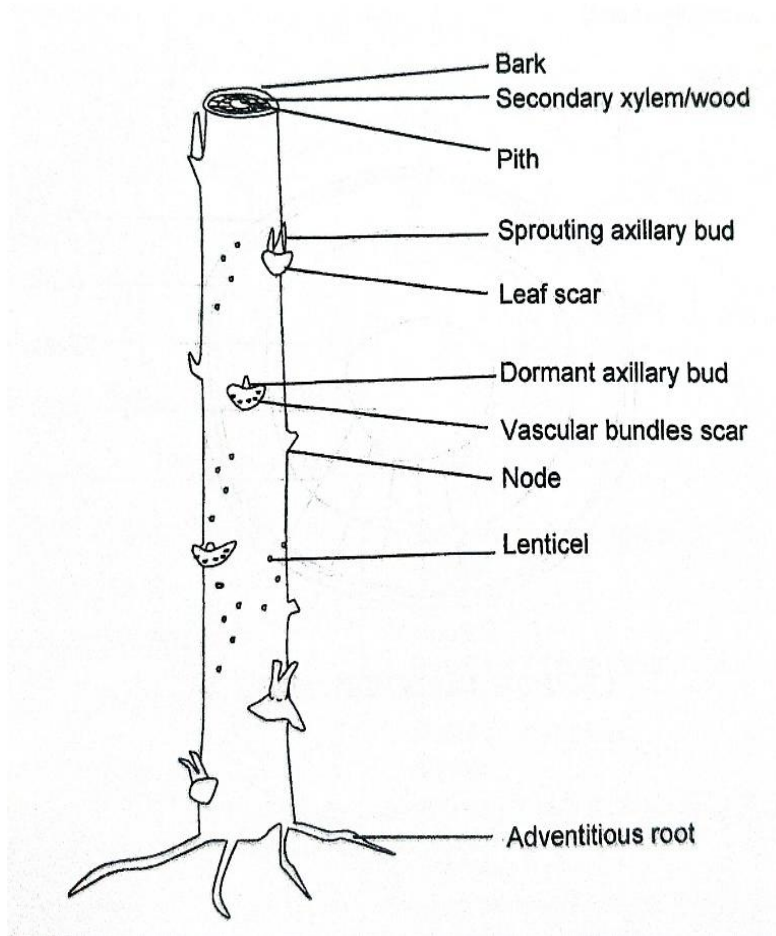


SPECIMEN A – CASSAVA STEM (WITH LEAVES AND ROOTS INTACT)

A drawing of the stem of Cassava x ½



CLASSIFICATION

KINGDOM = **Plantae**

Division = **Angiospermophyta**

Reasons:

- Presence of flowers
- Seeds are enclosed in ovary or fruit

Class – **Dicotyledoneae**

Reasons:

- Leaves have network venation
- Leaves possess petiole
- Possess tap root system
- Leaves are broad

Observable external features

- Have nodes
- Possess internodes
- Possess leaf scars
- Possess lenticels
- Possess buds
- Possess adventitious roots

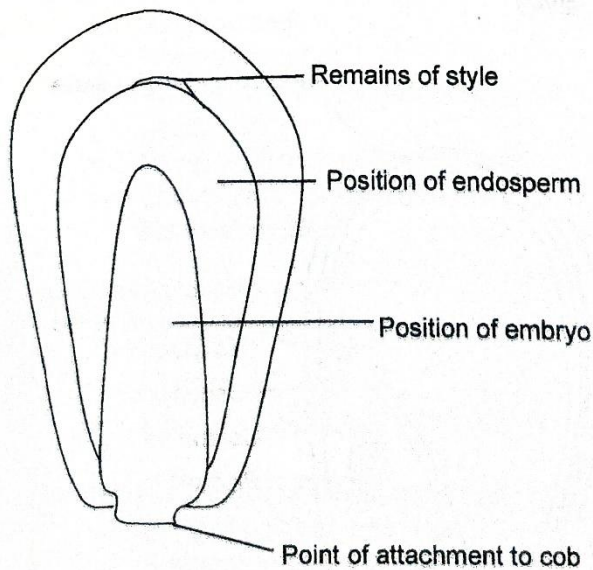
Economic importance of Cassava

- Source of food
- Source of raw materials for industries
- Source of income
- Source of employment

