2- Rice *Oryza sativa* L.

Prepared

By

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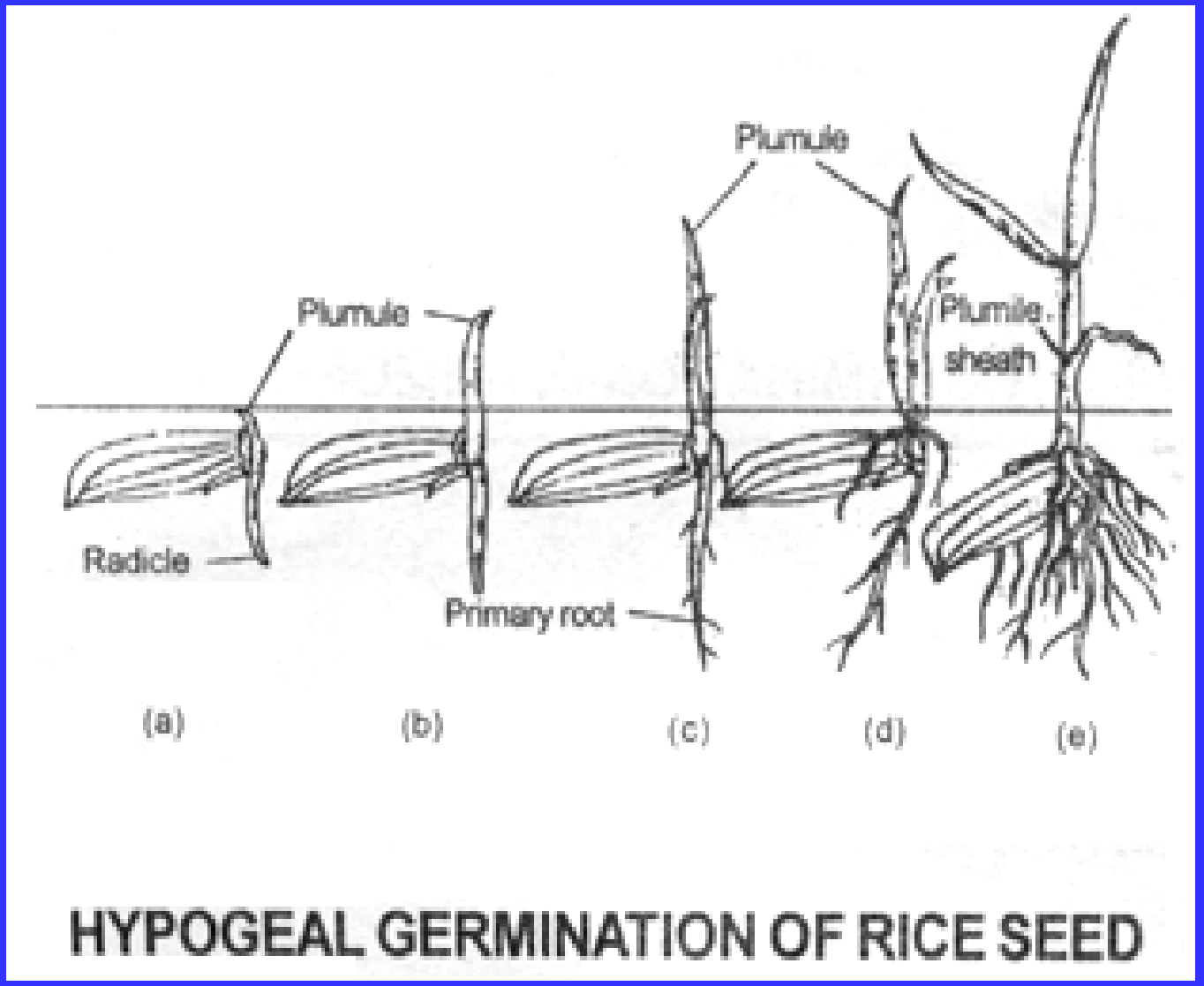
3-Rice: *Oryza sativa* L.
Fam.: Gramineae (poaceae)

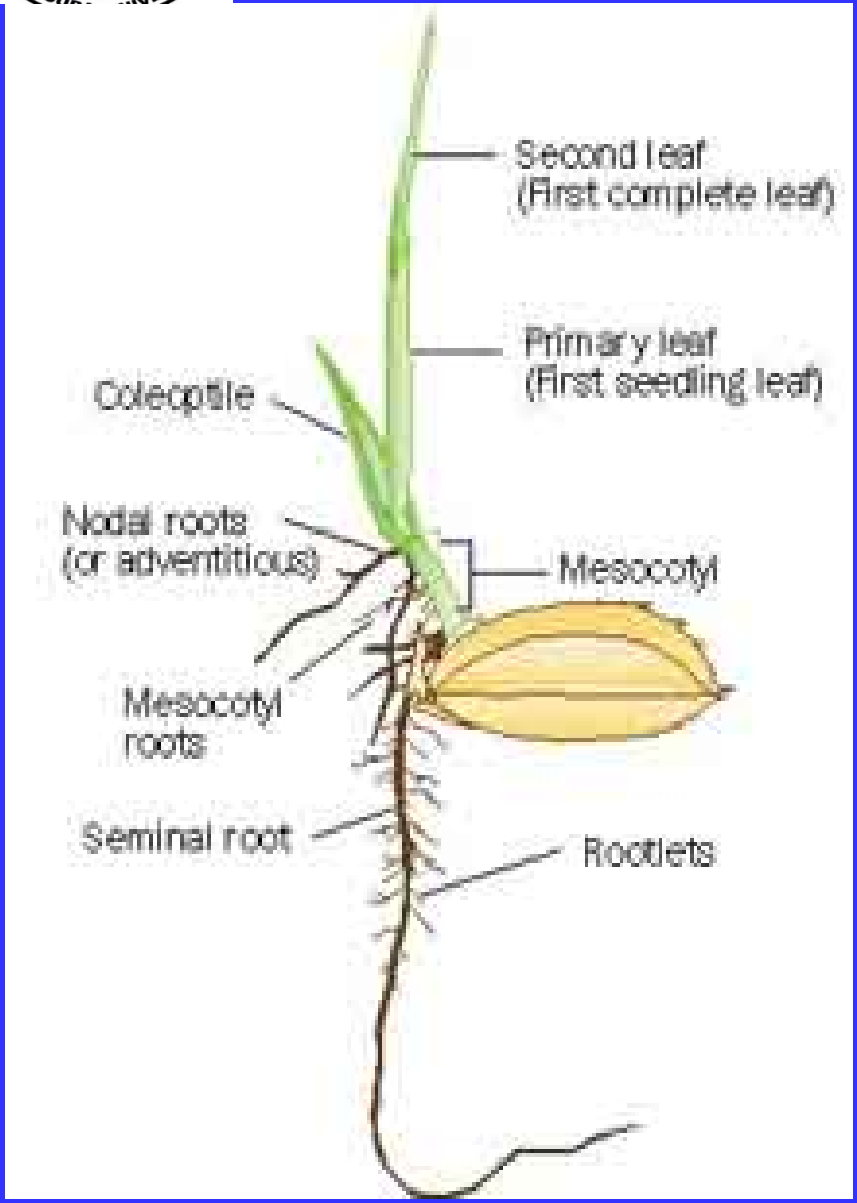
When the seed germinates in well-drained and well-aerated soil, the coleorhizae, a covering enclosing the radical or primary root, protrudes first. Shortly after the coleorhizae appears, the radical or primary root breaks through the covering. Two or more sparsely branched seminal roots follow.

