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# CITY LIGHTS

METROPOLITAN CHAPTER OF THE INDOOR GARDENING SOCIETY OF AMERICA, INC. MARCH 2013

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**MEETING NOTICE : Tuesday, March 26, 2013**

**TIME:** Doors open at **6:00 pm** to bring in plants and socialize  
Green Thumb Special at **6:30**, Plant Sale Table opens at **6:45**  
Program begins at **7:30**

**PLACE:** The LGBT Center, 208 W. 13<sup>th</sup> St., West of 7<sup>th</sup> Ave.  
(See reception desk for room number)

## Program

### **The Connecticut Cactus and Succulent Show Stephanie Ciparis**

The Connecticut Cactus and Succulent Show is a yearly thrill-fest for those who love strange and fascinating plants. At this spring event, one gets to see impossibly perfect specimens of Cacti, Succulents and Caudiciforms, most of which have required years of painstaking culture and expertise to produce. This month, we will survey the highlights of last year's show and no doubt inspire many to go this year, or at least to try to grow some of these amazing plants.

Stephanie Ciparis has a degree in Horticulture and Turfgrass Science and is a Gardener at the Madison Square Park Conservancy,

**Connecticut Cactus & Succulent Society  
30<sup>th</sup> Annual Show & Sale  
2013**

**Saturday April 6<sup>th</sup> 10:00 AM to 5:00 PM  
Sunday April 7<sup>th</sup> 10:00 AM to 4:00 PM**

**Naugatuck Valley Community College  
Art & Music Center Cafeteria, Fifth Floor  
750 Chase Parkway, Waterbury, CT (exit 18 off I-84)**

**Leading C&S Vendors! Books! Hardy Cacti Vendors! Pottery!  
Auctions! Raffles! Lectures & Demonstrations!**

[www.ctcactusclub.com/showsale2013.aspx](http://www.ctcactusclub.com/showsale2013.aspx)

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## VICE-PRESIDENT'S MESSAGE

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What makes succulents, cactuses and caudiciforms so interesting? Well, for one thing, growing one is like having a beautiful sculpture as much as a plant. They grow slowly and their shapes are compelling – not much of that green, leafy messiness. Their perfection of form has its drawbacks – a missing leaf or branch, or a scar from a fall or scratch, or corkiness can spoil that illusion of an immutable sculpturality. But then there are the flowers, a seemingly impossible product of round cactus globes, rocklike caudiciforms and water-filled succulents. They are a bonus in some and ever present in others, such as *Euphorbia milii*. The amazing diversity, colors and shapes of leaves, stems and roots in these plants is another reason to grow them. So is their hardiness, unthirsty habit, generally low maintenance needs, ease of propagation and yes, for some, like *Euphorbia francoisii*, even the ability to grow and flower well in no more light than the average plant. Are you convinced? If not, I'm sure this month's program will do the trick. Then, you can go to the show and get started.

*Tibor Fuchs*

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## WHERE TO BUY IT

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Indoor Light Gardening Fixtures: I.G.S., P.O. Box 527-6F, Dexter, Michigan 48130, 800-823-5740 (Indoor Garden Supplies). This company has for years been a leader in this field, featuring a wide variety of fixture styles, heights, widths, number of tubes per lamp, hardware, etc., etc. Among the offerings is an inexpensive compact 2-tube 20-watt table lamp which is 24" long, 17" high and 6-1/2" wide selling for \$52.40. This is handy for people with limited space, and for beginners. Anyone contemplating the purchase of a grow light should send for their catalogue.

Fluorescent Tubes: When purchasing tubes for indoor light growing, the best choice is "daylight", which is the brightest and whitest. Other tube colors tend to have unpleasant tints that are yellowish, pinkish and a bluish tone, which distract from the enjoyment of one's plants. Fluorescent bulbs can be purchased from hardware stores, or stores that specialize in electric supplies.

Gardener's Supply Company: 128 Intervale Road, Burlington, VT 05401, 888-845-0677 (Gardeners.com). Their "Sunlite Garden" fixtures are new, and "bring the sunlight indoors." Their wide fixtures feature 2-tube 40-watt lamps and come in 3 heights: tabletop, 2-tier and 3-tier. Their compact fixtures feature 2-tube, 20-watt lamps, and come in 3 heights: tabletop, 2-tier and 3-tier. The cost for wide fixtures is \$519, \$329 and \$299, respectively. The cost for compact fixtures is \$459, \$319 and \$149, respectively. (Some kits come with extra stuff included.)