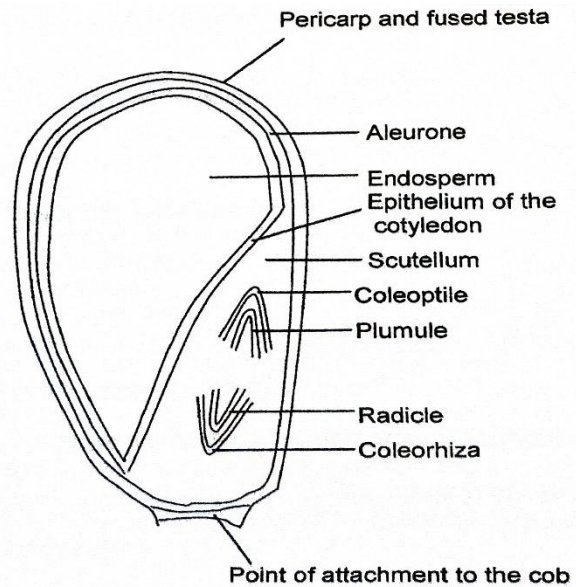
Type of vegetative propagation used to grow Cassava

- ✓ Stem cuttings

SPECIMEN B – DRY MAIZE GRAIN



Drawing of the external structure of maize grain



Drawing of the longitudinal section of maize grain x

CLASSIFICATION

Kingdom – **Plantae**

Division – **Angiospermophyta**

Reasons:

- Presence of flowers
- Seeds are enclosed in ovary or fruit

Class – **Monocotyledoneae**

Reason:

- Possess one seed leaf (cotyledon)

FACTS ABOUT MAIZE GRAIN

- ✓ The maize grain is not a seed but a fruit

Reasons:

- ❖ Its outer wall is formed from fusion of the testa and the pericarp (fruit wall)

Observable features of maize grain and their biological importance

- Presence of the remains of style
- Remains of stalk at the narrow end which indicates its attachment to the cob
- A ridge in the centre indicating the position of the plumule and the radicle

CLASSIFICATION OF MAIZE GRAIN AS A FRUIT

- TRUE FRUIT – Developed from the fertilized ovary only
- SIMPLE FRUIT – This is formed from a single flower
- DRY FRUIT – Fruit is not fleshy at maturity

- INDEHISCENT FRUIT – Fruit pericarp does not split open
- CARIOPSIS – A one seeded fruit in which a pericarp is dry and fuses with the seed coat

TYPE OF FRUIT – **Cariopsis**

Reasons / Characteristics:

- ✓ A one seeded fruit in which a pericarp is dry and fused with the seed coat

Type of seed: Monocotyledonous endospermous seed

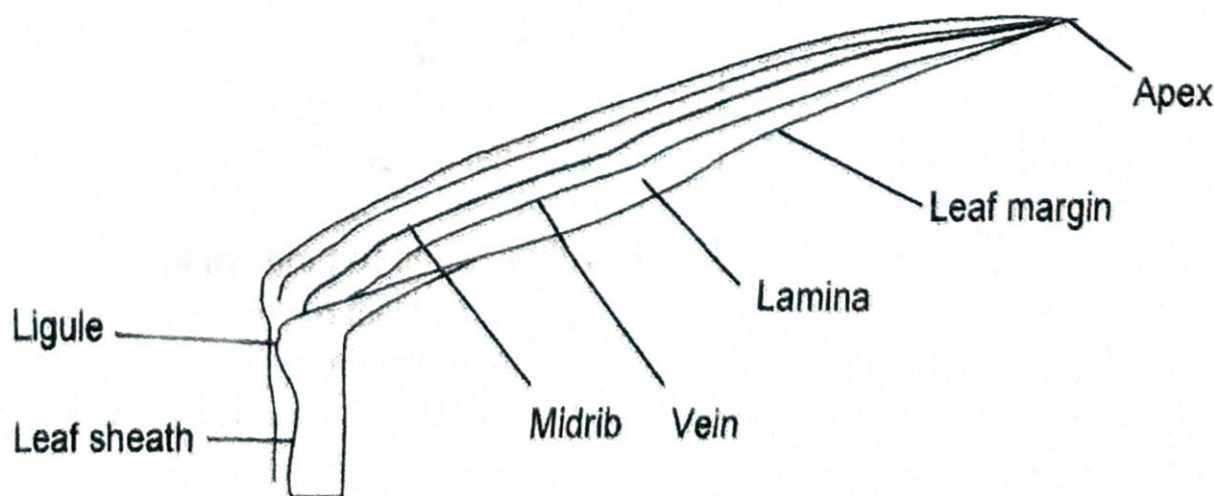
Agricultural classification of maize seed: Cereal

PESTS OF MAIZE – Weevil, Termites

TREATMENT / CONTROL / PRESERVATION OF MAIZE

- Use pesticides
- Use irradiation

SPECIMEN C – STEM OF MAIZE PLANT (with leaves and roots intact)



Drawing of the leaf of young maize plant x ½

CLASSIFICATION

Kingdom – **Plantae**

Division – **Angiospermophyta**

Reasons

- Produces flowers
- Seeds are enclosed inside fruits

Class – Monocotyledoneae

Reasons

- Long narrow leaves
- Possess parallel venation
- Leaf sheath present
- Possess fibrous roots
- Petiole absent

