Macro Photography

Tools and How-To

Laszlo Podor - October 2008
(all images in article are taken by Laszlo Podor)

What is a macro image?

- **Classical definition**: the image projected on the film or digital sensor is close to the same size as the subject – most 35mm macro lenses have 1:2 or 1:1 (half or full size of subject) magnification.
- **Today's definition by manufacturers**: close enough to be life size on 4x6 print – meaning only around 1:4 magnification (one fourth of life size on sensor).

You can get closer to the image using a lens that is a macro lens as per the classical definition. When buying a macro lens, look for the magnification ratio.

Which camera to use?

Point & Shoot Cameras

Pros:
- They have excellent macro capabilities.
- These cameras a affordable, you can get a decent one for $100-200.
- They are light and easy to use –important features for most of us.

Cons:
- Small sensors – print sizes are limited to around 8x10 or smaller.
- These cameras have limited or no extra macro accessories

An example would be the Canon PowerShot 590 IS.

Single-Lens Reflex (SLR) Cameras

Pros:
- Best results in image quality and you can get the best prints from images taken by an SLR or a DSLR camera
- Excellent array of accessories – see some of the available accessories below.
- Flexibility, configurability - since you are not limited to a handful of options.

Cons:
- The DSLR cameras are expensive – you are investing close to or over a thousand of dollars to have the DSLR with a macro lens, in cases the cost is a few thousands of dollars.
  If you are buying an SLR camera, the cost is possibly lower, buy you will be spending way more money on film development and prints – so it pays off buying a DSLR camera for macro photography (most possibly you'll take many shots to have one decent).
- These cameras and accessories are heavy and bulky. You need a bigger camera bag and hiking is more difficult as well. Imagine hiking the 13 km long Blomidon National Park trail with the camera, all accessories and the tripod on your back.

You cannot go wrong with any of the recent SLR or DSLR cameras from the major manufacturers.

Depth of Field (DoF)

The Depth of Field (or DoF) is very narrow in macro photography and it is the same regardless of the focal length, assuming the same magnification. In other words, if you are shooting with a 70mm macro lens at 1:1 magnification and your friend is using a 180mm macro lens at the same 1:1 magnification, you both will have the exact same DoF.

DoF at 1:1(life size) magnification:
f/8 at 15 cm: less than 1 mm
f/16 at 15 cm: 1 mm
f/22 at 15cm: 2mm!

This means you must focus very carefully to get a sharp image. Naturally, it is enough to have certain part of the image sharp, while blurring the rest of the frame. This feature actually works very well to separate the object from the background.

You must have to have steady hands too – slight movements are enough to get a useless image.

SLR Macro Accessories

- Close-up lenses – a set for $30-$40 on eBay. These go to the front of the lens and as they have glasses, these will not result the top quality images.
- Extension Tubes - $100 to $250. These will be mounted between the lens and the camera. Since no glass is involved, these produce higher quality images.
- "Macro Zoom" lenses- these are NOT macro lenses…
  These lenses have around 1:4 magnification ratios or worse and as per the classical definition, they are not real macro lenses.
- Macro Lenses – many available from all major manufacturers:
  Olympus 35mm f/3.5 1:1 Macro - $250
  Sigma 70mm f/2.8 EX DG Macro - $530
  Canon EF 100mm f/2.8 Macro USM - $600
  Canon EF 180mm f/3.5L Macro - $1,500
  Nikkor AF 200mm F4D ED-IF Micro - $1,470
  Nikkor AF 60mm f/2.8 Macro - $420.
- Extreme macro lenses
  Canon MP E-65mm F2.8 (1-5X) Macro - $1,000
  This Canon lens has only manual focus, but gives to five times the magnification 5:1!
- Reverse adapters – use wide zoom lenses for 2:1 to 3:1 magnification (from $10 from China), the front of the lens is mounted to the camera.

- Close-up flash system or Ring light (LED Ring light $75).
- Tripod – make sure you choose one with features for macro photography – you would need to be able to mount the center column horizontally to get closer to the ground.
- Macro focusing rails.
- Clamps, flex grips.

- Shooting tents – note, this is not permitted in National Parks, Provincial Parks and many gardens since you will damage the area you are photographing. These tents would give you protection against the winds and nice diffused light.
- Reflectors – white, silver, gold. These reflectors open up the shade for a better image. Mostly used when you have too much contrast between the highlights and shadows (e.g. bright sunny day).
- **Time**
- **Patience** – it might take quite some time to get the perfect light, or the perfect situation.
- **Luck…** Note, once you are lucky, you need to have the knowledge to capture the moment well. If you are shooting bugs, they may not stay still or may not stay there for long! You need to know your camera and adjust the settings within seconds, need to be able to frame the image and press the shutter release before the bug takes off.