*Beth Faricy*

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## PLANT TABLE DONORS

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Thanks to **Beth Faricy, Tibor Fuchs, Nadia Kulynycz, Bernice Meltzer, Jim Padula, and Helga Smith** for February's sale plants.

*LB*

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## SHOW AND TELL

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This month, Brenda Rivera brought in several rooted leaves of *Saintpaulia* 'Dresden Doll', grown with Northern exposure and under one 8-watt fluorescent tube on 16 hours a day. She brought it in to illustrate the multiple plantlets growing on the petioles and leaf blades giving the potential for many new plants. Jim Padula brought in *Aloe variegata* 'Partridge Breast', an attractive 'three-sided' aloe commonly available, but not so easy to keep as it is sensitive to overwatering and rot, from Lowe's, west exposure and an Easter Cactus (*Rhipsalidopsis gaertneri*) in a beautiful red shade, a nicely balanced flowering, grown in a SW window. This is about the third 'holiday' cactus in a row Jim has brought in – his touch with these is getting quite expert, as well as his skill in getting them in undamaged. Next was Jim's *Alluadia procera*, a succulent that looks a bit like a really vicious, spiky *Euphorbia milii*, but without the branching habit. This was leafless, a group of striking-looking thorny stems. When in leaf, the leaves come out singly along the stems. Some *Alluadias* are as thick-stemmed as a big python, like the ones at the BBG. Grown in a west window, from Shoprite. Finally, he showed *Calathea veitchiana* 'Medallion', a spectacular nearly black-leaved member of the *Marantaceae* with a squiggly rose variegation and central vein, grown six feet away from a west exposure, from Home Depot. Zabel Meshejian closed the show with 2 pots of *Aglaonema* 'Firecracker', one plant from friends, the other smaller, rooted from a branch of the first, both looking nice, grown under 2 40-watt tubes, examples of the Thai hybrids with their various red colors, now being seen more often with their characteristic red variegated leaves and pink stems and with another Thai plant: a *Euphorbia milii* with odd curled leaves and large pink flowers, grown in obstructed south exposure. Thanks to all. **Please bring in some of your plants and be a part of our show table.**

*TF*

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## FEBRUARY PROGRAM NOTES

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### THE BIZARRE BEAUTY OF CARNIVOROUS PLANTS

**Matt Kaelin**

**Intro by Tibor Fuchs:** A friend of mine was contacted by Matt and he thought he would make a good speaker for us.

Going by the amazing display that we have over to our right, I'm pretty sure he's right. If you haven't looked at it, don't deprive yourself. It's really very impressive. Matt is going to talk about carnivorous plants, so without further ado, Matt Kaelin.

**Dionaea muscipula, the Venus Fly Trap:** Here we have the Venus Fly Trap, the ubiquitous carnivorous plant. These little droplets that look like water are actually nectar and it's the nectar that attracts insects to the plant as well as these red lobes here. The Venus Fly Trap is a great name. It mostly eats flies that come and land and try to eat the nectar. There are three trigger hairs. If something triggers one of those hairs twice or one hair and then another hair, the trap closes. The plant wants to conserve energy so it has that mechanism so that it won't close on something like a twig, something that it doesn't need. Once these little hairs are activated, it'll send out an electrical signal through the plant, which is very interesting, almost like a nervous system in a way, that will activate certain cells to grow very fast and it'll transfer water from some cells to others in order to enlarge certain parts of the plant. So this is a nifty thing. We all know these poppers. It's the same kind of principle that this plant closes on. You can see it's kind of convex here and when the electrical charge hits certain cells and activates them, it'll release the pressure. That's how it closes so quickly. So that's the Venus Fly Trap, *Dionaea muscipula*. This is the Red Dragon, **Dionaea muscipula 'Akai Ryu'**, which is Japanese for red dragon. The whole plant is a beautiful crimson red, the leaves too. [Zabel comment] That one was developed by Atlanta Botanical Garden, as far as I know, and you can find them on eBay.

**Drosera, the Sundew:** This is **Drosera capensis, the Cape Sundew**. It grows near Cape Town in South Africa, its natural range. This has just one trap. As we saw with the fly trap before, one trap can capture the essence of a plant. And this is the same plant with a bunch of different traps. These secrete little nectar droplets which are also a very strong adhesive. The insect will get attracted to the nectar, crawl up to it to feed and get stuck. All these are tendrils that will close in on it and the leaf will actually wrap around it and at that point it starts to secrete digestive enzymes that break down the soft tissues of the insect. Then the glands on the leaf surface absorb the nutrient soup of the insect leaving behind the husk which dries up or gets blown away, or other insects just ignore the dead bones of their buddies. These plants catch lots of insects.

