

# **ARCHEGONIATE**

## **Lecture 10**

***Dr/ Haida Zaki***

***Faculty of Science***

***South Valley University***

# *Adiantum*

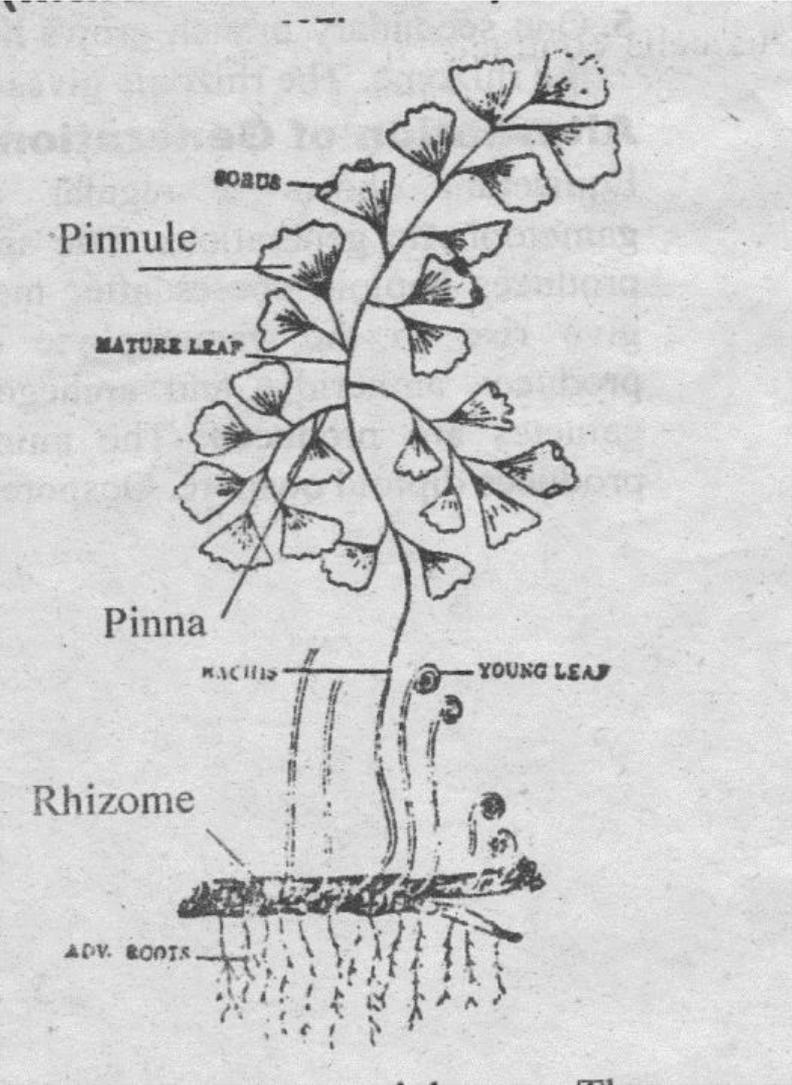


Body of *Adiantum* can be divided into root, stem and leaves.

**Stem (Rhizome):** The stem of *Adiantum* is underground, so it is called as rhizome. It does not grow deep inside the soil. Its rhizome grows horizontally near the soil surface. Scales, called palea covered the surface of rhizome.

**Leaves:** Leaves of *Adiantum* are called fronds. These leaves are large, about 4-6 inches in length and are bipinnately compound. Leaflets of first order are called pinnae and leaflets of second order are called pinnules. Main axis of leaf on which leaflets are produced is rachis. Rachis is of black color and shiny. Due to this characteristics color and shine of rachis, *Adiantum* is also known as Maiden hair fern.