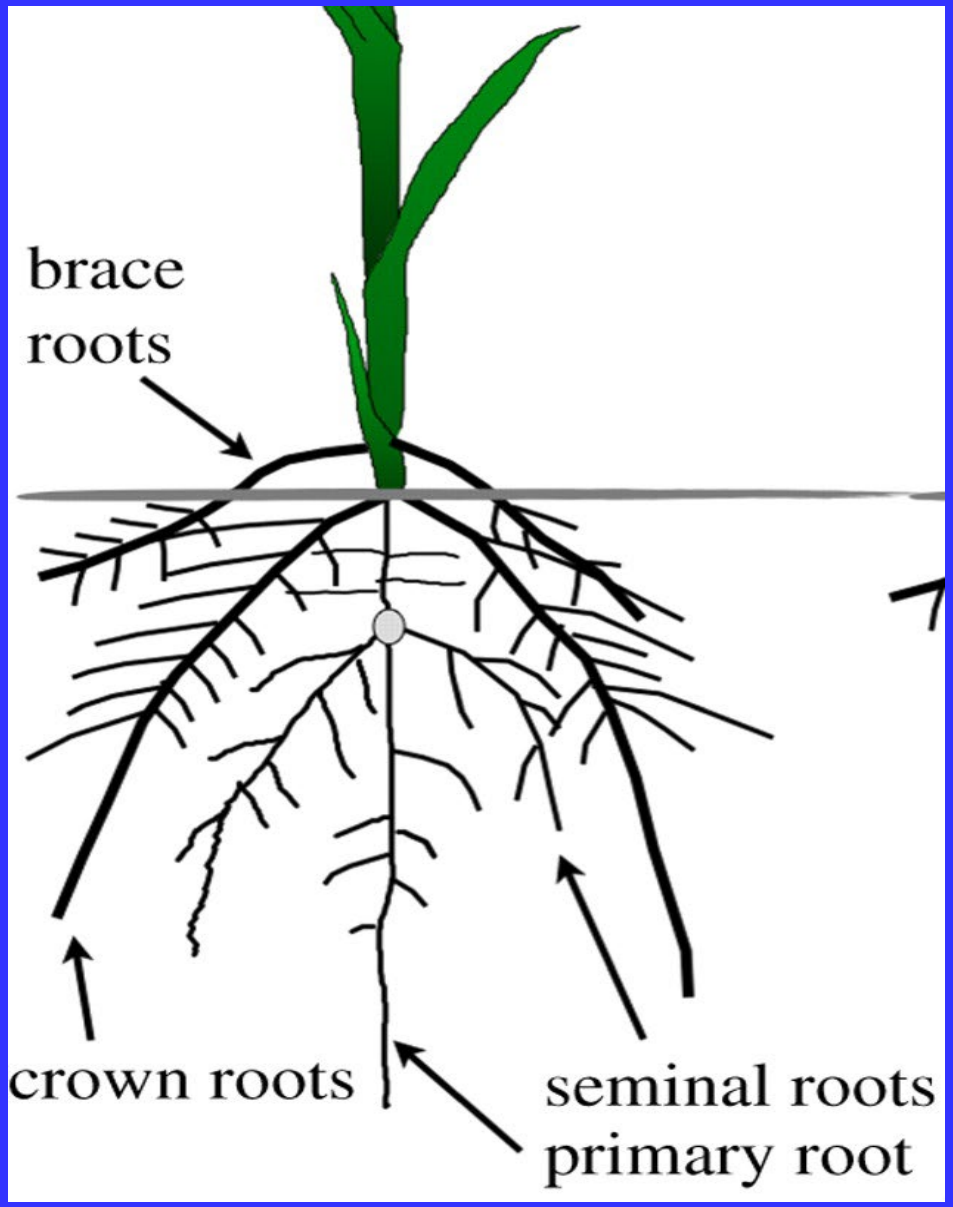
The rice plant has round and hollow stems, flat leaves, and panicles at the top of the plant. Rice is a very flexible/adaptable plant that grows well under both flooded and rainfed conditions.

1-Roots: The roots are fibrous, possessing rootlets and root hairs. The seminal roots are sparsely branched and persist only for a short time after germination. The secondary adventitious roots are produced from the underground nodes of the culm and leaves. Mature roots of the rice plant are fibrous and produce smaller roots called rootlets.