ADAPTATION TO MODE OF LIFE

- ✓ Narrow leaves reduce excessive loss of water through transpiration
- ✓ Presence of brace roots to provide additional support
- ✓ Presence of shallow fibrous roots for easy absorption of water and nutrients from soil
- ✓ Leaf sheath provide support to the plant to withstand wind
- ✓ Presence of chlorophyll for photosynthesis

ADAPTATIONS TO REGULATE WATER LOSS

- Possess narrow leaves to reduce water loss
- Leaves roll up to reduce the rate of transpiration
- Presence of epidermal hairs to reduce water loss

TYPE OF LEAF – **Simple leaf**

TYPE OF LEAF MARGIN – **Smooth / Entire**

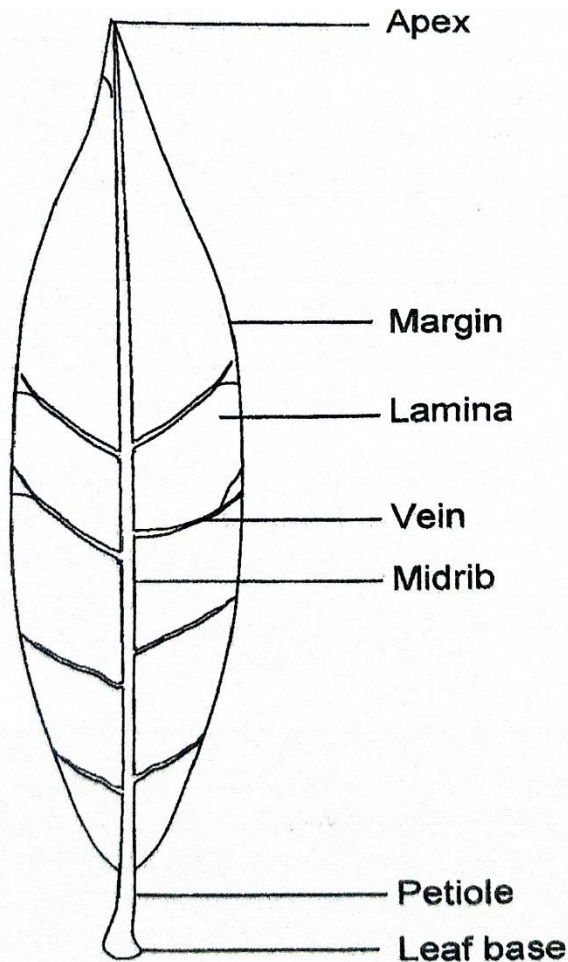
DIFFERENCES BETWEEN A (CASSAVA PLANT) AND C (MAIZE PLANT)

A (Cassava plant)	C (Maize plant)
Narrow leaves	Broad leaves
Petiole present	Petiole absent
Leaf sheath absent	Leaf sheath present
Leaves have network venation	Leaves have parallel venation
Possess taproot system	Possess fibrous root system

SIMILARITIES BETWEEN A (CASSAVA PLANT) AND C (MAIZE PLANT)

- ✓ They all have roots
- ✓ They all have green leaves
- ✓ They all possess veins in their leaves

SPECIMEN D – LEAF OF MANGO PLANT



Drawing of the upper surface of leaf of specimen A x½

Kingdom – **Plantae**

Division – **Angiospermophyta**

Reasons:

- Presence of flowers
- Seeds are enclosed in ovary or fruit

Class – **Dicotyledoneae**

Reasons:

- Leaves have network venation
- Leaves possess petiole
- Possess tap root system
- Leaves are broad

Leaf margin of mango – Entire / smooth

Type of leaf – Simple leaf

Reason: Leaf has a single leaf blade (Lamina)

