Phase Response Curve for the Ultradian Rhythm of the Lateral Leaflets of *Desmodium gyrans* Using DC Current Pulses

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In the present study the leaf movement rhythm was perturbed by the application of DC current pulses (15 μA, 10 seconds, voltage applied: 10 V) to the upper part of the pulvinus, passing through the pulvinus and its stalk. The pulses were applied at four different positions of the leaflets: when the leaves were at the lowermost position, when moving up, at the uppermost position and when moving down. The pre-perturbed and the post-perturbed rhythms were compared. We found that the rhythms were shifted in phase and the phase shifts observed at the four different positions of the leaflets were significantly different in magnitude as well as direction. Furthermore, we could also observe phase advances, which is in contrast to an earlier finding.

A phase response curve (PRC) was constructed to illustrate the sensitivity of the oscillating leaflet system to DC pulses. Substantial delays of about 50 s (as compared to the period of about 200 s) were obtained when pulses were administered at the lowermost position and when leaflet were moving upwards, while advances or no phase shifts were recorded in the uppermost position and when leaflet were moving down respectively.