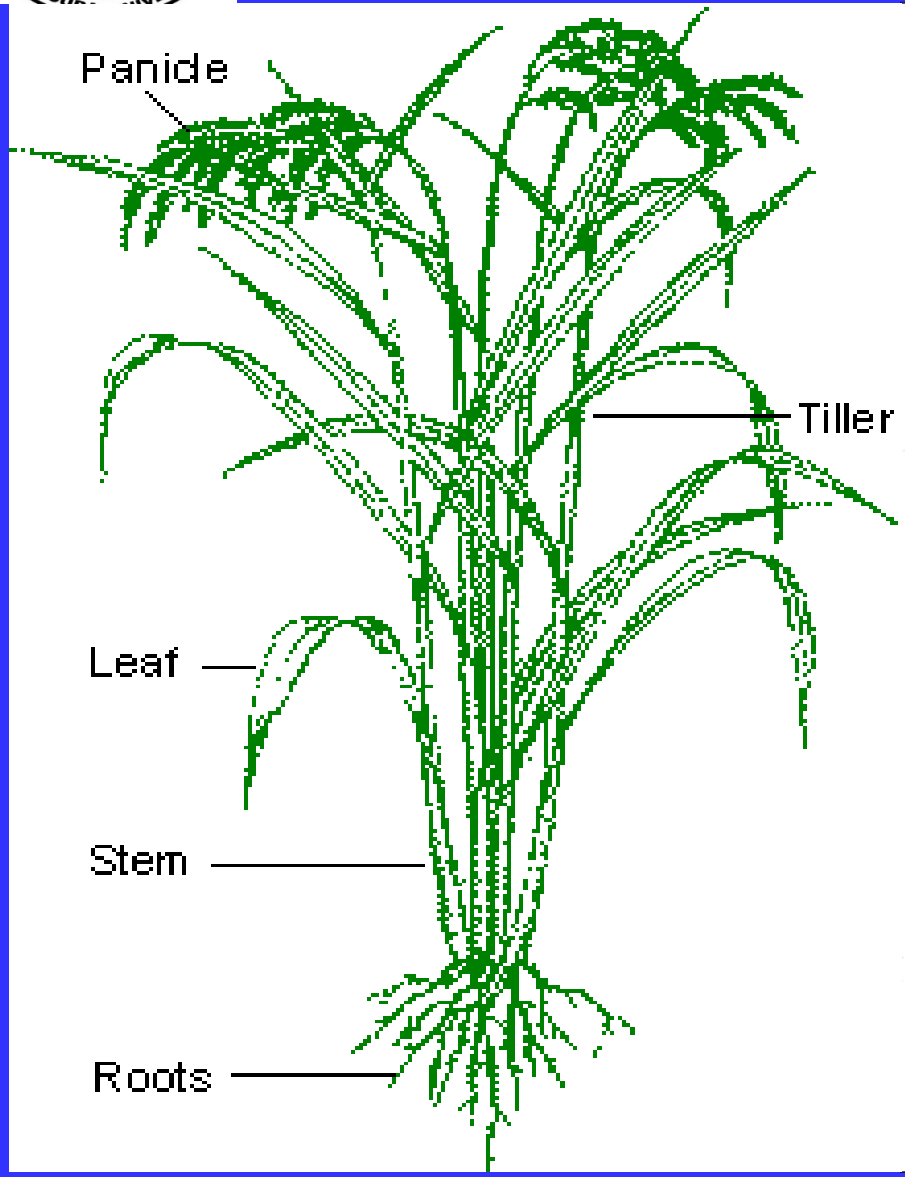
HYPOGEAL GERMINATION OF RICE SEED

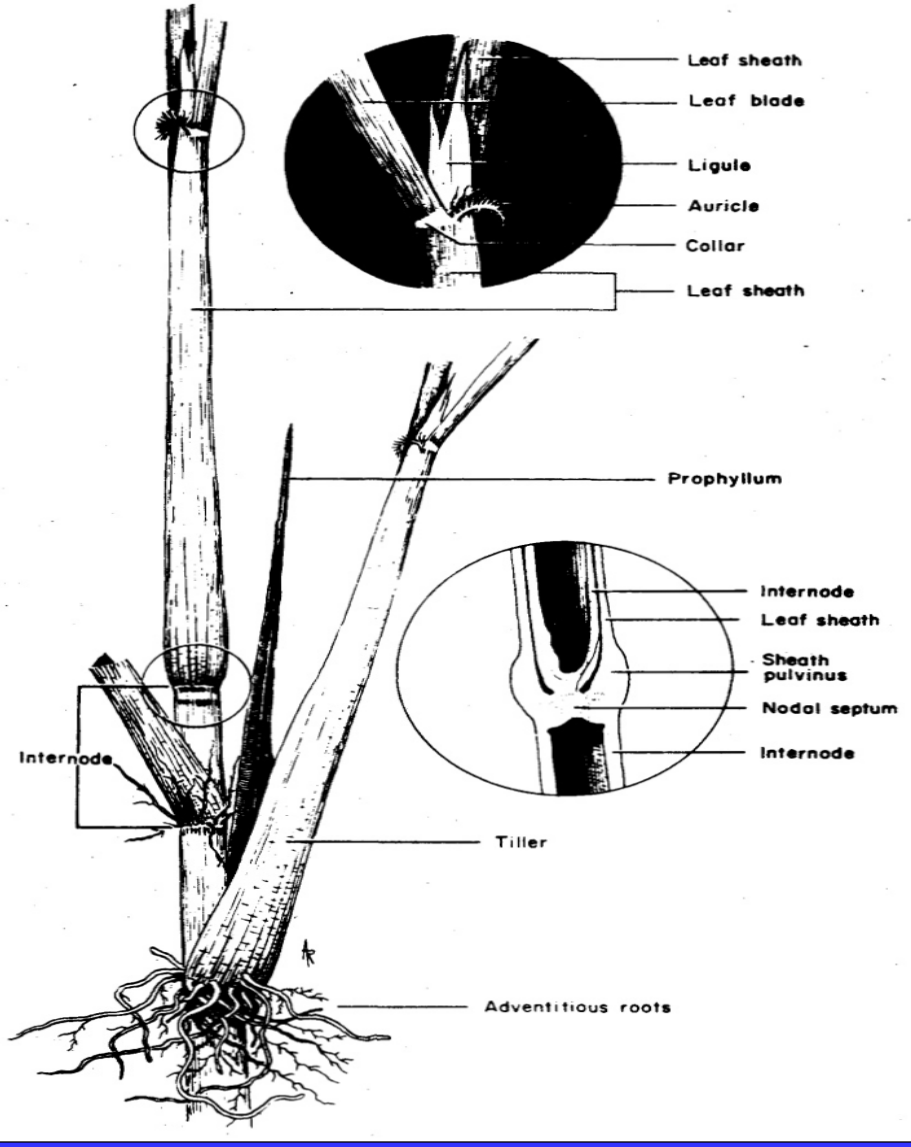

Second leaf
(First complete leaf)
Primary leaf
(First seedling leaf)
Coleoptile
