

A WORD OR TWO ABOUT GARDENING

From the Beautiful to the Bizarre: Some climbers that are sure to fascinate

With the exception of the showy flowers and attractive foliage of hoyas, this final article of a series on vines features those grown less as ornamentals and more for their curiosity value. This relates to the unusual structural modifications to leaves or flowers that reflect their varying intimate association with insects. Apart from *Nepenthes* (pitcher plants), all of these climbers are asclepiads (Apocynaceae).

If you are familiar with growing orchids, then **hoyas (wax plants)** require similar conditions. However beware, as with orchids they can become addictive! Like orchids some of the more than 200 species grow as epiphytes (climbers and small shrubs), while others occur as terrestrial vines and shrubs. Unlike orchids, hoyas develop woody stems; these bear opposite leathery to fleshy leaves of variable size (½ - 8"), shape (linear/lanceolate to cordate) and color (pale to dark green and frequently attractively variegated) depending on species. Some hoyas are of interest as much, if not more so, for the form and patterning of their leaves than the showiness of the inflorescence. The insect association referred to above is least developed in hoyas; a few less familiar species (e.g., *H. imbricata* and *H. darwinii*) having leaves modified so as to provide shelter for ants.

Hoya flowers are usually small, waxy and star-shaped, clustered in pendent, umbellate inflorescences. These develop from stout 1-4" peduncles (stalks) which persist over several seasons to generate a succession of further flower clusters. For this reason **never remove peduncles** – if at all necessary remove only individual flowers. Apart from their ornamental value, **hoyas are often highly fragrant** at night. Some hoyas can be grown indoors (e.g., *H. bella*, flowers white/pink very fragrant; *H. lacunosa*, creamy white flowers; *H. curtisi* red/white flowers and many small silver flecked leaves or *H. angustifolia* red flowers) or in an enclosed patio. Here they can be allowed to spill over the rim of a raised or hanging container. If grown indoors place near a window in bright light away from air conditioning vents. Avoid moving the plant once in bud/flowering to prevent flowers from dropping. Warning – hoya flowers are rich in nectar and can be messy if allowed to drip on the floor.

Outdoors use a wire trellis, preferably lagged with sphagnum moss, or tree as support. Choose small containers (e.g., 3-4" unglazed clay pots) since hoyas flower more freely when the root system becomes confined. Provide a fast draining organically enriched soil mix containing fibrous peat, coir or leaf mold, plus orchid bark, and coarse mason's sand (not play sand). The soil mix should be slightly acid. Since hoyas are susceptible to nematode damage, keep the container off the ground, placing it in a tree or secured to a trellis. Pruning is rarely warranted; only the minimum necessary to remove congested/dead growth.

Exposure to direct sun should be limited to at most 2-3 hours immediately after sunrise, there after **provide shade from direct sun** (bright light) to prevent leaves from yellowing. Insufficient light will suppress flowering. **Ensure good air circulation** but protect from direct wind, especially drying winds of winter. **Hoyas**

will rot in wet soil, especially in winter when frequency of watering can be reduced. Never allow them to dry out completely (in hot dry conditions flowers will drop), watering once the top half of the pot becomes dry. Moisture extremes can cause leaves to yellow as can extended periods of cool winter temperatures and poor nutrition. For all hoyas **cold damage** becomes more likely the lower and longer temperatures fall below 50°F. During winter, truly tropical species grown outdoors in Miami-Dade will need protection as temperatures fall below 70°F. A light application of a slow release **fertilizer** such as Nutricote 14/14/14 should be applied in spring and late summer. Indoors, provide monthly applications of a soluble fertilizer (dissolved in distilled water, not local tap water) such as Carl Pool BR 61 (at one third strength) during the growing season.

Hoyas, of which there are many in cultivation, are best obtained from specialist mail order growers. One of the most familiar and easiest to grow is *H. carnosa* (and its many cultivars), a hardy, fast growing species, with clusters of up to 40 flowers (white/pale pink corolla and red corona) in each inflorescence. *Hoya archiboldiana* is fast growing, though somewhat more tender than *H. carnosa* with individual flowers up to 2" across, each reddish pink and tipped white. *Hoya publicalyx* 'Red Buttons' is fast growing and can be allowed to cascade freely down into a tree or tied onto a trellis - the flowers have a purple calyx (appears silvery due to a covering of fine hairs) and dark red corona. **Shooting star**, *H. multiflora*, a popular shrubbier species has clusters of up to 40 lemony scented white flowers, each with strongly reflexed corolla lobes and prominent corona, and attractive bright green leaves. **For fragrance** *H. longifolia*, *H. acuta*, *H. fungii* and *H. lacunosa* are all good choices.

