COLLECTION

Size: Small bugs are preferred. The size of the bug's body is not as important as the size of its **head**, which should be **1/2 inch or less in diameter**. Bugs with heads larger than this are difficult to photograph in the scanning electron microscope. If the entire head cannot be photographed, the 'ugliest' part of the head (a subjective opinion of the site doing the photography) will be used for the contest.

Condition: The bug must be in good condition; i.e., not crushed, dirty, or partially eaten.

Packaging: Bugs may be dead or alive. A live bug may be turned into a dead bug by placing it in a freezer for about 48 hours. Bugs may also be preserved by immersion in isopropyl (rubbing) alcohol. If the bug has a soft body (i.e. a spider, tick, mite, chigger, etc), it should be treated this way so that it doesn't shrink due to dehydration. Make sure the alcohol can't spill during transit! Place the bug into a container that will protect it during mailing. Used 35 mm film canisters work well. Pack it so that it will not be damaged by handling. One way to do this is to pin it through the body to a piece of Styrofoam before placing it in a container. Further processing will be done at the receiving site.

SUGGESTIONS

Only one bug per school may be submitted to PEA. If only one classroom at the school is participating in the contest, the bug can be from that classroom alone. We would suggest holding in-classroom and/or in-school preliminary contests, using magnifying glasses or stereomicroscopes (if available) to pick the very ugliest bug for submission. The decision of whether to have all students find a bug and write individual descriptions or to pick the ugliest bug first and write a description as a class is at the discretion of the teacher. In determining which bug is the ugliest, look at the head, or 'face' of the bug. This is what PEA members will attempt to photograph for judging。

MAILING

Mail your ugly bug to the person listed below. This person will also be your contact for any questions regarding the contest.

Jim Ekstrom - Phillips Exeter Academy
20 Main Street, Exeter, NH 03833
jekstrom@exeter.edu

DESCRIPTION

In order for the bug to be included in the contest, it must be accompanied by a description (approximately a paragraph). The quality and accuracy of the description will be taken into account in the judging process, and used to break any ties between ugly bugs. The description may include, but is not limited to, the following:

1. **We call it a "bug", but what is it, really?**
   Give the bug's common name, and its scientific name if possible. Peterson Field Guides are an excellent source for classifying. ***If you have internet access, the "Insects Home Page" (www.ex.ac.uk/~gjlramel/six.html) is a fabulous site with lots of fascinating bug information, help with naming and classifying, and extensive resource lists of other books and websites for more information.

2. **Describe some things about this "bug"**
   Where does it live? What does it eat? How long does it live? How does it affect people or plants or animals? What is important about this bug?

3. **Describe your collection of this "bug"**
   Where did you find it? (county, town, etc.) What did you observe about its surrounding habitat?

THE SCANNING ELECTRON MICROSCOPE

The ugly bug you send to OMS will be processed, coated with gold or another metal to make it conductive, and examined in the scanning electron microscope of an OMS member. The scanning electron microscope allows us to observe objects at very high magnifications. Instead of using light, as in the familiar optical microscope, the electron microscope uses a fine beam of electrons. Because light is not used, no color is seen. The photograph of your bug will be black and white. Electron microscopes can magnify objects from 10 times to more than 500,000 times! Depending on the size of the bugs submitted for the contest, they will only need to be magnified 10 to 500 times their original size..

JUDGING

Entries will be judged by PEA judges. Judging will be based on the 'ugly' appearance of the bug (as seen in its SEM photo), and the quality, accuracy and thoroughness of the description accompanying it. In the case of several bugs of the same type being submitted, the description will be used to distinguish between them and to break any ties.

PRIZES

Grand prize for the 2002 will be a one stereomicroscope. A number of runner-up prizes of microscopy curriculla and books will also be awarded. More prizes may be given based upon the number of entries received. All participating schools will receive a poster highlighting some of the bugs from the contest, and an photo of their own bug. Bugs will also be displayed on the internet; at the Ugly Bug Web site.

MOST LIKELY "BUGS" TO BE FOUND

The phylum ARTHROPODA will be the likely source of the bugs. Arthropods have a characteristic chitinous exoskeleton. The name Arthopoda means "jointed legs" and refers to one of the basic characteristics of the group. Most of the bugs should fall into the ARACHNIDA and INSECTA classes.

Kingdom - ANIMALIA

Phylum - ARTHROPODA

Class - ARACHNIDA

Spiders, scorpions, ticks, mites
Six pairs of appendages on the cephalothorax
Two pair for eating or stinging
Four pair for walking
Cephalothorax and abdomen
Often simple eyes, never compound eyes or antennae

Class - CHILOPODA

Centipedes
Body: many segments all alike, one pair of legs per segment
Head - mouth parts and antennae
Feed on small animals

Class - DIPLOPODA

Millipedes
Same as Chilopoda except two pairs of legs per segment
Feed on vegetable matter

Class - INSECTA

grasshoppers, flies, beetles
Three body regions - head, thorax, abdomen
Compound eye
Three pairs of mouth parts
May also have simple eye or ocelli
Three pairs of thoracic legs

***A sincere thank-you to Marilee Sellers of the electron microscope facility at Northern Arizona University, and to the Oklahoma Microscopy Society.