

Cactus Comments

New York Cactus & Succulent Society

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April
2012

Next Meeting

KALANCHOES & CRASSULAS
Thursday, April 19th, 2012
6-7:45 pm
331 Madison Ave (near 43rd St)
7th Floor New York, NY
www.nycss.org
Guests are always welcomed
at meetings!

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Joining NYCSS gives you information packed monthly meetings, talks from experts and amateur enthusiasts, demonstrations, slide shows, trips, and our monthly newsletter, Cactus Comments. The 10\$ annual dues covers everyone in your household, from September to June.

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PEST ISSUE

With so many questions posed at our last meeting, it only seemed fitting to put together a special Cactus Comments newsletter to refer to during your next pest outbreak.

MEALY BUGS

Mealybugs are insects in the family *Pseudococcidae*. They are unarmored scale insects that feed on plant sap. Mealy bugs are sexually dimorphic. Males and females have distinct morphological differences. Males are winged and short lived while females produce a white, cotton like covering that protects the insect as they rapidly reproduce. In most species, 50-100 eggs are laid for each female. Mealy bugs produce honeydew, a sticky substance that attracts other insects such as ants. Mealy bugs can be found on every part of a plant. Infested plants will stop growing, take on a deformed appearance and start to shrivel.

Mealy bug infestations can be treated by mechanically removing the insects with a Q-tip dipped in 90% alcohol. Alcohol dissolves their outer coat and kills the insect. Keep checking the affected plant weekly to ensure populations do not return. Mealy bugs can hide in the smallest crevices, and can look remarkably like areoles making detection difficult. If root mealy bugs are present, unpot the plant and rinse off as many of the insects and the soil as possible, using warm water (cold water can damage your plant). Remove any unhealthy roots and allow the plant to dry. Once dried, repot the plant into a new soil mixture. Systemic insecticides may be required in the case of root mealy bugs. Mealy bugs have the ability to lay dormant on inert material for considerable periods. Be sure to regularly inspect areas that have had mealy bug infestations in the past.

If chemical treatment becomes necessary, pesticides containing Organophosphates are the recommended method of removal. Keep in mind that some strains of mealy bugs have been shown to have resistance to these chemicals. In greenhouse environments, biological control methods are available. Predators such as lacewings, and *Cryptolaemus* can help against mealy bugs, aphids, scale, greenfly, and whitefly.

APHIDS

Aphids go by many names in plant publications, plant lice, greenflies, black flies, are all commonly used to refer to aphids. Aphids are placed in the super family *Aphidoidea* and are among the most destructive crop plants worldwide. Luckily, these small green pests aren't usually a problem for cacti and succulents, but they can sometimes be found eating flower buds and tender new growth. Aphids, like mealy bugs, produce honeydew which can attract other pests such as ants. Honeydew also encourages the growth of black mold on foliage.

Aphids should be washed off with high water pressure from a faucet or hose. It may be necessary to do this several times. If the problem persists, try spraying the affected parts with insecticidal soap as a deterrent.

BLACK VINE WEEVIL

Otiorhynchus sulcatus, also known as the black vine weevil are large, beetle-like insects seen in the late summer. These insects lay eggs in the soil which later hatch into fat, white, larvae with brown heads. While these larvae normally aren't damaging to cacti, they are known to attack *Echeveria* and *Aeonium*. The first sign of vine weevil adults includes small triangular bites taken from leaf corners. While larvae normally aren't detected until significant damage becomes apparent. The larvae feed on the inside of stems, hollowing them out until the stem collapses. Plants with vine weevil larvae should be cut back to a healthy stem and then repotted in clean soil. Remove any damaged plant parts. Chemical control should not be necessary.



SCALE INSECTS

Mealy bugs are not the only scale insect found on cacti and succulents. There are over 8000 species of scale insects in existence and close to 3000 of these are in the family *Diaspididae*, those mostly likely to be found on cacti. The family *Diaspididae* is often referred to as the "armoured scale" because of the insect's substantial protective covering. The armored scale is able to combine the remains of its previous exoskeletons with fecal matter and fragments of the host plant to create a waterproof covering for the scale to feed under. These scales are so robust and firmly attached to the host plant that the scale often persists long after the insect has died. Even when the scale is removed, a scar often remains where the insect was attached and sucking the plant juices.

A second family of scales are common on *Opuntia*. The family *Dactylopiidae* contains cochineal insects. These insects are an important export in many South American countries as a brilliant red dye, produced from their pulverized bodies. Starbucks has recently been bashed by many vegans because of their use of cochineal dye in their Frappuccinos¹. While these scales are common in gardens in the south western United States, they are seldom found on this coast.

