

STEP 8

Photography

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Photography of specimens needs to be performed very carefully. Fish specimens are fixed in formalin (STEP 12) and preserved in alcohol. However, in the course of the fixation and preservation procedures, most of the original body color of a fish, except black, fades away. Therefore, we have only one chance to record the body color of a specimen.

In this section, the photography procedure is explained, along with the introduction of the equipments used in the Kagoshima University Museum. Refer to Information 1 for the basic technical information about specimen photography and cameras.

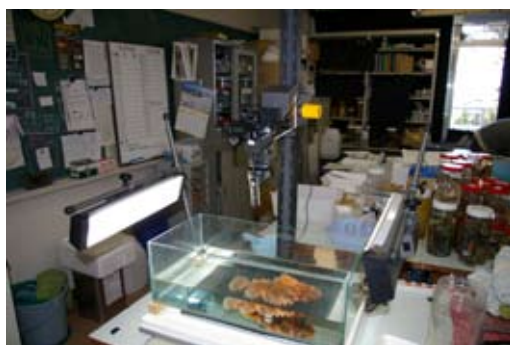
■Close-up copy stand

Fish specimens have body width. Hence, for good specimen photography, the depth of field should be increased (see Information 1 for details). This requires

stopping down the camera lens. However, stopping down the lens slows the shutter speed. Therefore, it is necessary to use a close-up copy stand for specimen photography.

■Lighting

Fish specimens are photographed indoors, and the lens requires to be stopped down. Therefore, lighting is a very important element of good specimen photography. In our museum, a photo-reflector lamp was used until 2007. Thereafter, it was replaced with a fluorescent lamp because of high heat generation (making photography in summer difficult) and short life (requiring to be turned on and off frequently) of the photo-reflector lamp. The following fluorescent lamps are used for specimen photography in our museum.



Close-up copy stand, light, and glass aquarium for medium specimens.



Close-up copy stand, light, and glass aquarium for small specimens.

For medium to large specimens: Copy light
Company: LPL Co., Ltd.
Model: FL-217 L18527
Japanese Article Number (JAN) code:
4988115, 185309

For small specimens: Web dot studio light
Company: LPL Co., Ltd.
Model: WL-230 L18552
JAN code: 4988115, 185521

■ Glass tank (aquarium)

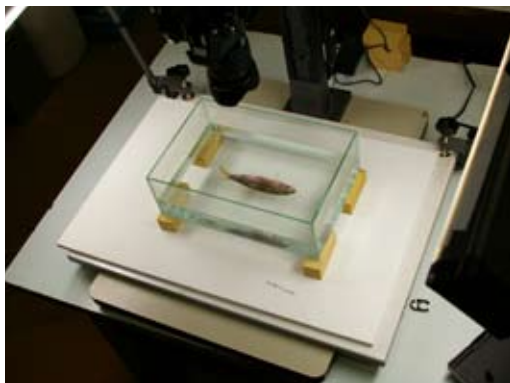
After pre-fixation (STEP 7), the photography procedure should be initiated immediately. The specimen should be re-washed according to STEP 4 and immersed in a glass tank filled with water. In our museum, 3 different sizes of tanks are used, depending on the sizes of fish specimens.

Small tank: 20 cm (length) × 15 cm (width) × 5 cm (height)

Medium tank: 30 cm (length) × 20 cm (width) × 10 cm (height)

Large tank: 60 cm (length) × 30 cm (width) × 20 cm (height)

The tanks are custom made, but they are relatively inexpensive (large: about ¥10000; medium and small: about ¥5000). At the time of ordering a glass tank, it is important to ask the manufacturer to use transparent silicone for gluing



Glass aquarium should be placed a little above the white board on the close-up copy stand. Here, square wooden blocks are used as legs for the aquarium.

each glass panel. If normal white silicone is used, photography lighting will produce shadows, marring the clarity of the photographs.

An acrylic tank is lighter and more convenient than a glass tank. However, its surface easily develops scratches (which will be visible in the photographs). Therefore, an acrylic tank is not recommended. On the other hand, a glass tank is heavy and breakable. In our museum, a glass tank is used in the laboratory, and an acrylic tank is used in the field. This is because a glass tank is so fragile that it can break by slight carelessness. If the tank breaks, it will not be possible to record the body color of the specimen in the fresh state, even when a rare specimen is obtained. To mitigate the risk, we arrange for 2 glass tanks each of the large, medium, and small sizes in our museum.

After the aquarium is filled with water, it is placed on a close-up copy stand. Prior to this, a clean white board (matte type) is placed on the close-up copy stand, following which 4 blocks are placed on the board as legs for the aquarium. The white board will serve as a white background for the photographs (details explained later). If the aquarium is directly placed on the white board, a shadow of the specimen will appear on the board. Therefore, the aquarium should be about 3–10 cm above the white board.

