حيوان ٦

اجنة وبيئة حيوان

305 scbio

الجزء العملى

اعـــــــداد

د/ زينب كمـــال ..... د/ عبيـــــــده فوزي

كلية التربية - شعبة: العلوم البيولوجية والجيولوجيةE

الفرقة الثالثـــــــــه

الفصل الدراسى الثانى

٢٠٢٣/٢٠٢٢

Practical ebook of Embryology and Ecology

الاجنه وبيئة الحيوان

(الجزء العملى)

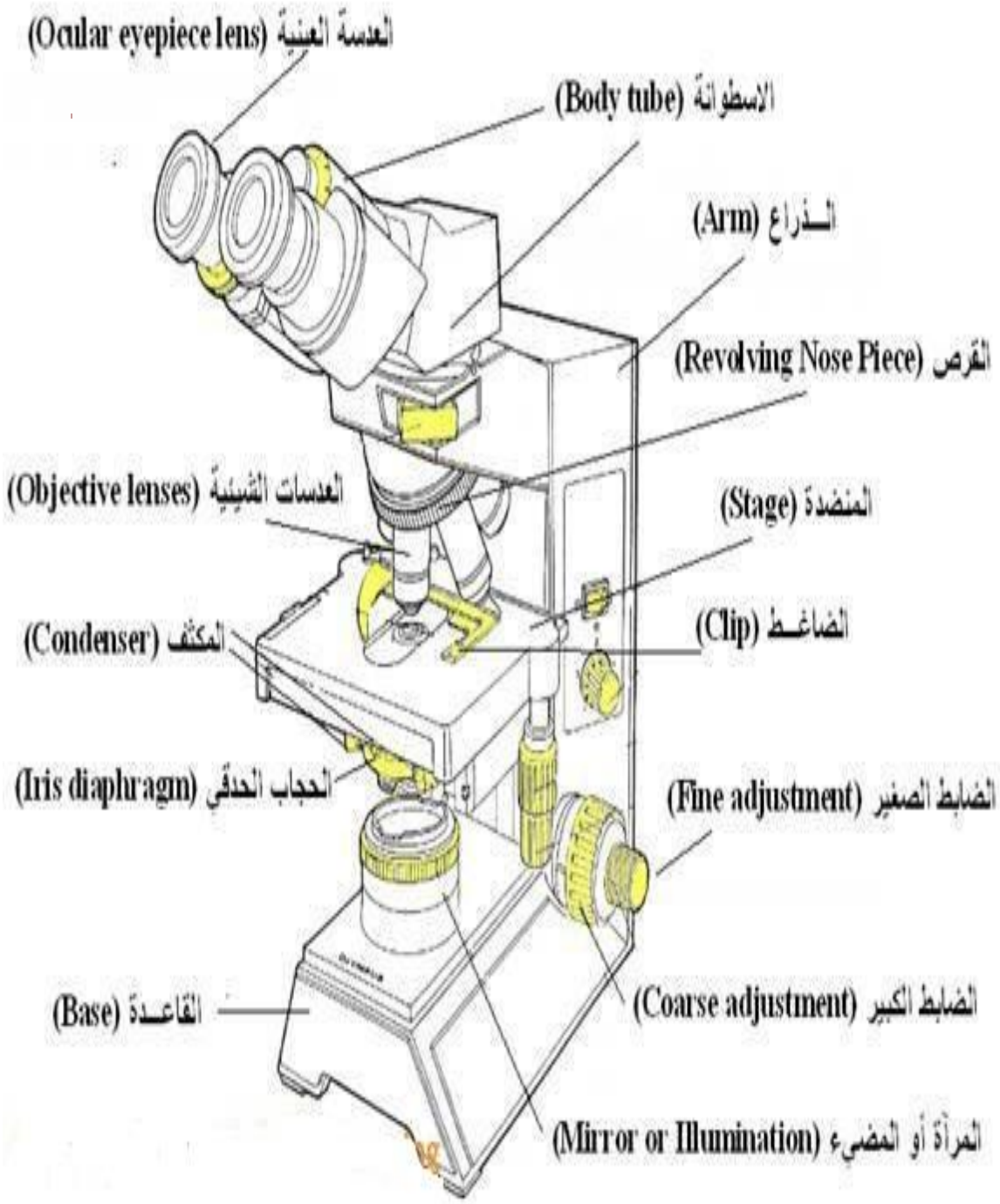


Figure1: Light microscope

قطاع عرضى فى خصية الفأر

تتركب الخصية من:

الانيبيبات المنويه التى تظهر على شكل تراكيب مستديره او بيضاويه الشكل. تتركب كل انيبيبه منويه من :

حيث يحتوى جدار كلا منها على عدة طبقات من الاخلايا (من الخارج للداخل) كالاتى:

١. امهات المنى

٢. الخلايا المنويه الابتدائيه

٣. الخلايا المنويه الثانويه

٤. طلائع المنى

٥. الحيوانات المنويه

حيث ان الحيوانات المنويه ما تكون متصله بخلايا تسمى خلايا سرتولى.

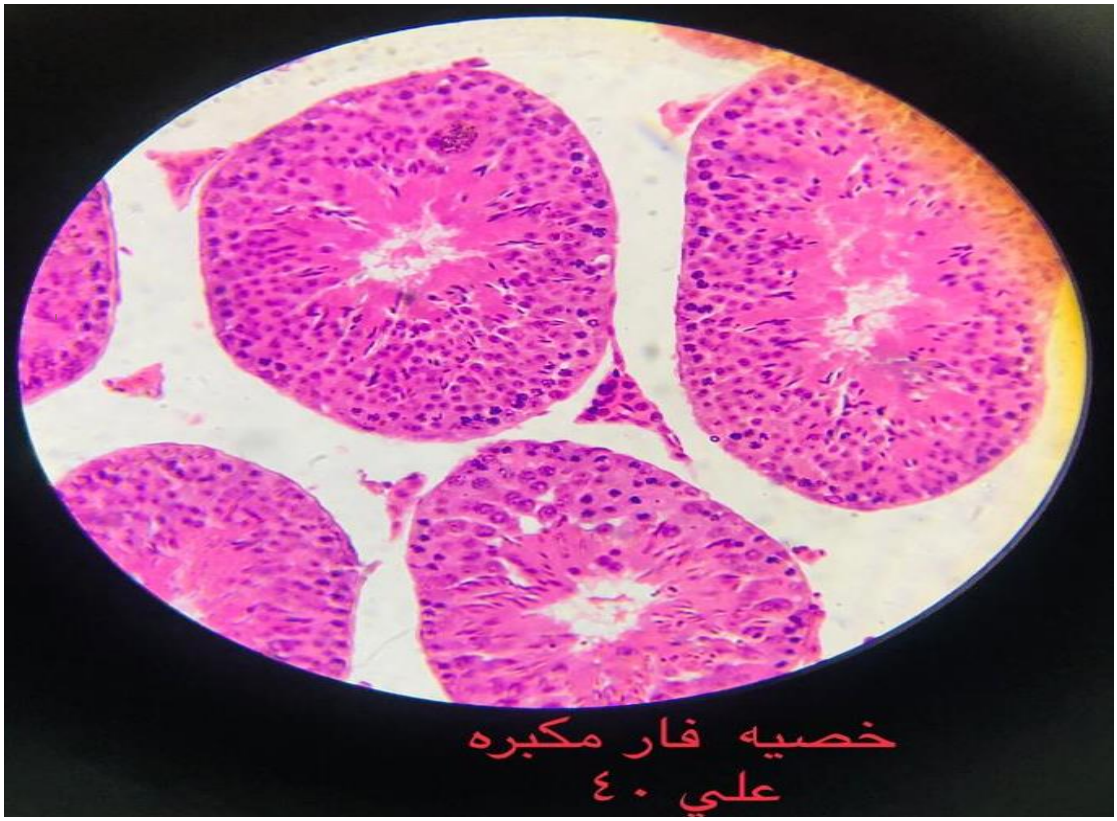
قطاع عرضى فى مبيض قطه

يحاط المبيض من الخارج بطلائيه بريتونيه يوجد تحتها الطلائيه المنبته التى تكون البيض.