Scale insects multiply quickly, completely covering the surface of a cactus in just a few days. They prefer shade and will wedge themselves in any small crevice within a cactus. Cacti with dense spination can provide sufficient shade for scale allowing populations to explode out of control before the pest is even noticed. Scale will spread to other nearby cactus plants if left untreated. The immature insects are highly mobile and can spread from plant to plant. Scale mostly prefer columnar and rock cacti and can be found on new growth and plant crevices. Be cautious when removing scales from plants since any scales that fall off, will migrate to the next closest host. *Agave* and *Opuntia* are their most common hosts.

Physically remove scale with tweezers or a soft brush. A high power spray nozzle might help remove scale in cacti with dense spines. Since scale are sucking insects, systemic insecticides are used to prevent repeated outbreaks. Systemic insecticides are poisons that are absorbed through the roots and into the plant tissue. The plant must be actively growing (not dormant) at the time of application. The scale may need to be physically removed several times before the systemic becomes effective.

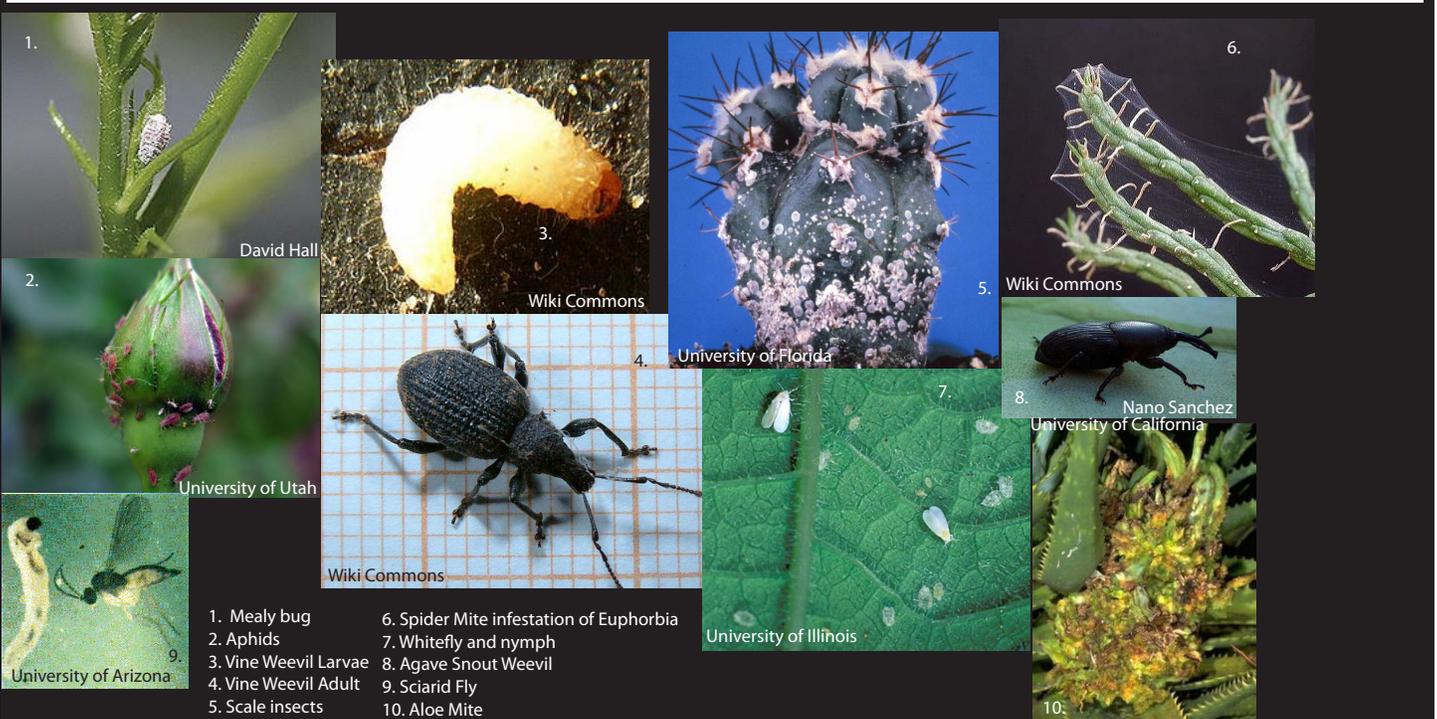
SPIDER MITES

Spider mites are arthropods, and members of the mite family *Tetranychidae*. There are over 1,200 species of spider mite. These mites are tiny, reddish, and less than 0.2 mm long. Spider mites spin protective silk webs and cause damage by puncturing plant cells as they feed. Their webs often contain small spherical, almost transparent eggs and are the source of their spidery misnomer. Hot, dry conditions lead to population explosions of spider mites. Under optimal conditions eggs can hatch in as little as three days. The new hatchlings become sexually mature within 5 days; laying up to 20 eggs per day. A single female can spawn a population of a million mites in under a month.