Next is **Drosera rotundifolia**. These are quite common. You can find them along rivers, streams, banks of sphagnum moss. And if you look in the moss you can find them, at least in the northern territories. Down south you see other types. They are one of my favorites. It was one of the first carnivorous plants I was exposed to. Next is the back side of a **Drosera prolifera**, an Australian Sundew plant. It looks very like *D. rotundifolia* and behaves in much the same way. This is **Drosera binata** with two traps. They make v-shaped traps with little glue traps along it. They are Australian, and very easy to grow. They become like a weed. They flower very easily and make lots of seed and spread them all over the pots. They are a great indoor growing candidate. They tend to do well year round, there's no dormancy like other carnivorous plants which require a

dormancy period that is hard to observe in an apartment. For growing at home those that have a dormancy period can be put in a garage or basement for the winter.

This is **Drosera 'Marston Dragon'** closely related to the *Drosera binata* but, as you can see, with an extra appendage, an extra part to the trap which makes it rather web-like. It reminds me of a dragon's foot with claws. It's another one of my favorites. It's also a very easy grower especially indoors. Its natural habitat is Australia and New Zealand. I've seen amazing pictures of its natural habitat, like cliff faces with water running down them and these growing right out of it, any nook and cranny it can find. There are thousands growing on the cliff face, glistening in the sun. I hope to see it in person some day. Some carnivorous plants eat any insect but some have specialties in terms of the insects they eat. Fly traps tend to catch flies or beetles. Others specialize in ants, or termites, flying insects, crawling insects, some even eat small mammals, lizards, snakes, snails, all sorts of things.

Here we have another of my favorites, **Drosera Regia (King Sundew Cultivar)**. It grows quite large and is very rare and extremely threatened in the wild. They grow in Beinskloof in the Cape Mountains of South Africa and there are only two known locations where they are found. One of them seems to be extinct because of fire suppression. Farmers who live there don't want fires. Naturally they don't want their land to be destroyed, but wildfires occur naturally in the habitat. If there are no fires, the vegetation gets crowded out and outcompeted and they dwindle. There are two known locations, an upper one and a lower one. The upper one seems to be gone. The lower one has fifty mature individuals, making it possibly one of the rarest plants on the planet. It's also rare in cultivation. It's a tricky plant. It likes to have cool temperatures. Seventy-five is rather warm for it. Eighty degrees is no good for it, especially long-term. During the summer I have it in air conditioning. They grow quite large like a small bush. People living in the Bay area around San Francisco have great success with these plants because they have year-round cool temperatures. It never gets too cold or too warm there. A lot of people grow these as windowsill plants. But people living in the rest of the country have a horrible time with them; it's either too hot or too cold. This particular one is called **Drosera Regia 'Big Easy'**. It's the cultivar name, meaning that it grows a little more easily as it's a bit more tolerant of warm temperatures, which makes it ideal for growing at home. This is especially true compared to the standard *Drosera Regia* which is a lot more finicky, no matter what. It's also in really high demand so hard to find.

This is **Drosera adelae, the Lance leaved Sundew**, very closely related to the one in the display that's in the globe the furthest to the right. This is a close up of the same plant that's over there. It has a wooly texture that keeps aphids away from it – it's a great adaptation.

**Pinguicula, Butterwort:** This is **Pinguicula 'Fraiser's Beaut'**. There are three plants here all growing on top of each other which makes a great contorted mass. There's a very sensual attraction that these plants have which I try to capture

in these slides. You can see how the leaf surfaces have little droplets which are an adhesive. These Pinguicula Butterworts have some of the most powerful digestive fluids of all and they are the cutest most harmless looking plants. This one is a hybrid of two Mexican plants. You can get these great colors by growing them under lights. [Q. about nectar droplets] No they are completely harmless. Some people have tasted them and say they're sweet. I've tried a couple of types, but those we'll see a bit later. This is the same plant showing how it grows naturally. The other one was contorted with the three on top of each other. These little droplets are like tiny hairs, almost like the Sundew, but much smaller. These don't close at all. The leaf margins curl upwards and create a film of digestive enzymes. They're great for catching things like fungus gnats and things that grow in the soil; really small prey is what these eat. Although I have seen them catch crane flies, which are very delicate though large. [Comment about putting them in a terrarium to control pests] You could but the numbers that it catches wouldn't be enough to control the pests. As indoor growers you know about controlling pests with pesticides.

