

***Marsilea* – The Fast Fern**

Leland G. Johnson

*Biology Department, Augustana College
Sioux Falls, South Dakota 57197*

The aquatic fern, *Marsilea* (sometimes called “water clover”), is a useful teaching organism because of the speed with which gametophyte development proceeds.

Development is initiated by hydration of the contents of the sporocarp, which consists of a hard capsule enclosing numerous megaspores and microspores. When the capsule is cut open and placed in a fern culture medium, clean pond water, or even bottled spring water, a gelatinous ring swells within a few minutes and carries the spores out of the sporocarp. Archegonium and antheridium development occurs quickly. At room temperature, sperm release occurs 6–8 hours after hydration, or in as little as 5 hours at 30°C. Though the period of active sperm swimming is relatively brief, students often succeed in observing swimming sperm in sample drops taken from the culture.

Development of the sporeling (young sporophyte generation plant) is also quite rapid. Within 48 hours the embryo, which is faintly visible inside the gametophyte, has leaf and root primordia. By 4 days, a small green-sheathed leaf and a primary root emerge from the gametophyte. The sporeling can be cultured for further observation.

Several major biological supply companies offer *Marsilea* sporocarps and include informative instruction bulletins with shipped orders. Though *Marsilea* sporocarps are relatively expensive, *Marsilea* gametophyte development can be a very informative and interesting addition to labs in general biology, developmental biology, or any of several plant biology courses.