Spider mites only affect a small number of cactus species. *Rebutia*, *Lobivia* and *Coryphantha* are most commonly attacked but occasionally *Melocactus*, *Sulcorebutia*, *Mamillaria*, *Lophophora*, *Turbinicarpus* and *Pelecypora* are affected as well. Some species of caudiciform succulents are also prone to similar mite attack on the surfaces of their leaves. Some succulents of *Mesembryanthemaceae* are susceptible to black spider mite.

Spider mite damage occurs at the top of the plant where new growth is still tender. Webbing and small dust like insects are always the best indicators of any spider mite presence. Pale yellow or white spots which later turn rusty brown will appear on cacti infested with red spider mites. On leafy succulents, cut foliage back once mites are detected. Spray new growth with insecticidal soap. Spider mite damage never heals. The unsightly corking will persist on cacti even as healthy new growth appears. Isolate any plants that you suspect may have spider mites. Spider mites are transported by wind and contact and can easily move throughout your plant collection.

When using pesticides to treat spider mites, multiple treatments will be required. Pesticides do not kill the eggs so reapplication will need to be done every week or so depending on temperatures. At higher temperatures, the mites reproduce faster and more frequent treatment will be necessary. Occasional overhead watering can help deter the mites. Many sources insist that high humidity and good air movement should eliminate this pest in your collection - take that advice with a grain of salt.



1. <http://www.usatoday.com/money/industries/food/story/2012-03-28/starbucks-strawberry-frappuccino-beetle-juice/53839006/1>

WHITEFLY

Whiteflies are small, 2 mm, white flying insects that tend to be more common on leafy succulents. Plants growing in the family *Asclepiadaceae* and leafy Euphorbias seem to be at the highest risk for infestation. More than 1,550 species of whitefly have been described, all found within the family *Aleyrodidae*.

Anyone who has ever seen a whitefly infestation should recall being attacked by a cloud of white flying insects after nudging the foliage of some passerby plant. The adult stage is highly mobile which makes control of the adults challenging. The nymphal stage can be found on the underside of the foliage or on emerging buds. Multiple development stages are always present during an infestation. The nymphs secrete honeydew that can lead to further problems.

Whiteflies are a pain to control. The plant must be washed off with a high pressure spray and then sprayed weekly with insecticide for at least four weeks to properly control all stages. Plants should be quarantined outside if possible.

AGAVE SNOOT WEEVIL & CHILOCUIL

The Agave Snout Weevil, *Scyphophorus acupunctatus*, and Chilocuill, *Hypochoeris agavis*, are two pests found in Agave crops. Both of these larvae are commonly found at the bottom of mescal bottles, giving the drink a unique flavor and color over the standard tequila. The Agave snout weevil is a black beetle-like insect with a pointed snout, typically seen in late spring and early summer. The adult feeds on sap from the leaves and may introduce harmful bacteria. The larvae are much more damaging as they can destroy the roots of a mature plant, eventually leading to the collapse of the plant. This pest isn't commonly found outside of Mexico, but be aware when purchasing mail order plants. Agave Snout Weevil prefers the broader-leaved Agaves, but any genera within *Agavaceae* is at risk for infestation. The Chilocuill are small red grubs that also feed on Agave roots. These grubs generally do not do economic damage to Agave crops. Chilocuill adults take the form of a small, white moth.

Any snout weevils seen around a plant should be killed and a systemic insecticide applied. Once a plant has collapsed, it is too late for treatment. The infected plant should be removed and destroyed, along with grubs that can be found.

SCIARID FLY

The sciarid fly, also known as fungus gnats, were once thought to be a nuisance pest only in the greenhouse. Modern studies have shown that fungus gnats are more than just flying pests and can significantly damage succulent plants. Adult fungus gnats are small (1/8 inch long), mosquito-like insects, categorized under the species, *Bradysia*. The weak flying females lay their eggs in moist soil where food is abundant. Fungus gnat larvae are small, almost translucent to white in color with a black head capsule.

Fungus gnat larvae are most damaging to seedlings, cuttings and young plants. They feed on tender young roots, providing entryways for pathogens. As the young feeder roots and stems are damaged, affected plants wilt, leaves may turn yellow and drop. Laboratory studies have shown adult fungus gnats to carry spores of *Pythium*, *Botrytis*, *Verticillium*, *Fusarium* and *Thielaviopsis* as they moved from plant to plant, helping spread plant disease.