حيث تكون ف البدايه امهات البيض التى تنتظم فى صورة اعشاش ثم تنقسم لتكون الخلايا البيضيه الاوليه ثم الخلايا البيضيه الثانويه ثم تحاط كل بيضه بحويصله جراف التى تكون صغيره ف البدابه ثم تكبر تدريجيا.

حيث يربط بين جميع هذه الاطوار سدى المبيض هو نسيج ضام يحوى اليافا عضليه غير مخططه.

قطاع عرضى فى خصيه الفار



قطاع عرضى فى مبيض قطة


قطاع عرضى
فى مبيض قطة

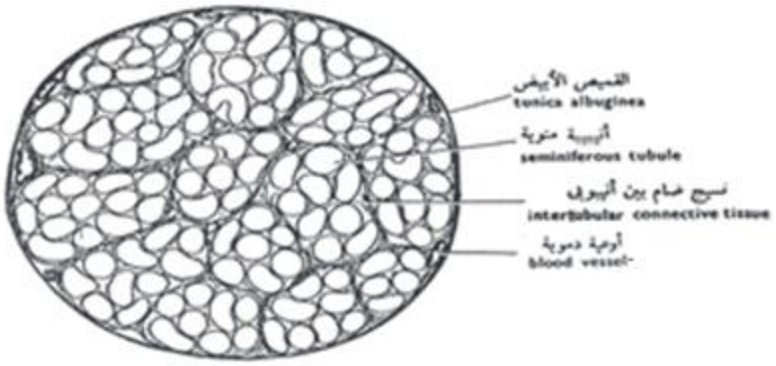


Figure 1: T.S of testes of rat

قطاع عرضى فى خصيه الفار

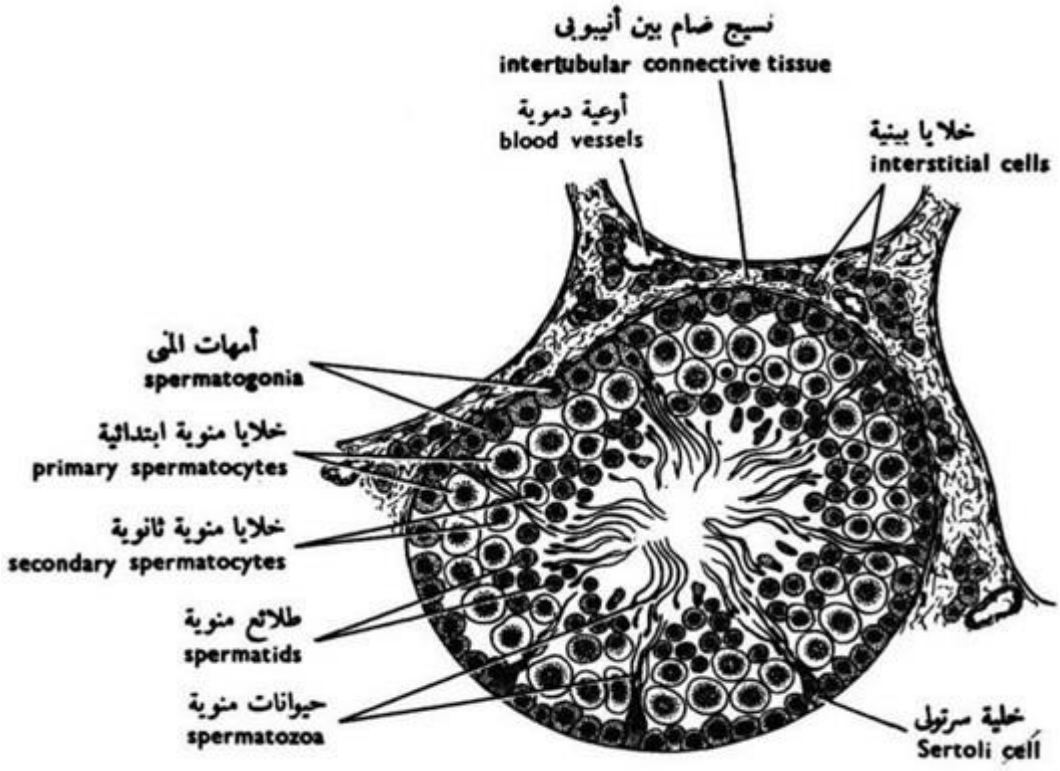


Figure 3: The seminiferous tubules

