

A'ali'i (*Dodonaea viscosa*)



- A'ali'i is a shrub that rarely reaches taller than 30 feet. It has very hard wood, used by ancient Hawaiians for building houses, tools, and weapons.
- The Koa butterfly (*Udara blackburnii*) often utilizes A'ali'i as its host.
- A'ali'i is very susceptible to scale insects. However, mealybug destroyer (a ladybug) frequently visits this plant to prey on the scale.

(Top photo from ctahr.hawaii.edu)

Blackburn's Blue or Koa Butterfly

(Udara blackburnii)



- This is one of the two endemic butterflies in Hawaii.
- The slug-like caterpillar of this butterfly feeds on koa, A'ali'i, and other legumes' leaves.
- The adults feed on the nectar of A'ali'i and koa flowers.



(Pictures are from www.hear.org)

Mealybug Predator

(*Azya orbigera*)

Larva: 12-17 days



Pupa:
7-10 days



Adult: 2 months

- This is a ladybug, commonly known as Globe-marked Lady Beetle. The adult has many fine short hairs covering its body giving a dusky appearance.
- This ladybug eats mealybugs and scales, and is present in the garden as a biological control for these plant pests.

(Pupa photo from: <http://www.flickr.com>)

Mamaki (*Pipturus albidus*)



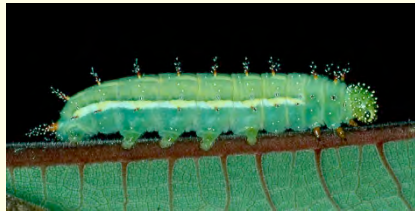
- Mamaki is a broad leaved flowering plant endemic to Hawai'i that was traditionally used as medicine.
- The Kamehameha butterfly (*Vanessa tameamea*) prefers mamaki as its host plant, and is an acceptable host for the Koa butterfly (*Udara blackburnii*) as well.
- A native moth, *Udea stellata*, may also choose mamaki as its host plant.

Kamehameha Butterfly

(*Vanessa tameamea*)



Chrysalis



Larva

- Mamaki and other nettles are a food source for the larval stage of this butterfly.
- Larvae will create a shelter by rolling up the mamaki leaves.
- Adults will feed on sap fluxes of koa trees.
- Unfortunately this butterfly is rarely found in urban gardens.

‘Uki’uki (*Dianella sandwichensis*)



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- Indigenous to Hawaii, its purple fruits were used for seed lei and to produce a pale purple-blue dye by ancient Hawaiians.
- This plant is the specific host plant for the endemic Hawaiian moth *Omiodes monogramma*.

Creeping Lantana

(Lantana montevidensis)



- These are varieties of non-invasive creeping lantana as they hardly produce fruits.
- Purple and yellow flowers produced by these plants provide an energy source for butterflies in the form of nectar.
- Passion vine butterflies have been seen visiting the lantana in this garden.

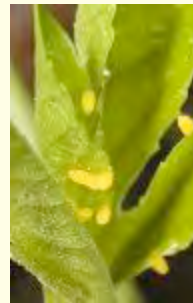


Passion Vine Butterfly

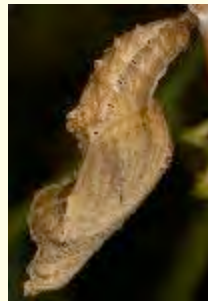
(*Agraulis vanillae*)



Eggs



Larva



Chrysalis

- The larvae of this butterfly will feed on the leaves of the passion vine.
- This caterpillar is poisonous to many predators.

Crown Flower

(Calotropis gigantea)

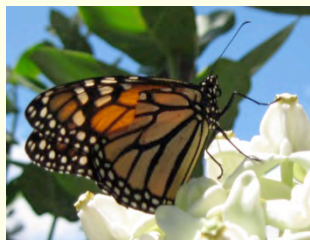


- Also known as giant milkweed, this shrub attracts Monarch butterflies.
- The flowers of this plant are long lasting and were viewed by the Hawaiian monarch Queen Liliuokalani as a symbol of royalty.