**Roots** are produced from under side of rhizome. These are adventitious roots.









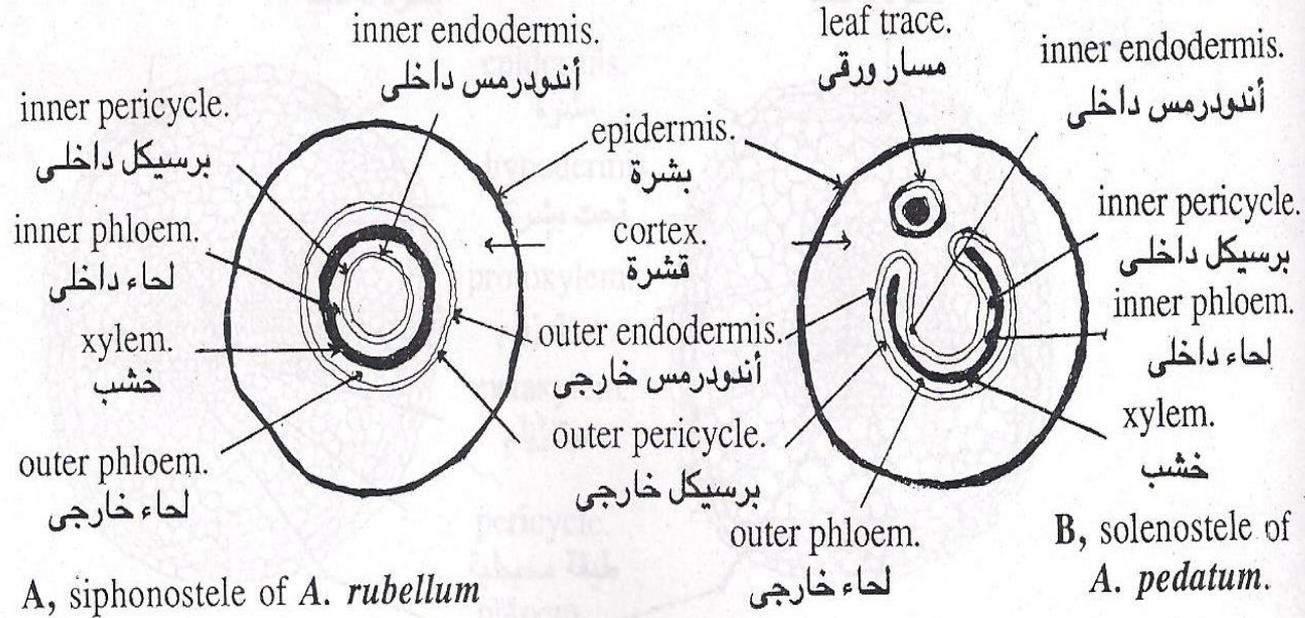


Fig. 27.2, *Adiantum* sp. T.S. of rhizome.

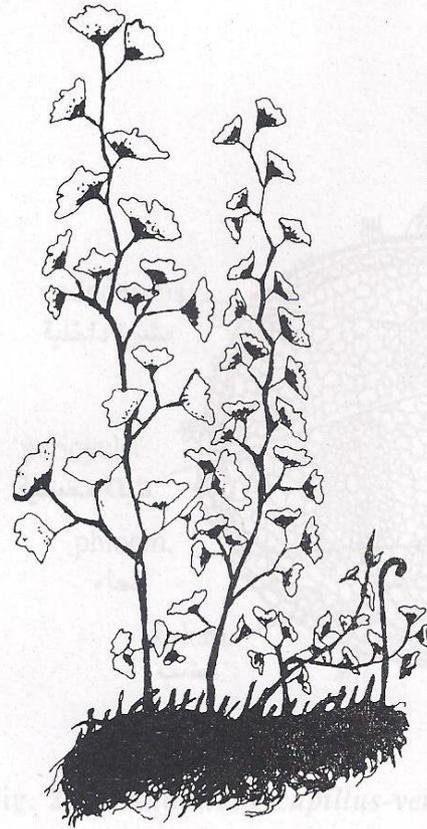
شكل (٢٧-٢) قطاع مستعرض في ريزوم . نوعان من كزبرة البئر