Nodal roots
(or adventitious)
Mesocotyl
Mesocotyl
roots
Seminal root
Rootlets


brace
roots
crown roots
seminal roots
primary root

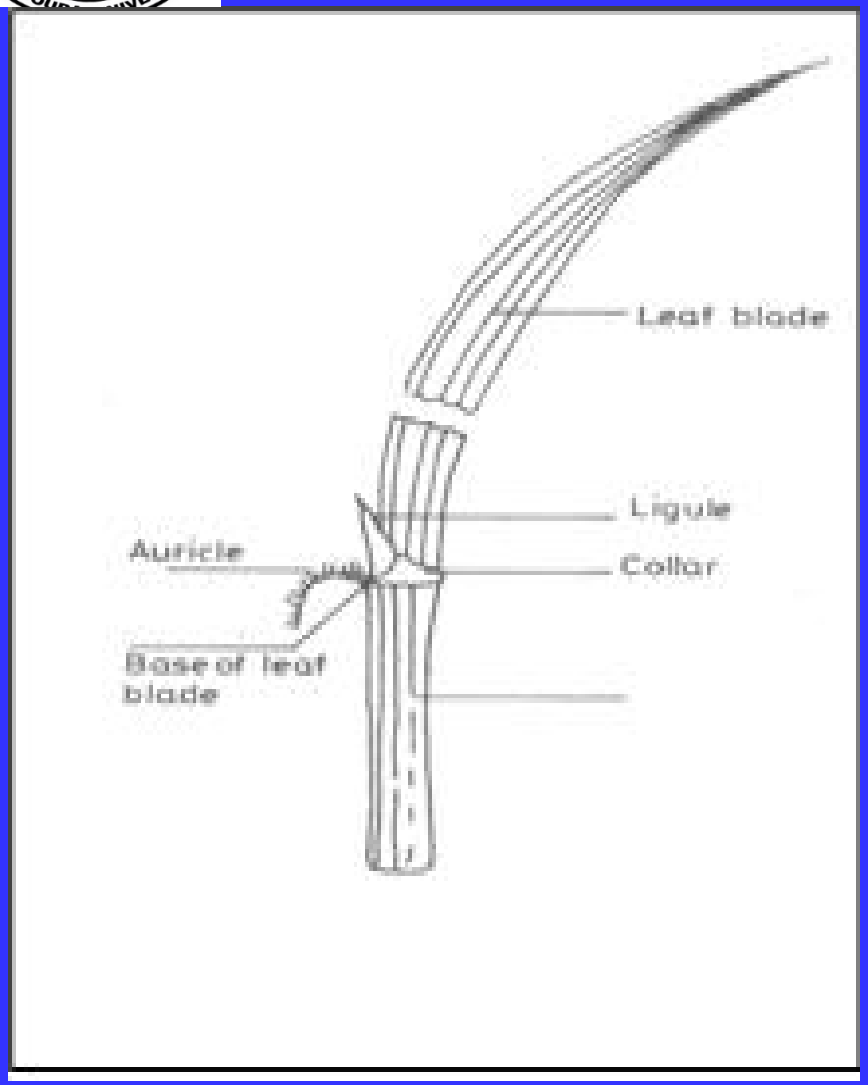
2. Culm (Stem):

