Type Imaging at the Academy of Natural Sciences

Computer Aided Photography and Digital Editing Techniques
Project Goals

- Photograph all Primary Type specimens
- Radiograph all Primary Type specimens
- Edit images and format for the web
- Upload all images and metadata to the Types Website
- Verify Type status
- Replace faulty lids and jars and top off Ethanol
Proposed Workflow

- Transport specimens from the collection to the Imaging Lab (1 shelf at a time)
- Verify Type information
- Photograph 1 lot at a time in lateral view (dorsal and ventral if appropriate) insert “Imaged By” label
- Radiograph 1 lot at a time in lateral view (dorsal/ventral if appropriate) insert “Imaged By” label
- Enter Metadata for each lot into the Collection Database
- Once all lots are imaged move all images to the server
- Replace lids and jars if needed, top off Ethanol and return specimens to the collection
- Complete image processing in Photoshop
- Upload images to the Type Imaging website
- Repeat
Actual Workflow

• Transport specimens from the collection to the Imaging Lab (multiple shelves – taking specimens of similar size)
• Verify Type information check against Type Collection spreadsheet
• Photograph 1 lot at a time in lateral view (dorsal and ventral if appropriate) insert “Imaged By” label
• Change out lid if necessary
• Radiograph 1 lot at a time in lateral view (dorsal/ventral if appropriate) insert “Imaged By” label place black ribbon around jar
• Once all lots are imaged move all images to the server
• Enter photograph and radiograph views with date and photographer info for each image in Type Collection spreadsheet
• Replace jars if needed, top off Ethanol and return specimens to the collection
• Complete image processing in Photoshop
• Enter Metadata for each lot into the Collection Database
• Upload images to the Type Imaging website
• Repeat
Actual Workflow

- Transport specimens from the collection to the Imaging Lab (multiple shelves – taking specimens of similar size)

Set up time was optimized by choosing specimens of similar size. Cut down on swapping out tanks and tripods.
Actual Workflow

• Transport specimens from the collection to the Imaging Lab (multiple shelves – taking specimens of similar size)
• Verify Type information check against Type Collection spreadsheet

A spreadsheet exported from the Collection Database helped identify which lots needed further investigation without checking the literature for each and every lot.
Actual Workflow

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We eventually skipped the label in favor of a black ribbon which we use to indicate that a lot has been x-rayed in the general collection.

It also made more sense to change out lids when the specimens were put back in jars after photography.
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- Enter photograph and radiograph views with date and photographer info for each image in Type Collection spreadsheet

When images were moved to the server they were placed into dated folders. Rather than go to the spreadsheet after each lot it seemed more efficient to update the spreadsheet at the end of each photography or radiography session.
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- Complete image processing in Photoshop
- **Enter Metadata for each lot into the Collection Database**
- Upload images to the Type Imaging website

The workstation used for image capture did not have Filemaker installed and was not used to enter Metadata into the Collection Database. This made it more efficient to enter the data before upload to the website.
Questions?
Photography Software and Equipment

- Nikon D90 with Nikon Micro-Nikkor 60mm Macro Lens
- Nikon Camera Control Pro 2 (Mac)
- Helicon Focus Lite
- Apple iMac
Nikon Camera Control Pro Settings

The D90 is connected.

Exposure 1

- Exposure Mode: Aperture Priority
- Shutter Speed: 2.5 sec
- Aperture: f/16
- Exposure Comp.: +2/3 EV
- Flash Comp.: 0 EV
- Flexible Program: 0 Step(s)

2.5” F 16+ 0.7 (r 6)

AF and Shoot  Shoot
Nikon Camera Control Pro Settings
Nikon Camera Control Pro Settings

The D90 is connected.