## **Reproduction of *Adiantum* (Life Cycle)**

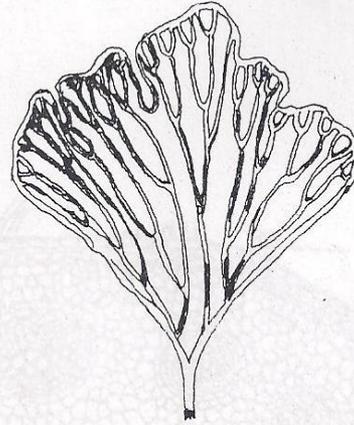
Life cycle of *Adiantum* contains two generations i.e. sporophyte and gametophyte. Both of these generations are independent.

### **Sporophyte generation:**

Sporophyte of *Adiantum* produces vegetative leaves at start. At later stages, fertile leaves also start producing along with vegetative leaves. Fertile leaves produce sori on their underside. Sori are group of sporangia. These sori are covered with a flap of tissue called false indusium.



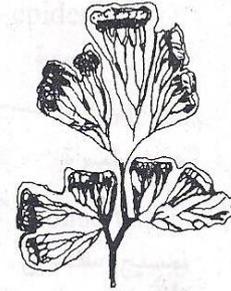
A, complete plant.  
نبات كامل



B, pinnule.  
رويشة



C, sterile pinnules.  
رويشات عقيمة

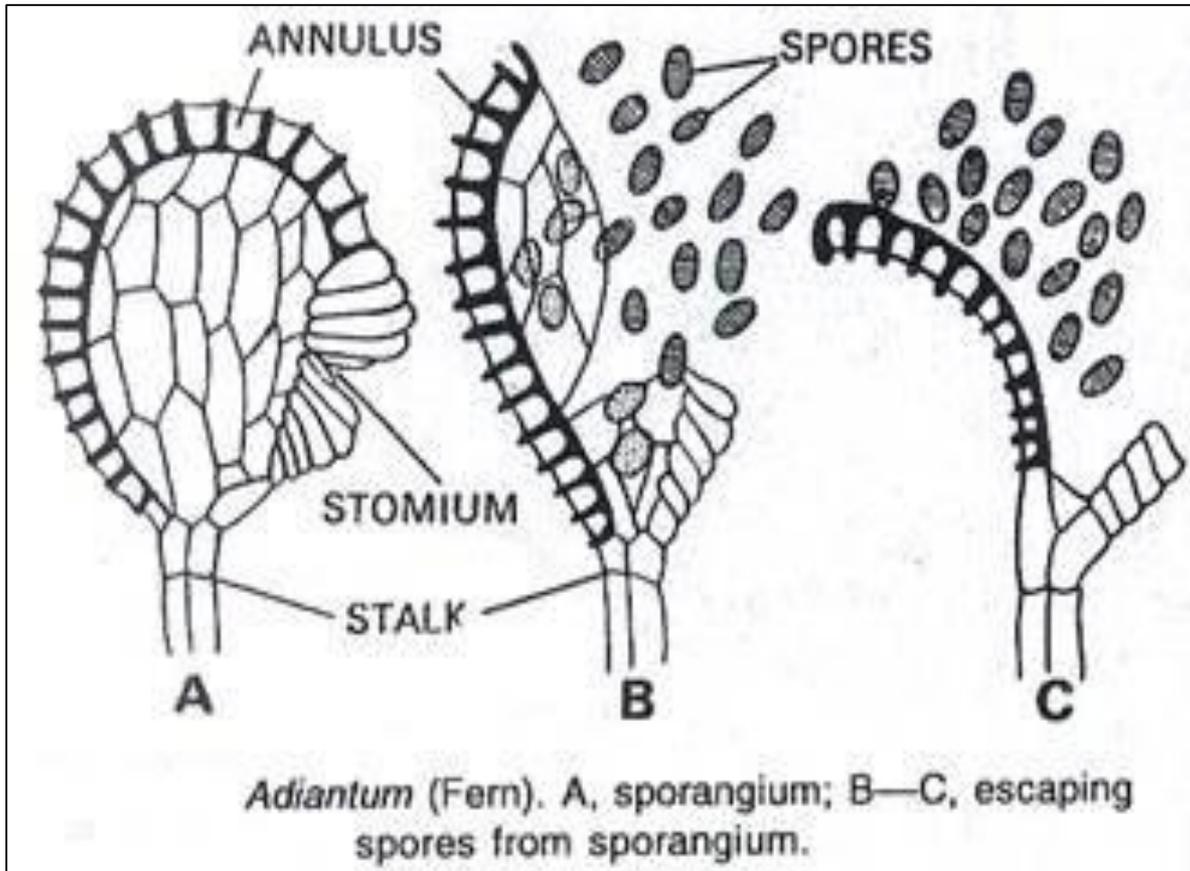


D, fertile pinnules.  
رويشات خصبة

Fig. 27.1, *Adiantum* sp.

## Sporangium:

A mature sporangium is flattened, spherical or ellipsoidal. It consists of a stalk and upper swollen portion called capsule. Capsule is covered with single layered wall. Wall consists of two portions **Annulus** and **Stomium**. Annulus portion contains cells with thick radial and inner tangential cell walls. Stomium consists of cell with thin cell walls. This is the site for bursting of sporangia. Inside sporangia, spores are produced by meiosis of spore mother cells. Many spores are produced inside sporangia. Spore wall contains two layers **exine** and **intine**.