الانيبيه المنويه

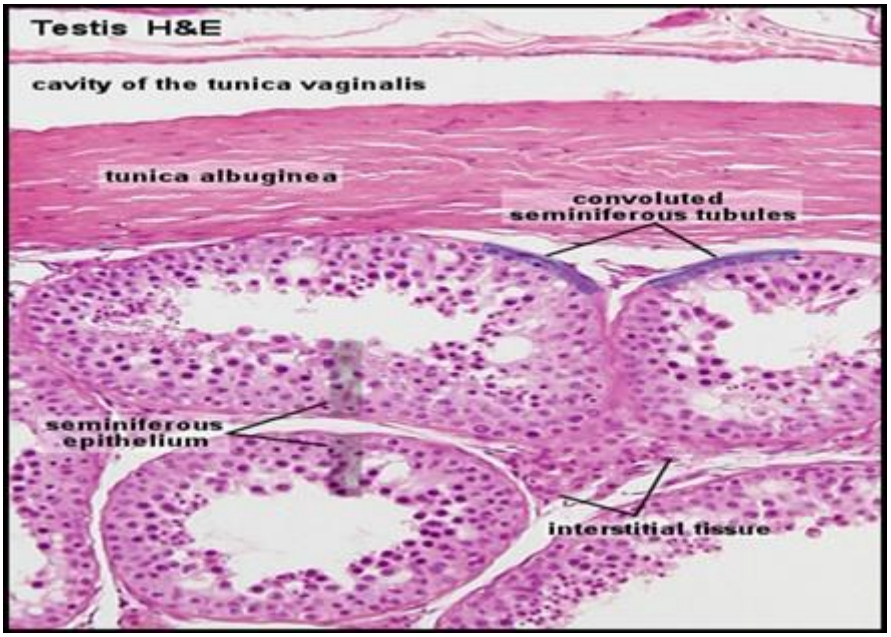


Figure 4: T.S of testes of rat (H&E) قطاع عرضى فى الخصيه الفار

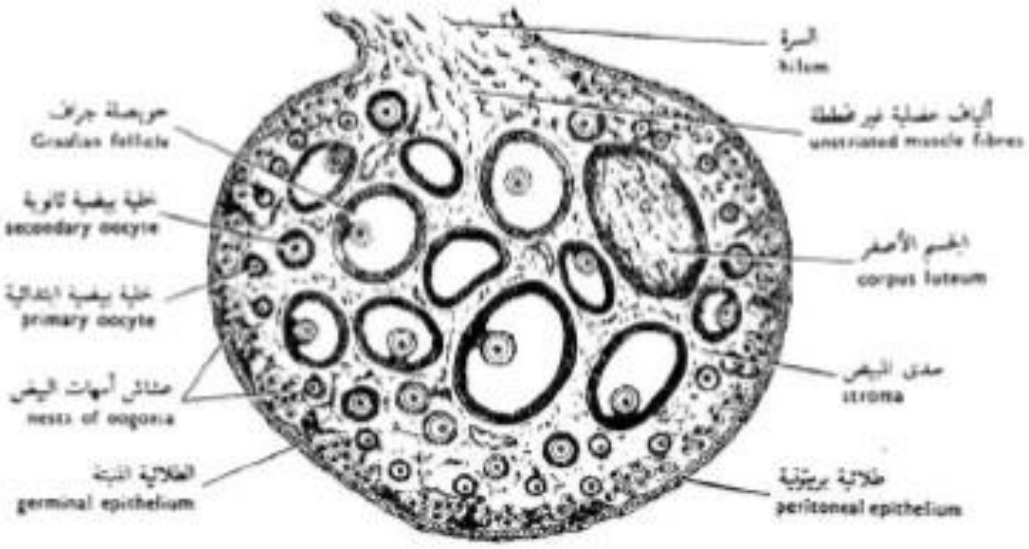


Figure 2: T.S. of ovary of cat

قطاع عرضى فى مبيض القطه

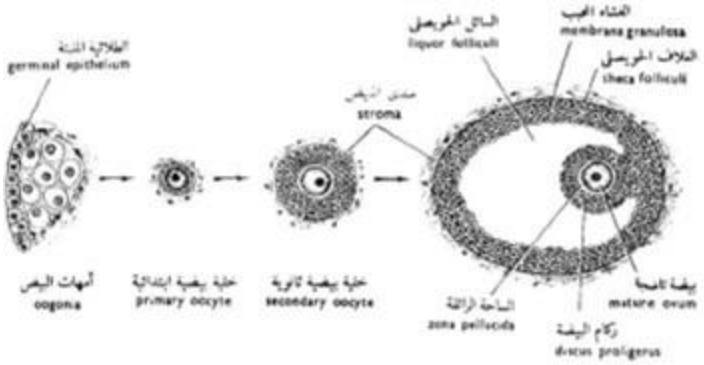
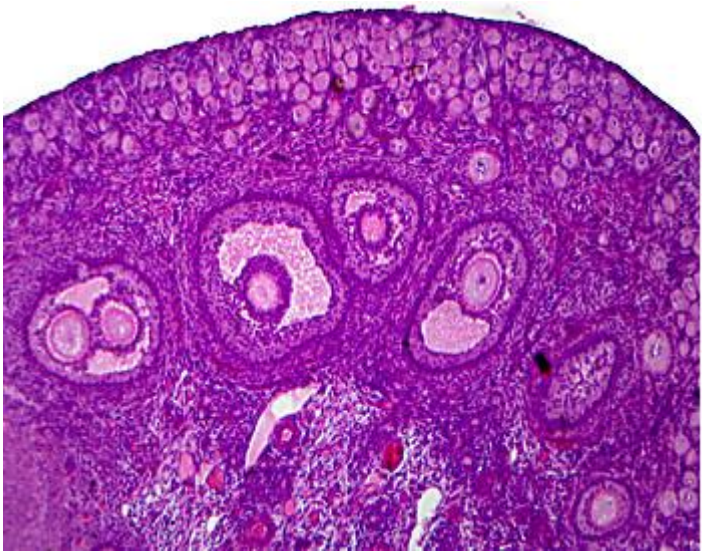
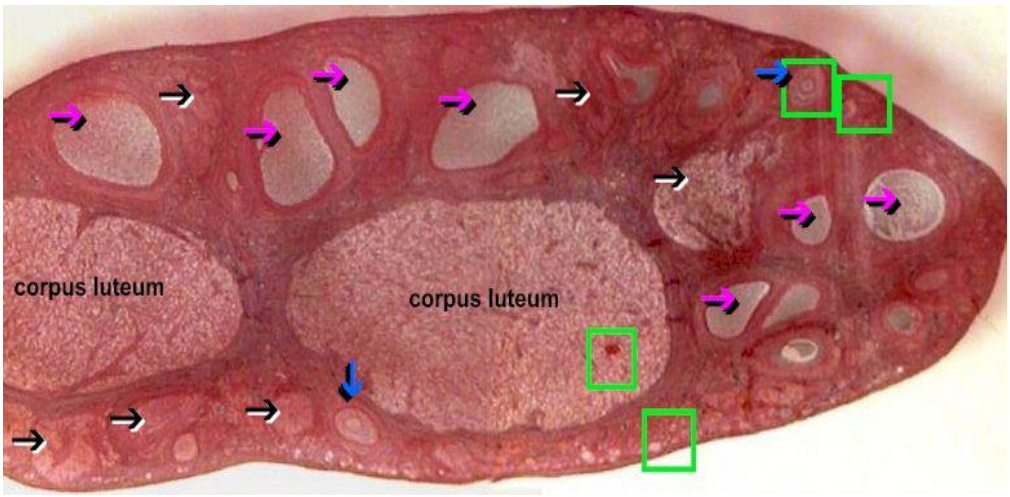
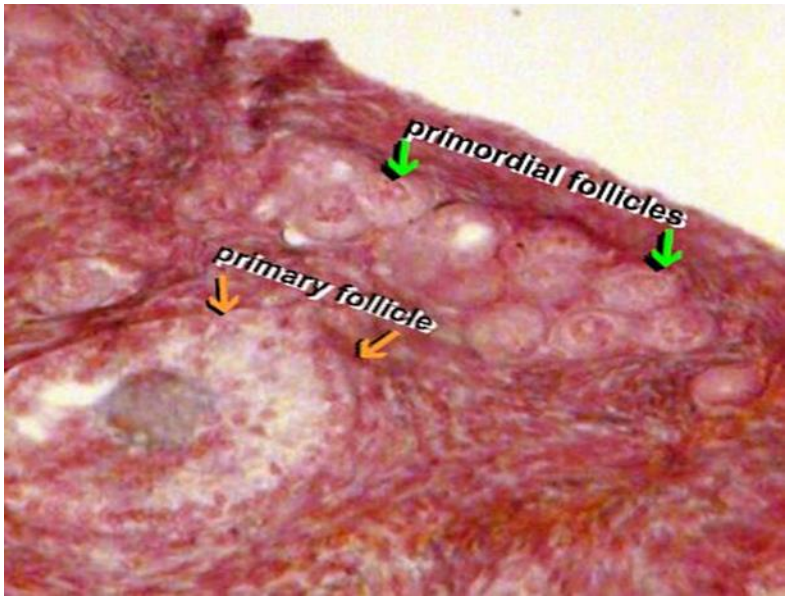


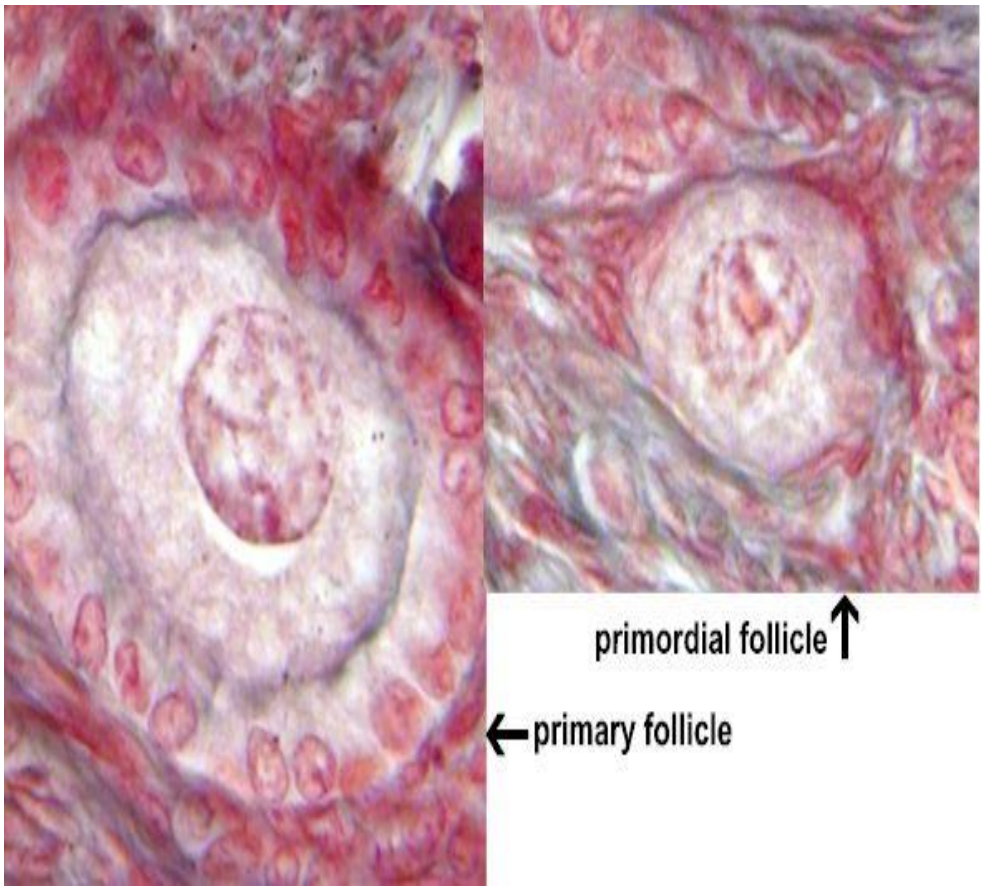
Figure 6: developmental stages of Graafian follicl مراحل تطور حويصله جراف



