SOME TECHNIQUES IN INSECT PHOTOGRAPHY

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Insects are very small compared to man. Since average cameras are built for panoramic and human photography, this means that to photograph small objects extra equipment is necessary such as extension tubes, telephoto lens or multi-lens built for microbe work. The camera should have a reflex system focusing through the lens to relieve the camera-man of parallax correction worries. A very firm support for the camera should be used such as a bench or tripod. For accurate light intensity reading an incident type light meter is preferable.

Reflectors should be made by the photographer of size and type to suit the occasion. Aluminum foil glued over a stiff backing which is then mounted in a stand, allows two-way movement. A smooth-surfaced aluminum foil reflector will give a hard, clear beam of light, but a slightly wrinkled aluminum surface will give a softer light. If a very soft effect is required, use a dull white reflector. Take care that there is not any light beamed directly into the camera lens from a reflector.

For shiny convex surfaces of dark color in the subject, which is very often encountered with insects, use a polar screen over the lens to cut out unwanted reflections. For extremely shiny subjects it may be necessary to use polar screens over the light beam and over the lens. The light source may vary from the sun to strobe or tungsten. In any case with a number of reflectors, not only is the light increased, but also the heat factor. This can be controlled by heat screens which are placed in the light beam, if the subject is susceptible to heat.

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The following examples will help to show how the equipment mentioned can be used:

Photographing Wasps Digging Burrows

Having observed a wasp at work, imagine a clock face lying on the ground, its figures facing up, with the wasp's position at the centre of the dial. Call this position X.

The sun's rays enter at 9 o'clock passing through X to 3 o'clock. One reflector placed at 3 o'clock reflects the sun's rays to X, a second reflector at 5 o'clock also reflects the sun's rays to X, while the camera is at 6 o'clock with its lens focused on X. Check the front of the lens to make sure that no light rays are directly beaming into it from the sun or reflectors. If light is entering directly into the lens, put on a lens hood over the lens mount. Check the exposure with a meter, and set the lens aperture and speed.

Photographing Into Cavities, Cocoons, etc.

A comb containing young honey bee larvae is held in its natural vertical position, at right angles and at eye level to the observer who faces the sun.

Make a variable parabolic reflector. Take a large piece of plywood coated with aluminum foil on one of its surfaces and cut a small hole in its centre. Two loops of cord positioned at either end of the board and tightened with a piece of wood twisted between the cords, produce the parabola. Place this reflector immediately in front of the observer. Focus the camera lens through the hole in the reflector. Use a lens hood to prevent stray direct light entering the lens.

Photographing Internal Structures of Insects

Visualize a clock face in its normal vertical position. At the dial centre (X) place a shallow transparent trough containing the organs in fluid. Direct a light beam from 4 o'clock to pass through X and illuminate the organs. The camera is positioned at 2 o'clock with its lens focused on X.

Improvised Controlled Artificial Lighting

Visualizing the clock face once more, direct a projector beam from 9 o'clock through X where the insect is stationed to 3 o'clock, where a flat or parabolic reflector is placed to re-direct the beam to X.

It is left to the artistic ability of the photographer or his desire to emphasize certain features as to how far from the subject the reflectors are placed in these examples.

Exposure Compensation

When the subject is closer to the camera than 10 times the focal length of the lens the exposure must be increased. For instance with a 4 inch lens any object less than 40 inches away requires additional exposure.

The corrected exposure is determined by the following method:

Multiply exposure time *as indicated by meter* by a *correction factor.*

The correction factor is $(M + 1)^2$ where M = magnification or reduction. To calculate M, measure the object and its image in the viewing screen, and divide the value for the object into that for the image. Example: with insect size and image size the same, write $(1 + 1)^2 = 4$. With a meter reading of 1/100 sec. at F 11, we have $1/100 \times 4 = 1/25$ sec. at F 11.

Following are the comparative F stop settings for this exposure giving a varying depth of focal field:

1/400 at F 2.8, i.e. the shallowest field of focus, 1/50 at F 8.

1/200 at F 4, 1/25 at F 11.

1/100 at F 5.6, 1/10 at F 16, i.e. the deepest field of focus.

Reference

Exposure Meter Manual. Photo Research Corporation, Hollywood, U.S.A.

SCIENTIFIC NOTE

An instance of chemical attraction of the ambrosia beetle, **Trypodendron lineatum** (Oliv.), is of enough interest to record. During December, 1957, a batch of home-made beer was prepared, using malt extract, sugar, bakers yeast, hops and gelatin. It was capped and held for about three months. After use, a few bottles were put in a basement, these still containing small amounts of liquid and settled material, possibly including living as well as dead yeast cells.

The following May, after the spring flight of the ambrosia beetles, it was noted that there were several dozen **Trypodendron** in the bottles. They had apparently entered the basement and crawled through the necks of the bottles and had drowned in the liquid residue. Four or five bottles had attracted and trapped an estimated 80 - 100 beetles.

Youbou is the site of a large sawmill and log booms are common on Cowichan Lake, close to the town. Although beetles may have been attracted to the general area by the floating logs or freshly sawn lumber, they have not been known to enter houses in numbers. It is assumed, therefore, that a strong attractant was produced in the beer residue, leading beetles, presumably at the time of their spring attack flight, to enter the basement, find the bottles and crawl inside them.

No other insects were found with the beetles, which were readily recognized as **T. lineatum.** The British Columbia Forest Products Company has carried out control operations against this species in recent years, and the species is familiar.

This observation is being placed on record as a result of the interest of J. A. Chapman and J. M. Kinghorn, Forest Entomology and Pathology Laboratory, Canada Department of Forestry, Victoria, B.C.

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