

Raising Monarchs

Monarchs and other butterflies belong to the insect order *Lepidoptera* and are well known for their beauty. They are also important for their role as pollinators of many plants. Worldwide, the presence or absence of butterflies indicates the health of the environment.

Butterflies are becoming increasingly scarce, mainly due to the destruction of their habitat. Where once there were 20 or so butterflies common in our neighbourhoods, now you only see a few.

Why?

- Removing what we consider to be unsightly plants from our environment — two specific examples are *Lantana camara*, which was once a wonderful nectar source for the Monarch, and Stinging nettle (*Urtica* species) because of its unpleasant effects. The *Urtica* family is the larval host for our native Red Admiral butterfly.
- Using pesticides to control weeds is damaging insect life.
- Reduction of wild spaces and conversion to mown lawn and tidy spaces.

No matter what size our garden, we can all play a small part in providing more nectar plants and larval food plants for butterflies and caterpillars.

You need a wide variety of nectar plants for the adult, and the correct larval plants for the butterflies to lay eggs. Butterflies need places to hide; mass plantings help hide eaten foliage and provide a naturally wild look sure to attract many butterflies and pollinating insects. When planting be diligent to allow room for growth, use a time release fertiliser, and water when necessary.

Things to consider:

- Is my garden in a sunny location? (Sun is important not only for the plants, but for the butterflies to warm their wings to be able to fly. A north-facing slope is best.)
- Does my garden have shelter from the wind? (Shrubs, trees or a fence will help a butterfly when it tries to land, and will block breezes from cooling the butterflies)
- Do I have a warm perch on which the butterfly can land to warm itself? Rocks, evergreens, etc.
- Have I rid my garden completely of pesticides? (Butterflies are insects!)
- Is there a water source – both for the garden and for the butterflies? (You will need to water your garden, but butterflies also like to gather at mud puddles or wet sand.)
- Have I planted my plants in clumps as opposed to single specimens? (Butterflies like large areas of flowers for nectaring. Clusters of flowers are easy to land on and planting several of the same species means that butterflies get more food at each stop.)
- Do I have both attractive nectar plants and larval food plants for the butterflies? (Different plants attract different species.)

Nectar Plants:

The butterfly, the final stage of the insect's metamorphosis, needs nectar to survive. The following plants grow in most parts of New Zealand, and will provide nectar for your butterflies:

Ageratum, candytuft, cleome, coreopsis, cosmos, dianthus, echinacea, lantana, marigold (calendula and tagetes), osteospermum, salvia, sunflowers, wallflowers and zinnias. The Monarda family, primula and spring bulbs also work. Conifers, of which there is a huge variety, appear to be their favoured tree, although bottlebrushes, cabbage trees, poinsettia, rhododendrons and camellia are also popular. Fruiting trees and ornamental blossoms like flowering cherries and mock orange blossom are also included. But this is just a small sample of what's available! Watch the monarch in other people's gardens and see what it is nectaring on.

Larval Plants:

Growing milkweed in your garden is usually extremely easy — it just materialises out of nowhere, and never in the spot you'd really like it to be. There are two branches of the milkweed family here in New Zealand.

The best known is the swan plant (*Gomphocarpus fruticosus*). (Note. It was reclassified in 2000 — you may find some nurseries still refer to it by its earlier name, *Asclepias fruticosa*, sometimes *A. physocarpus*.)

There is also the giant swan plant (*G. physocarpa*) and seed from this is available from the Moths and Butterflies of New Zealand Trust. Both plants originate from Africa and are perennials (lasting many years).

The *Asclepias* family originates in North America. They are not so common in New Zealand as the swan plant, but are:

A. curassavica (bloodflower or scarlet milkweed) — orange and red flowers OR gold flowers, with spindle-shaped seedpods, 7.5-10 cm long

A. incarnata (red swamp milkweed) — dusty rose flowers, in large dense umbels and the seedpods are erect and about 7.5cm long.

A. speciosa (showy milkweed) — flowers are pale pink, like a skyrocket just exploding. Large grey leaves, oval to nearly round, up to 15cm long. Seedpods horn-shaped.

A. syriaca (common milkweed) — grows to 2m tall, flowers are sweet-smelling, pink-purple to white. Seedpods have small protuberances on them.

A. tuberosa (pleurisy root or butterfly weed) — clusters of brilliant orange flowers, followed by long green pods. Does not have milky sap.

With each plant, seeds are mature when they are dark brown/black. Scattered by the wind on their kapok-like parachutes, you will find seedlings growing in many parts of your garden — and the neighbour's. We suggest you leave the 'weeds', and then when you are running short of food, shift your caterpillars onto them, or pull them and take them to your caterpillars — let them do the weeding for you.

It can be difficult to know just when to collect the seed, not too early that it is still ripening, but before it disperses on the breeze. Another challenge is to separate seed from the fine down, to which some people are allergic. The easiest way is to cover the seed pods as they mature on the plant in a sleeve made from an old curtain, tie it off, and ensure that none of the seed is blown away. Empty the sleeve regularly, especially after rain when the down is damp and can be easily removed, and then harden the seeds off in a warm place or the hot water cupboard.