Leaf shape: Lanceolate

SPECIMEN E – HIBISCUS FLOWER

Classification

Kingdom – **Plantae**

Division – **Angiospermophyta**

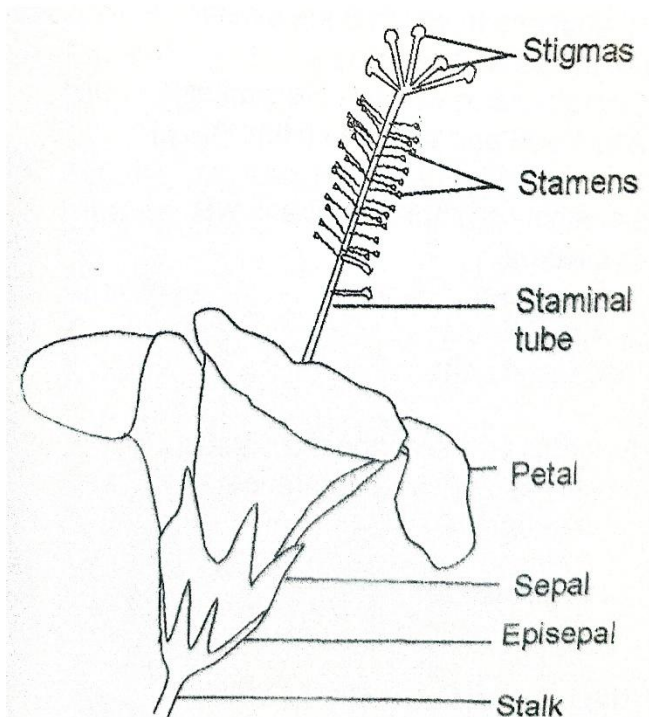
Reasons:

- Presence of flowers

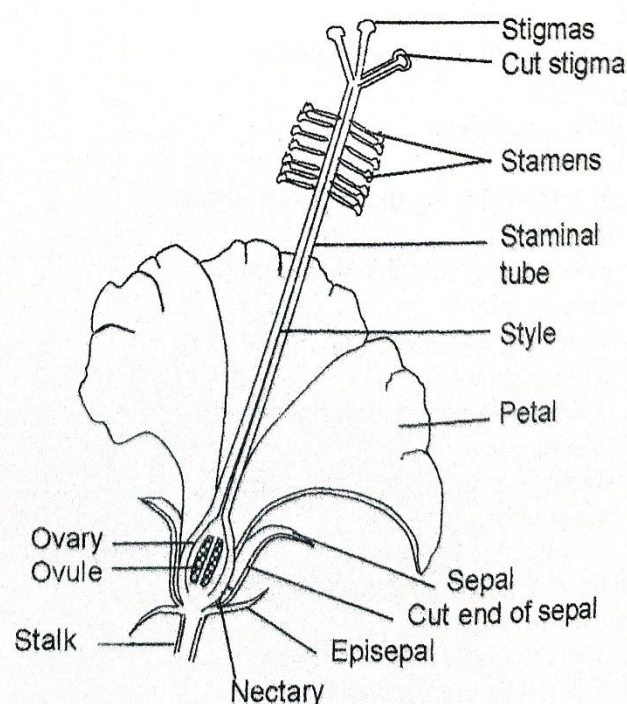
Class – **Dicotyledoneae**

Reasons:

- Floral parts in multiples of four or five
- Petals exhibit network venation

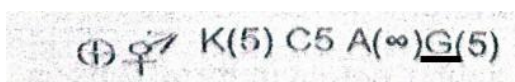


Drawing of the flower of hibiscus



Drawing of the half flower of hibiscus

Floral formula of Hibiscus -



DESCRIBE THE FLOWER OF HIBISCUS

- It is a bisexual and actinomorphic flower
- Possess a total of five similar sepals which are fused
- Has a total of five similar petals which are free
- Has indefinite number of stamens which are fused
- Possess five fused carpels which are similar with a superior ovary

CLASSIFICATION OF HIBISCUS

- ✓ It is a complete flower because it has all the floral leaves
- ✓ Bisexual because it has both androecium and gynaecium
- ✓ Actinomorphic because it is radially symmetrical
- ✓ Syncarpous because gynaecium has more than one carpel which are fused
- ✓ Hypogynous because it has a superior ovary
- ✓ Entomophilous because it is insect pollinated flower due to the presence of coloured petals, nectar, sweet scent and is conspicuous

ESSENTIAL PARTS OF HIBISCUS FLOWER – Gynaecium and Androecium

NON-ESSENTIAL PARTS – Calyx and Corolla

ADAPTATION FOR POLLINATION

- Large and conspicuous to attract insects
- Brightly coloured and sweet-scented petals to attract insects
- Nectaries produce nectar for insects
- Pollen grains are large, heavy and which are sticky and gets attached onto insects

