

Taking digital photos of suspect invasive alien invertebrates in the UK Overseas Territories for identification purposes

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Background

Fera offers a free identification service for suspect invasive alien invertebrates found in the UK Overseas Territories (UKOT). However, it can take several days or even weeks for samples to arrive at the Fera laboratory for identification. Digital images can be sent instantly and can be used to efficiently screen out non-pest species and triage potential invasive pests. For example, Fera has received pictures taken at a Border Inspection Point of fly larvae intercepted in fresh imported fruit and could separate primary plant pests (e.g., Tephritidae) from incidental fly families (e.g., Drosophilidae). However, it is important to stress that even with good quality photographs, most invertebrates are difficult, if not impossible, to identify accurately to species. In many cases voucher specimens of invasive species will still need to be submitted to Fera to confirm an identification.

Submit digital photographs of suspect invasive alien invertebrates to: ukot@fera.co.uk. If the files are larger than 10MB, they are best sent singularly or as zip files (data compressed) in a folder. If you have any problems, contact Fera for advice.

Digital photography

There are a range of options for taking digital images. Most people have a smart phone and the camera technology in modern mobile phones has improved significantly in recent few years. Other options include compact cameras, bridge cameras, and full-frame digital SLRs. When choosing a camera, it is best to check that it has macro capability. Pictures of medium to large-sized invertebrates (5 mm plus) suitable for making a provisional identification can be taken with a modern phone or compact camera, and it is not necessary to use expensive, heavy, full-frame cameras and specialised equipment.

Basic rules for taking photos of live invertebrates

- Get as close as you can, without scaring the organism away (if it's alive). If it is fast moving, catch it in a plastic container and place it in a fridge to slow it down before photographing it.
- Make sure there is enough light. In the tropics the light can be too strong, washing out the colours and creating strong shadows, so try photographing the invertebrate in the shade.
- Use a flash in low light.
- As a minimum, take photos dorsally (top view) (Fig. 1) and from the side (not always practical if the invertebrate is relatively flat).
- It is always preferable to take several photos from different angles. The camera does not always get it right and may focus on the wrong subject; and some diagnostic features can only be seen from certain angles or distances.
- The specific diagnostic characters differ between the different types of organism but if you have an adult specimen, take close-ups of the wings (if present) and the head (mouthparts can be important). Fera may request photos of diagnostic features if you have the specimen.
- If you have a caterpillar or larva, try to photograph from the side (Fig. 2) to show the legs, including any prolegs, if present.
- If there are different life stages present, photograph all the stages, and ensure to photograph any adults present (i.e., the largest individuals and if an insect, it will usually have wings).
- Use the maximum size picture (number of pixels) that your camera will allow.
- If using a telephoto lens, use a tripod or lean on something sturdy to avoid camera shake.



Figure 1 Dorsal view of a beetle clearly showing all the body parts, antennae and legs © C. Malumphy



Figure 2 Side view of a caterpillar showing the legs and prolegs © C. Malumphy



Figure 3 This picture shows a plant infested with a scale insect. The subject is out of focus, the insects are too small and there is too much contrast with the strongly lit floor in the background. It would be difficult or impossible to identify the insect species © UKOT



Figure 4 This picture shows a plant infested with the same species of scale insect. The subject is in focus, closer to the camera, and the light is even. The photo was taken in the tropics, but the subject was shaded to avoid too much contrast. This insect was identified to species © C. Malumphy

Common problems include, subject is too small in the picture, or the picture is blurred due to camera shake, low light levels or the bug is moving too fast (see Figs 3 and 4).

USB digital microscopes

The simplest (and cheapest) option for photographing very small invertebrates, is to use a USB digital microscope. There is a wide choice of low-cost USB digital microscopes that can be attached to a laptop or computer to view the image on the screen. These will also take video. The higher magnification (e.g., up to x200) means less depth of field and they often work best when examining dead or immobile specimens. Lighting is critical, but most USB digital cameras have inbuilt LED lights. They often come with an adjustable stand, so your hands are free to move the specimen, and it can be useful to include a ruler or scale in the picture.

Collection data

Finally, always record the collection details including location (GPS if possible), note any plant association and damage, date, and recorder's name. The camera may automatically include metadata such as the date, time and camera settings used to capture the image. If you suspect that you have found an invasive species, collect the pest in a plastic container and keep until you have at least a preliminary identification.