This is **Pinguicula cyclosecta**, Butterwort Species. Here you can see how the margins of the leaf curl upwards so that they can be filled with digestive fluids. This one has purple edges. Next is **Pinguicula rectifolia**, Butterwort Species. It's very very small. This is in its winter growth phase, where they tighten up into smaller buds for the winter time and open up during the summer.

**Cephalotus follicularis, the Australian Pitcher Plant:** Now we're into *Cephalotus follicularis*, the Australian Pitcher Plant. This is one of my favorite plants. It's a very ornate pitcher plant from the Albany, in the extreme southwestern area of Australia. It has a very small range and is very threatened in the wild. There are many ranches in the area and the plants get trampled by the livestock. This is **Cephalotus follicularis 'Hummer's Giant'**, an Australian Pitcher Plant Cultivar. As the name suggests, it tends to grow large. In this case, I grew it close to the lights and produced this beautiful color. The other one was a little greener. They tend to grow larger but greener when you keep them away from the light. I prefer great coloration to size. They're real small, just a couple of inches, and they grow in a rosette. The next one is a close up. Here you can see the peristome (rim of the pitcher). These specialize in ants which climb up the front where the little spikes are – it's like a ladder for them. Then there's the glistening nectar secreted to lure the insects to the mouth. The plant can't go after the insects as it can't move so the insects come to it. It's really like a maw. You have these great "teeth" with points on the end. It tends to have the most nectar at the points so that the insects climb out over the hole and then slip and fall into it. Once it falls in there's no getting out. There are all sorts of mechanisms that keep the prey from escaping. Exceptions might be things like frogs which like to hide inside and can come and go as they please. They'll hide in there to get away from the summer heat and keep from drying out and then come out at night.

**Sarracenia, the Pitcher Plant: Darlingtonia Californica, the Cobra Plant,** is aptly named as it looks like a cobra. It's my favorite of the Sarracenias. It's the North American western pitcher plant. It grows only around Oregon and Northern California and no other Sarracenias do. The insect will land on its tongue structure and crawl up. There's a hole with a lip so it operates rather like a lobster trap. It'll come in but it's hard for it to come out. There are window-like parts so when the sunlight comes through the insect doesn't sense it's a trap. It thinks it's nice and light and airy and there's nothing wrong here and there's nectar glands along the way enticing it into the trap. **Sarracenia purpurea, the Purple Pitcher Plant,** grows all over the place, all along the eastern seaboard into eastern Canada. There are a number of populations of these on Long Island and in the New Jersey Pine Barrens. They're another favorite. They have these downward pointing hairs where the insect will slip and fall off them tumbling down into the trap and then have a hard time trying to get out. **Sarracenia x Catesbei** is an American Pitcher Plant hybrid between the *S. purpurea* that you've just seen and the *S. flava* - I don't have a picture of it - that occurs naturally in the wild. I bought this at a Whole Foods in San Francisco in 2003 for about eight bucks and I still have it to this day. It's an easy grower. I grow it in my back yard. During the winter I take it in and grow it under lights. During the summer I put it in the back yard and water it and that's it.

All Sarracenias have a dormancy period – they rest over the winter. In order to do that you have to lower the photo period – give it less light and cooler temperatures. So that makes it a little tricky for growing in an apartment unless you have a cool area where you can keep them. There are people who cut off the leaves, take the rhizome, and put it in a plastic bag with some moss and fungicide and leave it in the fridge for three months. They'll repot it in the spring. I've never done it myself so I can't give you firsthand experience with that but people do keep them year after year this way. In that case, you could grow them on your fire escape, windowsill, or even under lights in your apartment. They're very grower friendly plants. They tend to be very tolerant of water levels. You can give them too much water and they won't mind. Too much is better than too little. They are happy to be cultivated and it's easy to grow them in a lot of places because their natural range is from the Florida panhandle up along the eastern seaboard to North Carolina, Virginia, for the more exotic types. Anywhere further north would be the *S. purpurea*. Their climate conditions are very similar to those around here so if you keep them outside, you'll have good luck with them. The next slide is a back view – see the lovely veins, it seems as if blood is pumping through it, as if it has a heart, it's alive.