Before moving on from hoyas, there is the impressive *H. lauterbacchii*. This is much sort after for the clusters of up to eight rosy pink/cream flowers, each individual flower measuring 3" across, so far the largest known *Hoya* inflorescence. It belongs to a truly tropical group of hoyas collectively referred to as *Eriostemma* (not a species but technically referred to as a clade). These are terrestrial (not epiphytic) preferring alkaline (pH>7.0) rather than acid soil and unlike most other hoyas do not retain their peduncles after flowering. Allow the vine to climb on a tall trellis in bright light to filtered sun, in a protected site (susceptible to cold damage in winter). Blooms can be expected at the earliest after 2-3 years (when the vine has grown between 5 -10'). A slight word of caution – some have described the fragrance when blooming as resembling warm chocolate, for others it is more like vomit!

The mutualistic relationship with ants (termed myrmecophily) that is seen in some species of hoyas is more evident in a closely related group of vines the **dischidias**. Compared to hoyas they offer fewer ornamental attributes (flowers are far less showy), being mainly of interest for the attractive often curiously modified leaves. *Dischidia major* syn. *C. rafflesiana* (**Malayan urn vine**) is the most frequently found species in cultivation. Leaves are paired and two types are found: most are small (about 1") and rounded, but some become enlarged (2-5"), inflated like a small balloon. In the wild, the interior of these modified leaves offer nesting sites for ants; the plant benefits by using carbon dioxide and nitrogenous waste products produced by the nesting ants. The inner surface of the leaf possesses stomata to absorb

carbon dioxide (to synthesize carbohydrates), while the cavity becomes filled with roots to facilitate uptake of nutrients as the ant waste decomposes.

Dischidias are epiphytic and can be grown in a sphagnum moss lined orchid basket (not a regular plant pot) containing a mix of orchid bark, coir or leaf mold and Perlite. Suspend the basket in a shaded area with bright light and plenty of humidity (a covered patio or tree limb). The vine can be allowed to climb up the chain suspending the basket and then cascade down once it reaches the top. Keep the root ball just moist, misting the entire plant during periods of low humidity (< 60%). If grown outdoors provide protection when winter temperatures fall below 50°F. When in active growth, use a liquid (orchid) fertilizer every 3-4 weeks and prune back overlong and congested stems.

The final group of climbing asclepiads to be discussed, the **Ceropegia** range from tropical rain forest to arid scrub. Cultivated species are of the latter type; succulent with swollen, spindle shaped roots or enlarged (caudiciform) stem bases. Leaves are opposite, small, linear to rounded, reduced to scales in some succulent species. Flowers are uniquely modified to trap pollinating insects: the corolla is tubular, swollen at the base with the lobes fused at the tips to form a lantern/cage like structure. Minute flies, attracted to Ceropegia flowers by their smell (over ripe fruit/musty) as egg laying sites, enter only to become temporarily trapped unable to exit due to stiff downward pointing hairs lining the inside of the corolla tube. Pollinia (accretions of pollen unique to asclepiads and orchids) become attached to the fly during its forced sojourn within the flower. Trapped flies are finally released as the flower wilts, free to visit other ceropegias.

Situate ceropegias in bright light and keep soil somewhat dry, especially during winter when the caudex/swollen roots are prone to rot. A covered patio is ideal for growing ceropegias, providing protection from both direct sun and excessive rainfall. Use wide, shallow, unglazed clay pots and a soil mix of 1 part each coir/sphagnum, leaf mold and cactus soil plus 2 parts coarse sand or fine grit. Familiar as a house plant ***C. linearis* ssp. *woodii*** (hearts on a string) as the name suggests possesses ½", heart shaped, silvery grey to pale purple flecked mid-green leaves, with purple undersides. Leaves are borne on many long thin stems which are usually allowed to spill over the edge of a hanging container. The **parachute flower, *C. sandersonii*** is grown for its unusual 1½" green flowers, (funnel shaped with lobes fused above at the tips to form a parasol-like canopy) rather than its foliage.

Nepenthes are even more intriguing but their association with the insect world is decidedly one-sided; growing on nutrient-poor, peaty soils they have evolved mechanisms to trap insects as a supplemental food source. Belonging to an assemblage of insectivorous plants collectively referred to as **pitcher plants**, ***Nepenthes*** fall into **two broad groups**: species from **lowland tropics**, requiring hot summers, warm winters; those from **tropical highlands**, favoring cool winters and warm summers (with cool nights). Both groups require year round high humidity and shade (bright light). Highland species can survive a south Florida winter but most usually fail to endure the heat of summer. Lowland species are better adapted to growing in south Florida, providing they are protected from extended winter temperatures that fall below 55°F, and most importantly humidity levels are

maintained at > 60%. Plants should be misted as necessary to maintain humidity, or if grown in an enclosed patio the container can be placed on a humidity tray