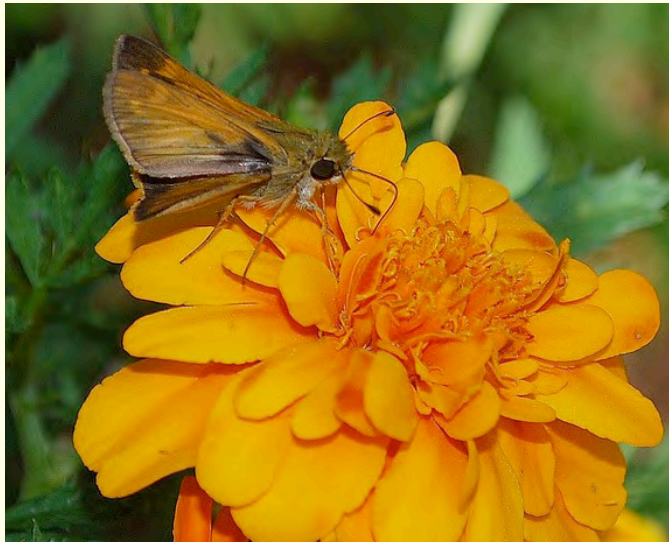
Monarch Butterfly

(Danaus plexippus)



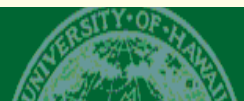
- Monarchs can live for 2-8 weeks in a garden containing milkweed (*Asclepias*) and sufficient flowers for nectar.
- The caterpillar feeds on leaves of the crown flower or other plants in the milkweed family (*Asclepiadaceae*).
- The adult monarch butterfly will visit flowers of many other plants such as cat's whiskers, marigold, butterfly bush (*Buddleia davidii*) etc.

Marigold (*Tagetes patula*)



Skipper on a marigold flower

- Known to produce α -terthienyl which can deter plant-parasitic nematodes in the soil. Marigold also deters whitefly.
- In butterfly gardens, marigolds could be used as a ground cover as well as a nectar source for butterflies.



Monarch Butterfly (*Danaus plexippus*)

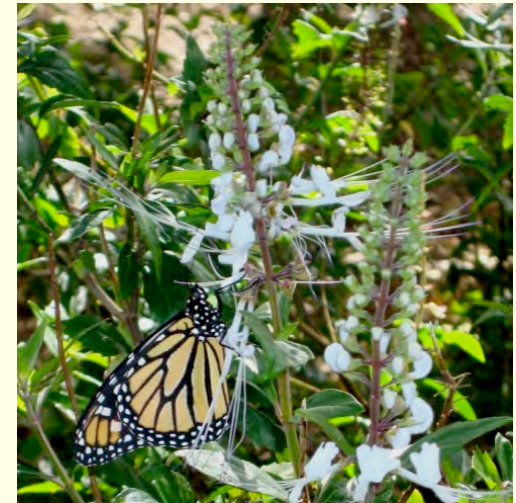


Butterfly bush
(*Buddleia davidii*)



Milkweed
(*Asclepias syriaca*)

Milkweed can become an invasive weed because it produces numerous wind borne seeds; however, if contained it can be an excellent insectary plant for the monarch butterfly.



Cat's Whiskers
(*Orthosiphon stamineus*)

(Butterfly bush photo from: <http://msucares.com>)

Calamondin

(Citrofortunella microcarpa)

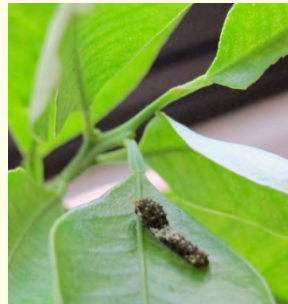


- Calamondin, or Calamansi is a tree that produces small citrus.
- Calamondin is known to attract swallowtail butterflies, and is planted in the garden for this reason.
- The leaves are a food source for the swallowtail larvae

Swallowtail Butterflies (*Papilio xuthus*)



14 days old



11 days old



16 days old



21 days old



A few days later

The 1st instars of this butterfly resemble bird droppings

Osmeterium = A hidden forked structure that emerges when the caterpillar is threatened, and emits smelly terpenes to deter predators.

