

# Trees in the landscape, Part 8:

## *Olmediella betschleriana*

Donald R. Hodel

### *Olmediella betschleriana* (Göpp.) Loes.

In the fall of 1972, while an undergraduate majoring in ornamental horticulture at California State Polytechnic University in Pomona, I was taking the plant materials class on trees from my professor, good friend, and person responsible for my addiction to palms, the late James L. Degen. As we often did for his plant materials classes, we were walking the streets of nearby San Dimas and Jim was pointing out various trees, offering his insights and opinions about each tree, extolling its virtues or pointing out its foibles, always with his incomparably

Figure 1. Guatemalan holly is a choice and attractive if not curious, medium to large, evergreen tree that makes a superb park, lawn, shade, or, in some cases, even a street tree (11840 Stanwood Dr., Los Angeles, CA).



dry wit, humor, and charm. One such tree he brought to our attention was in front of a handsome, gray California bungalow, and, waving his ever-present notched stick like a magic wand, Jim proclaimed this spiny-leaved plant to be Guatemalan holly. With its spiny leaves we could easily see the origin of part of its common name while the other part conjured up images of an exotic, intriguing, tropical place, a destination I dreamed of visiting. Over the last 41 years this tree

*sincephala*, *Olmediella cesatiana*, *O. ilicifolia*, *Xylosma aquifolia*.

**Common names:** Guatemalan holly, Costa Rican holly, *manzanote*.

**Etymology:** The origin of the Latin binomial is somewhat obscure. The genus name *Olmediella* is simply the diminutive form of another tropical American genus in the Moraceae (fig) family, *Olmedia*, which was named in 1794 likely for a Spanish or Peruvian

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and the memories it provokes have frequented my mind so I take great pleasure in writing about it here.

*Olmediella betschleriana* is a choice and attractive, if not curious, medium to large, evergreen tree much prized for its exceedingly handsome, thick, sturdy, glossy green, holly-like leaves. It makes a superb park, lawn, shade, or, in some cases, even a street tree (Fig. 1) and, because of its generally dense foliage and branching habit, it also finds use as a background plant, screen, barrier, or a trimmed, tall hedge or other shape.

#### Taxonomy and history

**Synonyms:** *Croton tuerckheimii*, *Dovyalis cesatiana*, *Ilex betschleriana*, *Licopolia*

botanist or patron of the sciences, and to which *Olmediella* is perhaps similar. Because *Olmediella* was originally described from material cultivated in Europe, where it seldom flowered and fruited, its relationship was only guessed at, and was at one time or another erroneously placed in the Aquifoliaceae, Sapindaceae, Fagaceae, or Moraceae families (Standley and Williams 1961). The specific epithet *betshleriana* is likely named in honor of Betschler of whom nothing is known and this person was not mentioned in the original description.

**History:** Johann Heinrich Robert Göppert (1800-1884) described and named this tree as *Ilex betschleriana* in



Figure 2. (Left) Guatemalan holly is a small to large, moderately fast-growing, broad-leaved, evergreen, armed, dioecious tree to 60 feet tall and wide (11814 Stanwood Dr., Los Angeles, CA).

Figure 3. (Center left) The canopy of Guatemalan holly is irregular but with little or no pruning can be dense and pyramidal with branches and foliage often nearly to the ground (Fullerton Arboretum, Fullerton, CA).

Figure 4. (Center right) The trunk of Guatemalan holly is typically thick, robust with age (11834 Stanwood Dr., Los Angeles, CA).

Figure 5. (Right) Arborist Ken Greby provides scale for this exceptionally large Guatemalan holly with a trunk 30 inches DBH (11827 Stanwood Dr., Los Angeles, CA).

1855, basing it on cultivated material at Herrenhausen in Hannover, Germany. Ludwig Eduard Theodor Loesener (1865-1941) transferred it to *Olmediella* in 1905.

### Description

The description is primarily from Standley and Williams (1961) and supplemented from cultivated specimens in California.

