Digital Photography for Diagnostics and DDIS

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Outline

• Photography basics
• Common image problems
• Taking better pictures with microscopes
Why take pictures?

• Diagnostic purposes
  – Faster than mailing specimen
  – Damage present, but no bugs

• Research, extension, or teaching
  – Document pest outbreaks
  – Publications
  – Presentations

• Time vs. quality
Types of Digital Cameras

- Point-and-shoot
  - compact
  - affordable

- Digital single-lens reflex (DSLR)
  - interchangeable lenses
  - more control of settings
Photography Basics

- **Shutter speed (exposure time)**
  - fractions of a second: $1/30$, $1/60$, $1/125$, etc.

- **Lens aperture (f-stop):**
  - $f8$, $11$, $16$, $22$, $32$, etc.
  - the larger the f-stop, the smaller the aperture & greater the depth of field
Photography Basics

- ISO setting
- Depth of field
Common Problems with Insect Images

- Subject not in focus
- Subject is washed out (overexposed)
- Image is too dark
- Diagnostic characters not visible
- How big is the bug?
Why isn’t my picture in focus?

- Point-and-shoot cameras - too close
- Exposure too long
  - subject moved
  - photographer moved
- Auto-focus problems
Closer than minimum focusing distance
Subject (or photographer) in motion

• Chill subject

• Reduce exposure time
  – Adjust shutter speed & f-stop
  – Increase ISO setting
  – Use flash
  – Tripod
Auto-focus problems
Dealing with auto-focus problems

• Lock the auto-focus and then re-frame subject
• Use manual focus
Getting the proper exposure
Overexposed subject

• Move farther away
• Use ambient light instead of flash
• Adjust exposure compensation
Exposure Compensation

- Especially helpful when:
  - Dark subject on light background
  - Light subject on dark background
Bracketing

- Helpful when in a hurry
- Bright sunlight
Size Reference
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Macro Photography and Microscopes

- Macro lenses
- Extension tubes
- Microscopes
Digital camera mounted in eyepiece tube
Holding a point-and-shoot camera next to eyepiece
Getting better pictures with your dissecting microscope

- Backgrounds
- Diffusers
- Extended depth of field software
Getting a cleaner background
Diffusers
Photographing pinned insects
Diffused light outdoors

bright sunlight

cloudy day
Photographing in Alcohol

- Some insects can be dried and photographed (ants, beetles, etc.)
- Specimens need to be completely submerged
Extended Depth of Field Photography

Auto-Montage Pro
Syncroscopy
Distance Diagnostics for Insects

• What picture quality is needed?
Distance Diagnostics for Insects

- Dorsal and side views
- other characters: antennae, wings, legs, mouthparts, etc.
Distance Diagnostics for Insects

- Ants: antennae, petiole
- Termites: wing veins, other characters depending on caste
- Spiders: eye arrangement
- True bugs: antennae, mouthparts
Image Library

- File size
- External hard drives
- Backups!!