

## FMCS Gastropod Workshop, March 15-18, 2004

### *Morphometrics*

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Sources of software and information:

- **Integrated Morphometrics Package (IMP):** Dr. H. David Sheets, Dept. of Physics, Canisius College, Buffalo, NY  
<http://www2.canisius.edu/~sheets/morphsoft.html>
- **tpsDig and tpsUtil:** SUNY Stony Brook Morphometrics Lab, Dr. F. James Rohlf, <http://life.bio.sunysb.edu/morph>

Taking digital pictures for morphometrics:

- 1) Develop standard methods and setup for taking digital pictures.
- 2) Use a neutral "photo gray" background for proper camera metering and exposure.
- 3) Use a copy stand or tripod to steady camera, and cable release if available. The camera's self timer may substitute for the cable release. The point of using either is to minimize vibration of the camera while taking the photo. Camera movement is magnified when shooting pictures at close range. Also, many digital cameras have a "macro" setting to allow focusing at close distances from the subject. Use this setting if needed.
- 4) Use modeling clay or "poster tack" to position shell so that the longitudinal axis is parallel to the table.
- 5) Depending on the camera used, the flash may need to be reduced in intensity or diffused to prevent overexposure. The diffuser can be as simple as lens paper taped over the flash. Supplemental lighting and/or aperture and shutter speed adjustment may make the flash unnecessary, but camera motion may become more of a problem without the flash at slower shutter speeds.
- 6) Be sure the scale (ruler) is propped up so that it is at the same height from the table as the longitudinal axis of the shell, when viewed from the side. This is very important to prevent optical distortion of the scale and introduction of error into measurements on digitized photos. The height of the scale should be checked and adjusted with each photo. A good way to check that the scale is accurate is to measure the length of a shell using the ruler and the naked eye, then repeat the measurement using the ruler when viewed through the camera. Both techniques should produce the same measurement.
- 7) Position the camera so that the lens surface is parallel to the surface on which the specimen is supported. Taking photos from positions other than parallel can introduce distortion in the image. For best accuracy in measurements across all your specimens, it is advisable to use a standard orientation for all your shells. We position our shells so that, when viewed through the camera, the posterior edge of the aperture lip is viewed on edge (i.e. appears as thin as possible).
- 8) Store all digital photos for a project in the same folder on your computer. This is important for the proper operation of tpsUtil.