When spores get mature, the wall of sporangia burst. Sporangium becomes dry, so the cells of annulus region contracts which exerts pressure on stomium cells. Stomium is weak region of wall of sporangia, so sporangia get burst from this region. Bursting of sporangia caused the dispersal of spores. After falling on suitable place, spore germinates. During germination, exine of spore bursts and intine elongate into a tube like structure. The apical portion of tube gives rise to new generation of *Adiantum* the gametophyte generation.

### Gametophyte of *Adiantum*:

Gametophyte of *Adiantum* has heart like shape. It has a notch, where growing point reside. Gametophyte of *Adiantum* is many cells thick from center and only one cell thick at margins. Rhizoids are produce from underside of Gametophyte for anchorage and absorption of water and nutrients. Gametophyte contains chloroplast, so carried out photosynthesis. Gametophyte is independent. Two kinds of organs antheridia and archegonia are produce on gametophyte (monoecious). Archegonia is flask shaped structure with two portions i.e. venter and neck. Venter contains egg while neck contains neck canal cells. Antheridia are globose structures, in which many antherozoids are produced. Antherozoids when get mature has two flagella for movement in water.

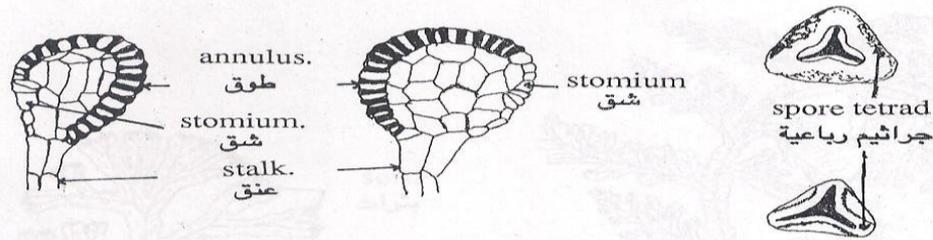


Fig. 27.5, *Adiantum* sp. sporangia and spores.  
 شكل (٢٧-٥) كزبرة البئر . حافظة جرثومية وجراثيم