The swimbladder is not evolved in the members of Scorpaenoidei and abyssal fishes, and therefore, they can easily and stably sink to the bottom of the aquarium. On the other hand, fishes such as those of Perciformes live in shallow water, and therefore, it is often difficult to sink them to the bottom of the aquarium. In such a case, the right side of the abdomen should be punctured with a needle to let



Specimen is stably lying on the bottom of the water-filled aquarium. Above: view from the back. Below: view from the front.



A slight tilt in the fish position can be adjusted using a rubber piece (e.g., an eraser piece).

the air out of the swimbladder, and the fish should then be re-immersed in water. If the fish still floats, the right side of the abdomen should be incised to let the air out of the abdominal cavity. Small fishes may not sink even after incising the abdomen, or even if they sink, they may lie tilted. In such a case, a thick needle

should be inserted in the abdomen or the pectoral area to stabilize the body by the weight of the needle. However, it should be ensured that the needle does not overlap the pectoral and pelvic fins. It will not be possible to process the image (STEP 16) later if the needle is visible through the fin membrane.



Specimen is not stable. The body is leaning backward. Further, the photograph is not taken from the right angle. This is an example of a poor photograph.



Specimen is stabilized using a needle. Ensure that the needle does not overlap the pelvic fin.

■ Photography technique

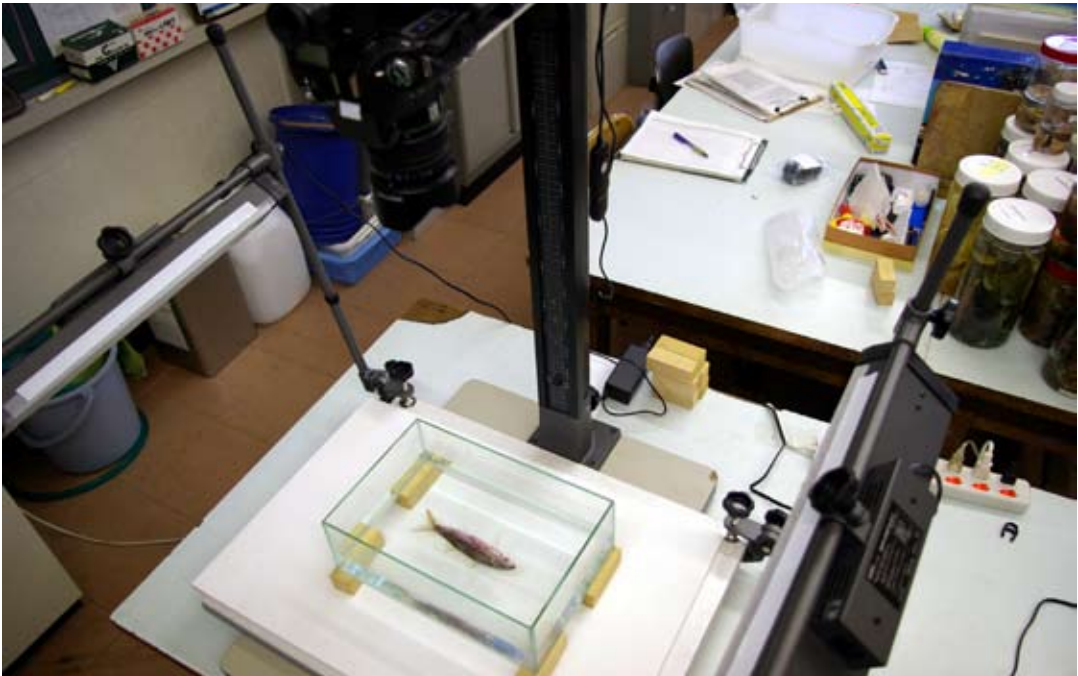
Refer to Information 1 for the general specimen photography technique and camera characteristics. Here, the actual photography technique is explained, taking a digital single-lens reflex (SLR) camera (Pentax K100D Super) as an example.

We use 2 kinds of lenses: general zoom lens (DA 18-55mm F3.5-5.6 AL) and micro lens (D FA 50mm F2.8 Macro). With one camera body and 2 different lenses as one set, we always prepare 3

sets, so that the situation can be managed when multiple groups of students and volunteers want to go to the field at the same time.

The photography technique involves the following steps.

1. Fix the camera on the pole of the close-up copy stand. Ensure that the camera is not tilted and has a memory card. Replace the lens with the micro lens while photographing small fishes. Con-



Specimen (*Upeneus tragula*) ready for photography (light not turned on). Remote release is hanging behind the pole of the close-up copy stand.