**Habit/conformation:** small to large,

moderately fast-growing, broad-leaf, evergreen, armed, dioecious tree to 60 feet tall and wide (Fig. 2); canopy irregular, generally broadly columnar (oval) to rounded or pyramidal and typically dense, branches and foliage often nearly to the ground (Fig. 3).

**Trunk:** usually solitary, sometimes short and branching into multiple trunks close to the ground, to 30 inches DBH (Figs. 4-5); irregular branching with narrow to wide

branch angles.

**Bark:** whitish, smooth (Fig. 6).

**Leaves:** variable, simple, alternate, dark glossy green (Fig. 7), new growth bronzy to chocolate brown (Fig. 8), 3-5 × 1-2.5 inches, oblong or elliptic oblong, thick, leathery, rigid, short- to long-pointed at apex, rounded or obtuse at base, 6-9 pairs of lateral nerves, margins variable, typically coarsely toothed with prominent

Figure 6. (Left) Bark of Guatemalan holly is whitish and smooth (John F. Enders Elementary School, Garden Grove, CA).



Figure 7. (Center left) While variable, the handsome leaves of Guatemalan holly are typically thick, stiff, and glossy green (Fullerton Arboretum, Fullerton, CA).

Figure 8. (Center) New growth of Guatemalan holly is chocolate brown (Fullerton Arboretum, Fullerton, CA).

Figure 9. (Right) Leaves of Guatemalan holly on non-flowering juvenile or epicormic growth are typically coarsely toothed with spine-tipped teeth (11814 Stanwood Dr., Los Angeles, CA).





Figure 10. (Upper left) Leaves of Guatemalan holly have smooth, entire margins or nearly so on flowering, mature growth (John F. Enders Elementary School, Garden Grove, CA).

Figure 11. (Lower left) Leaves of Guatemalan holly have smooth, entire margins or nearly so on flowering, mature growth (John F. Enders Elementary School, Garden Grove, CA).

Figure 12. (Center) The base of the leaf of Guatemalan holly has two minute, conical glands, one on each side of the midrib at the petiole (11840 Stanwood Dr., Los Angeles, CA).

Figure 13. (Upper center) While staminate (male) inflorescences of Guatemalan holly are conspicuous they are not particularly showy because they are close to or proximal of branch tips and somewhat hidden among the foliage (11840 Stanwood Dr., Los Angeles, CA).

Figure 14. (Lower center) Staminate (male) inflorescences of Guatemalan holly are 5-9-flowered racemes to 5 inches long (11840 Stanwood Dr., Los Angeles, CA).

Figure 15. (Upper right) Staminate (male) flowers of Guatemalan holly are a hemispherical “head” of stamens nearly an inch wide (11840 Stanwood Dr., Los Angeles, CA). Figure 11. (Lower left) Leaves of Guatemalan holly have smooth, entire margins or nearly so on flowering, mature growth (John F. Enders Elementary School, Garden Grove, CA).

Figure 16. (Lower right) Pistillate (female) inflorescences of Guatemalan holly are short, compact, 6-8-flowered racemes to 2 inches long (11814 Stanwood Dr., Los Angeles, CA).

spine-tipped teeth on non-flowering juvenile and epicormic growth (Fig. 9) but smooth or entire or nearly so on mature or flowering growth (Figs. 10-11); two minute, conical glands at the base of the leaf, one on each side of the midrib at the petiole (Fig. 12).