Next is **Sarracenia leucophylla red, the White topped Pitcher Plant;** this is the red form of it. This is redder than the standard *S. leucophylla* which has great white spots on it. This one has a deeper red and more of it, making for a very striking plant. The photograph lighting pumps it up and makes it even more vivid. Sometimes they're used as cut flowers; it's okay if they do it in a sustainable way; if they are cut at the end of the season when they're not really capturing prey any more that's fine. These kinds of plants are extremely threatened in the

wild. There are overzealous collectors who go and dig up a whole bunch of them and keep them. One of the big threats is poachers who sell them to their local garden centers or on eBay. People will steal them by the thousands and then there's nothing left in the wild to keep the population going. But the number one threat to them in the wild is land development. The shopping malls, and strip malls at the side of the road are replacing the 'stinky' old bogs and wetlands with paving and parking lots. People don't know about them and they'd rather have movie theaters than this wonderful form of biodiversity in their own back yards. Fortunately, there are a number of conservation organizations.

**Nepenthes, the Monkey Cup:** Now we're into *Nepenthes*. This one is *Nepenthes x Dyeriana*, Monkey Cup Hybrid. It's a complex hybrid of four different parents produced in 1901, I believe by Beech Nurseries. There was only one individual that survived both world wars and all the turmoil since and it was propagated from that one and then propagated further so now they're not entirely uncommon. They're really popular in Asia – in Thailand, Malaysia, and Indonesia. A lot of these are from Asia anyway so they just put them outside and grow them like a native plant. The midrib of the leaf extends into a tendril and that's where it connects to the main vine of the plant. The peristome is really beautiful (described as a candy-cane stripe).

This is *Nepenthes eymae x (stenophylla x lowii)*, Monkey Cup Hybrid. It's an interesting man-made complex hybrid. I grew it under a lot of light to give it these red colorations. You don't normally see that and it's fairly rare anyway. [Q. In normal houseplant conditions, with moderate light and humidity, would you grow *Nepenthes*?] It's really the temperature you have to worry about. These are cool growing plants. They don't want it to get over 75 or 80 degrees for too long. I can get away with pretty low humidity. Next is *Nepenthes ventricosa x (xTrusmadiensis)*, Monkey Cup Hybrid. They have a great thick ridged peristome. And this is *Nepenthes 'Ile de France'*, Monkey Cup Cultivar. It's an old hybrid, first hybridized in the Victorian or Edwardian Age. They grow in hot, humid conditions. You could use a grow chamber that you can heat and keep humid (which I find easier than keeping it cool and humid). This is *Nepenthes truncata x ephipeata*, Monkey Cup Hybrid, which grows quite large. The good thing about hybrids is that they're more tolerant of conditions – they'll take lower humidity and more of a range of temperatures and not be too affected. So with the hybrids you can get the characteristics of a parent that you particularly like and be able to grow it successfully. Some of the species that you buy as a tiny plant take years and years to grow to maturity and you won't be able to get it to maturity without the right conditions. The hybrids, by contrast, are very rewarding. [Q. What's the function of the lid?] Just to keep rainwater out and provide shade and prevent debris from falling in from the forest canopy. Some of these grow so large that rats have been observed being caught in them. [Q.] You might be thinking of *N. lowii*. It's actually the vertebrate scat that it eats. Next is *Nepenthes hamata*, Monkey Cup Species, always a popular one. People love it because it has sinister teeth. This is a great plant but it can be tricky. It's a highland

plant from the tropical alpine habitat from the islands around Borneo, three thousand meters up. It has cool temperatures and fog that rolls in, kind of hard to recreate in an apartment, but I have. It has a hairy lid. The next slide is of *Nepenthes lowii x spectabilis*, Monkey Cup Hybrid, the one displayed on the table over there. It has great spikes that come out from beneath the lid and it makes a foamy substance. *Nepenthes lowii* is famous for its big wide mouth and is really spectacular. This is the one that eats mammal scat. So birds and particularly tree shrews fit perfectly on it. They sit here and there's this foamy substance that it secretes here and it's really sweet. I've tried it – it's pretty good. They leave their droppings in the pitcher and the plant will get its nitrogen and phosphorous that way. The hairs are there mostly for the foam to stick to something so it doesn't just fall off the plant. Next is a cross between *N. lowii* and *N. ventricosa*. **N. ventricosa** is an easy to grow plant you could grow it in your kitchen without any special conditions but *lowii* is difficult to grow. I picked one up a number of years ago, flowered it, described it, and named it as a cultivar. It's now published and the publication is coming out in March. *Nepenthes* first make low, ground traps and then upper traps. As they get older they turn into a vine which grows up the tree into the canopy and then makes upper pitchers. These are two very distinct types of pitchers on the same plant.