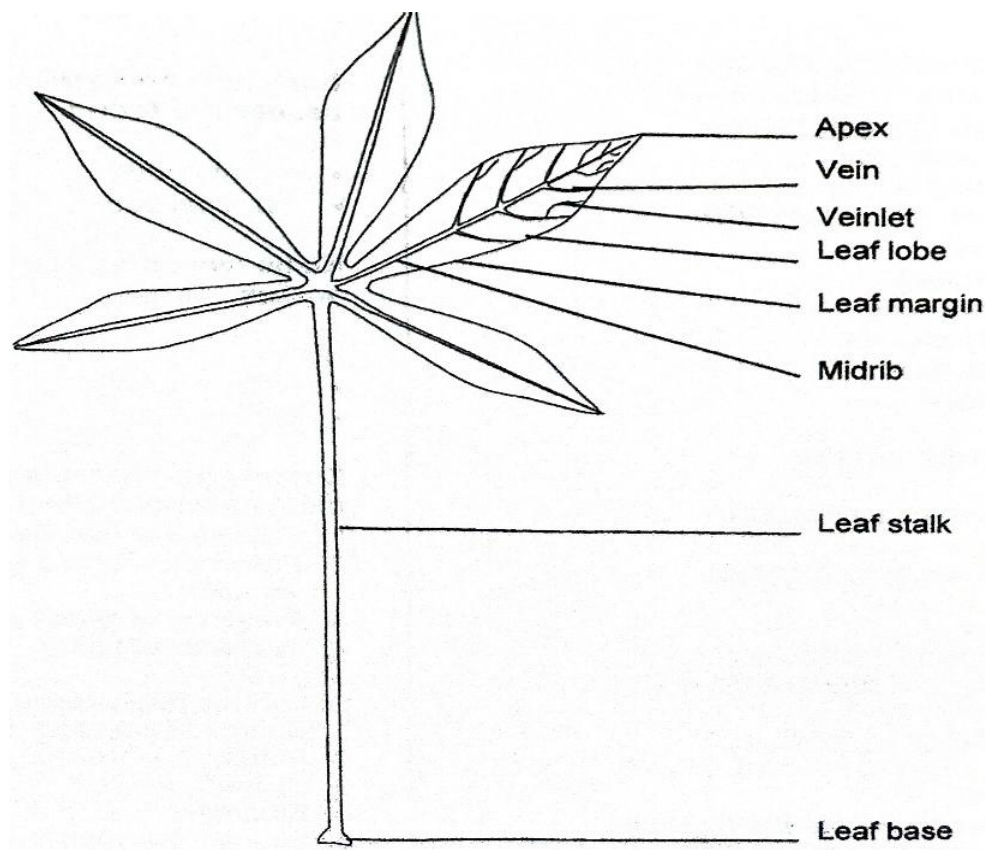
TYPE OF PLACENTATION – AXILE

Reason / Features

- Ovules are attached to the central axis (placenta)
- Ovules located in several chambers (locules) inside ovary
- Ovules arranged in a circular (radial) pattern

SPECIMEN F – CASSAVA LEAVES

CLASSIFICATION – SAME AS CASSAVA STEM



TYPE OF LEAF – Palmately compound leaf

LEAF MARGIN – Smooth / Entire

DIFFERENCES BETWEEN LEAF OF CASSAVA AND LEAF OF MANGO

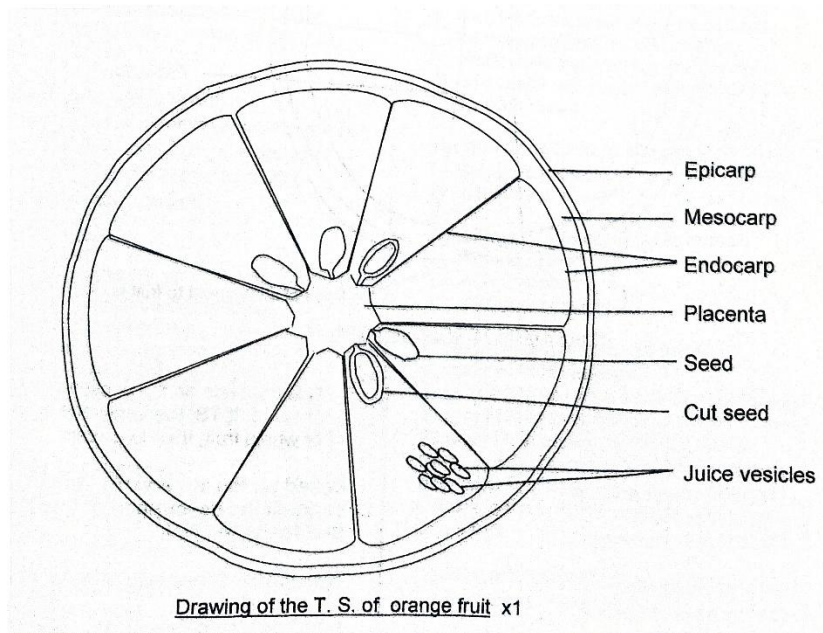
F (CASSAVA LEAF)	D (MANGO LEAF)
Leaf made up of only one lamina (simple leaf)	Leaf made up of five to seven leaflets (palmately compound)
Veins are prominent that run parallel to the leaf margin	Have network of veins that branch in various directions
Leaf has a waxy texture on the upper surface	Leaf has smooth, glossy upper surface
Leaf margin usually serrated (toothed)	Leaf margin is smooth (entire)
Petiole is relatively longer	Petiole is relatively shorter
Leaf is typically smaller and narrower	Leaf typically larger and broader
Exhibit a reddish tint on the underside	Has uniform green colour

