

AVES → Unique among Vertebrates → **Feathers**

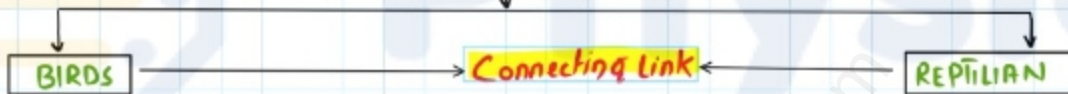
→ Birds evolved from Reptiles → **Crocodile**

EVOLUTIONARY HISTORY

• 1861 → Rocks of Jurassic period

• **Archaeopteryx** → Lizard-tailed Bird

CHARACTERS

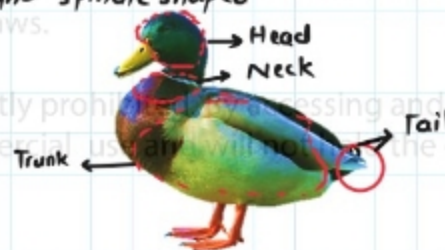


- | | |
|---|---|
| • Feathers → Covering The Body | • Scales → legs |
| • Forelimbs → Flying wings | • Bones solid and heavy without air space |
| • Tail with two rows of Feathers | • Jaws → Sockets → Teeth |
| • Skull large with a single → occipital condyle | • Long tail → 20 caudal vertebrae |
| • Jaws elongated → Beak | • Nine to Ten Cervical Vertebrae |

GENERAL CHARACTERS

BODY

- Stream Lined and spindle shaped
- 4- Division
 - Head
 - Neck
 - Trunk
 - Tail



LIMBS

- Fore Limb → FLY → Flying Birds
- Fore Limb → Reduce → Running birds
- Hind Limb → Walk, Ache, → Flying Birds
- Hind Limb → Running → Running Birds
- Hind Limb → Swimming → Aquatic Birds

SKELETON

- Endo-Bony Skeleton
- Epidermal Exoskeleton → Feathers

- Legs → Scales
- Light weight skeleton → Air space
- Sternum → Keel → Right help and muscle attachment
- Skull large → Sockets → Jaws → Teeth absent
- Horny beak

DIGESTIVE SYSTEM

- Alimentary canal
 - Crop → Food-store
 - Gizzard → Food grind

CIRCULATORY SYSTEM

- Closed- Circulatory system
- 4- chamber heart —
 - 2- Atrium
 - 2- ventricles
- Right single carotid arch
- Blood → Pigment → Hemoglobin → Nucleated RBCs

RESPIRATORY SYSTEM

- Lungs → Extensions → air-spaces → also extend → Bone
- Sound- Box → Syrinx → At the junction of Trachea and Bronchi

EYES & EARS

- Eyes → 3rd eyelid → Nictitating membrane
- Ears → Rudimentary pinna → External auditory opening

EXCRETORY SYSTEM

- Paired- kidney → Metanephric kidney
- Ureters → open into → cloaca
- Urinary bladder → Absent

REPRODUCTIVE SYSTEM

- Separate sexes
- Sexual- Dimorphism
- Fertilization → Internal
- Some- birds → Copulatory organ

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- Some birds → copulatory organ
- Female left ovary and oviduct functional
→ eagle → Right ovary & oviduct functional
- Female - egg lay → oviparous
→ shelled - eggs
→ large amount of yolk
- Extra-Embryonic-Membrane
 - Amnion
 - Chorion
 - Allantois
 - Yolk Sac
 } → Amniotes
- Birds → well-developed parental-care

TYPES OF BIRDS

1 FLIGHTLESS BIRDS Running Birds

- Do Not Fly
- Bones not hollow
- Sternum not keeled
- Tail-Feathers irregularly arranged
- Pelvic-girdle - strong

EXAMPLES



Ostrich



Emu



Cassowary

FLYING BIRDS

- Strong forelimbs → wings
- Bones → Hollow
- Sternum → keeled

- Tail-feathers well-developed → steering
- Pectoral girdle → strong

EXAMPLES



Robin



Kingfisher



Kestrel



Mallard



Ostrich

↓
Running
Bird



Pigeon

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