Difference Between Reticulate and Parallel Venation

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Key Difference - Reticulate vs Parallel Venation

Veins are visible traits present in the leaf that provide different characteristic features to the leaves. They provide mechanical support to the leaf. They involve in the transportation of water and food in and out of the leaf by xylem and phloem cells that are present in the leaf mesophyll respectively. This provides adequate water into the leaf and also translocates the produced food by photosynthesis into the rest of the plant body. According to the type of pattern they arrange, veins could be categorized into two types, reticulate venation, and parallel venation. **In parallel venation, the veins develop in parallel to each other from the petiole to the end of the leaf (the leaf tip) whereas, in reticulate venation, the veins form a net-like structure which is present on both sides of the midrib.** This is the **key difference** between reticulate venation and parallel venation.

What is Reticulate Venation?

Reticulate venation of leaves possesses a distinct primary vein which enters through the leaf petiole and runs through the center of the leaf. The primary vein or the midrib connects the leaf. The midrib possesses numerous branches which give rise to small secondary veins. These secondary veins extend from the midrib towards the margin of the leaf. The extension of these secondary veins terminates at a special structure present in the leaf margin. This is referred to as hydathodes. Hydathodes are modified pores and act as a secretory organ. The secondary veins also develop further branching patterns which give rise to the development of tertiary veins or third order veins. These branching patterns of tertiary veins develop a reticulate pattern in the leaf. Areoles are structures that present in the mesophyll between tertiary veins. Some veinlets present in this structure ends up at the areoles. This ending process of veinlets is known as areolation.

Figure 01: Reticulate Venation

The veins possess xylem cells and phloem cells. The xylem involves in the transportation of water into the leaf from the stalk and is distributed throughout the mesophyll of the leaf. The phloem translocates the produced food through photosynthesis from the leaf into different parts of the plant body. The vascular cells are embedded in the parenchyma and are surrounded by bundle sheath cells. Similar to parallel venation, in secondary venation, the type of vein endings varies. It either ends up at the leaf margin or tends to link up with the other veins present. Examples for reticulate venation are hibiscus and mango. Reticulate venation is the characteristic feature of dicot plants.

What is Parallel Venation?

Before approaching the term parallel venation, the terms primary veins and secondary veins are explained. The veins which enter the leaf through the petiole are called primary veins or first order veins. In botanical terms, the leaf petiole is a stalk that connects the leaf blade with the stem. The primary vein which enters further divides into branches which are referred to as secondary veins or second order veins. The primary vein has a higher diameter when compared with the secondary veins. Veins are composed of xylem and phloem cells. They are embedded within the parenchyma in sclerenchyma tissue which is surrounded by bundle sheath cells. They function in the transportation of substances. The xylem veins transport water and other minerals from the stalk throughout the leaf mesophyll whilst the phloem vein translocated the produced food through photosynthesis out of the leaf and provided it to the rest of the plant body.

In parallel venation, the primary veins are located parallel and at equal distance throughout the leaf and converge towards the apex of the leaf. The converging is often referred to as anastomosis; fusion towards the apex. Small minor veins associate the primary veins but have

the potential to terminate which end up with fine vein endings. In angiosperms the minor veins are prevalent. In the context of vein endings, the number is highly variable. This could be either secondary veins end up at the margin of the leaf or involves in the formation of links back to the other veins. The veins function as a network of distribution of various substances for the leaf and involve in providing mechanical support to the leaf.

Figure 02: Parallel Venation

Parallel venation present in most monocot plants always correlates with the shape of the leaf. They possess elongated leaves with a broadleaf base. The most prominent example that could be provided for parallel venation is a banana. Also, monocots such as maize, wheat, rice, grass, and sorghum demonstrate parallel venation.

What are the Similarities Between Reticulate and Parallel Venation?

- Both venations posses xylem and phloem cells.
- Both are involved in the transportation of water and food.
- Both venations provide mechanical support to the leaf.

What is the Difference Between Reticulate and Parallel Venation?

Reticulate Venation vs Parallel Venation	
In reticulate venation, the veins form a net-like structure which is present on both sides of the midrib.	In parallel venation, the veins develop in parallel to each other from the petiole to the leaf tip.
Type of plants	
Reticulate venation is the characteristic feature of dicot plants.	Parallel venation is the characteristic feature of monocot plants.
Examples	
Hibiscus and mango are some examples of the plants which show reticulate venation.	Maize, banana, and wheat are some examples of the plants which show parallel venation.

Summary - Reticulate vs Parallel Venation

Veins are important structures of the plant leaf. They involve in the transportation of food produced in the leaf by photosynthesis and transportation of water into the leaf. Veins provide mechanical strength to the leaf. According to the pattern of arrangement veins are of two types; parallel venation and reticulate venation. In reticulate venation, the veins form a net-like structure which is present on both sides along the midrib. In parallel venation, the veins develop in parallel to each other from the petiole to the leaf tip. In dicot plants, reticulate venation is a characteristic feature, and in monocot plants, it's the parallel venation that provides a characteristic feature. This can be highlighted as the difference between reticulate venation and parallel venation.

Reference:

1.Inamdar, J. A., et al. "Leaf Architecture of Some Monocotyledons with Reticulate Venation." Annals of Botany, vol. 52, no. 5, 1983, pp. 725–735., doi:10.1093/oxfordjournals.aob.a086631.
2.Sack, Lawren, and Christine Scoffoni. "Leaf venation: structure, function, development, evolution, ecology, and applications in the past, present and future." New Phytologist, vol. 198, no. 4, 2013, pp. 983–1000., doi:10.1111/nph.12253.

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