The first photograph should be taken with the tag.

nect the alternate current (AC) adapter to the external power port of the camera. If a battery is used, the photographs will not be clear when the battery reaches exhaustion, and further, the camera settings may not be saved due to battery exhaustion. Therefore, we recommend the use of external power for the camera. The AC adapter is compatible with 240 V, and therefore, it can directly be used outside Japan.

2. Set the aperture priority mode (Av) to stop down the lens to focus the fish body. Configure the aperture value setting with the mode dial (the extent of stopping down the lens depends on the size and thickness of the fish body; see Information 1 for details.)

3. Turn on the light and adjust the white balance. If the light in the photograph is the same as that in the previous photographs, it need not be re-adjusted (the setting does not change even when the camera is switched off). A flash lamp may not be used.

4. Push the “Function (Fn)” button on the side of the monitor, and use the Auto Bracket function (this setting needs to be configured every time). The Auto Bracket function allows 3 successive shots by clicking the shutter button only once. When this function is used for the



Photography with a black background. A black board is placed between the white board and the aquarium base. In order to avoid reflection of roof barre and lamp in the glass of the aquarium base, it is necessary to hold a large black board above the camera.

first time, go to “Settings” in “Menu” and set the increment level of the exposure of the 3 serial shots as 0.5 steps (this setting does not change even when the camera is switched off).

5. Configure Remote Release on the camera. Since the aperture priority mode is used, the shutter speed becomes slow, and the photograph can be blurred because of a little camera shake when the shutter button is pushed. Further, since 3 successive shots are taken using the Auto Bracket function, the shutter button needs to be kept pressed. Therefore, it is necessary to configure Remote Release.

6. Adjust the camera lens and pole of the close-up copy stand to bring the fish on the bottom of the aquarium inside the viewfinder. In the case of most cameras, the view from the viewfinder and the actual photograph do not match completely—a point that should be considered while photographing the specimen. The viewfinder field of view in Pentax K100D Super is 96%, which means 4% of the actual photograph (the outer edge) is not observed from the viewfinder.

7. Take the first shot such that it includes both the fish body and the specimen tag (STEP 5). Next, take 3 serial

shots, using the Auto Bracket function. When a white background is used, set the initial Auto Bracket level as 0 and then take the photographs (the increment level should be set as 0.5 steps in point 4, so that the photographs are taken at 3 exposure levels: 0, +0.5, and +1.0).

8. After 3 photographs are taken with the white background, place a black board (or black velvet fabric) between the aquarium base and the white board, and take 3 successive shots with the black background. Each specimen should be photographed with both white and black backgrounds. This is because white parts (*e.g.*, fins) will not be clearly visible against a white background, whereas black parts (*e.g.*, black spots on the fin membrane) will not be visible against a black background.

If the specimen is photographed with a black background, with the initial Auto Bracket level set as 0, the photograph may be too bright and overexposed. Therefore, set the initial level as -1.5, and then take the photographs (the specimen will be photographed at the 3 exposure levels of -1.5, -1.0, and -0.5). Note that this setting depends on the model of the camera and the brightness of the light.

When a black background is used, a roof lamp and/or patterns of roof may be reflected in the glass of the aquarium base and on some part of the fish body. Some measure should be adopted to avoid the reflection. In our museum, we hold a large black board above the camera fixed on the close-up copy stand to avoid the reflection.

The above steps describe the actual photography technique. With regard to saving the photographs in the memory card, 7 photographs for each specimen should be saved as follows: one photo-

graph of the specimen with the tag (with a white background), 3 specimen photographs (taken in 3 steps of exposure compensation) with a white background, and 3 specimen photographs (taken in 3 steps of exposure compensation) with a black background. These photographs are obviously digital images and can be modified on the computer, but the overexposed parts cannot be modified because they do not contain any graphic information. The body color of fishes like those of Carangidae and Trichiuridae is silver gray, which is easily reflected. Therefore, overexposure should particularly be avoided in their case. For these types of fishes, it is safe to take photographs by using the 3 steps of exposure compensation.

Very large specimens (*e.g.*, sharks and hairtails), which cannot fit on the close-up copy stand, can be placed on the floor and photographed. When we photographed a 2-m-long largehead hairtail, we placed it on the floor and clicked the photograph from the second-floor balcony. Extreme caution should be exercised while photographing specimens outdoors, since cats may target the specimens.

1. Details about specimen photography
→ Information 1

2. Photography in field → Information 2

3. Tagging → Step 9

4. Image processing → Step 16