Black arrows - corpus albicans الاجسم الاصفر
Blue arrows - secondary follicle بيضيه ثانويه
Pink arrows - portions of mature follicles اجزاء من حويصله تحتوى بيضه الناضجه




primordial follicles
primary follicle


primordial follicle
primary follicle

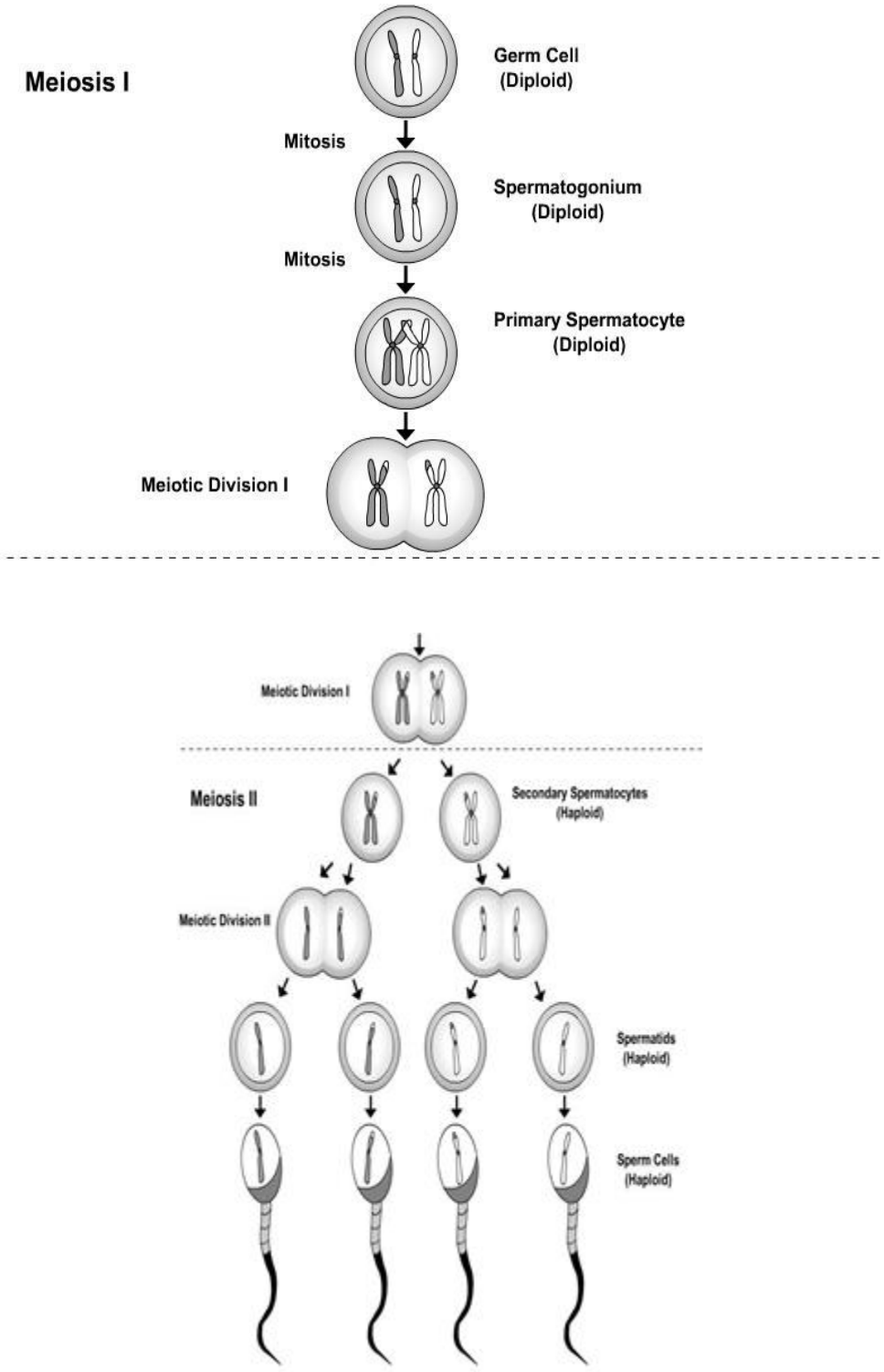


Figure 7: developmental stages of sperms

مراحل تكوين الحيوان المنوى

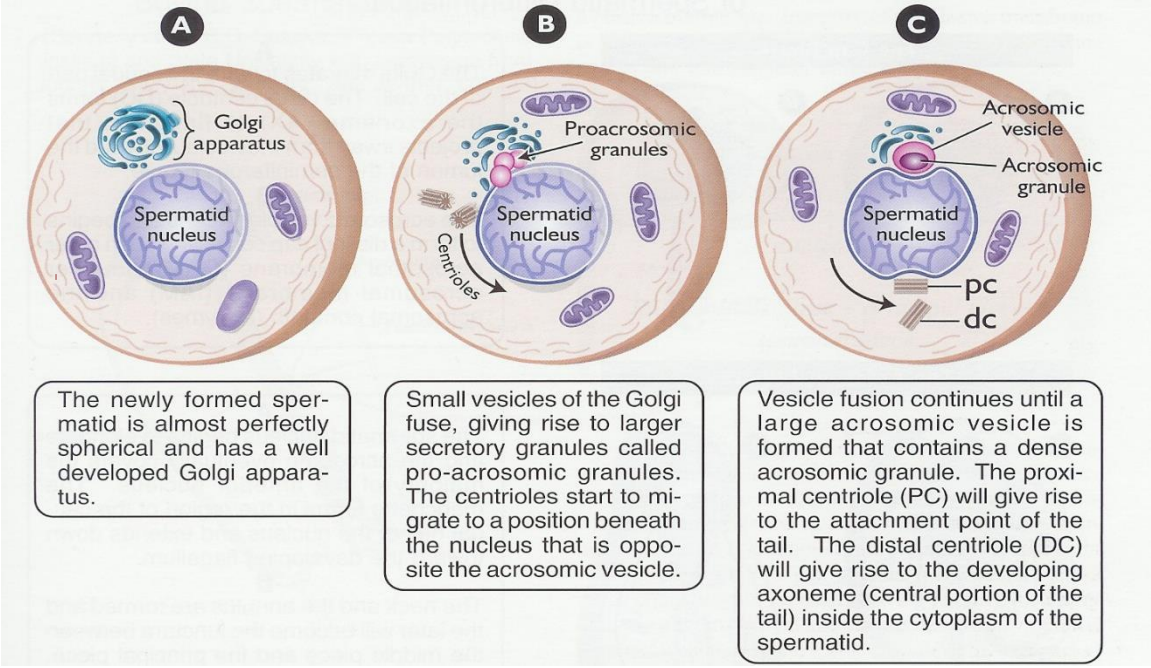
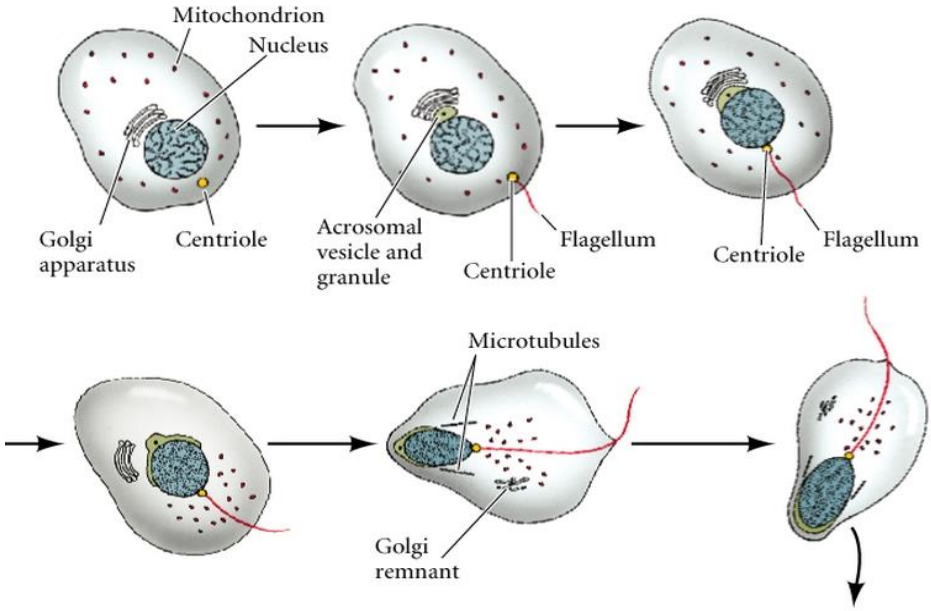