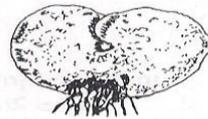
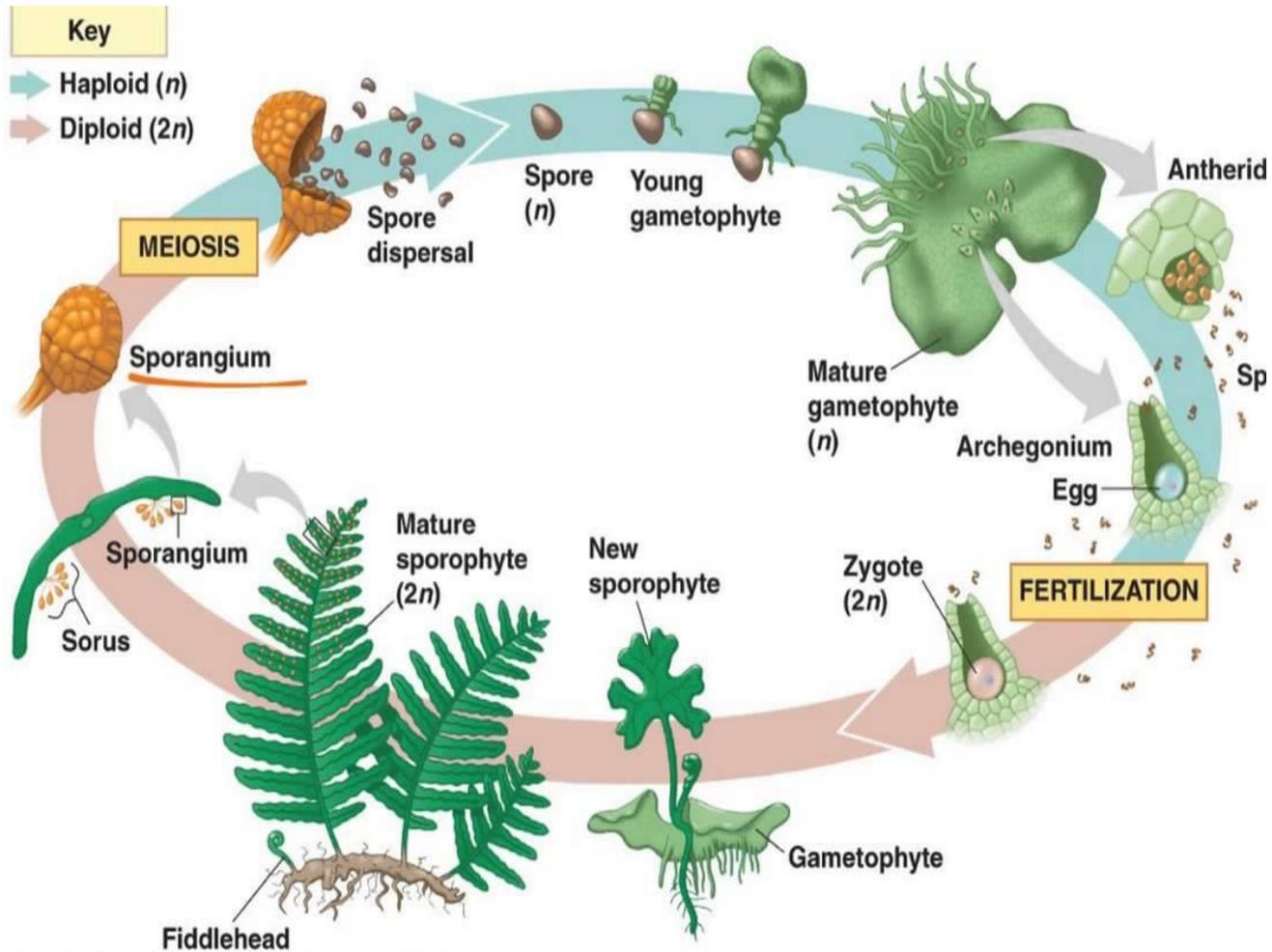


Fig. 27.6, *Adiantum* sp. mature prothallus.  
 شكل (٢٧-٦) كزبرة البئر . الثالوس الأول الناضج



Fig. 27.7, *Adiantum* sp. an antheridium.  
 شكل (٢٧-٧) كزبرة البئر . أنثريدة



*THE END*

