FAMILIES OF FLOWERING PLANTS

Floral formula

Position, number, structures, cohesion, adhesion of different parts of flower are represented as a formula through specific signs. It is called floral formula.

(i) Bracts (Br)

Br	Bracteate
Ebr	Ebracteate

(ii) Bracteoles (Brl)

Brl	Bracteolate
Ebrl	Ebracteolate

(iii) Symmetry of the flower

⊕	Actinomorphic
Φ or %	Zygomorphic

(iv) Sex

♂	Staminate (male)
♀	Pistillate (female)
⚥	Hermaphrodite

(v) Calyx (K)

K_5	5 sepals, polysepalous
$K_{(5)}$	5 sepals, gamosepalous
K_{2+2}	4 sepals in 2 whorls of 2 each

(vi) Corolla (C)

C_5	5 petals, polypetalous
$C_{(5)}$	5 petals, gamopetalous
C_{2+2}	4 petals in 2 whorls of 2 each

(vii) Perianth (P)

P_6	6 tepals, polytepalous
$P_{(3+3)}$	6 tepals, in 2 whorls of 3 each, gamotepalous
P_{3+3}	6 tepals, in 2 whorls of 3 each

(viii) Androecium (A)

A_6	6 stamens, polyandrous
A_{2+4}	6 stamens in 2 short and 4 long
A_0	stamens absent
A_α	stamens indefinite
$A_{(\alpha)}$	monoadelphous
$A_{1+(9)}$	diadelphous
$A_{(5)}$	5 stamens, syngenesious / synandrous
$\widehat{CA}$	epipetalous
$\widehat{PA}$	epiphyllous

(ix) Gynoecium

G_0	Gynoecium absent
G_2	2 carpels, apocarpous
$G_{(2)}$	2 carpels, syncarpous
$\underline{G}_{(2)}$	bicarpellary, syncarpous, superior
$G_{(2)}$–	bicarpellary, syncarpous, semi-inferior
$\overline{G}_{(2)}$	bicarpellary, syncarpous, inferior.

Test your Resonance with concept

1. Floral formula represents

(1) Position of flower (2) Symmetry of a flower

(3) Functions of a flower (4) Diagrammatic notation of floral characters

2. Epiphyllous condition is indicated by-

(1) $\overset{\frown}{C\ A}$ (2) $\overset{\frown}{A\ G}$ (3) $\overset{\frown}{K\ C}$ (4) $\overset{\frown}{P\ A}$

Answers

1. (4) **2.** (4)

1. FAMILY - LEGUMINOSAE

Classification:

Kingdom	**–**	**Plantae**
Division	**–**	**Angiospermae**
Class	**–**	**Dicotyledonae**
Sub - class	**–**	**Polypetalae**
Order	**–**	**Rosales**
Family	**–**	**Leguminosae**

- It is also called Legume family this is the second largest family of Dicots. **Leguminosae is divided into three sub-families on the basis of variations in corolla, Androecium and other parts**. These sub families are as follows.

(I) Papilionatae **(II) Caesalpinoideae** **(III) Mimosoideae**

PAPILIONATAE (FABACEAE)

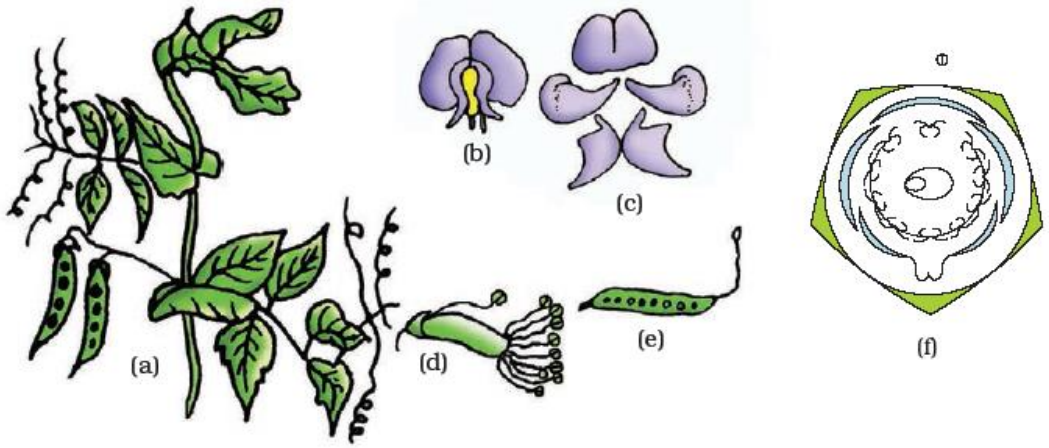


Figure: *Pisum sativum* (pea) plant: (a) Flowering twig (b) Flower (c) Petals (d) Reproductive parts (e) L.S.carpel (f) Floral diagram

Distribution:

It includes about **400 genera and 12000 species, cosmopolitan distribution**.