Figure 3: The golgi phase of spermatid differentiation



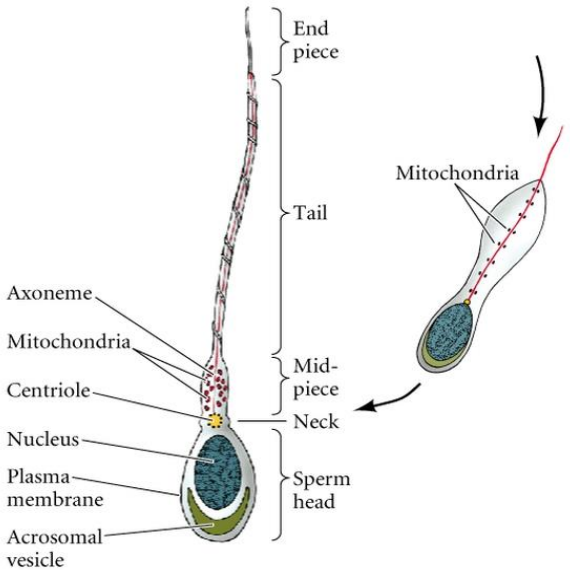
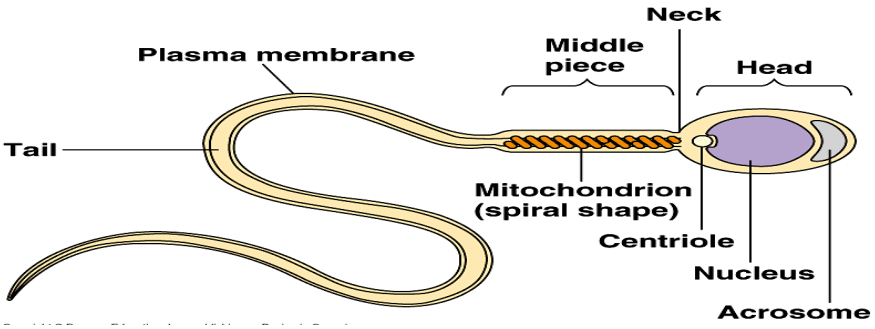


Figure 9: Differentiation stage of sperm



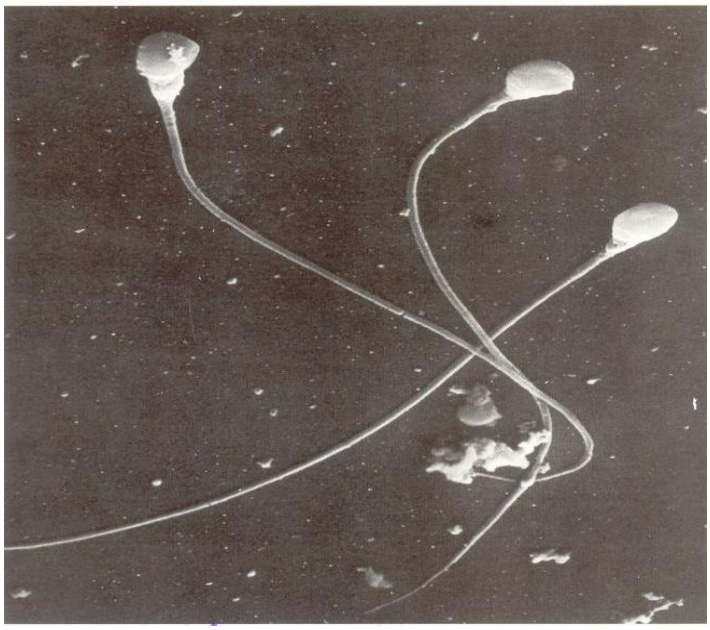


Figure 10: Structure of sperm

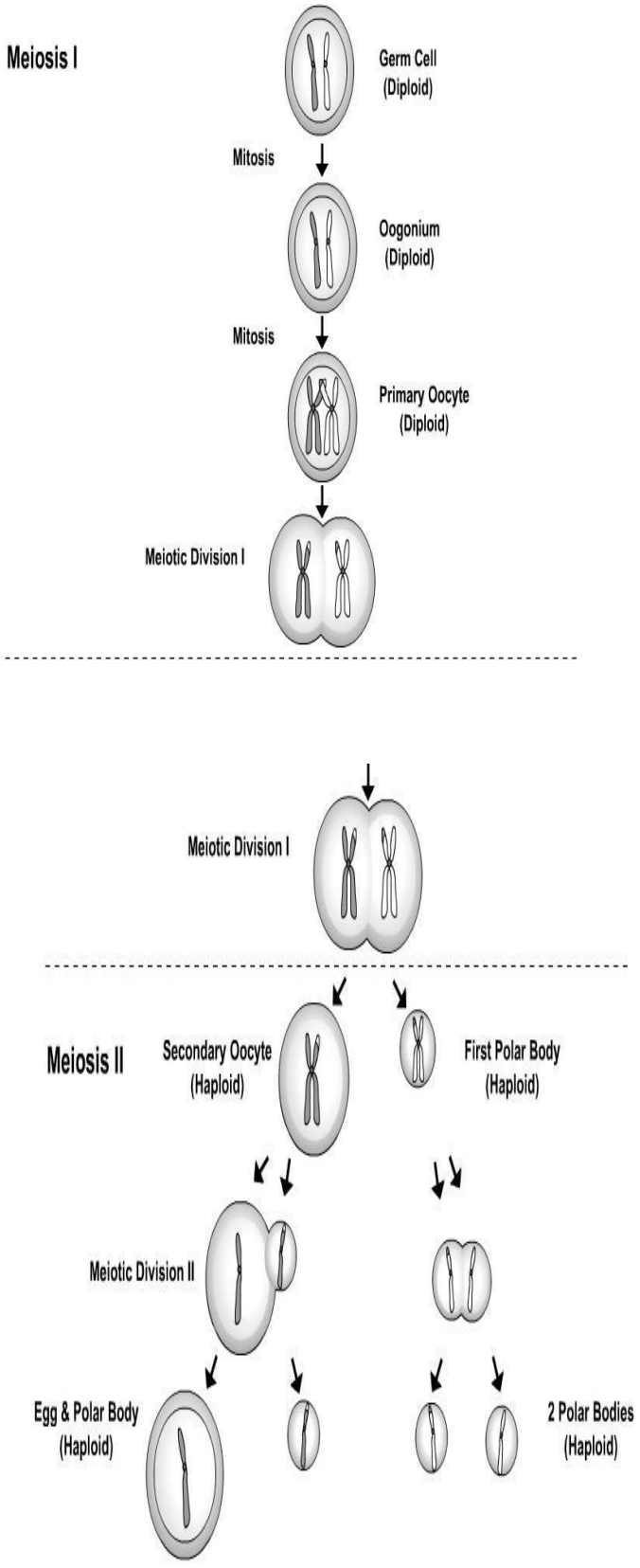
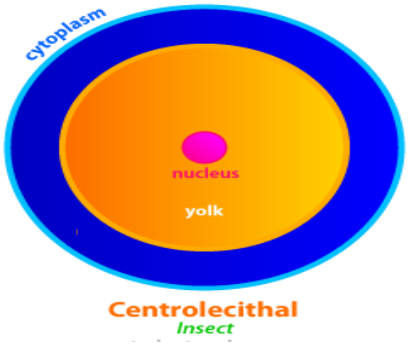
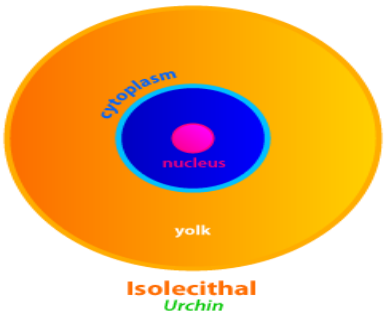