SPECIMEN G – GARDEN EGG FRUIT

CLASSIFICATION – SAME AS DICOT

PLACENTATION – **AXILE**

SPECIMEN H – ORANGE FRUIT (CROSS SECTION)



TYPE OF FRUIT – **BERRY**

Reasons

- Has a thin outer epicarp
- Fleshy mesocarp
- Fleshy inner endocarp

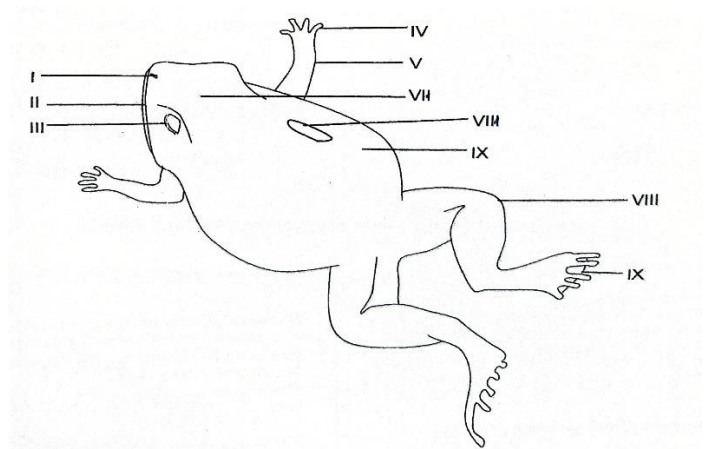
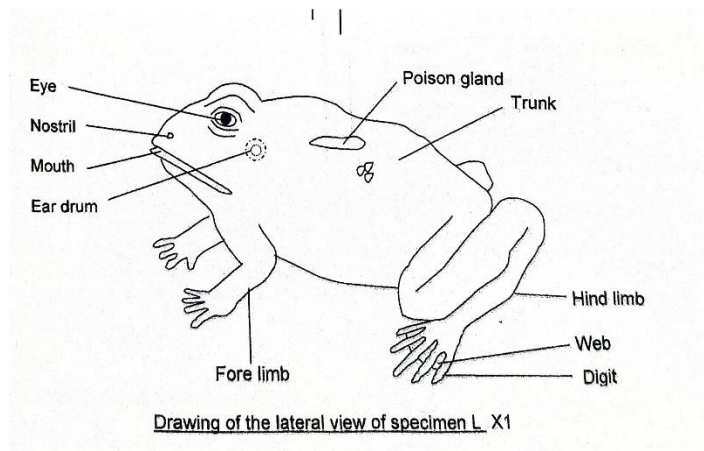
OBSERVABLE FEATURES

- Bright colour of epicarp
- Succulent mesocarp
- Fleshy endocarp
- Presence of seeds
- Several chambers (locules)
- Remains of style present

Reagent used to test for the presence of vitamin C is DCPIP

The orange fruit changes the colour of the DCPIP to colourless

SPECIMEN J – TOAD



CLASSIFICATION

Kingdom – **Animalia**

Phylum – **Chordata**

Reasons

- Presence of notochord
- Presence of hollow dorsal nerve cord
- Presence of pharyngeal slits
- Presence of backbone

Class – **Amphibia**

Reasons / Features

- ✓ Scaleless skin
- ✓ Moist and loose skin
- ✓ Two pairs of legs

MODE OF NUTRITION – **Holozoic**

METHOD OF FEEDING – **Carnivorous**

DIET – **Insects**

ADAPTATIONS TO FEEDING

- ❖ Wide mouth to capture insects
- ❖ Long sticky tongue for capturing insects
- ❖ Large eyes when pulled inwards for swallowing food
- ❖ Nostril for detecting food

HABITAT – Under stones, logs, under litter, pond, hole

GENERAL ADAPTATIONS TO ESCAPE DANGER

- Presence of bulging eyes to see prey
- Dark dorsal surface and light ventral surface reduces detection when in water
- Eardrum to detect vibrations
- Large hind limbs for hopping to escape predators
- Can change colour on land to blend with the environment