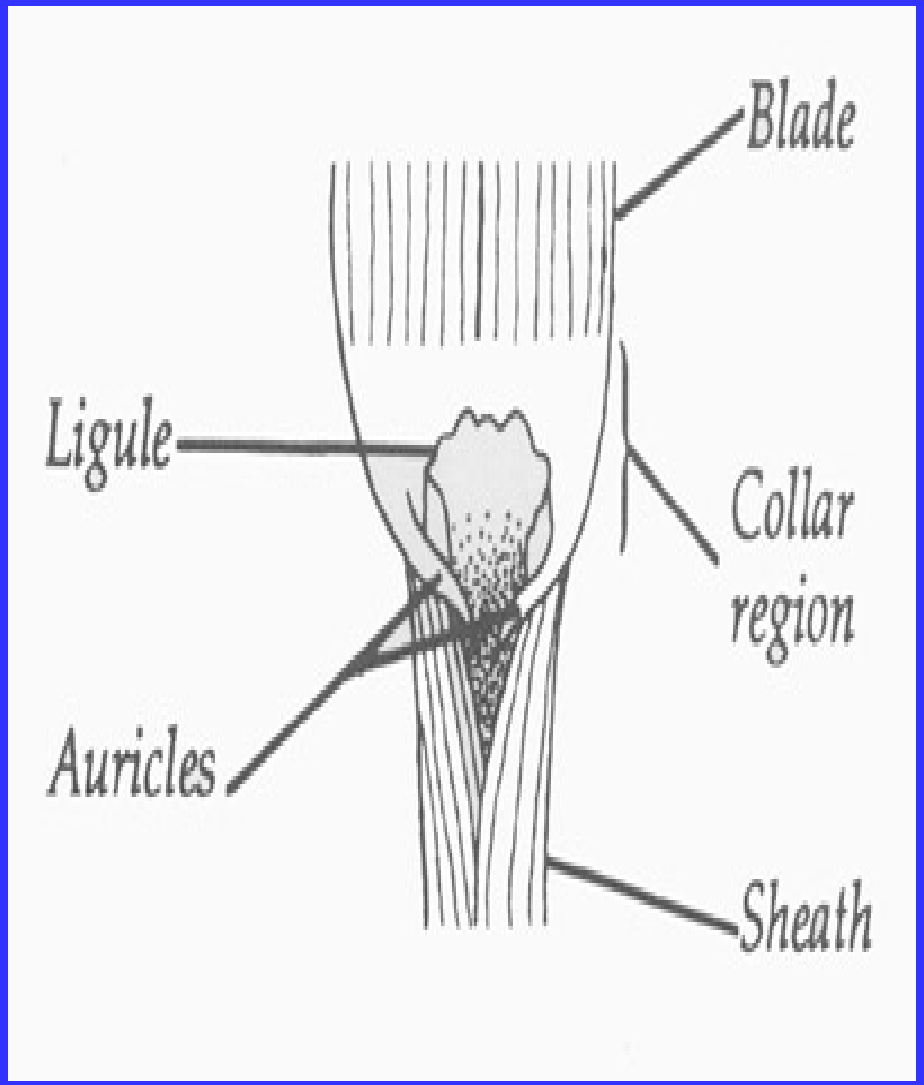
Erect, cylindrical, and hollow except at the nodes includes 6-12 internodes (30-180 cm). The culm, or jointed stem of the rice, is made up of a series of nodes and internodes.The young internodes are smooth and solid. Mature internodes are hollow and finely grooved with a smooth outer surface. Generally, internodes increase in length from the lower to the upper portions of the plant. The lower internodes at the plant base are short and thick. The node is the solid portion of the culm.


Panicle
Tiller
Leaf
Stem
Roots


Leaf sheath
Leaf blade
Ligule
Auricle
Collar
Leaf sheath
Prophyllum
Internode
Leaf sheath
Sheath pulvinus
Nodal septum
Internode
Internode
Tiller
Adventitious roots

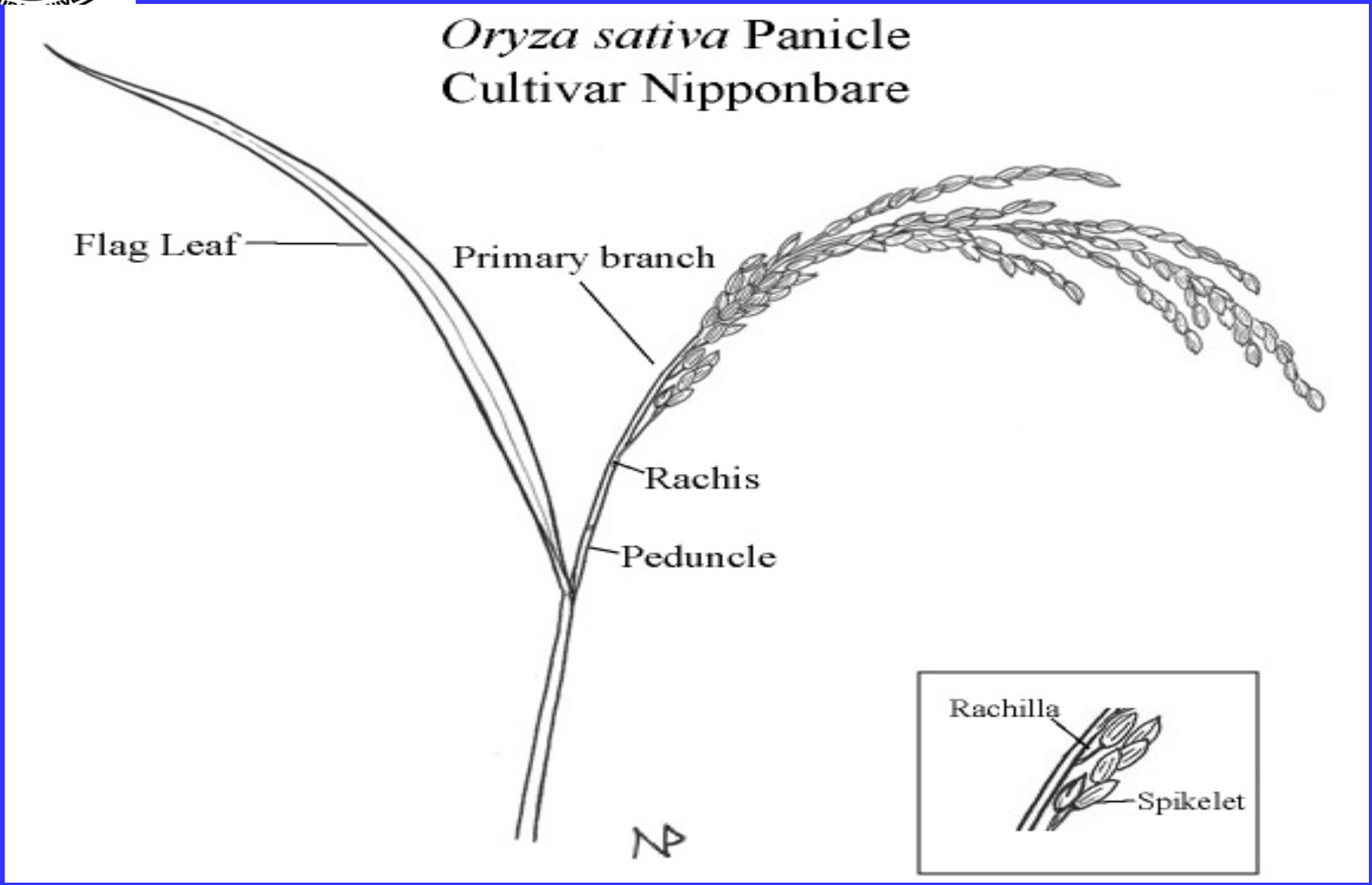
3. Leaves: The leaves are borne on the culm in two ranks, one at each node. The leaf consists of the sheath, blade and Ligule. **Blade** is the upper expanded part of leaf and begins at node, where it is jointed with leaf sheath. At the joint there is a thick collar. **The leaf sheath:** is continuous with the blade. It envelops the culm above the node in varying length, form, and tightness. **Ligule:** It is a thin papery structure just above the auricles. **Auricle:** these are having appendages at the base of the leaf blade. **Flag leaf: It is the uppermost leaf just below the panicle. It is generally shorter in length and remains erect at an angle.**



