundell, 1981, 1985, 1987; Williams, 1964) and two from northern South America (Lundell, 1970; Steyermark, 1988), bringing the number of recognized species to 16.

The genus was recently reported to occur in Ecuador from collections made in the province of Loja (Madsen, 1991; Ulloa Ulloa & Jørgensen, 1993). These collections appeared to represent an undescribed species endemic to a small area of the Podocarpus National Park. Further examination of the specimens deposited at the Missouri Botanical Garden showed the presence of a second species in Ecuador, *Zinowiewia australis* Lundell.

The species of *Zinowiewia* are trees or shrubs characterized by their one-winged samaras, decussate leaves, and one- to several-times forked cymes. The genus is distributed from south-central Mexico through Central America to Peru, from 250 to 3,150 m elevation. At present two distinct species occur in Ecuador.

KEY TO THE SPECIES OF *ZINOWIEWIA* IN ECUADOR

1a. Leaves 4.2–9 cm long, 2–4.5 cm wide, membranaceous to subchartaceous, petioles 6–11 mm long; cymes subsessile, 4- to 6-times forked; samaras 20–28 mm long, 7.5–17 mm wide; Amazonian lowlands ..... *Zinowiewia australis*

1b. Leaves (0.9–)1.8–3(–4.2) cm long, (0.7–)1.4–1.8(–2.3) cm wide, subcoriaceous to coriaceous, petioles 2–4 mm long; cymes on peduncles up to 8 mm long, 1- to 2-times forked; samaras 14–19 mm long, 4–7.5 mm wide; upper Andean forest ..... *Zinowiewia madsenii*

Zinowiewia australis Lundell, Bull. Torrey Bot. Club 65: 469. 1938.

Tree to 40 m high; buttressed; trunk canaliculate; bark fissurate (*Palacios et al. 3528*); branchlets slender. *Leaves* membranaceous to subchartaceous, dark green; petioles deeply canaliculate, 6–11 mm long; leaf blades ovate-elliptic, lanceolate or elliptic, 4.2–9 cm long, 2–4.5 cm wide, apex acuminate to apiculate, base narrowed, acute, decurrent, margin revolute; venation reticulate, midvein impressed above, prominent beneath, the main lateral veins 4–6 on each side, elevated above and beneath. *Inflorescence* a dense cyme on mostly defoliate branches, to 2.4 cm long, forked 4–6 times, subsessile, peduncle up to 1.5 mm long, primary branches up to 7 mm long; bracts and bracteoles up to 0.8 mm long; pedicels of all flowers jointed at or near the base, up to 0.5 mm long below joint. *Flowers* green; calyx lobes 5, 0.3–0.5 mm long, 0.7–0.8 mm wide, widely ovate, slightly 3-lobed, central lobe acute, margin light green, entire; petals 5, 0.9–1.2 mm long, 0.5–0.8 mm wide, lanceolate-ovate, acute to obtuse; stamens 5, filaments 0.6 mm long, borne on angles of disk, anthers 0.2 mm long; disk fleshy, pentagonal, margin slightly elevated; ovary 2-locular, submerged in the disk, 2 ovules in each locule. *Fruits* (from the original description and Peruvian material) broadly oblanceolate to obovate samaras, 20–28 mm long, 7.5–17 mm wide, strongly veined, apex rounded, mucronate; seed 1, 8–11 mm long, 2.5–3 mm diam.

Distribution. Venezuela to Peru, in lowland to submontane forests, 250–1,250 m elevation.

Zinowiewia australis is characterized by its large, dark, thin leaves, long peduncles, subsessile cymes forked 4–6 times, and large obovate samaras.

Figure 1. *Zinowjewia madsenii* C. Ulloa & P. M. Jørgensen. —A. Habit. —B. Inflorescence in bud. —C. Flower. —D. Fruits. Habit and flower based on *Madsen 86233* (AAU), inflorescence based on *Madsen 85826* (AAU), fruits based on *Madsen 86076* (AAU).

Specimens examined. ECUADOR. **Napo:** Vía Coca–Loreto–Hollín, sitio Huaticocha, 00°45′S, 77°29′W, 500–575 m, 11 Jan. 1989 (fl), *Palacios, Iguago & Hurtado 3528* (MO, QCNE), 10 Jan. 1989 (fl), *Hurtado, Palacios & Iguago 1384* (MO, QCNE). PERU. **Pasco:** Oxapampa, Gran Pajonal, ca. Chequitano, 10°45′S, 74°23′W, 1,250 m, 23 Sep. 1983 (fl, fr), *Smith 5178* (MO).