Figure 114: developmental stages of oocytes

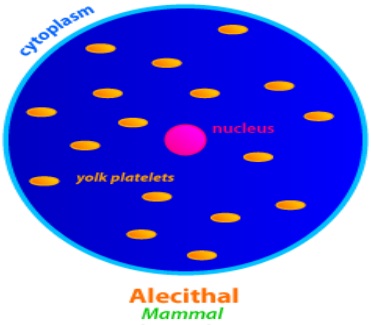
مراحل تكوين البيضه



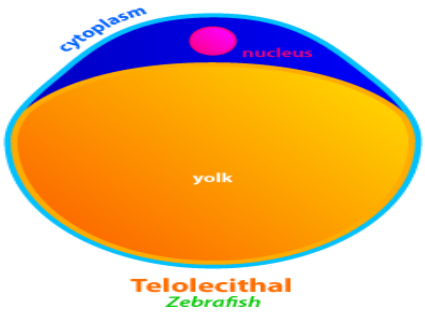
بويضة مركزية المح



بويضة متساوية المح



بويضة قليلة المح



بويضة طرفية المح

Figure 12: Types of eggs

انواع البويضات من حيث المح

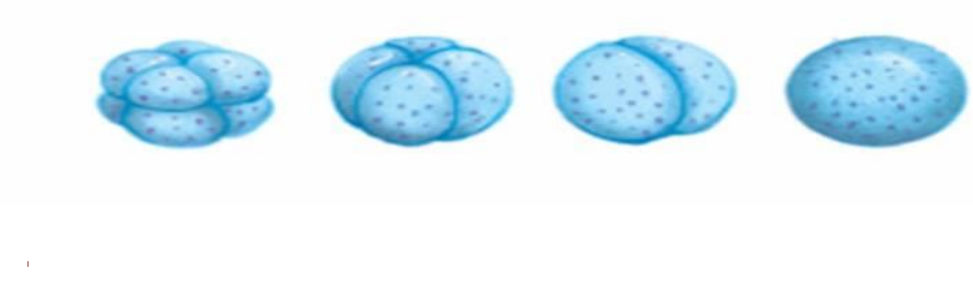


Figure 13: Equal holoblatic cleavage الانقسام المتساوى

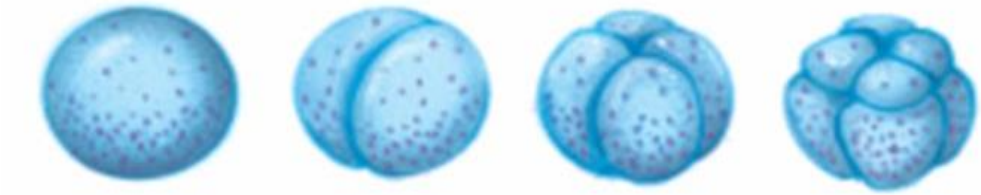