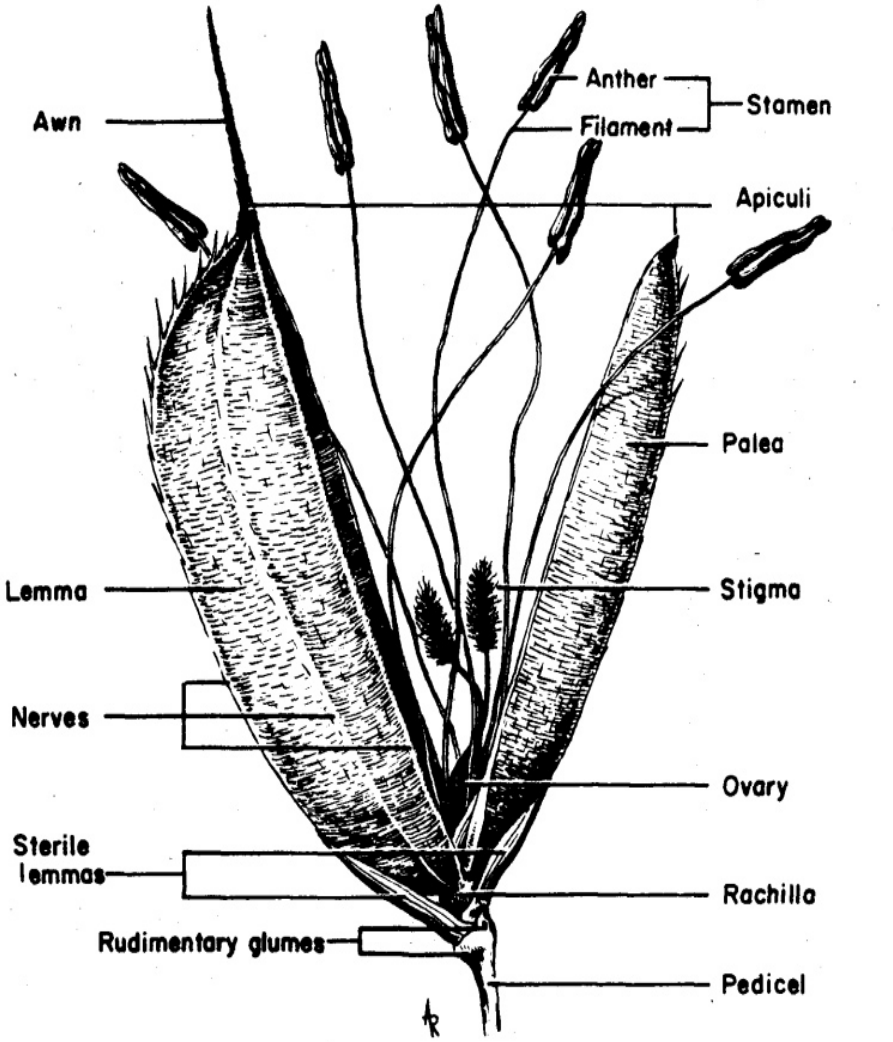


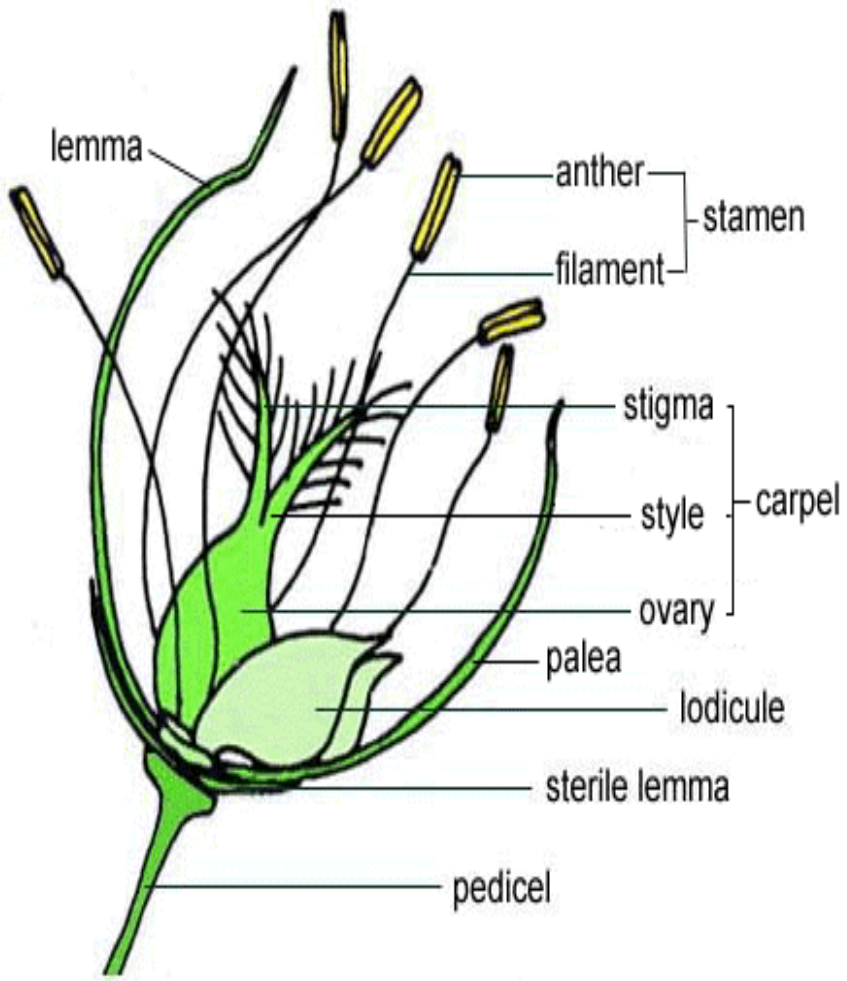
Leaf stricture

4-Spikelet: The rachilla, sterile lemmas and the rudimentary glumes all support the floret. The floret includes the lemma, palea, and the flower. The larger protective glume covering the floret is called the lemma and the smaller one is referred to as the palea. Both the lemma and palea have ridges referred to as nerves. The lemma has five while, the palea has three. The middle nerve of the lemma can be either smooth or hairy. The floret contains a flower. The flower consists of a pistil (female organ) and six stamens (male organs. In Each stamen is composed of an anther and a filament. An anther includes 4 elongated sacs where pollen grains are stored. The filament is a long, thin stem that holds the anther. The carpel consists of the female parts of the rice flower--the Stigma, the style ,and the ovary. The stigma receives pollen grains, which will then be transported into the ovary, where fertilization occurs.