**Flowers:** in few-flowered, axillary inflorescences (clusters) near or some distance proximally of branch tips. Staminate (male) conspicuous but not showy (Fig. 13), short, 5-9-flowered raceme to 5 inches long (Fig. 14), peduncle to 0.4 inch long, rachis to 2.75 inches long; individual flowers appearing as a hemispherical “head” of stamens, to 0.7 inch long and 0.9 inch wide (Fig. 15), yellowish aging to greenish white, on short branch to 0.4 inch long and pedicel 0.8 inch long; sepals small, green, connate in proxi-

mal half and forming a 16-18-lobed, flat, crown-like calyx 0.6 inch wide, lobes 0.1 inch long, long-triangular, sharp-pointed; petals none; receptacle to 0.25 inch wide, reddish; stamens up to 85, to 0.4 inch long, anthers 0.04 inch long. Pistillate (female) flowers in inconspicuous, short, compact, 6-8-flowered raceme to 2 inches long (Fig. 16), peduncle to 0.2 inch long, rachis to 0.8 inch long; individual flowers to 0.25 inch long and 0.45 inch wide, green, on short branch to 0.2 inch long and pedicel 0.2 inch long; sepals small, green, imbricate in proximal two-thirds and forming an 8-lobed, somewhat flat, crown-like calyx to 0.08 inch high and 0.45 inch wide, sepals to 0.2 inch long and 0.14 inch wide, triangular, long-sharp-pointed free lobes; petals none; ovary to 0.15 inch long and 0.2 inch wide, oblate

(wider than long, like a squashed or depressed sphere), style short, 0.04 inch long, branching into 10 abruptly spreading arms to 0.16 inch long; fall to spring, heaviest in February in southern California.

**Fruits:** to 1.75 inches long and 3.5 inches wide, oblate (wider than long, like a squashed or depressed sphere), smooth, green when ripe (Figs. 17-18), eventually aging to black (Fig. 19), hard, durable; seeds are much the same size and shape of watermelon seeds, to 0.35 inch long, 0.2 inch wide, 0.06 inch thick, ovate, tan to black, pointed, flat (Fig. 20).

**Distribution and ecology**

Guatemalan holly occurs in, moist or wet mountain forests and cloud forests from 4,500 to 8,500 feet elevation

from southern Mexico through Guatemala, Honduras, and El Salvador to Nicaragua. These areas are typically covered with dense, rich, broad-leaf, evergreen forests with little daily or seasonal variation in temperature and rainfall. Depending on the location, rainfall ranges from 30 to over 100 inches annually. However, even in lower-rainfall areas cloud cover, including fog, and high humidity are nearly always constant. Day-time high temperatures range from the 60s to the 70s°F while night-time low temperatures are typically in the 40s and 50s°F but can drop into the 30s°F and frosts are common (Breedlove 1981), especially on clear, winter nights at high latitudes and altitudes.

### Propagation and growth rate

Guatemalan holly can be propagated by seeds, which are typically available nearly year round, and cuttings. Seeds germinate readily within a month or so if handled correctly. To extract seeds use a heavy hammer or brick to smash the hard, green but ripe fruits (Fig. 20). Sow seeds in a clean, moist, well drained and aerated medium and maintain the temperature at about 70 to 75°F. Sherry Tobin, nursery manager at the Los Angeles County Arboretum & Botanic Garden (pers. comm.), reports that seeds germinated within four weeks when planted in Sunshine Mix 3 (Sun Gro Horticulture, Agawam, WA) and maintained at temperatures of 75 to

85°F. Plants grew to about 12 inches tall after one year. Barrie Coate (pers. comm.) notes that he grew Guatemalan holly from seeds at the Saratoga Horticultural Foundation in the Bay Area in the late 1950s as a standard tree form in five-gallon containers without any problems other than its sensitivity to cold when small (which see below under Environmental Tolerances).

Cuttings might be somewhat difficult to root but are necessary if a staminate plant (no fruit litter, which see below under Problems/Litter) or a specific form (less spiny) is desired. The key to root cutting successfully might be to use spiny-leaved juvenile foliage. Glen Williams (pers. comm.) reports about 80% success in rooting four-to-six-leaf tip cuttings of immature but firm (not hard), spiny-leaved, juvenile growth. He used a rooting hormone and simply placed the cuttings in a 30-gallon aquarium tank with no bottom heat. Apparently others have tried using entire-leaf foliage from mature flowering or fruiting trees with little or no success. The use of bottom heat (70°F) and intermittent, overhead mist might also be beneficial. Grafting and air layering might be other methods to obtain fruit-free staminate plants.