Figure 14: Unequal holoblatic cleavage الانقسام غير المتساوى

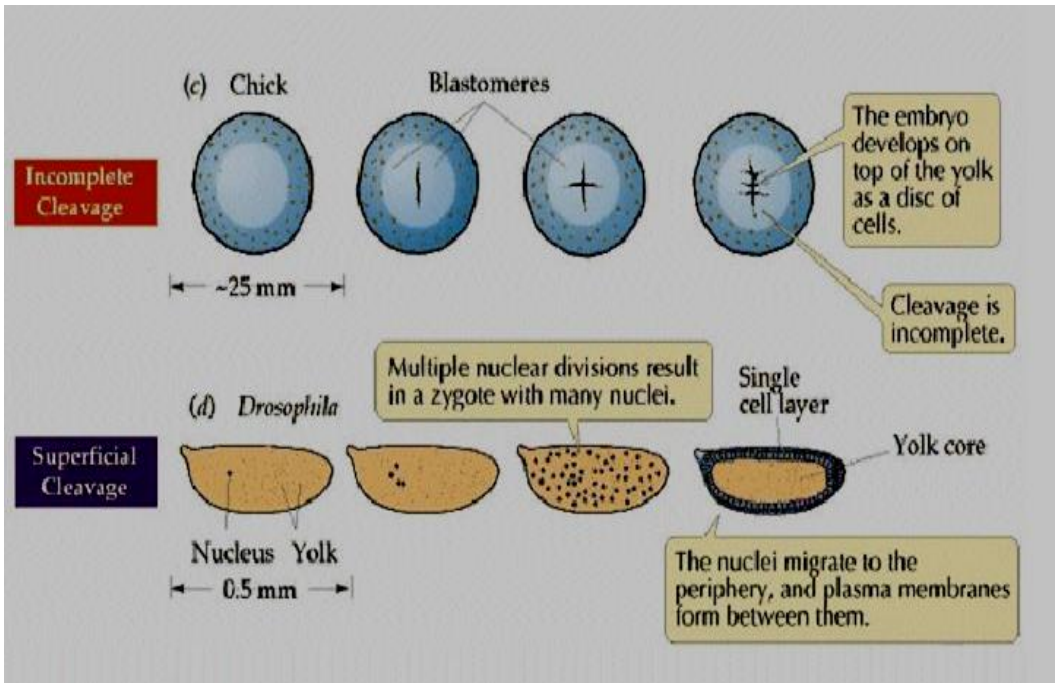


Figure 15 :Discodial and superficial meroblastic cleavage

Figure 16: Superficial meroblastic cleavage

Early developmental stages of Amphioxus

التطور الجنينى المبكر للسهيم

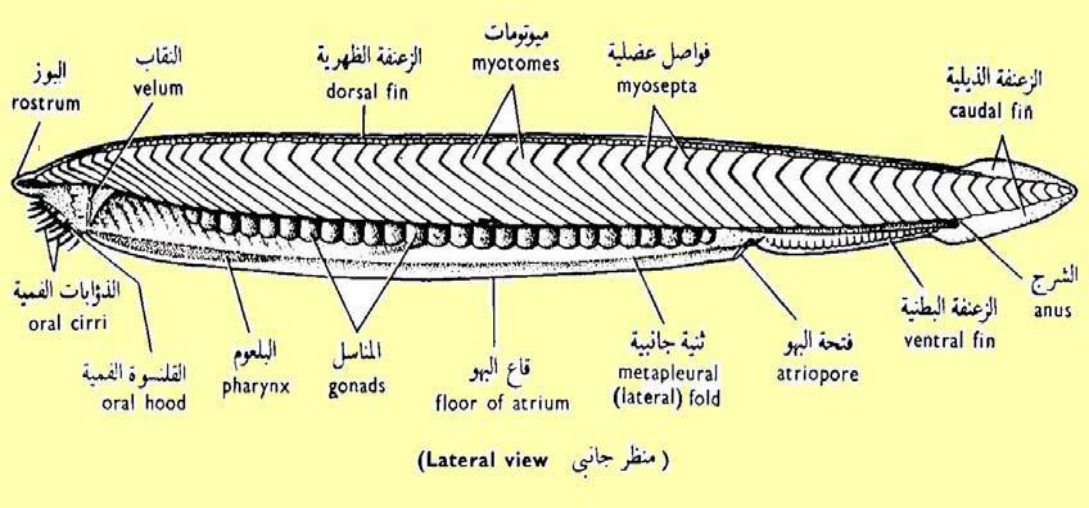


Figure 17: General shape of Amphioxus الشكل العام للسهيم

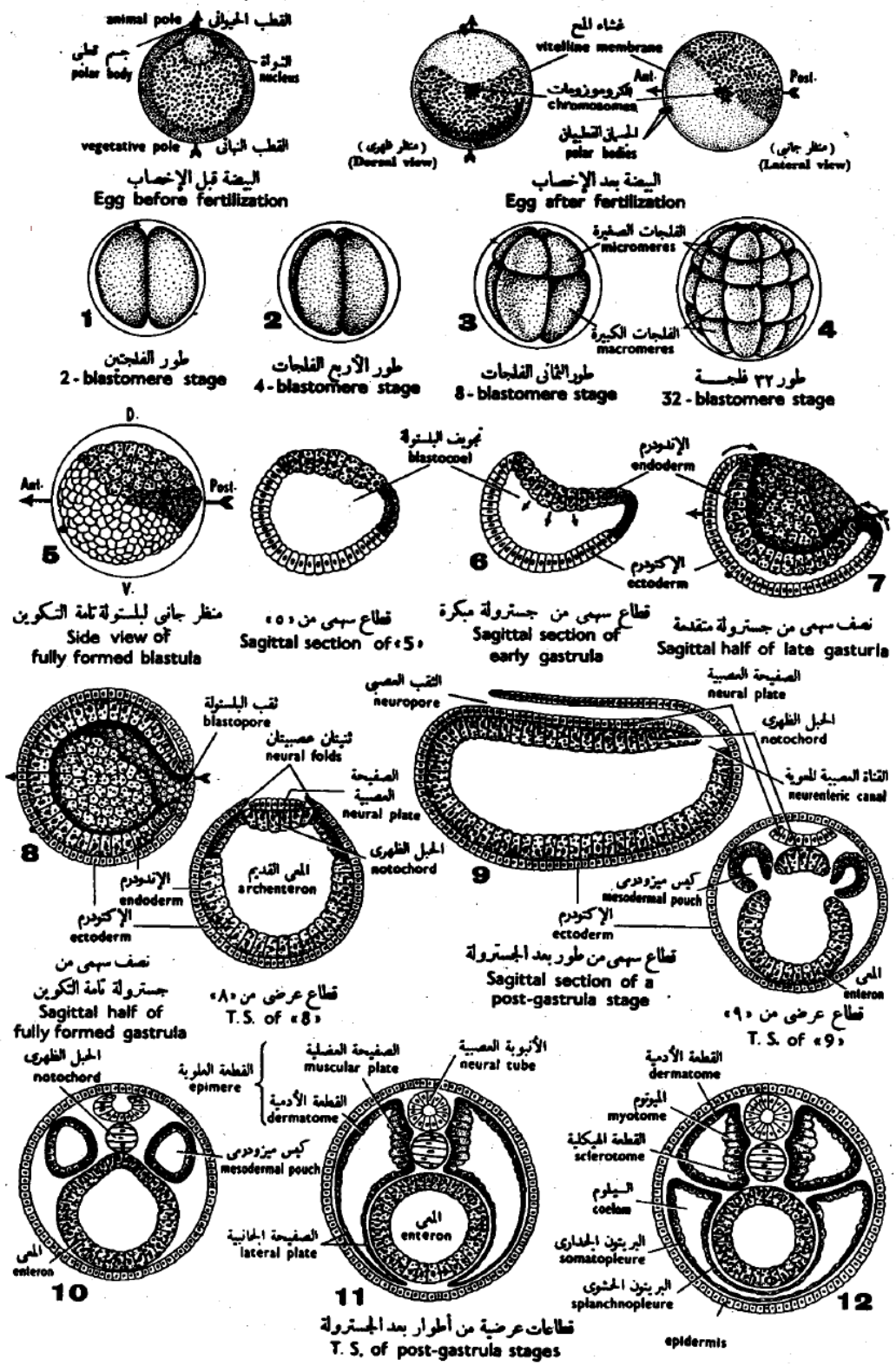
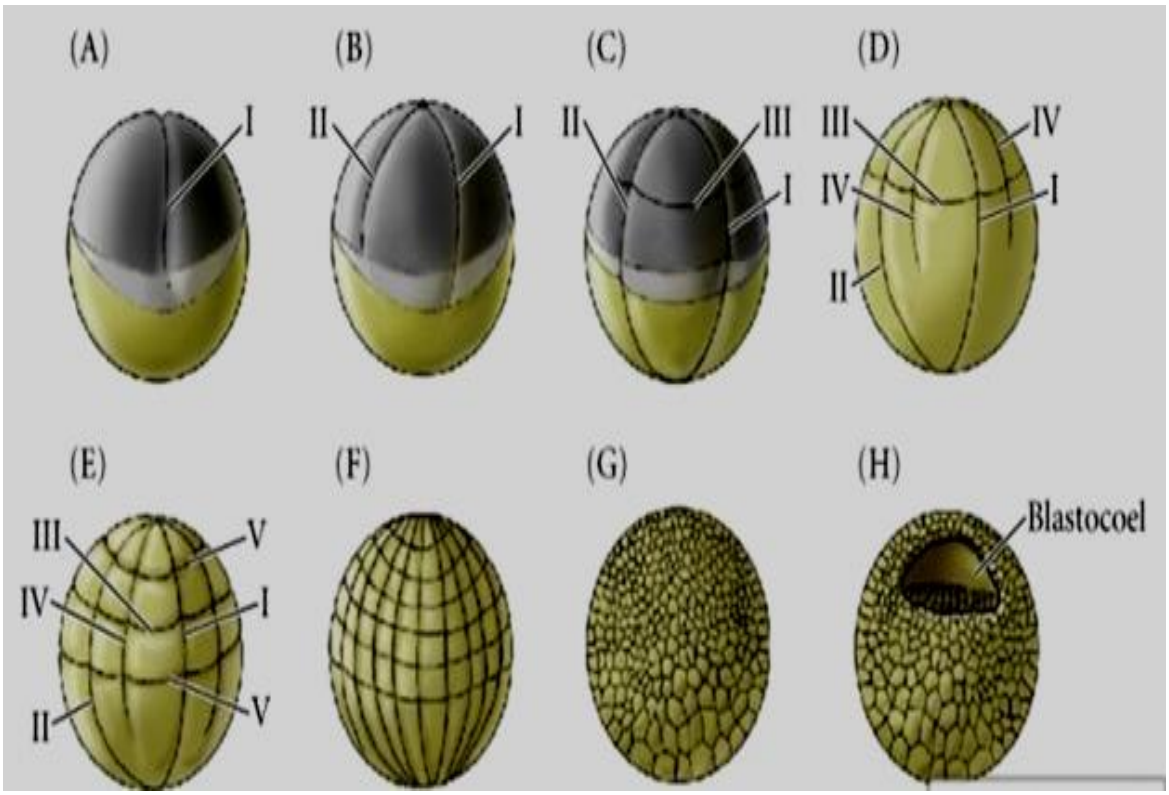