Rice Panicle





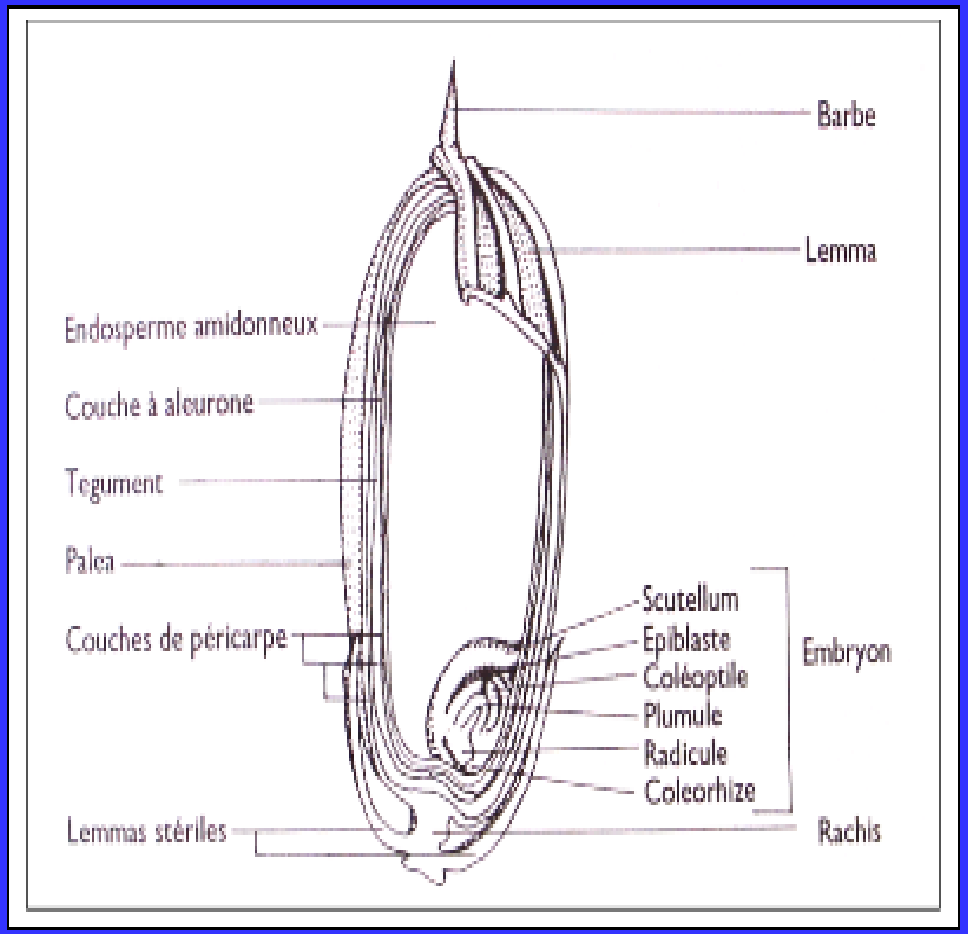
Parts of a spikelet

5- Rice grain

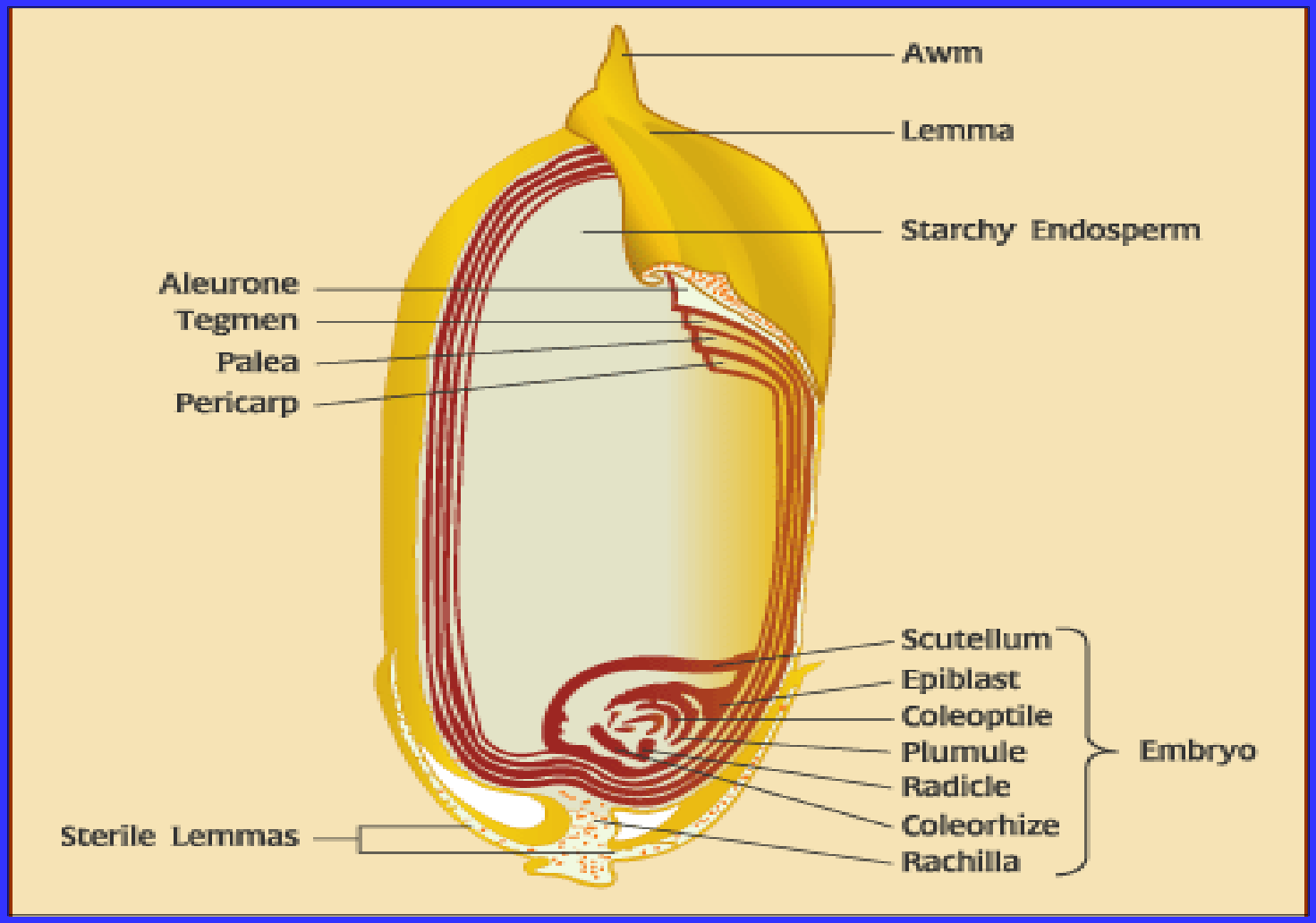
Rice grain is the ripened ovary, with the lemma and palea firmly attached to it. The rice hull includes the lemma and palea and their associated structures – the sterile lemmas, rachilla, and awn.

The dehulled rice grain is called caryopsis, commonly referred to as brown rice because of three brownish pericarp layers that envelope it. Next to the pericarp layers are the two tegmen layers and the aleurone layers.

The remaining part of the grain consists of the endosperm and the embryo. The endosperm provides nourishment to the germinating embryo. The embryo lies on the belly side of the grain and is enclosed by the lemma. It is the embryonic organ of the seed



Rice grain structure



Structure of a grain

Blending- Leveling

	Rice (*Oryza sativa* L.) Germaine Poacese
Germination	Hypogeal : grains remains below the ground
Root	Fibrous: One branched seminal root- Adventitious roots (node)-brace root (from the base node)
Stem	Erect, cylindrical, and hollow except at the nodes,7-12 internodes (30-180 cm) - the short node in the base - the long the uppermost- 2-3 tillers
Leaf	Compound- 1-Blade with midrib- 2-Sheath cylindrical tubular on stem -3-Ligule-4-Aurticles. Flag leaf erect.
Inflorescence	Panicle- Penducle-50-500 spikelets-one flower per spikelet-Rachis-Rachilla
Flowers	Perfect-palea (3 ridges)-lemma (5 ridges)-stamens include 6 stamens- stigma-ovary - Self pollination
Fruits	Grain-Kernel – Caryopsis –hull encloses the brown rice.

Questions

1-The roots of rice are ……possessing rootlets and root hairs.

a- fibrous b- tap c-tuber d- swelled

2- The ……roots in rice plant are produced from the underground nodes of the young culms and are freely branched.

a-adventitious b- primary c- aerial d-seminal