Data Format: RAW (12-bit)
JPEG quality:
Image Size:

2.5 "F 16 +, 0.7 (6)

AF and Shoot  Shoot
Nikon Camera Control Pro Settings
Helicon Focus Lite
Helicon Focus Lite
Helicon Focus Lite
Helicon Focus Lite
Helicon Focus Lite
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File Names

Photographs
*Genus_species_ANSP_00000_view*
d-dorsal, v-ventral, ll-left lateral, rl-right lateral, dh-dorsal head, vh-ventral head, llh, rlh-left or right lateral head, cp-caudal peduncle, m-mouth, etc

*Barbus_stigmasemion_ANSP_65865_ll*

Radiographs
*Genus_species_ANSP_00000_view_x*
ll-left lateral, rl-right lateral, dv-dorsal ventral

*Barbus_stigmasemion_ANSP_65865_ll_x*
Folder Names

Folder for each specimen
Genus_species_ANSP_00000_type_by

type: H - Holotype, S - Syntype, L - Lectotype, N - Neotype, P - Paratype, PL – Paralectotype

by: Photographers initials

Barbus_stigmasemion_ANSP_65865_H_KRL
Inside the main folder for each lot is another folder titled “originals” which contains unedited images:
- All raw files used to create the final montaged image
- Unedited montaged images
- Radiograph images with .viva extension

Edited images:
- 16 bit layered tiff image with LZW and ZIP layer compression
- 8 bit layered tiff image with LZW and ZIP layer compression
- 8 bit flattened jpg image
Helicon Focus Pro

- Same functions as Lite version
- Automatic Step with Helicon Remote and StackShot Rig and Shutter Cable
- No need for Nikon Camera Control Pro
Helicon Focus Pro

• Retouching Brush – clones from individual source images to the resulting image
• 3-D Model export
• Batch Mode – process multiple image stacks or one image stack with a variety of parameters
Photography Setup with Stackshot

Nikon D90 with Infinity K2SC long distance microscope mounted on a motorized copy stand run by the StackShot control box.
## Pricing

<table>
<thead>
<tr>
<th>Product</th>
<th>1 year license</th>
<th>Unlimited license</th>
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<tbody>
<tr>
<td>Helicon Focus Lite</td>
<td>$30</td>
<td>$115</td>
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<tr>
<td>Helicon Focus Pro</td>
<td>$55</td>
<td>$200</td>
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<td>Stackshot Macro Rail Package</td>
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<tr>
<td>Shutter Cable</td>
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Editing in Photoshop CS6

- Image Size
- Levels Adjustment
- Scale Bar
- Cropping
- Background
- Removing Artifacts
- Sharpening
- Saving
Image Size

Pixel Dimensions: 69.9M
- Width: 4288 pixels
- Height: 2848 pixels

Document Size:
- Width: 151.27 cm
- Height: 100.47 cm
- Resolution: 72 pixels/inch

- Scale Styles
- Constrain Proportions
- Resample Image: Bicubic (best for smooth gradients)
Image Size

Image Size dialog box with settings for Pixel Dimensions and Document Size. The Pixel Dimensions are 69.9M, with Width: 4288 pixels and Height: 2848 pixels. The Document Size is 151.27 cm x 100.47 cm at a Resolution of 72 pixels/inch.
Levels Adjustment
Levels Adjustment
Scale Bar
Scale Bar

Create a line using the pen tool.
Stroke the path.
Scale Bar

Use the Marque tool to create a selection.
Scale Bar

Clip off the excess portion of the line and add text.
Cropping
Cropping
Background (Wacom Tablets)

Bamboo - $79

Intuos 5 - $229

Intuos 5 - $349

Intuos 5 - $469
Background
Background
Background
Background
Background
Background
Background
Background
Background
Background
Removing Artifacts
Removing Artifacts
Removing Artifacts
Removing Artifacts
Sharpening
Sharpening
Saving

• Use “save as” option to save layered 16bit and 8bit .tif files with LZW and ZIP layer compression.

• Flatten layers, then save as a .jpg file

Be careful not to save over the existing files when saving tifs. Either move files into folders as you save them or add an identifier to the file name

Barbus_stigmasemion_ANSP_65865_ll_16.tif
Barbus_stigmasemion_ANSP_65865_ll_8.tif