

Topic: Polygonaceae; Diagnostic features &  
Economic Importance  
B.Sc. Botany Sub. II  
Group: A

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# Polygonaceae

## **Systematic Position**

**Class – Magnoliopsida (Dicotyledons)**

**Sub-class – Caryophyllidae**

**Order – Polygonales**

**Family – Polygonaceae (Buckwheat family)**

## **Distinguishing Characters**

Mostly herb, climbing, leaves stipulate ochrea intrapetiolar, sheathing, swollen nodes; racemose, flowers small, crowded, di-trimerous, hypogynous, hermaphrodite, polyphyllous in two whorls; stamens 6 (3 + 3) or more; carpels (3), 1-loculed, single basal ovule; fruit a nut, enclosed by persistent membranous perianth.

## **Distribution of Polygonaceae**

It is commonly called buck-wheat or knot-wheat or smartweed family. The family contains about 32 genera and 800 species (Rendle), mostly distributed in temperate countries. In India it is represented about 10 genera and 100 species.

### **A. Vegetable characters:**

#### **Habit**

Mostly herbs e.g. *Polygonum plebejum*, annual or perennial rarely shrubs (*Polygonum hydropiper*) or small trees (*Coccoloba uvifera*); tendrills – climber (*Antigonum* spp.). Acidic properties due to presence of various oxalates.

#### **Root**

Tap, branched.

## **Stem**

Generally herbaceous with swollen nodes surrounded by a stipular sheath; sometimes bent like a knee i.e., geniculate; phylloclades in *Muehlenbeckia*.

## **Leaves**

Simple, alternate, sometimes sparse, entire, lobed leaves occur in *Rumex acetosella*; leaves usually sour in taste due to the presence of calcium oxalate crystals in the cells.

## **B. Floral characters:**

### **Inflorescence**

Variable compound, the general plan usually is racemose but may also be a spike or a panicle; the individual bunches may be built on cymose pattern.

*Erigonum*, which is non-ochreate, has its flowers in cymose umbels or heads.

## Flower

Small, open, crowded on the inflorescence; parts arranged in 4 or 5 whorls; trimerous, rarely dimerous as in *Oxyria digyna*; bisexual, rarely unisexual than monoecious or dioecious; cyclic or acyclic, actinomorphic, hypogynous; honey secreted in large amount.

## Perianth

Tepals 3 to 6 in two indistinguishable whorls (= homochlamydeous). According to Laubengayer (1937) the trimerous whorled plan is fundamental, the apparent spiral plan is fundamentally whorled as can be seen anatomically; when 5 tepals are present, the fusion of one of the outer tepals with one inner has occurred; tepals usually pink, green or white and often persistent.

## **Androecium**

Stamens 6 to 9, in two whorls, the six outer ones often introrse, the three inner extrorse (*Polygonum fagopyrum*), A4 in *Polygonum diospyrifolium*; A 4+2 in *Oxyria*; filaments free or slightly adnate with tepals at the base; anthers 2-celled, longitudinal dehiscence.

## **Gynoecium**

Generally tricarpeal, rarely bicarpeal (*Oxyria* and some species of *Polygonum*), syncarpous, unilocular, superior; ovule one, orthotropous, basal placentation, style 1, stigmas 2-4. The ovary is subtended by a nectariferous disc which may be lobed with as many as 8 lobes.

## **Fruit**

A dry nut with a single seed, it may be three-sided or biconvex, laterally

winged, or an achene with wings. The wings may be furnished in bristles or hooks.

### **Seed**

With embryo excentric or lateral, curved or straight; the endosperm mealy and copious.

### **Pollination**

Flowers made conspicuous by crowding and nectar secreted by the disc aid in cross pollination mostly by insects (Polygonum), anemophilous in Rumex, when cross pollination fails self pollination may take place.

### **Important species:**

i. *Polygonum plebejum*

ii. *Polygonum chinensis*

iii. *Polygonum capitatum*

iv. *Rumex nepalensis*

## Economic Importance

### Food:

*Coccoloba uvifera* supplies edible fruits as well as gum kinos. The starchy seeds of *Fagopyrum esculentum*, called 'buckwheat', form an article of diet. The young shoots of *Rumex conglomerate*, *R. crispus*, *R. obtusifolia* and *R. vesicarius* are used as edible greens. The leaves of *R. hastatus* are used as condiment.

### Medicinal:

*Rheum emodi* is of medicinal value. The root-stock of *R. officinale* (China) and *R. palmatum* (Turkey) is the source of 'drug rhubarb'.

### Dye:

*Polygonum tinctorium* and *Rumex dentatus* yield dye.

### Ornamentals:

*Antigonum leptopus*, *Coccoloba uvifera* and *Polygonum aubertii*.