

# Family Brassicaceae

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▶ **The Brassicaceae family is commonly known as the Mustard family or Cruciferae family.**

▶ It is a large family which comprises about 365 genera and 3250 species.

It includes economically important plants used as vegetables, medicines, oil-yielding seeds, and ornamental purposes.



# Identification Characteristics

1. Herbaceous plant with pungent sap having sulfur-containing glucosides.
2. Leaves are covered with fine hairs called trichomes.
3. Flowers ebracteate, bimerous or tetramerous, bisexual, actinomorphic, and hypogynous
4. Calyx contains four sepals, polysepalous arranged in two whorls.
5. Corolla cruciform, contains four petals, polypetalous
6. Stamens tetradynamous, six in number, polyandrous
7. Stamens are associated with green nectaries
8. Carpels are two in number (Bicarpellary), syncarpous, ovary superior, and parietal placentation.
9. Fruits siliqua or silicula
10. Seed non-endospermic with the curved embryo.

# Distribution

- The plants of the Brassicaceae family have a global distribution.
- These plants can be found in diverse climates; primarily, most of them are found in temperate regions of the northern hemisphere.
- Many plants are cultivated for different purposes. Some species are grown for their edible parts as vegetables (Cabbage, radish, cauliflower, etc.) and other as oil yielding seeds (mustard). Additionally, certain plants are grown for ornamental purposes.

# Habit and Habitat

- The plants are mostly herbs which may be annual, biennial, or perennial, rarely undershrubs (e.g., *Farsetia*)
- Most plants in this family are adapted to terrestrial habitats, while some are aquatic (e.g., *Nasturtium officinale*)
- The plants are often characterized by their hairy appearance
- Many Brassicaceae herbs possess a pungent smell of sulfur (sulfur-containing glucosides).

# Vegetative Characteristics

- **Root - tap root system.**

In some species within this family, the tap root undergoes modification to store food and assumed different shapes. Two common modified tap root forms found in this family are **fusiform** (*radish*), **napiform** (*turnip*), etc.

- **Stem - erect, herbaceous, rarely woody,** typically **solid** and **cylindrical, branched** or **unbranched** depending on the species, most of the plants are **hairy** in which the stem are covered with fine hairs known as trichomes.
- **Leaf:** Radical ( in radish), cauline and ramal, simple , alternate, margin smooth, serrated or lobed, exstipulate, usually lyrate.

# Floral Characters

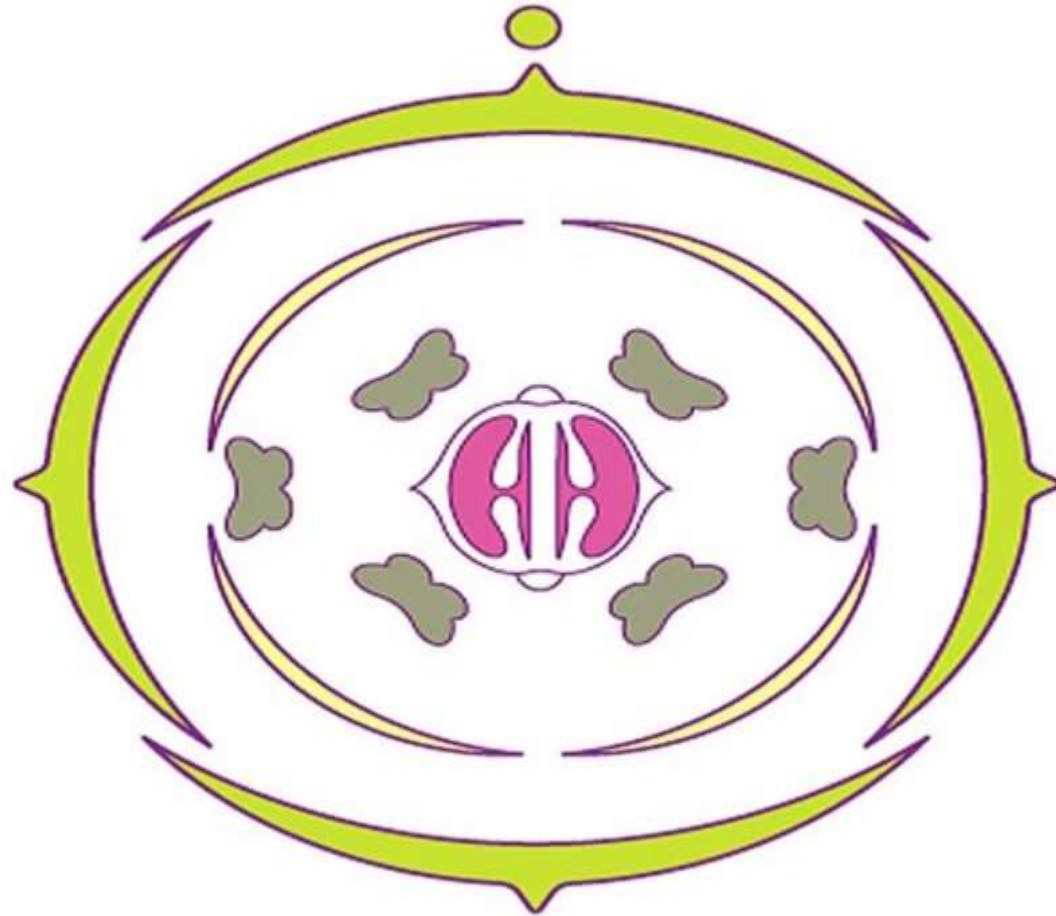
- **Inflorescence** - Racemose type
- **Flower** - Ebracteate, pedicellate, bisexual, complete, actinomorphic, rarely zygomorphic, tetramerous or bimerous, hypogynous, cyclic
- **Calyx**: 4 sepals, polysepalous, arranged in two whorls of two each, imbricate aestivation. Sepals may be caduceous, green or petaloid, inferior
- **Corolla**: 4 petals, polypetalous, cruciform