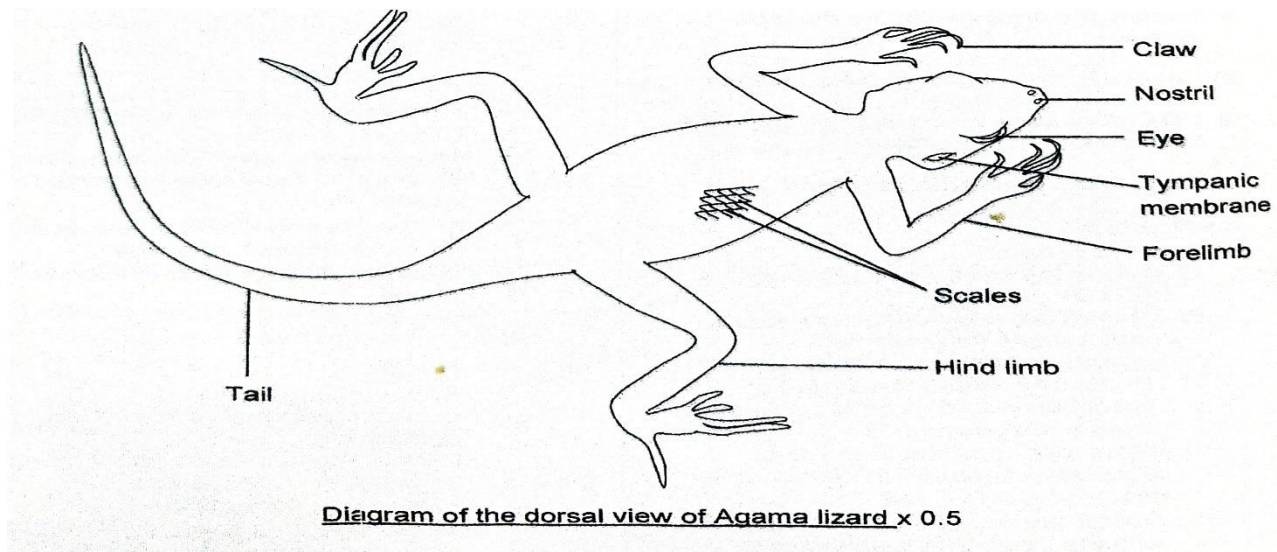
DIFFERENCES BETWEEN TOAD AND LIZARD

SPECIMEN J (TOAD)	SPECIMEN K (LIZARD)
Webbed digits	Web absent
Digits not clawed	Digits clawed
Scaleless skin	Scaled skin
No tail	Tail present
Nuchal crest and gular fold absent	Nuchal crest and gular fold present

SIMILARITIES BETWEEN TOAD AND LIZARD

- ❖ They all possess a wide mouth
- ❖ They all have nostril above the mouth
- ❖ They all possess a tympanum
- ❖ They all possess two pairs of limbs

SPECIMEN K – LIZARD



CLASSIFICATION

Kingdom – **Animalia**

Phylum – **Chordata**

Reasons

- Presence of notochord
- Presence of hollow dorsal nerve cord
- Presence of pharyngeal slits
- Presence of backbone

Class – **Reptilia**

Reasons

- Skin is covered with dry, horny scales
- Have two pairs of limbs with clawed digits
- Have homodont dentition
- Absence of external ear

HABITAT: **On trees, under stones, walls, ceiling**

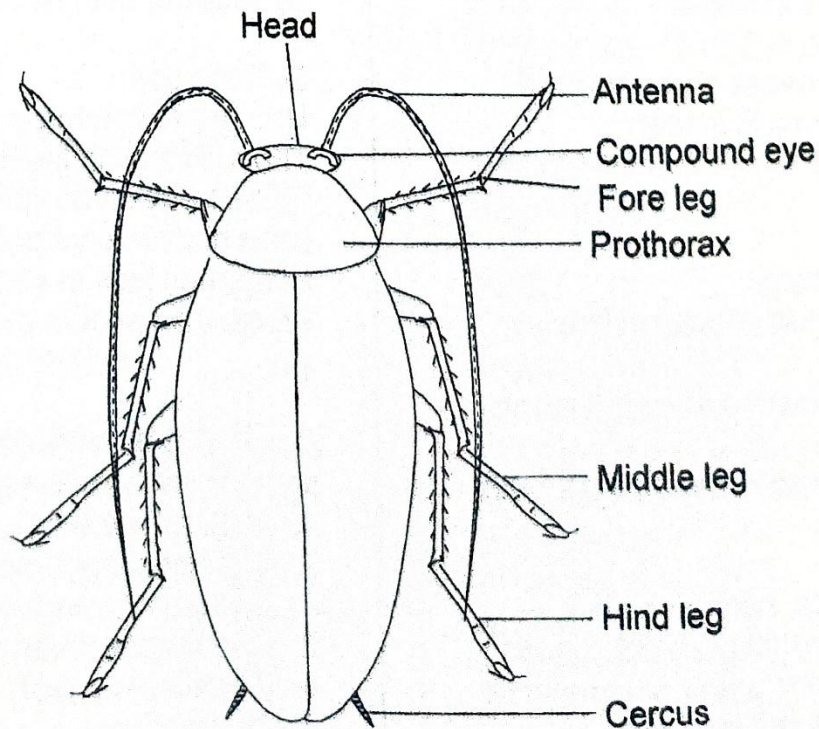
MODE OF FEEDING – **Holozoic**

METHOD OF FEEDING – **Carnivorous**

Reasons

- ✓ Horny scales to reduce continuous loss of water on land
- ✓ Two pairs of limbs to support the body and for movement on land
- ✓ Clawed digits to hold on support or for climbing

