Activity-33: Venation

Introduction-what is venation:

Plants have a network of vessels through which water with dissolved food materials are transported to each and every cell of the plant. These vessels are called Xylem and Phloem.

If these vessels did not exist none of the organs will get food and the plant will die. Because water cannot reach the tip of a plant which could be couple of feet high just by diffusion or the air surrounding the plant does not have enough moisture which can be diffused in through the openings or pores (stomata) in the leaves.

Thus these vessels are indeed the backbone of a plant's life. So hence they should be protected from physical damage.

Hence these vessels are bundled together with other protective (strong) fibre-like cells (called Sclerenchyma) to form vascular bundles.

Since leaves are very thin, they are visible on their surface and are called as "veins."

Procedure:

To study venation and various types the strategy is:

1. Students should collect different types of leaves from their surroundings or even from their own kitchen (bay leaves), spinach (palak), Gongura, cabbage leaf, amaranth (thotakura) etc.
2. Wash the leaves for any debris and place them under a bright light source.
3. Try to observe the vein distribution pattern
4. Try to answer the following questions:

❖ Do all leaves have veins?

❖ How many midribs does the leaf have?

❖ Does the midrib end at the tip of the leaf?

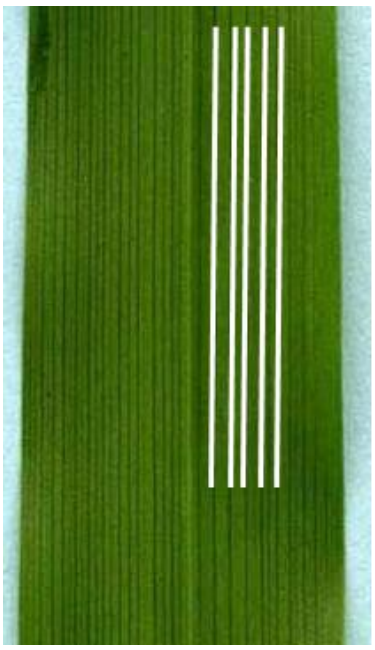
❖ If there is more than one midrib, do they connect with each other?

- ❖ Do all the midribs end at the tip of the leaf?
- ❖ How many branches are seen coming from the midrib? These are called primary branches.
- ❖ Do these primary branches further divide? If so, how many secondary branches are present for each primary branch?
- ❖ What is the distance any two branch points on the midrib?
- ❖ What is the distance between any two branch points on the secondary branches?
- ❖ Do these distances change? If so, how much?
- ❖ Do you think stem braches in the same on the plant as the midrib branches in a leaf?
- ❖ Do you see a different vein-network underneath the leaf?

Tasks:

- ➢ Take an OHP marker and try to draw a matrix on the leaf with a spacing of ½ cm. just like a graph paper. Try doing this on leaves which are relatively hard. Try to count the number of branch points in each ½ cm X ½ cm area. Now compare how this branch point differs across the surface of the leaf.
- ➢ Now repeat the above experiment on the leaves from two different plants from different areas but of the same kind. Do you see a difference? If so why?
- ➢ Go enquire your neighbours in the surroundings if they have a diseased plant in their home which is dying. If so, take leaf from it along with a leaf of a healthy plant of the same kind and try to find the number of branch points per unit area. Do you find a difference? If so, what caused the difference?

If possible try the experiment with a bamboo leaf or pumpkin leaf (fast growing plants) and a leaf from a tree.



5	5	9	5	1	25
9	7	5	5	4	30
7	4	2	6	4	23
5	8	5	6	4	28
7	5	9	4	6	31
33	29	30	26	19	137

137/25 = 5.48

~ 6 branch points per unit area

16 branch points on the mid rib