Growth rate of Guatemalan holly is moderately fast in southern California to slow in cooler areas like central and northern California (McClintock 1991). Young trees seem to grow more

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quickly than old trees. UFEI (2013) states it can grow up to 36 inches per year, which is rather fast. Trees in southern California typically grow to about 30 feet in 15 years and 60 feet after about 50 to 60 years.

### Environmental Tolerances

Figure 17. (Left) Fruits of Guatemalan holly are to 1.75 inches long and 3.5 inches wide, oblate (tomato-shaped), smooth, hard, and green when ripe (John F. Enders Elementary School, Garden Grove, CA).

Figure 18. (Center left) Fruits of Guatemalan holly are large and shaped like a squashed or depressed sphere (11814 Stanwood Dr., Los Angeles, CA).

Figure 19. (Center right) Fruits of Guatemalan holly are ripe and fall from the tree when green but eventually turn black with age (John F. Enders Elementary School, Garden Grove, CA).

Figure 20. (Right) Using a hammer or brick to smash the fruits of Guatemalan holly will reveal the tan to black seeds that look much like those of watermelon (John F. Enders Elementary School, Garden Grove, CA).



Guatemalan holly is surprisingly tolerant and adaptable despite its origin in moist to wet, somewhat cool areas with little daily or seasonal variation. Williamson (1987) listed it for *Sunset* zones 9 and 14-24 in California, making it suitable for the Bay Area, warmer parts of the Central Valley, and central and southern coastal plains and interior valleys. It is rated for USDA Hardiness Zones 9 to 10 (UFEI 2013). Old, mature specimens will tolerate temperatures to about 20°F (Williamson 1987) although young trees might be damaged at even higher temperatures, about 30°F (Barrie Coate pers. comm.). Guatemalan holly is likely not well adapted to the desert areas of southern California, western Arizona, and southern Nevada. It would likely perform well in cooler, upland areas of Hawai'i, such as on the Big Island and Maui, but the risk of it becoming invasive needs to be determined (which see below under Weed/Invasive Species Risk).

Guatemalan holly is tolerant of the cool, moist, foggy, humid conditions of the coast as well as the heat and aridity of interior valleys in California. It also tolerates wind, air pollution, and light or heavy or alkaline or acid soils. It is likely intolerant of poor drainage and the most limiting factors in its wider use might be intolerance of severe cold and the extreme heat and aridity of desert areas. Although

not investigated, drought tolerance of Guatemalan holly is likely low and trees probably need regular irrigation, especially in warmer, more arid interior areas.

**Uses**

Guatemalan holly makes a superb park, lawn, shade, or, in some cases, even a street tree and, because of its generally dense foliage and branching habit, it also finds use as a background plant, screen, or barrier. Much like various *Ficus*, *Eugenia*, or *Syzygium* spp., it can also be severely pruned into a tall hedge or other shape. Staminate (male) trees are preferred for street use because of the lack of large, hard, heavy fruits of pistillate (female) trees (which see below under Problems/Litter).

**Pruning/management**

Because of a tendency for strong, straight, upright growth when young, Guatemalan holly needs little pruning in the nursery. Provide adequate space and retain lower branches to encourage maximum trunk caliper. However, for street or other use where a single trunk is desired, removal of competing lateral trunks or upright basal branches, if any, is likely necessary in nursery production or early in the landscape. To encourage a broader, more rounded canopy, reduction pruning and/or

heading back of the upright leader and selection of lateral scaffold branches are probably necessary. Also, because trees have a tendency to retain lower lateral branches, these will have to be removed if pedestrian or vehicular clearance is required in the landscape.

If trees leave the nursery with proper structure and form, little or no pruning should be necessary in the landscape. Only judicious thinning out to reduce canopy density, if desired, and pruning to encourage or maintain structure might be required.

