

Bud Orientation in the Genus *Magnolia*

by DAVID P. EARNSHAW

In the spring of 1971, Dr. P. Allison, Pathologist of the Morris Arboretum, called to the attention of the writer a magnolia tree in which all the buds pointed in a common direction. Observation of numerous magnolia trees over the next two years led to the following conclusion: Only certain members of genus *Magnolia* act in this manner. Those that do, point approximately N 15 degrees E.

The pointing is not a motion of the bud on the pedicel, but a distortion of the bud axis.

The south side of the bud in the northern hemisphere gets more solar radiation than the north side. This causes a temperature difference between the two sides and the petal tissue grows thicker and heavier on the side toward the sun.

Bending of the bud axis will occur in members of the genus which have convolute petals. Because of the tight overlapping of the petals, the force from the strong tissue growth on the south side causes the axis of the bud to bend toward the north.

Buds Bend	No Bending
<i>M. soulangiana</i> 'Lennei'	<i>M. kobus</i>
<i>M. soulangiana</i> 'Alexandrina'	<i>M. cordata</i>
<i>M. soulangiana</i> 'Andre Leroy'	<i>M. tripetala</i>
<i>M. soulangiana</i> 'Brozzonii'	<i>M. X proctoriana</i>
<i>M. denudata</i>	<i>M. salicifolia</i>
<i>M. liliflora</i>	<i>M. fraseri</i>
<i>M. liliflora</i> nigra	<i>M. grandiflora</i>

This phenomenon can only be observed just before the bud comes into bloom, as measurements indicate that the bud length triples in the fourteen days before the petals open.

These conclusions were verified by negative results of tests for the effect of phototropism and magnetotropism. Tests using artificial illumination and complete shielding of southern light showed positive results. The tissue swelled on the side toward the energy source. Spectral absorption in selected bands due to various petal colors was not the cause of bending.

Tests were made of the energy absorption by implanting small thermistor beads in the bud tissue on the south and north side. Plotting the temperature variation throughout the daylight hours, fifteen degrees Fahrenheit temperature difference between the two sides was commonly observed. ***

Editors Note: We regret it was not possible to reproduce the slides Mr. Earnshaw provided for this article but they were appreciated anyway.