Scatter the seed on top of poor soil (individually, in egg containers works well) and cover lightly with a sprinkling of sand. Keep mix damp - germination is 7-10 days. Harden off seedlings when they are 10-15 cm and transplant into your garden in a sunny location.

Monarch Metamorphosis

Times are longer for cooler conditions and zones, than in the peak of the summer.

Eggs

These take between **1-5** days to hatch. Eggs are usually laid on the underside of the leaf and prefer young plants. The egg will appear dark just before the caterpillar (larva) is ready to emerge.

Larva (Caterpillar), 9-14 days

Larvae can be handled safely with fingers after they are about three to four days old, but it is best to handle them as little as possible until they are over 2cm long. If necessary, a moistened artist's brush can be used to transfer younger larvae without hurting them.

Caterpillars go through stages (instars) and will shed or moult their skin between stages. Larvae of any size should not be handled when they are moulting. They are getting ready to moult when they remain very still, often on the side or top of the leaf, and when you can see their black head capsule about to come off. Just after they have moulted, their tentacles will look droopy, and you may see the old skin behind the larva. They will usually eat their discarded skin.

As larvae grow, so will their appetites. When they are 2+ cm long, in the fourth instar, they will want to pupate and need to be able to climb so that they can hang in the 'J' position.

There is some mortality in the larval stage. One bacterial disease causes the larva to turn very dark, and then die. Others may simply stop eating and growing, and then die after several days.

While this may be difficult for children to accept, you can assure them this is perfectly natural and no-one's fault.

Pupa (Chrysalis) , 9-14 days

When larvae are ready to pupate, they crawl somewhere high where they can suspend themselves, attach themselves with silken thread, and form a prepupal 'J' before shedding their skin for the last time and becoming pupae.

This process is fun to watch but it happens quickly. You can tell that they will shed their larval skin soon (within minutes) when their tentacles hang very limply and their bodies straighten out a little.

Moving the Pupa

If desired, you can move the pupa after it has formed. Wait until it is hard and dry (several hours or longer). Tie a piece of thread around the cremaster (the stem), but not tightly, and with a needle or pin carefully tease away the silk that holds the pupa to the surface.

Leave the silk attached so the thread does not slip off. If the pupa has fallen and there is very little silk remaining, add a drop of glue to the thread where it surrounds the cremaster. The loose ends of thread can then be tied to a branch or coat hanger. Clothes pegs can also be used to hold the loose end of the thread to a ring stand or other similar object. It is safe to handle pupae carefully and even put them lying on their side on a table briefly, but the pupa must hang for the butterfly to form properly.

The adult will emerge in 10-14 days. When it is ready to emerge, the adult wings will be visible through the pupa covering.

The Adult Butterfly

Adults usually emerge mid-morning. When the pupa is very dark and the orange and black wings are visible, check it often to increase your chances of observing this amazing event.

Allow the newly-emerged adult plenty of time to inflate its wings and for the wings to dry before handling (up to four hours). To hold a butterfly, always hold all four wings at once in their vertical position.

For record-keeping, adults can be marked with a permanent, very fine felt tip pen by writing a number on the hind wings. It is safe to handle monarchs if you do it carefully. A few scales may come off during handling, but this will not generally hurt the butterfly. You can either encourage the monarch to climb onto your finger, by putting your finger in front of its head, or when the wings are closed (together) you can hold it gently with all wings together.

Wait for the wings to dry before releasing the monarchs outside in the fresh air. Monarchs that emerge in the morning can be released at the end of the day, or kept until the following day without needing to be fed. Those emerging in the afternoon should be released the next day. It is best if they are released on a warm sunny day, near flowers if possible. If it is colder than 16° C, they often cannot fly.

If you keep the adults, they should have a cage large enough to allow flight. Mosquito nets or hanging or wooden frame cages work well for adults. Adults do not need to be fed until the day after they emerge. After this they should be fed daily.

They can be fed in a variety of ways. Fresh cut flowers can be placed in containers and put in the cage, as can living, potted, flowering plants. A small dish or jar lid containing a sponge saturated with a mix of 15 grams glucose, 15 grams fructose, 15 grams sucrose and 100ml water (it should taste like a sweet cup of tea) can be set in the cage. Gatorade can also be used. Change daily to prevent fermentation.

To encourage feeding in any of the above methods, place the front feet into the solution and the butterfly will sometimes unwind the proboscis and start feeding. If the butterfly does not unwind its proboscis after several tries, place a probe or pin in the loop of the proboscis and gently pull

the pin away from the head so the proboscis is extended and touches the nectar solution. Once the proboscis is in the syrup the butterfly is feeding.

Information on weighing and measuring Monarch butterflies and larvae can be found on <http://www.monarchwatch.org>. We are indebted to this organisation for the help with educational material.

Adult males usually die a few days after mating, females lay about 400 eggs and die soon after.

Remember death is a part of the process of life. Nothing is expected to survive to maturity – or forever.

Check out the links and the glossary on our website for more information.