**Nepenthes 'The Succubus'**, Monkey Cup Cultivar, is the name I gave my cultivar, after Succubus in mythology. I flowered it with *Nepenthes* as male and female. All other carnivorous plants are unisex plants. The female parents are the ones that transfer more of their traits to the plant, so with this you have more *lowii* traits because it's a *N. lowii* female parent. Another cultivar has *N. ventricosa* as its female parent and that has less of the *lowii* characteristics. *N. 'The Succubus'* is very voluptuous, it has a thin waist with a bulbous bottom and a very wide top. It's a very well loved plant because of those features.

**Cultivation. Highland Plants:** I made this highland chamber in 2007. In my apartment there's a downstairs and an upstairs. Downstairs, it's much cooler in the winter, as low as in the 50's. At the bottom it'll get into the 40's which is ideal for the temperate plants that need winter dormancy. My lights are regular T12 lights. I have two for the *Nepenthes* and three for the different temperates. I set timers to go on and off automatically. I shorten the photoperiod slowly for the dormancy period down to about eight hours in the dead of winter and then slowly increment the period in the spring until I put them outside when they get natural sunlight. These ones get about fourteen hours year round. Sometimes I'll put them up to sixteen to get more color out of them. These pictures were taken when I first started. I used one wire rack and hung the light off the rack in an area that's naturally cool. It's as simple as that. I grow them in these bins. [Q. What kind of light for *Nepenthes* vs. *Sarracenia*?] *Sarracenia* take very bright conditions. When you see them in the wild they're growing in broad daylight all day long, without shade. That would be too much light for *Nepenthes*. People growing in greenhouses use shade cloths if necessary. I move the lights a little further away from them. It keeps them from burning or

drying out. The lights tend to make for a dryer environment and they emit some heat from the ballast which is bad for the cool growing plants. [Q. What kind of lights?] Cool white fluorescent bulbs, no Grow Lights. With the cool white you get more of what the plant needs to grow. Warm lights are for flowering but these flower on cue every year anyway and you wouldn't want to force them to flower too much. Also, most people grow these plants for the traps, not the flowers. They (myself included) cut off the flowers because they want more energy to go into the development of traps. [Q. What about electric bills?] During the summer when I have the air conditioning on all day long for three months my bills are rather high. [Q. Do you use fans?] Yes, I use them here and there on very low power so that they don't dry out the plants, they need the humidity. [Q. About usage of the lights] There is a measurement on the side of the box they come in but I never use it. I buy mine in Home Depot. I go with what works and what doesn't, using trial and error. To successfully grow these plants you need to pick up on their cues and give them what they need.

You can see from my pictures how with time they've grown and now they (Nepenthes) grow all the way up and wrap around. The nice thing about Nepenthes vines is that they are very malleable, you can train them to go the way you want. You can run out of space quite quickly. This one is about four feet. In one year I got six feet of vine from this plant and I let it grow two years in a row before cutting it back. [Q. Will they grow smaller in a terrarium?] Not the Nepenthes. Some will grow slower or more compact. But this is more of a vine forming plant. The *N. ventricosa* is more compact without vining as much. So there are some you could get away with in a terrarium for a while, but they'll eventually need room to grow. They always send out new growths from the base. It's great. You trim it back and cut them. You plant them in the soil and get new plants. If you sell them off you can make some money back. [Q. What substrate do you use?] I use live sphagnum moss with cocoa bark and clay pebbles. You want to have a mix to loosen up the live sphagnum so that it doesn't get too dense. So mostly it's live sphagnum with some other chunky inorganic mix so that it drains freely. Next, you can see how they looked July 11, 2009, after I repotted everything. As the plants got bigger and needed more space I expanded to two racks. You have to train the Nepenthes vines otherwise they'll grow straight up and outside the lighted area which is no good.

**Tropical Alpines:** This is my kitchen closet which is a pantry that I use as a plant chamber with a tropical alpine climate and this is a standard temperate climate. Just by keeping things closer to the ground you have cooler temperatures. Higher up, it's warmer, a bit more stable. This chamber (closet) has a little window. The ideal temperature for these is a low of 55F at night and a high of 75F during the day. In the spring when it rains and the temperatures are correct, usually for about three months, I'll open that window and they love the cool moist air. During the summer I use air conditioning to keep the temperature cool, between 65 and 75F, which is fine for them. In the winter it tends to be around 48F in there and rarely gets over 65F. With the extended period during the winter with