Habit:

Usually Annual or perennial herbs, shrubs, some are **Tendril climbers like *Pisum sativum*, *Lathyrus odoratus*,** some are **Twiners like *Clitoria*** and some are **trees like *Dalbergia sissoo***.

Roots:

Tap root system, Many plants have nodules on secondary roots. **Nitrogen fixing bacteria-*Rhizobium* lie in the root nodules in the symbiotic form**.

Stem :

Erect, Herbaceous or woody, cylindrical, branched, solid, some are **twiners like *Dolichos lablab***.

Leaf :

Stipulate, Alternate, Unipinnately compound and imparipinnate, **Pulvinous leaf base**, ReticulateVenation. **In *Pisum sativum* and *Lathyrus odoratus*, upper leaflets are modified into tendrils.**

Inflorescence : Usually Raceme or Solitary axillary, **e.g. *Lathyrus aphaca*.**

Flower :
Bracteate, bracteolate, Pedicellate, bisexual, Zygomorphic, Pentamerous.

Calyx :
5, Gamosepalous, Valvate or imbricate aestivation, odd sepal anterior.

Corolla :
5, Polypetalous, **Descending imbricate or vexillary aestivation** in which the posterior large bilobed petal called **vexillum or standard** overlaps the two smaller lateral petals named **wings or alae**. The latter overlaps the two small anterior petals which are fused lightly by the upper anterior margins called **keel or carina**. This type of corolla is also called **Papilionaceous corolla**.

Androecium :
10 stamens, **Diadelphous - $A_{(9)+1}$** in which filaments of 9 stamens are fused while one stamen is free, Anther dithecous, Dorsifixed, Inserted.

Gynoecium :
Monocarpellary, Unilocular with many ovules, superior ovary, **Marginal Placentation**, style one.

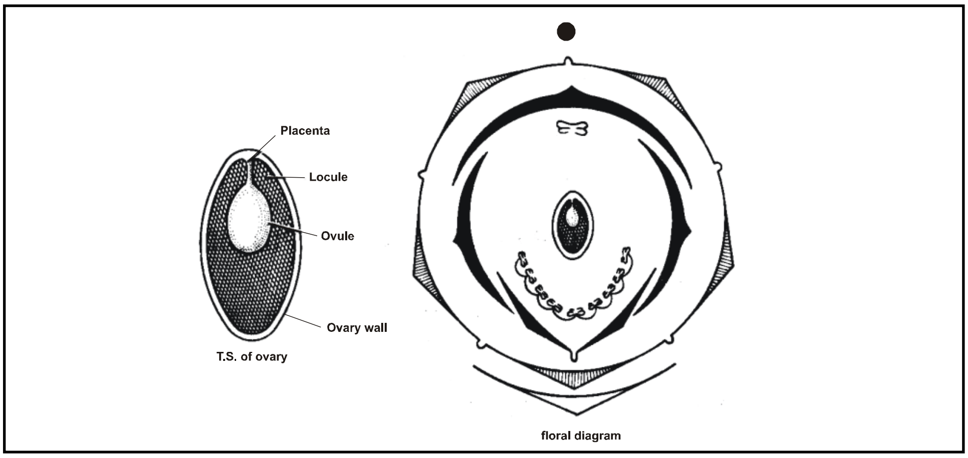
Fruit :
Legume or pod which is single, dry, dehiscent fruit.
Exception : Lomentum in *Arachis*

Seed : Non-endospermic, one to many.

Pollination :
Entomophilly but self pollination occurs in ***Pisum sativum***.

Floral formula : Br. $\% \, ⚥ \, K_{(5)} \, C_{1+2+(2)} \, A_{(9)+1} \, \underline{G}_1$

Floral diagram :



Economic Importance:

Many plants belonging to the family are sources of pulses **(gram*, arhar, sem, moong*, soyabean)**; edible oil (**soyabean, groundnut**); dye (**Indigofera**); fibres (**sunhemp**); fodder ***(Sesbania, Trifolium),*** ornamentals (**lupin, sweet pea**); medicine (***muliathi***).