Nepenthes grow as terrestrial or epiphytic, climbing or rambling shrubs, with a few as semi-woody herbaceous perennials. Stems of terrestrial species are prostrate at first, but on encountering a tree will climb (some up to 50' in the wild). Eventually under suitable conditions, a few leaves become highly specialized. These exhibit an expanded petiole (sometimes erroneously referred to as 'the leaf'), beyond which the axis extends as a long tendril (may coil around support), terminating in a highly modified leaf blade, the pitcher. This comprises a lid that in part prevents rain filling the pitcher and in some instances is involved in luring insects through nectar secreting glands. The rim of the pitcher forms a thickened, waxy collar (peristome) with the inner surface filled with nectar glands; insects, lured by the sweet smelling nectar, are unable to gain a solid footing on the peristome's slick surface and fall into the pitcher's fluid filled base. Glandular cells found lining the inner surface of the pitcher base secrete enzymes to digest trapped insects and facilitate assimilation of breakdown products. As well as at least one proteinase (to digest proteins) there is evidence of a chitinase (to digest the insect exoskeleton) and a proton pump to lower the pH (increase acidity) of the fluid in the pitcher. Some authors have suggested that bacteria present in the pitcher fluid may aid in the digestion of trapped insects.

Pitchers vary not only between species but on the same plant (dimorphic); on horizontal spreading stems pitchers are larger and rounder, while on climbing stems pitchers appear smaller, more slender not as squat. Each pitcher becomes less effective at trapping and digesting insects as it ages, with an effective life span of 2-3 months.

While insects predominate as the most common prey, small lizards are sometimes trapped while rats have been found in the pitcher of ***N. raja*** (king monkey pot, highland type). *Nepenthes* show little specialization in attracting specific groups of insects - most often ants in the wild. One known exception ***N. albomarginata*** (lowland type) exclusively traps termites which feed on a conspicuous bright white band of fine hairs immediately below the peristome, falling into the pitcher as they do so. Before considering growing this as a termite lure, the termites attracted are higher species that feed mostly on lichens, not wood. Another specialization involves ***N. lowii*** (lowland), which has squat pitchers, constricted in the middle but with an extremely wide mouth. Birds and small mammals perch on the rim of the pitcher attracted to copious sugary secretions present on the underside of the pitcher lid. The lid is so positioned that while feeding, the visitors' nitrogen rich excrement falls into the pitcher below (a ready made chamber pot!). ***Nepenthes ampullaria*** (lowland) is unique in having pitchers designed to catch and recycle falling leaves: pitchers, often in clusters are produced from trailing stems, blanketing the floor of tropical forests where they occur.

Apart from their fascination as insect traps, pitchers are *Nepenthes* spp. principal ornamental feature; basically green but usually mottled or suffused in shades of pink, orangey red to deep red. Specialist growers, some local, offer various lowland species and cultivars suitable for Miami-Dade. For instance: ***N. x coccinea***

(yellowish green, red/purple markings); *N. gracilis* (light green, red spots suffused pink to dark maroon); *N. mirabilis* (light green, red spots to almost entirely red) and *N. rafflesiana* (green, extensively spotted red, crimson peristome).

Grow *Nepenthes* in shallow plastic pots having sufficient holes to allow rapid drainage (azalea pots are ideal). The soil mix should be acidic and free draining: e.g., a mix of medium orchid bark, Perlite or Perma-Till, and coir or long fiber peat moss in the proportions 2:2:1. Place plants in a shaded area receiving bright light (similar to an area where you would grow orchids) equivalent to 40 - 60% shade cloth. Provide a wire trellis for support, or in a covered patio stems can be allowed to spill over the edge of a suspended container. Stems of mature plants can be pruned by up to 30% in spring. This will stimulate vigorous new lateral shoots and the formation of more the of the larger size pitchers (stems that are allowed to climb on a trellis produce the smaller, slimmer less rounded pitchers).

In Miami-Dade use rain or bottled water when misting plants or moistening growing media – local tap water is too hard and alkaline. Water from softeners that work by reverse osmosis is fine, but not that from systems that use ion exchangers. Provide liquid fertilizer (non-nitrate) once every 2-3 weeks (such as a 30/10/10 orchid fertilizer) when in active growth. Failure to form pitchers can be due to too little fertilizer, though is more likely the result of low humidity or insufficient light exposure. Thoroughly drench every 2-3 months with water to flush any residual salts out of the growing mix. Don't worry if your pitcher plant is growing inside a screened patio – *Nepenthes* will grow quite satisfactorily without trapping insects providing it is receiving fertilizer nitrogen. Despite being popularly thought of as carnivorous plants, refrain from feeding your pitcher plant pieces of steak - it will become putrid (smell) and damage the pitcher. If you feel so inclined, the odd small dead insect can be dropped into a mature pitcher.

John McLaughlin

May 29, 2007