**Problems/litter**

Guatemalan holly is largely problem free. Older trees at the peak of flowering in February in southern California can produce abundant staminate (male) flower litter and attract bees on warm, still days, and leaf drop prior to flushes of new growth can be somewhat heavy. However, the most significant problem is fruit drop that, because of their large size and hard texture, can damage autos and hurt pedestrians. Selection of staminate trees will eliminate fruit litter.

Guatemalan holly is rather long-lived, up to 150 years, and has medium branch strength, low root damage potential, and no known health hazards (UFEI 2013).

Figure 21. (Left) Perhaps the nicest trees of Guatemalan holly line the 11800 block of Stanwood Drive in Los Angeles, CA.

Figure 22. (Right) A trio of small but well shaped specimens of Guatemalan holly is in the Murphy Sculpture Garden on the campus of the University of California, Los Angeles (U.C.L.A.).



### Pests and diseases

There are no serious pests and diseases of Guatemalan holly in California.

### Weed/invasive species risk

While Guatemalan holly has not been officially evaluated for invasiveness in Hawai'i (HEAR-PIER 2013), it should be thoroughly assessed prior to planting. Its invasiveness has not been assessed for California but it is likely a low risk.

### Availability

Although uncommon in the trade, Guatemalan holly is occasionally available in a few nurseries in California. San Marcos Growers in Santa Barbara and Pacific Tree Farms in Chula Vista (now out of business) occasionally offered it for sale. The presence of fruiting trees and ease of germination should encourage more nurseries to grow Guatemalan holly.

### Trees in California

Perhaps the nicest trees of Guatemalan holly line the 11800 block of Stanwood Drive in Los Angeles (Fig. 21). They are estimated to be 50 to 60 years of age, are up to 60 feet tall, and have trunks up to 30 inches DBH. Not too far away in the Murphy Sculpture Garden on the campus of the University of California (U.C.L.A.) are three small but well shaped specimens (Fig. 22).

Figure 23. (Left) John F. Enders Elementary School in Garden Grove, CA has several small but nice specimens of Guatemalan holly.

Figure 24. (Right) John F. Enders Elementary School in Garden Grove, CA has several small but nice specimens of Guatemalan holly.



Figure 25. (Left) In Santa Barbara the First Congregational Church on State Street has two specimens of Guatemalan holly, one of which fruits abundantly.

Figure 26. (Right) On the campus of California Polytechnic State University in San Luis Obispo there is a pair of Guatemalan hollies, one staminate (male) and one pistillate (female), southeast of the Robert E. Kennedy Library just at the west end of Mathematics & Sciences Building 38.

The Los Angeles County Arboretum and Botanic Garden in Arcadia has a plant it received in 1966 and that is now about 45 feet tall and wide and produces fruit although no staminate plant is in the collection, which suggests a staminate plant is not too distant in the area.

The Fullerton Arboretum on the Campus of California State University in Fullerton has a rather unusual, narrowly pyramidal or conical specimen with a dense canopy of dark green,



spiny-leaf, juvenile foliage all the way to the ground (Fig. 3). Also in Orange County in front of John Enders Elementary School in Garden Grove are several small but mature specimens frequently in fruit (Figs. 23-24).

Farther north in Santa Barbara the First Congregational Church on State Street has two specimens of medium size, one of which fruits abundantly (Fig. 25). Another specimen about 25 feet tall and 20 feet wide is at 101 San Roque in Santa Barbara. On the campus of California Polytechnic State University in San Luis Obispo there is a pair of trees, one staminate and one pistillate, southeast of the Robert E. Kennedy Library just at the west end of Mathematics & Sciences Building 38 (CPPC 2013) (Fig 26).

The Strybing Arboretum in Golden Gate Park in San Francisco had a double-trunk specimen about 45 feet tall in 1991 in the South American section and younger trees, planted in the 1980s, in the New World Cloud Forest collection (McClintock 1991).