- **Androecium** - 6 stamens, polyandrous, stamens tetradynamous, arranged in two whorls, outer two stamen short while inner four stamen long, stamens having slender filaments that support the anthers at the top, the anther contain the pollen sacs where the pollen grains are produced
- **Gynoecium** - bicarpellary (two carpels), syncarpous, ovary superior, style short, stigma capitate, simple or bilobed, tricarpellary i.e. three carpels (*Lipidium*), tetracarpellary i.e. four carpels (*Tetrapoma*)



- **Fruits** - Siliqua (elongated, narrow fruits with a long and slender shape) or silicula (elongated, narrow fruits with a short and broader shape)
- **Pollination** - cross-pollination, entomophilous, sometime self-pollination (arrangement of stamens and pistils within a flower promotes self-pollination).
- **Seed** - small, round to oval or elongated, non-endospermic with large curved embryo, cotyledons are oily

## *Brassica campestris* Floral Diagram



Ebr.  $\oplus$   $\begin{matrix} \text{♂} \\ \text{♀} \end{matrix}$   $K_{2+2}$   $C_4$   $A_{2+4}$   $G_{(2)}$

# Some common Plants of Brassicaceae Family

1. Mustard - *Brassica campestris*
2. Radish - *Raphanus sativus*
3. Cauliflower - *Brassica oleracea var botrytis*
4. Cabbage - *Brassica oleracea var capitata*
5. Turnip - *Brassica rapa*
6. Candytuft - *Iberis amara*
7. Black mustard - *Brassica nigra*
8. Shepherd's purse - *Capsella bursa-pastoris*
9. Garden cress - *Lepidium sativum*
10. Knol (Ganth-gobi) - *Brassica oleracea var. gongylodes*



*Brassica compestris*



*Iberis amara* (Candytuft)





*Raphanus sativus* (Radish)



*Brassica nigra* (Black mustard)





Cabbage - *Brassica oleracea* var *capitata*



Cauliflower - *Brassica oleracea* var *botrytis*



Knol (Ganth-gobi) - *Brassica oleracea* var. *gongylodes*



*Brassica oleracea* var. *italica*  
Broccoli



Shepherd's purse - *Capsella bursa-pastoris*

# Floral Characters of *Brassica campestris*

*Brassica campestris*, also known as Indian mustard or brown mustard, is an annual plant belonging to the Brassicaceae family.

Key floral characters are:

**Inflorescence:** Racemose, specifically a bracted raceme or corimb.

**Flower:** Small, yellow, actinomorphic (radially symmetrical), and bisexual.

**Calyx :** Sepals: 4, in two pairs, with the outer pair being smaller.

**Corolla :** Petals: 4, cruciform (cross-shaped), clawed, and yellow.

**Androecium:** Consisting of 6 tetradynamous stamens (4 long and 2 short).

**Gynoecium:** Consisting of a superior, bicarpellary, and syncarpous ovary with a short style and a capitate stigma.



# Economic Importance of Brassicaceae Family

- 1. Vegetables** - Plants such as *Raphanus sativus*, *Brassica rapa*, *Brassica juncea*, *Lepidium sativum*, etc. are used for vegetables.
- 2. Oils** - Seeds of *Brassica campestris* (mustard), *Brassica juncea* (Rai), *Brassica nigra* (black mustard), *Brassica alba* (white mustard) are used for extraction of oil which is used for cooking, burning, etc.
- 3. Cattle feed and manure** - The remains of seeds after extracting oil can be used as cattle feed and manure.
- 4. Fodder** - The leaves and other parts of the species are used as fodder.

- 1. Condiments** - The seeds of *Brassica nigra*, *Brassica alba* and *Brassica juncea* are used as condiments.
- 2. Medicines:** Seeds of *Iberis amara* and *Chieranthus cheri* are used in treatment of asthma and bronchitis. The seeds of *Mathiola incana* has anti-inflammatory and antimicrobial properties. The root of *Lepidium sativum* are effective against syphilis.
- 3. Weeds** - *Capsella bursa-pastoris*, *Farsetia spp*, etc. are common weeds of medicinal value.
- 4. Ornamental purpose** -  
*Iberis amara* (candytuft), *Lunaria* (honesty) and *Chieranthus cheri* (wall flower) are used as ornamental purpose and are grown in gardens.



Thank You