Zinowiewia madsenii C. Ulloa & P. M. Jørgensen, sp. nov. TYPE: Ecuador. Loja: Parque Nacional Podocarpus, E of Nudo de Cajanuma, just N of Centro de Información, sample plot site, wet montane forest, 04°05′S, 79°10′W, 2,900 m, 14 Oct. 1989 (fl, fr), *Madsen 86233* (holotype, AAU). Figure 1.

Zinowiewiae sulphureae Lundell affinis sed petiolis brevioribus, foliis minoribus, nervis lateralibus pauciioribus, pedicellis brevioribus, disco quinqueangulato, samara 1-seminata differt.

Shrub to trees, to 15 m high, densely branched; branchlets densely foliose, drying brown-red, strongly canaliculate, and angulate. *Leaves* subcoriaceous to coriaceous, darker and lustrous above, opaque below; petioles deeply canaliculate, 2–4 mm long; leaf blades lanceolate-elliptic to ovate-elliptic, (0.9–)1.8–3(–4.2) cm long, (0.7–)1.4–1.8(–2.3) cm wide, apex acute, acumen rounded, base attenuate to cuneate, and decurrent, margin revolute; venation reticulate, midvein impressed above, prominent beneath, the main lateral veins 4–6 on each side, elevated beneath, obscure above. *Inflorescence* a cyme, axillary in the upper leaves, up to 1.3 cm long, forked 1–2 times, peduncle up to 8 mm long, primary branches up to 3 mm long, glabrous to sparsely pubescent; bracts and bracteoles up to 1 mm long; pedicels up to 1.8 mm long below joint, those of terminal flower of cyme jointed below the middle, those of lateral flowers jointed at or below the middle. *Flowers* green; calyx lobes 5, ca. 0.5 mm long, 0.8 mm wide, broadly deltoid, obtuse, margin brown-red, erose; petals 5, 1.2–1.8 mm long, 0.8–1.3 mm wide, oblong-ovate, apex rounded; stamens 5, filaments 0.4 mm long, borne on angles of disk, anthers 0.3 mm long; disk fleshy, pentagonal, margin slightly elevated; ovary 2-locular, submerged in the disk, 2 ovules in each locule. *Fruits* oblong-obovoid samaras, apex rounded to acute, mucronate, 14–19 mm long, 4–7.5 mm wide, light green, midvein prominent, veinlets well developed; seed 1, 4–7 mm long, 1–2 mm diam., straight to slightly curved.

Distribution. Southern Ecuador, in upper montane rainforest, at 2,900–3,150 m elevation.

Zinowiewia madsenii most closely resembles *Z. sulphurea* Lundell from the Andes of Colombia. Both species grow in the same type of habitat, have reddish, grooved, thick branchlets, short internodes, coriaceous leaves with revolute margins, reticulated venation on lower surface, few-times branched cymes, and sepals with erose, reddish margin. The Colombian species differs, however, in having longer lanceolate leaf blades (5–8 cm long), with 6–8 pairs of main lateral nerves, longer petioles (5–8 mm), longer pedicels (up to 3 mm long), annular disk, and 2-seeded samaras.

Zinowiewia madsenii is readily distinguished by its dense foliage of small leaves with very short petioles. Furthermore, the occurrence of cymes 1-forked and sometimes sparsely pubescent is unusual within the genus. One collection (*Madsen 85771*) has an additional infertile branch with herbaceous longer leaves, 6.1 cm long, 2.5 cm wide, that may correspond to a juvenile or a shaded shoot. This species is named after the Danish botanist Jens E. Madsen, the only person who has collected this species and the one who brought this interesting plant to our attention.

Paratypes. ECUADOR. **Loja:** same locality as holotype, 28 Oct. 1988 (fl), *Madsen 75523* (AAU), 3 Feb. 1989 (fl), *Madsen 85771* (AAU), 20 July 1989 (fl, fr), *Madsen 86076* (AAU, QCA), 14 Oct. 1989 (fl, fr), *Madsen 86226* (AAU); above Nudo de Cajanuma, trail to Mirador, scrub and ridge-top vegetation above tree limit 3,000–3,150 m, 23 Feb. 1989 (fl), *Madsen 85826* (AAU).

Acknowledgments. We thank the curators of AAU, MO, QCA, and QCNE for permitting us to study the material; Nancy Henshold and Carol Todzia kindly provided photocopies of types deposited at F and LL, respectively. We thank Henk van der Werff for helpful comments, and for improvement of the Latin diagnosis.

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