Microscopic Identification (MID)

Text and drawings by Oscie B.Whatley, *Missouri*

Most of us, including myself, will procrastinate about using microscopic identification and will resort to eyeballing the plant parts because MID just seems to be too much trouble. Usually, there are unaided visual differences between the diploid and its conversion (tet) such as the following:

1. Tetraploid foliage will be more ridged.
2. The upper surface of tet foliage is warty.
3. Tet scapes are usually shorter and heavier.
4. The tetraploid sepal tips are thicker than the diploid and tend to open prematurely.
5. A tet ovary may be shorter and larger in diameter.
6. Most tet flower segments are thicker.
7. Tetraploid flower styles are larger in diameter and may twist or kink.
8. Scapes of tets are more susceptible to vertical cracking.
9. Flowers are usually larger on tets with the sepals proportionately longer.
10. Color may change in value (darker more likely on the tet flower).

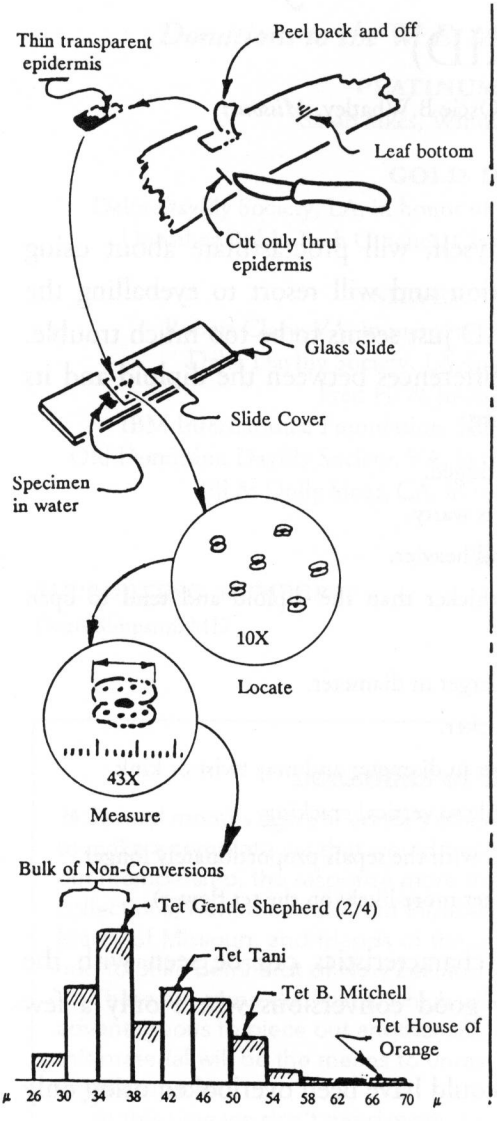
A significant number of these characteristics can be seen with the naked eye, but I have seen many good conversions where only a few (sometimes none) were evident.

Tet GENTLE SHEPHERD easily could have been overlooked using only unaided visual evaluation.

HYBRIDIZING WITH CONVERTED TETRAPLOIDS
PART II

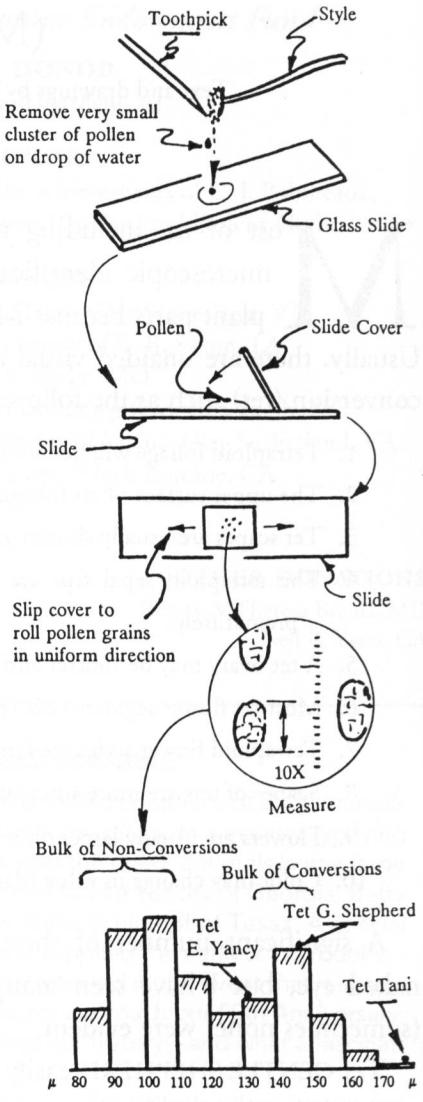
Microscopic Identification (MID)

STOMATA GUARD CELLS - Illustration "A"



Guard Cell Length Distribution for Treated Plants

POLLEN - Illustration "B"



Pollen Length Distribution for Treated Plants

We should look for these conspicuous differences; but if we depend entirely on the eyeball method, the chimera zebras and jokers will have lots of fun at our expense.

To further confirm suspicions of conversion, we turn to making test crosses to known tets. This practice could be the ultimate of testing if we follow safe hybridizing rules and observe carefully the resulting seedlings.

Unfortunately, there are natural barriers such as high temperatures, incompatibility of parent, limited sterility, etc. The influence of these barriers can be easily mistaken for a non-conversion. I have seen good conversions discarded because successful crosses could not be made in the first 10 or 20 tries. If the treated plant had been MIDed, a lot more persistence would have taken place, thus enlarging the possibility of ultimate success. **JUMBLE EDGE** was the result of over 300 crosses that netted only three pods. On the strength of microscopic identification, I was convinced of the parent **ZENAR**'s potential as a converted tet.

Adding MID to eyeballing and test crossing will reinforce your knowledge of where to concentrate your efforts. Becoming qualified and efficient at MID will save you time and increase your success rate.

It takes a microscope to do MID, but not necessarily an expensive one. A grade level normally used in high schools is more than adequate. You must have 10X and 43X power for checking both pollen and stomata guard cells. A measuring device (optic micrometer) installed in the eyepiece is beneficial. A good used microscope with above features should cost less than $150.00. (Note: Any measuring device should be calibrated to a standard by the user. I will supply anyone interested with a piece of wire of an exact diameter 412μ (microns) with instructions. (Include a self-addressed envelope with request.)

Determination of the conversion is by comparison. This can be done two ways: (1) by comparing to a standard created by the distribution charts in illustrations "A" and "B" or (2) by comparing the treated plant to an untreated plant. The treated plant should be about 40% larger on stomatas and pollen sizes.

Refer to illustration "A" for checking foliage stomata guard cells. Tet foliage will increase strongly your chances of tet pollen. However, even if the leaves check diploid, you still may have a ¾ conversion, which is usable. This rare conversion has occurred only once for me, in tet **GENTLE SHEPHERD**. Try to check all your treated plants before they bloom on mature leaves (after leaf #3).

Refer to illustration "B" for checking pollen. Collect pollen early to avoid contamination from other daylily flowers. It should be dry and fluffy when preparing the specimens.

Hybridizing with some conversions can be a snap while others may be next to impossible. MID should make the difficult ones a little easier to accomplish.

The next article will deal with the practice of "Safe Hybridizing." Ω