

very much decreased. This causes absorption of water from the xylem elements of the leaf, resulting in an increase in their turgor pressure. This succeeds in forcing some of the cell solution into the sieve tubes because of which the osmotic potential of the phloem decreases. On the other hand, in the cells of the root or the storage organs, the food is either consumed or is converted into insoluble forms resulting in increase in their osmotic potential and decrease in their turgor pressure. Under the conditions mentioned above, a turgor pressure gradient is established between the supply end in the leaf and the consumption end in the root and, therefore a mass flow of water (containing dissolved solutes) takes place in the phloem from the upper end to the lower end of the plant. At the consumption end, water diffuses out into the xylem elements of the root due to the lowering of the osmotic pressure. This water along with the absorbed water is translocated to the leaf through the xylem elements. A sort of cyclic circulatory system is formed. It should be noted that the movement of solutes is actually due to pressure gradient and not due to water potential gradient. Though the pressure flow hypothesis is a passive but there is role of energy in phloem loading and unloading.