these cool temperatures they grow slower but very healthy so they are able to tolerate the warmer summer temperatures. I don't have it down perfectly, it's not ideal. Right now in the closet the humidity is 34% which is very low. [Q. Can any Nepenthes tolerate a New York summer?] There are some that love the heat – the lowland plants. [Comment about *N. ventricosa*]. Yes they're the best. They can tolerate lower temperatures, whereas the lowland plants love the heat but when it gets cool they go downhill very quickly. By April 2012, the moss that I was basically farming before has taken over the tubs that I grow it in. I use clay pebbles at the bottom and trays to keep the moss elevated out of the water. When I water the plants the water goes right through and collects at the bottom. Every once in a while I'll put in an electric siphon and draw out the water so nothing has its roots in the water, which is what you don't want. The moss just takes over, growing in between the plants and around the pots. It's New Zealand sphagnum. I used distilled water because tap water has too many salts and particles that are very bad for these plants. In the summer I leave some of my plants in globes or ten gallon fish tanks and they get watered by rain. I only have to water them a few times in the season. But that wouldn't work for these that need cool temperatures. [Q. Do they attract insects indoors?] One of the ways that I feed them in the summer is by leaving the front door open for a few minutes. All the bugs that are attracted to the lights over the chambers fly in. When the lights go off they go for the nectar. They next day we're bug free. I use outdoor electrical wiring because it's so wet here. I keep the wiring and the power strip in the front rather than the back, away from the water. Also, that whole thing was under water during the hurricane. I live by Jones Beach. My kitchen was flooded but I got my plants in the nick of time. Luckily, most of them were elevated anyway.

**Orchidarium:** This has lights at the top and a fan. It's a great self contained unit but for Nepenthes it's too constricting – the flowers are all distorted and it grew very slowly when I put it in there. When you put smaller plants in it they look great. This is from December 2005.

**Lowland Plants:** I took PVC, made a frame and hung it from the ceiling with plant hooks. It made a chamber which I lined inside with shower curtains and bubble wrap between the two layers to insulate the chamber. Then I hung lights off the ceiling. It was too cold so I took insulation which I put on the ground and covered with a mat. I keep the racks off the ground with a seed mat in between. In this little fish tank is a tank heater and bubbler which makes the environment more warm and humid. In the winter keeping the plants warm and humid can be tricky but they thrived during the summer when I had the chamber completely open and they did amazingly. These tropical lowland plants grow in Borneo, Indonesia, the Philippines. This chamber was in my apartment living room taking up a lot of space. I also had a 75 gallon terrarium in the kitchen, and the pantry, and outside plants. So I took this down.

**Outdoor Cultivation:** I first started growing these things in San Francisco in 2005. It's a lot easier to grow outdoors there than here. Here on Long Island you see outdoors *Sarracenia*

purpurea, Sarracenia x Catesbei, Fly Traps, and Drosera rotundifolia. This Sarracenia I grow outdoors year round; it's Sarracenia Leucophylla Red. I leave them outside in a 10 gallon tank with (that much) water in the bottom. If you put them in a sunny spot you're good to go. You can do the same with Sarracenia x Catesbei. Sometimes I leave a tray with water under it. Keep it substantially watered. When it rains it waters them anyway. Then there's Sarracenia purpurea which grows naturally around here. I grow Cephalotus follicularis outside during the summer but not in the worst heat. I bring it inside. I put it out in April and take it back at the beginning of June. Because of lack of air movement and damp conditions there's a lot of fungus which can wipe it out completely. The best thing to control the fungus is sunlight. Put it out in the sun for a little while to burn off the fungus and then bring it back inside. This is Drosera regia, the King Sundew – it got the name for a reason, it grows big. I only grow them outside for a little bit as they are cool growing plants and don't like to be too hot. [Q. Could you shade them a bit?] Then it doesn't get enough light. It loves the light, despises the heat. People in England and San Francisco have great success with Drosera regia. In England they use greenhouses to grow them. This is Drosera rotundifolia which you can see in multitudes in certain parts of Long Island and the New Jersey Pine Barrens. They're found along mossy river banks. The Venus Fly Trap has small traps and uses a lot of energy to send up these tall flowers. They want tall flowers to keep the pollinators from getting eaten. South facing is generally the best because it's cooler sun at the beginning of the day. I try to keep them facing south or south-east.

LB/tf

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## UPCOMING

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**April** – Creating Succulent Bonsai – Susan Amoy, Succulent and Caudiciform plant sale.

**May** – Video: Five Horticultural highlights of N.J., including Presby Memorial Iris Gardens and the collection of Dr. Gerald Barad

**June** – Favorite Plant Exhibit

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## NEWS AND NOTES

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**Financial Update:** To help keep us solvent, please remember to donate, give a membership as a gift, or recruit new members with the materials available at every meeting.