Basil (*Ocimum basilicum*)

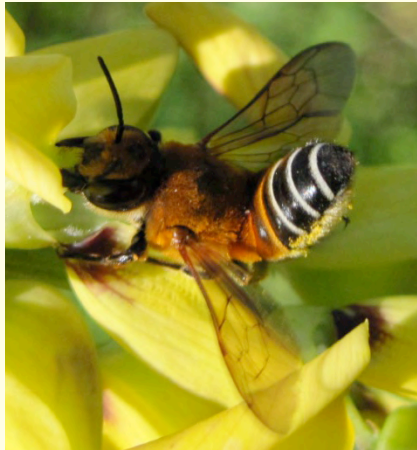


Pollen
basket

Honeybee

- Besides serving as an herb for culinary use, in the garden, basil can also serve as an insectary plant to attract pollinators and insect pest predators.
- Bees are frequent visitors to basil plants and will forage for both pollen and nectar from their flowers.

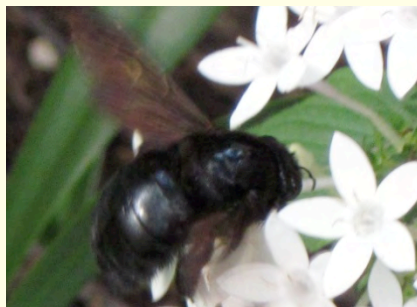
Leafcutter Bees (Megachilidae)



Leafcutter nest
box

- Leafcutter bees are non-aggressive solitary bees and build nests with leaves that they cut into circles and roll into tubes.
- They can be encouraged to take up residence in a garden by providing a leafcutter nest box.

Pentas (*Pentas lanceolata*)



- This flowering plant is in the family Rubiaceae: the coffee family.
- Pentas are known to attract butterflies of various species, and are hardy and easy to care for in a garden.
- In this garden carpenter bees have been seen foraging for nectar.

Carpenter Bee (*Xylocopa sonora*)



Due to its large size, they often rob nectar from flowers. Here the female bee is making a hole along the long corolla tube, thus robbing the flower.



The male carpenter bee can be easily discernible by its golden color.

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Monarch butterfly on pink pentas

(Monarch picture from: <http://highlanders.floridatrail.org>)

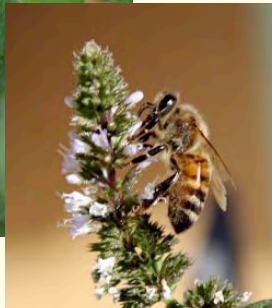
Panama Rose

(Rondeletia odorata)



- Belonging to the family Rubiaceae and is originally from Cuba.
- It is a prolific bloomer and is another addition to this garden that is known to attract butterflies.

Mint (*Mentha spp.*)



- Various species of mint are planted in the garden.
- Mints are used as a cover crop and as insectary plants to encourage the utilization of the garden by bees and natural predators of plant pests by providing nectar and pollen.

(Bee photo from: <http://beeisbeautiful.wordpress.com>)

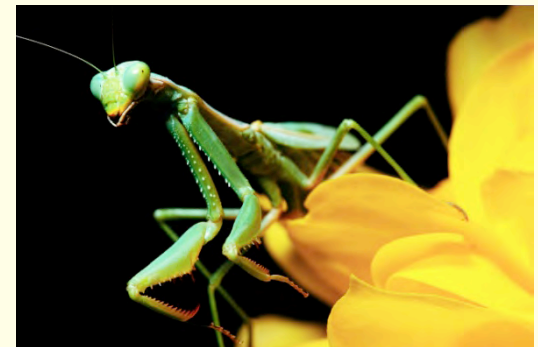
Acknowledgement



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