SPECIMEN L – ADULT COCKROACH



Drawing of the Dorsal view of Adult Cockroach x2

CLASSIFICATION

KINGDOM – **Animalia**

PHYLUM – **Arthropoda**

Reasons / Features

- Presence of exoskeleton made of chitin
- Metamerically segmented body
- Presence of jointed appendages
- Bilaterally symmetrical body

Class – **Insecta**

Reasons

- Presence of a pair of compound eyes
- Three body divisions namely head, thorax and abdomen
- Presence of a pair of antennae
- Presence of three pairs of thoracic legs

Order – **Dictyoptera**

Reasons

- ❖ Presence of leathery forewings
- ❖ Presence of biting and chewing mouthparts
- ❖ Legs almost equally developed

HABITAT – **Dark cupboards, toilet, kitchen, wall cracks, crevices**

MODE OF NUTRITION – **Holozoic**

METHOD OF FEEDING – **Omnivorous**

ADAPTATION TO FEEDING HABIT – **It has chewing mouthparts**

OBSERVABLE ADAPTIVE FEATURES FOR FEEDING

- Maxillary and labial palps for choosing suitable food
- Mandibles for biting and chewing food
- Labrum for holding the food
- Labium prevents food from leaving the mandibles

ECONOMIC IMPORTANCE OF COCKROACH

- It is a household pest that destroys that destroys clothing, books etc
- It spreads germs of diseases
- It has a foul smell
- It contaminates food

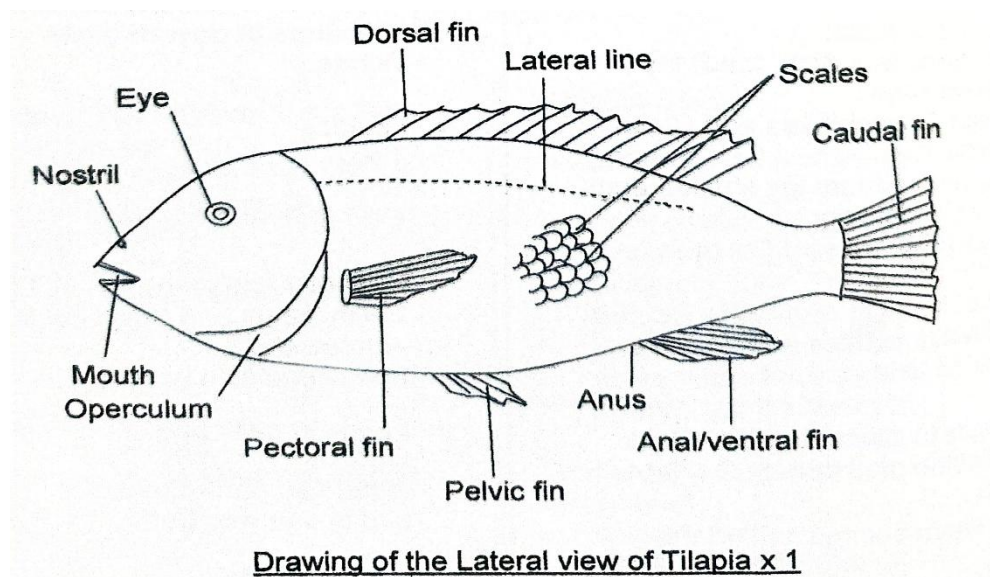
DISEASES SPREAD BY COCKROACH

- ✓ Cholera, Typhoid, Tuberculosis, Dysentery

CONTROL OF DISEASES TRANSMITTED BY COCKROACH

1. Use insecticides to kill adult
2. Keep kitchen clean and airy with enough light
3. Cover food

SPECIMEN M – TILAPIA



CLASSIFICATION

Kingdom – **Animalia**

Phylum – **Chordata**

Reasons – same

Class – **Osteichthyes**

Reasons

- ✓ Skeleton made of bones
- ✓ Possess terminal mouth
- ✓ Possess fins strengthened with spines
- ✓ Possess cycloid scales homocercal tail
- ✓ Presence of operculum

HABITAT – **Pond, lake, lagoon**

MODE OF NUTRITION – **Holozoic**

FEEDING HABIT – **Omnivorous**

REASONS FOR HABITAT

1. Possession of fins
2. Possession of gills
3. Possession of opercula
4. Streamlined body