Root Modifications

Most dicots form a **tap root** system:

- radical persists: becomes main root with lateral branches.

Most monocots form a **fibrous root** system:

- radical dies: roots arise from stem tissue (adventitious).

Root modifications to know: **adventitious roots**, **storage tap root**, **storage tuberous roots**, **storage fleshy roots**, and **aerial roots**.
Tap roots (dicots) and fibrous roots which are formed adventitiously (monocots).
Adventitious roots of English ivy, climbing hydrangea, and philodendron (dicots).
Adventitious roots on a chrysanthemum cutting (dicot) and on lily bulbs (monocot).
Storage fleshy roots of daylily (*Hemerocallis*) – a monocot and still is a fibrous root system.
Aerial root on an epiphytic orchid (*Phalaenopsis*) – a monocot with a fibrous root system.
Storage tap roots of carrot, horseradish, and beet (dicots).
Storage tuberous roots of dahlia (dicot), yam, and of two sweet potato cultivars.

Modifications - Root

<table>
<thead>
<tr>
<th>Genus / species</th>
<th>True yam</th>
<th>Sweet potato</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dioscorea spp.</td>
<td></td>
<td>Ipomoea batatas cvs.</td>
</tr>
<tr>
<td>Class</td>
<td>monocot</td>
<td>dicot</td>
</tr>
<tr>
<td>Plant Type</td>
<td>vine</td>
<td>vine</td>
</tr>
<tr>
<td>Organ modification</td>
<td>tuberous roots</td>
<td>tuberous roots</td>
</tr>
</tbody>
</table>
Root nodules of alder (which contain *Frankia*) and clover (which contain *Rhizobium*). The bacteria inside can fix atmospheric nitrogen gas and convert it into a form the plant can use as a source of nitrogen (do NOT confuse with ETM – no fungus can do this!).

Modifications - Root