

BOTANY

Aldrovanda, The Waterwheel Plant

By Adam Cross. 2012. Redfern Natural History Productions, 61 Lake Drive, Hamworthy, Poole, Dorset, England, UK, BH15 4LR. 249 pages, 61.08 USD, Cloth.

This is the first comprehensive monograph of the Waterwheel Plant. It shows a small, submerged, carnivorous plant which is rarely seen due to its specialized habitat and also because it is on the verge of extinction. Adam Cross, who was still in PhD studies at the time of writing, shows not only the uniqueness of a rare plant in his monograph, but also the ecology of wetlands which are rapidly changing and the limited abilities of rare plants to keep up with that process of change.

He begins with the work of Charles Darwin, who studied this plant from his lab in England in the mid eighteenth century though the plant is not a native English species. Darwin liked to study carnivorous plants

and so gave some of the first descriptions of the Waterwheel Plant's ability to grab mosquito larvae and consume it to supplement its restricted photosynthetic abilities. From the 19th century to modern research, Cross follows the progression of science and brings us to biochemical and physiological mechanisms which govern its carnivorous actions of grabbing prey, choosing prey and biogeography.

Biogeography then becomes the main focus, listing *Aldrovanda's* particular chemical needs, its *niche* requirements and its dispersal patterns, mostly by avian migrants. A detailed list of sites from world herbaria follows the collection record of the species through Europe, Asia, Africa and Australia over the past two

centuries. North and South America have never had naturally occurring populations. The next chapter explains its genetic diversity or lack thereof using current studies of protein chemical differences as well as the makeup of chloroplastic and mitochondrial DNA. His thesis focuses on the increasing lack of diversity due to diminishing samples and the vectors necessary to disperse the remaining populations throughout the world.

The last part of the book is dedicated to cultivation of *Aldrovanda* in tanks, labs, and greenhouses. Previous conservation and management initiatives have been only incidentally successful and changes in drainage patterns in the lands where the species has occurred naturally have resulted in its disappearance from a local lake, or a geographic area and in some cases like Japan, an entire country where it was once collected frequently. New introduction techniques are described but most-

ly the time-proven conservation strategies are regarded as being the most successful in sustaining local or world populations.

For a floating, submerged plant which is only 1.5-3 cm across and 10-20 cm long with the ability to consume small insect larvae by snapping its leaves shut on the victim, and occasionally but not often flowering and setting seed, this is a remarkable plant. Plants under our feet, floating in muddy parts of the swamp where no one except botanists care to tread continue to fascinate us and bring us exciting examples of the biodiversity around us. The Waterwheel Plant is a fascinating study combining older research techniques with modern biochemical revelations and is a detailed but fascinating read for any botanist.

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