### Notes

*Olmediella* contains only one species and until recently was placed in the Flacourtiaceae family along with

some more commonly known genera like *Azara*, *Dovyalis*, and *Xylosma*. However, work by the Angiosperm Phylogeny Group has moved many genera out of Flacourtiaceae and into Salicaceae, which originally contained only three genera, *Salix* (willows), *Populus* (poplars), and *Chosenia*, but now includes 55 (Stevens 2013).

Standley and Williams (1961), who called Guatemalan holly "one of the most interesting trees of Guatemala," noted that while it was cultivated in Europe, especially Italy, since the 1870s, it rarely flowered or fruited there so its taxonomic relationships and position were only guessed at. Even the source of the European plants was a mystery until 1932 when Standley, one of the foremost students of tropical American plants of his time, confirmed that material sent to him from mountain forests in Guatemala was this species (Standley and Williams 1961). Although now considered endangered in many areas of its distribution, it was once apparently abundant in the rich, dense, mountain rain and cloud forests of Guatemala where it was particularly common on the slopes of Volcan Pacaya and Acatenango and similar areas in the central region of the country (Standley and Williams (1961). These forests must be especially intriguing and interesting for they harbor at least two other unusually handsome and

undeservedly rare species, *Chiranthodendron pentadactylon* and *Robinsonella cordata*, which I will write about in future installments of this series.

Known in Guatemala as *manzanote*, which is derived from the Spanish *manzana* or apple, perhaps alluding to its firm, green fruits, Guatemalan holly is extensively cultivated in the capitol and other municipalities in the central region as a favorite park and street tree. The Paseo de la Reforma in Guatemala City and Parque Central in Antigua are well known for their Guatemalan holly trees (Standley and William 1961, Juan Jose Castillo pers. comm.).

The Westcott brothers introduced Guatemalan holly to California in the middle 1930s, sharing seeds they had obtained in Guatemala with famous Los Angeles nurseryman Paul J. Howard (McClintock 1991). In the 1950s Howard shared a plant with Eric Walther, first director of Strybing Arboretum in Golden Gate Park in San Francisco.

Guatemalan holly was first named as a species of *Ilex* (holly), undoubtedly because of its spiny, holly-like leaves. Indeed, its handsome, thick, lustrous green leaves, especially those with the lobed margins and each lobe tipped with a sharp spine, are strikingly similar to those of several species of *Ilex*. However, the leaves are extremely variable in their spiny

nature. The spiny, holly-like leaves are more typical of non-flowering and epicormic, more juvenile growth while the leaves with entire, nearly smooth margins are more typical of mature, flowering growth. Also, the holly-like, non-flowering and epicormic, juvenile growth tends to be lower in the tree canopy while the smooth-margined, mature, flowering growth is lighter green and tends to be higher in the canopy.

Because of its naturally dense growth, Guatemalan holly, much like species of various *Ficus*, *Eugenia*, or *Syzygium* spp., is amenable to rather severe pruning. In Guatemala it is often found pruned into dense, globular shapes that, while formal and artificial, are, nonetheless, still handsome (Standley and Williams 1961). Several references recognize this feature and recommend it for use as a pruned screen or hedge or even a potted subject (Hoyt 1958, UFEI 2013, Williamson 1987).

Residents of the 11800 block of Stanwood Drive in Los Angeles where Guatemalan holly is a street tree say that falling fruit can easily crack a car window. The dioecious nature of this species, though, offers a solution to the problem of fruit litter: asexual propagation by cuttings, grafting, or air layers of staminate (male) material will eliminate fruit litter.

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**Donald R. Hodel is the Environmental and Landscape Horticulture Advisor for the University of California Cooperative Extension in Los Angeles, a position he has held for nearly 30 years. Don develops and implements educational and applied research programs for the professional tree and landscape management industries. He specializes in the selection and management of trees and palms. <[drhodel@ucanr.edu](mailto:drhodel@ucanr.edu)>.**