

OHIO PLANTS WITH CONTRACTILE ROOTS.

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One of the interesting phenomena to be observed in studying geophilous plants is the habit which some have of keeping certain parts of their body below the surface by means of contractile roots. This subject has received the attention of DeVries, Rimbach and others, whose papers should be consulted for a more complete presentation of the subject.

The burrowing habit may be of advantage in several ways. Many seedlings possess contractile roots, by means of which they reach a suitable depth of soil. In certain plants which produce stolons or runners, root contraction is also an important factor. When the stem touches the ground it strikes root and is soon pulled beneath the surface.

Rhizomes may develop horizontally, at right angles to the direction of gravity, without being influenced in a mechanical way. There are, however, many, like the long rhizomes of *Iris versicolor*, which are continually growing upward, but contractile roots developed on the under side continue to pull them down into a horizontal position. In such forms as *Trillium grandiflorum* the short rhizome is not only kept horizontal, but is buried deep in the earth by the strong contraction of the numerous long roots growing out of the under side.

There are rhizomes and bulbs which develop vertically, and would thus grow out of the ground. But as the stem elongates or dies away below, the newer part is pulled backward by a whorl of contractile roots which grow out on the young nodes near the upper end. Very striking examples of this type are *Botrychium obliquum* and *Spathyema foetida*.

In some plants there is a main tap-root which continues to contract for a long time, and thus keeps the growing points at or near the surface. This may occur in acaulescent herbs or in crownformers like *Aquilegia canadensis* and *Taenidia integerrima*.

The following plants have prominent root contraction :

<i>Botrychium obliquum.</i>	<i>Trillium undulatum.</i>
<i>Botrychium dissectum.</i>	<i>Hypoxis hirsuta.</i>
<i>Arisaema triphyllum.</i>	<i>Iris versicolor.</i>
<i>Arisaema dracontium.</i>	<i>Iris hexagona.</i>
<i>Spathyema foetida.</i>	<i>Allionia nyctaginea.</i>
<i>Zygadenus elegans.</i>	<i>Aquilegia canadensis.</i>
<i>Veratrum woodii.</i>	<i>Aquilegia vulgaris.</i>
<i>Hemerocallis fulva.</i>	<i>Gentiana andrewsii.</i>
<i>Trillium sessile.</i>	<i>Plantago major.</i>
<i>Trillium recurvatum.</i>	<i>Taenidia integerrima.</i>
<i>Trillium nivale.</i>	<i>Lacinaria squarrosa.</i>
<i>Trillium grandiflorum.</i>	<i>Mesadenia tuberosa.</i>
<i>Trillium erectum.</i>	<i>Taraxacum taraxacum.</i>
<i>Trillium cernuum.</i>	<i>Taraxacum erythrospermum.</i>