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**Have you an amusing plant-related anecdote? City Lights is looking for contributions! Send your missive by mail to City Lights, c/o Tibor Fuchs, 505 Elmwood Ave #4H, Brooklyn, N.Y. 11230, or even better, by email to [tfuchsya@yahoo.com](mailto:tfuchsya@yahoo.com).**

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## HORTICULTURAL ARCHIVES

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The New York Times, March 7, 2013

**Nectar That Gives Bees a Buzz Lures Them Back for More**  
By JAMES GORMAN

Nothing kicks the brain into gear like a jolt of caffeine. For bees, that is.

And they don't need to stand in line for a triple soy latte. A new study shows that the naturally caffeine-laced nectar of some plants enhances the learning process for bees, so that they are more likely to return to those flowers.

"The plant is using this as a drug to change a pollinator's behavior for its own benefit," said [Geraldine Wright](#), a honeybee brain specialist at Newcastle University in England, who, with her colleagues, [reported](#) those findings in Science on Thursday.

The research, other scientists said, not only casts a new light on the ancient evolutionary interaction between plants and pollinators, but is an intriguing confirmation of deep similarities in brain chemistry across the animal kingdom.

Plants are known to go to great lengths to attract pollinators. They produce all sorts of chemicals that affect animal behavior: sugar in nectar, memorable fragrances, even substances in fruit that can act like laxatives in the service of quick seed dispersal.

[Lars Chittka](#), who studies bee behavior at Queen Mary, University of London, and wrote a commentary on the research in the same issue of Science, said that in the marketplace of plants seeking pollinators, the plants "want their customers to remain faithful," thus the sugary nectar and distinctive scents.

"The trick here," said Dr. Chittka, who was not involved in the research, "is actually to influence the memorability of the signal using a psychoactive drug. And that's a new trick in the book for plants."

Robert A. Raguso, who studies the interactions of plants and pollinators at Cornell and was not part of the study, said in an e-mail, "It makes the reader think twice about where natural products that have economic importance to humans actually came from before we 'discovered' and co-opted their biology."

Dr. Wright did not set out to investigate the evolutionary stratagems of plants. Rather, her goal was to use the honeybee as a model to study drugs that are commonly abused.

About eight or nine years ago, she said, “I ran across this paper on caffeine in floral nectar.” And then, she said, she thought, “ ‘This could be quite interesting because there might be some ecological interaction between the plants and the pollinator.’ That’s how it started.”

Several varieties of coffee and citrus plants have toxic concentrations of caffeine in leaves and other tissues, but low concentrations, similar to that in weak coffee, in the nectar itself. The toxic concentrations help plants fend off predators.

But Dr. Raguso pointed out a well-known axiom that “The dose makes the poison,” a principle that Dr. Wright and her colleagues followed in lab experiments. She conducted learning experiments with bees to see if they associated a reward with an odor, the reward being either sugar water or a combination of sugar water and caffeine in the same concentrations found in the nectar of coffee and citrus plants.

The effect of caffeine was not obvious at first, but as Dr. Wright refined her experiments, it became more clear that the chemical had a profound effect on memory. “If you put a low dose of caffeine in the reward when you teach them this task, and the amount is similar to what we drink when we have weak coffee, they just don’t forget that the odor is associated with the reward,” she said.

After 24 hours, three times as many bees remembered the connection between odor and reward if the reward contained caffeine. After 72 hours, twice as many remembered. They then tested the effect of caffeine on neurons in the bee brain and found that its action could lead to more sensitivity in neurons called Kenyon cells, which are involved in learning and memory. Dr. Wright said that this was one plausible route for enhancing memory, but was not definitive.

Insect and human brains are vastly different, and although caffeine has many effects in people, like increasing alertness, whether it improves memory is unclear. But the excitation of the Kenyon cells was similar to the action of caffeine on cells in the hippocampus in a recent experiment on rats, Dr. Wright said.

Such similarities in neurochemistry that allow caffeine to affect mammalian and insect brains in similar ways may seem surprising, but insects like fruit flies and the nervous systems of even more primitive organisms like nematodes have been used to study learning at the level of individual cells and the chemistry that changes their activities.

Cori Bargmann of Rockefeller University, who studies the brain and behavior of a microscopic roundworm called *Caenorhabditis elegans*, said that the bee findings added more support to the idea that some very ancient behaviors like learning must have very deep evolutionary roots. Finding the

common neurochemistry in such diverse creatures, she said, is like “learning the vocabulary of the brain.”