Shooting Macro with Point & Shoot Cameras

(The image on the right is taken with an Olympus C750UZ advanced point & shoot compact camera)

- Use tripod – sometimes this is not possible, e.g. if you are photographing insects, they would not stay in the same spot, so handling a tripod is an added complexity and slows you down.
- Select Macro Mode (usually the Flower symbol) and get close to the subject.
- Macro Extension Lens can get you even closer – screwed onto the front of the lens.
- Flash – most P&S cameras have only built in flash. Soften flash with tissue paper.
- Adjust aperture if possible (most P&S cameras do not allow this), use small aperture. This means you will either need to use the camera in manual mode or use the Aperture Priority. When buying your camera, make sure your new camera will have these options.
- Focus carefully – manual focus is the best. Remember, the DoF is very narrow, so you need to focus on the part of the object you think must be sharp. If shooting insects, the eyes of the bug must be sharp.
  If you do not have manual focus available, you can half push the shutter release to autofocus and then push it fully when you have the subject in perfect position.
- Composition – the usual rules apply as in other areas of photography. You can break the rules, like in the Cornus kousa Satomi (Flowering Dogwood) flower image above. The yellow flowers are in the dead centre of the image but it still works well as the edges of the four pink bracts leading your eyes to the flowers.
- Set your self timer or use remote control – if you are using your tripod. You can also use a bean bag or similar object to place your camera on.
- Take your shot. You may need to take several shots to get the perfect one. If you shoot digital, you do not need to worry about the cost of developing – you can take as many as possible and then delete the bad ones.

Shooting macro with SLR cameras

- Use tripod, focusing rail.
- Your choice of Extension Tube or Macro lens. A good macro lens with your expertise will make wonders.
- Flash – ring light or close-up flash system. Since the DoF is narrow, you want to use smaller apertures (f/11 – f/16) to have sufficient DoF. Ring lights and close-up flash systems will help you in taking better images – they will allow you using small aperture with acceptable shutter speed with no or minimum shadow.
- Choose small aperture – e.g. f/11 or f/16. F/22 may not be sharp enough, so if possible do not use it too often.
- Use Aperture Priority or Manual setting. Auto or Program settings will choose the aperture and shutter speed (along with the ISO) to minimize the motion blur, so you are not in control of the process. You do need small aperture and you can get it using Aperture Priority or Manual setting.
- Focus carefully – manually. You can use the manual focus ring on the lens – or you can half push the shutter release to autofocus and then push it fully when you have the subject in perfect position.
- Composition – follow the rules or break them.
- If you are using tripod or bean bag, you can use cable release or remote control – this gives you better control of the sharpness. You can minimize the camera shake even more if you have a mirror lock-up feature in your camera.
  You push the button on the remote control to lock-up the mirror, a couple of seconds later you push the button again to take the shot. The mirror movement in this case cannot cause camera shake.
- Take your shot. As with Point & Shoot cameras, you may need to take many images to get the perfect one.

Try to frame the image in camera as much as possible – cropping the image always reduces the maximum print size and the image quality suffers.

How to improve your "macro vision"?

There are many famous landscape photographers, many great portrait photographers, but there are very few (if at all) who are great in all areas of photography. Macro photographers have trained eyes to see the tiny objects most of us would not see or would not see the same way. You need to get close enough to the subjects – this will mean getting dirty, kneeing or laying on the ground for several minutes (or more).

These exercises will help you improving your "macro vision", to see the tiny details.

1. Indoor: search for tiny items in your house (garage, kitchen, study), try different compositions with different objects and backgrounds. Aim for taking as many good images as possible. Make sure you have sufficient time available.
2. Set aside a couple of hours of a Sunday and take a macro image every 5 minutes – handheld. You might have a few images that are not pin-sharp, but your macro vision will improve greatly.
3. Use a 10ftx10ft area of your garden and search for macro opportunities. You'll be surprised how many good shots you'll have. Although Spring or Summer are the best for this, you will find interesting tiny subjects in Winter as well – just dress warm.

You might get a number of great shots on the first session, but it will take a few days until you will be more comfortable shooting macro.

You can take many different shots of the same subject