In as little as three to four weeks, the fungus gnat's life cycle may be completed from egg to adult. Overlapping and continuous generations make control difficult. Supposedly allowing the plant to dry out in between watering is effective. It seemed most of our members agreed this wasn't true. The use of yellow sticky cards has been my most successful remedy.

ALOE MITES

Eriophyes aloinis (or *Aceria aloinis* depending on your source) causes severe damage and galling to some species of *Aloe* and other members of the *Aloaceae*. This pest has been highly damaging to aesthetic crops such as *Aloe* and *Haworthia*. The mites inject a plant growth regulator into plant cells as they feed. The regulator induces the formation of a gall which surrounds the mite, creating a protective covering. Once the gall is produced, eggs are laid inside and nymphs mature within. Emerging adults later infest new foliage. An affected plant can harbor six to eight generations of Aloe mite per year. Like spider mites, these mites are microscopic and spread mainly by the wind or by contact. The infestation can be found on leaves and inflorescence. Galls should be cut off and disposed of on sight. Miticides are ineffective on mites within galls, but they are effective at controlling any remaining mites on the surface.



Photos: Leanne Pundt, University of Connecticut IPM

1. Yellow sticky cards are used to monitor pest infestations.
2. Fungus gnat stuck to yellow sticky card.

PEST MANAGEMENT OPTIONS

STICKY CARDS

Sticky cards are a common pest monitoring tool in greenhouse production. They are a pre control tool, allowing growers to determine when a pest is present and at what population. Most sticky cards are yellow, 3x5 inches, and contain a sticky glue on both sides of the cards. Some cards are larger and feature a grid to make it easier for a technician to count the pest population. Yellow cards are most often used since they appeal to a wide variety of insect pests, but some growers may choose to use white or blue cards as well. Yellow sticky cards will trap the adult flying stages of thrips, whiteflies, fungus gnats, leafminers, leafhoppers, shore flies and winged aphids. Blue cards are used specifically for thrips and shore flies on crops that are highly susceptible to damage. White cards appeal to tarnished plant bugs, which affect mostly fruit and vegetable crops.

For best control in greenhouses, use 3-4 cards per/1000 sq feet. Cards should be placed 4-6 inches over the plant canopy on vertical stakes and should be monitored weekly to see developing pest populations. If high levels of insects are present, the cards may need to be changed every week as the pests stick to the cards. When monitoring for fungus gnats specifically, horizontal placement of the cards just above the soil surface is more effective than placement above the crop canopy. This is most effective before any fungus gnats are seen flying.

In large scale production, sticky cards are only used to monitor pests, they might trap some of the pests, but they aren't designed to be the only means of control. Every pest plan has its faults. Some are hard to apply, others include dangerous chemicals and others just require persistence. The easiest way to get rid of pests is to keep them from being introduced in the first place. Be sure to check all new plants for pests and quarantine them from your collection for about a month. Sticky cards can be very useful at this point in small scale home collections making it easy to determine if pests are present.

INSECTICIDAL SOAP

Insecticidal soaps are useful in treating a wide range of plant pests, they have been used in production for over 200 years. The soap is applied as a spray containing the active ingredient potassium salts of fatty acids. Sprays are effective against most small, soft-bodied arthropods such as aphids, young scales, whiteflies, psyllids, mealybugs, and spider mites. The mechanism of control behind these products is poorly understood. In some cases control results from disruption of the insect's cell membranes while in others it seems to degrade their protective coatings, causing the pest to dry out. Application must be thorough and completely wet the pest. Be sure to spray the undersides of leaves and try to apply within small crevices for best control.

Like most pesticides, plant injury can result from repeat applications to a plant. Your plant should not be placed in direct sunlight while the solution is still moist. You can decrease your chances of pesticide build up by rinsing your plant before the next application. Some plants may have sensitivity to insecticidal soaps. Read the label before applying any pesticides and apply as directed.

HORTICULTURAL OIL

Horticultural oils are usually made of refined petroleum products that are mixed with a water soluble emulsifying agent. A few other products exist on the market consisting of oils and extracts from the neem tree (*Azadirachta indica*). Vegetable oils are not as effective, but can be used in for the same purpose. Horticultural oils are used to treat many pests including aphids, mites, scale, adelgids, leafhoppers, and whiteflies. Horticultural oils have been used for centuries to control both insects and mites. They work by blocking the spiracles through which insects breathe. Other times, they act as poisons, interfering with the fatty acids in its normal metabolism. Again, some plants may be sensitive to oil application. Read the label and apply as directed.

SUBMISSION OF COMMENTS FOR THE NEWSLETTER OR SUGGESTIONS FOR FUTURE MEETINGS, ETC.

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