3-true or false:

(false) in rice plant internodes increase in length from the upper to the lower portions of the plant.

4-In rice plant Early tillers arise from the main culm in an ……pattern.

a- alternate b-opposite c-alternative with opposite

5-The ……. contributes largely to the filling of grains because it supplies photosynthetic products, mainly to the panicle.

a-Lower leaf b- flag leaf

c-middle leaf d-modern leaf

6-Most leaves possess small, paired ear-like appendages on either side of the base of the blade. These appendages are called …….

a-blade b- ligule c- sheath d- auricles

7- True or false:

(True)Auricles may not be present on older leaves.

8-……is a papery membrane at the inside juncture between the leaf sheath and the blade. It can have either a smooth or hair-like surface.

a- sheath b-ligule c- blade d- auricles

9-The terminal component of the rice tiller is an inflorescence call …….which bears rice spikelets

a- the panicle. b-spike

c- spikelets d- inflorescence

10- ……. is the basic unit of the inflorescence and panicle. It consists of the pedicel and the floret.

a- the panicle. b-spike

c- Spikelets d- inflorescence

11- ……..are the lowermost parts of the spikelet and During threshing, are separated from the rest of the spikelet.

a- The rudimentary glumes b-lemma

c-baleta d-awn

12-The larger protective glume covering the floret is called the ……..

a- rudimentary glumes b-lemma

c-baleta d-awn

13- The lemma of the spikelets has ..... while.

a-three b-five c-one d- tow

14- The palea of the spikelets has ..... while.

a-three b-five c-one d- tow

15- The rice flower consists of a pistil (female organ) and ..... stamens (male organs).

a-three b- six c- five d- tow

16- The dehulled rice grain is called .....

a- caryopsis b- compact

c-huller d- no answer


Thank
You!