Figure 18: Early developmental stages of Amphioxus

التطور الجنينى المبكر للسهيم

Early developmental stages of Toad

مراحل التطور الجنيني المبكر للضفدعة



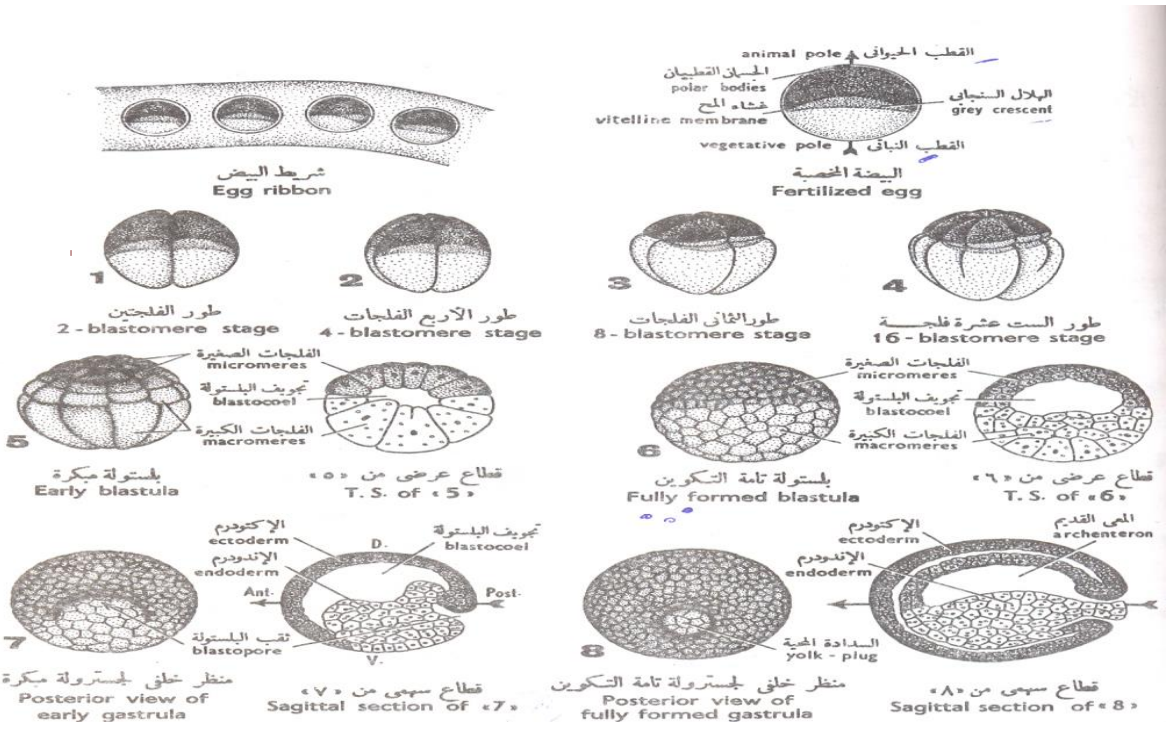
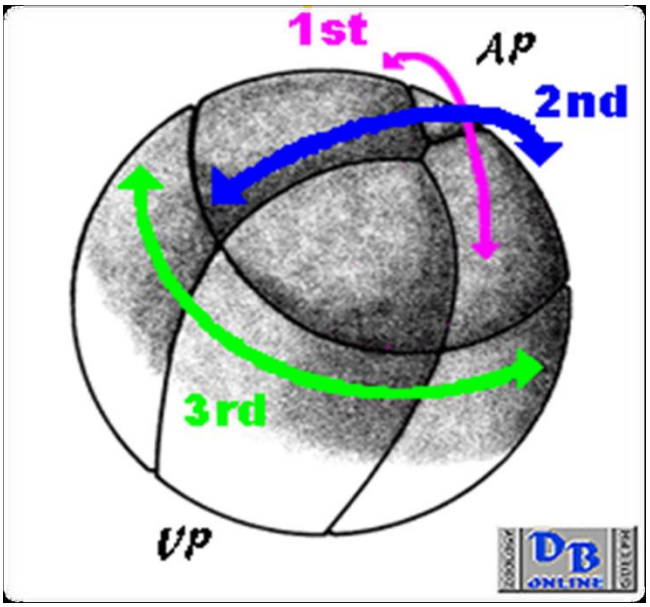


Figure 19: Early developmental stages of Toad



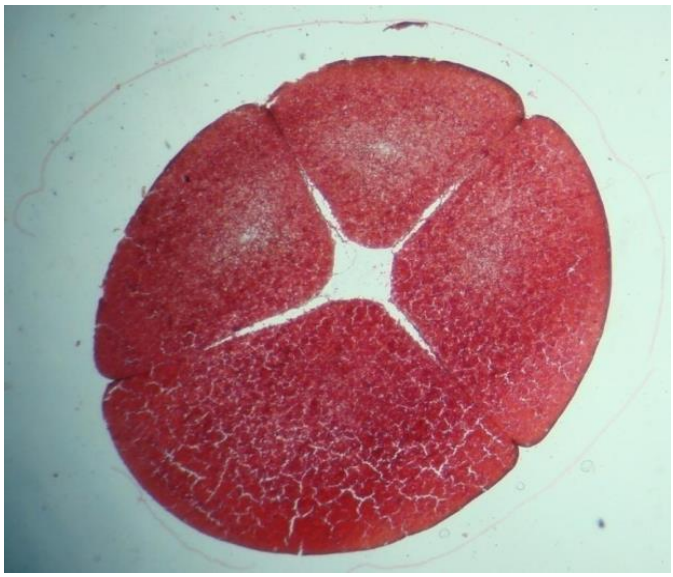


Figure 20 : 4 – blastomers stage

طور الاربع فلجات

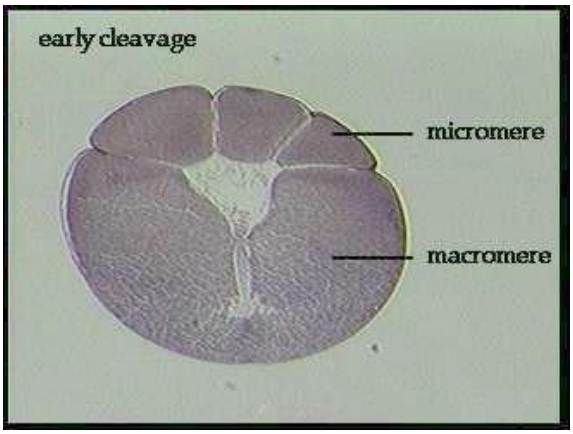


Figure 21 ٥: 8– blastomers stage –

طور الثمان فلجات

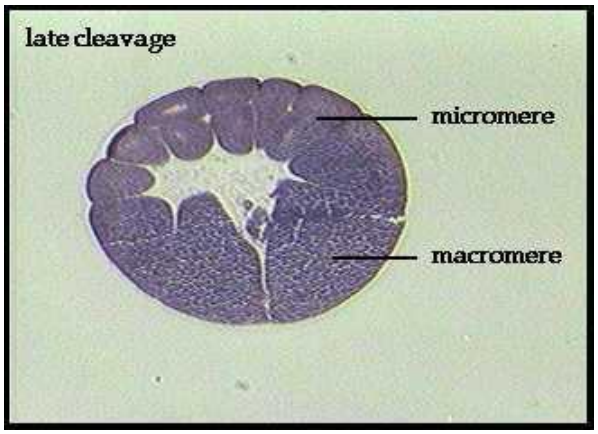


Figure 22 : 16– blastomers stage

طور الست عشر فلجه

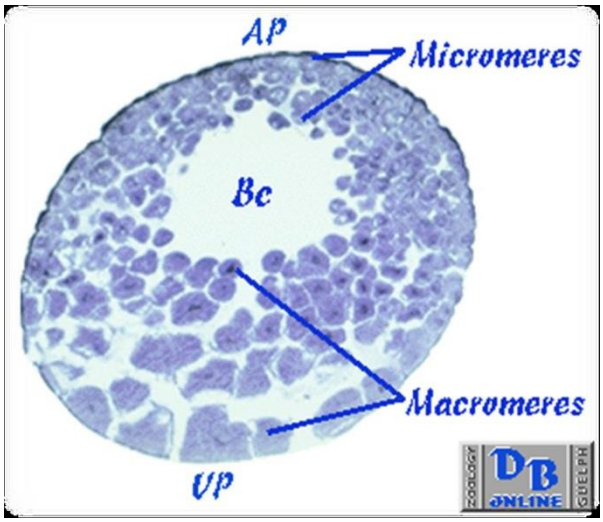


Figure 23: Blastula stage

البلاستوله

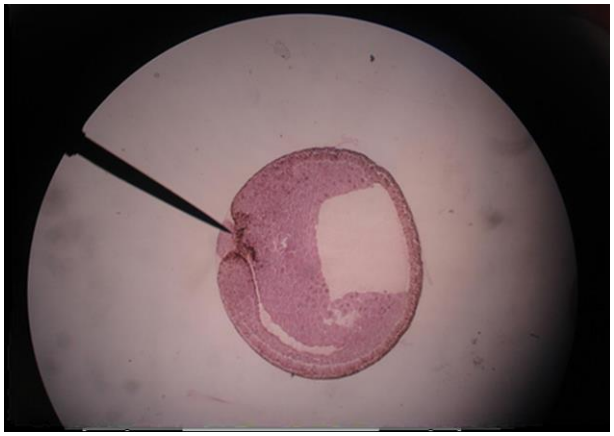


Figure 24 : Gastrula stage showing yolk plug

طور الجاستروله يوضح السداده المحيه

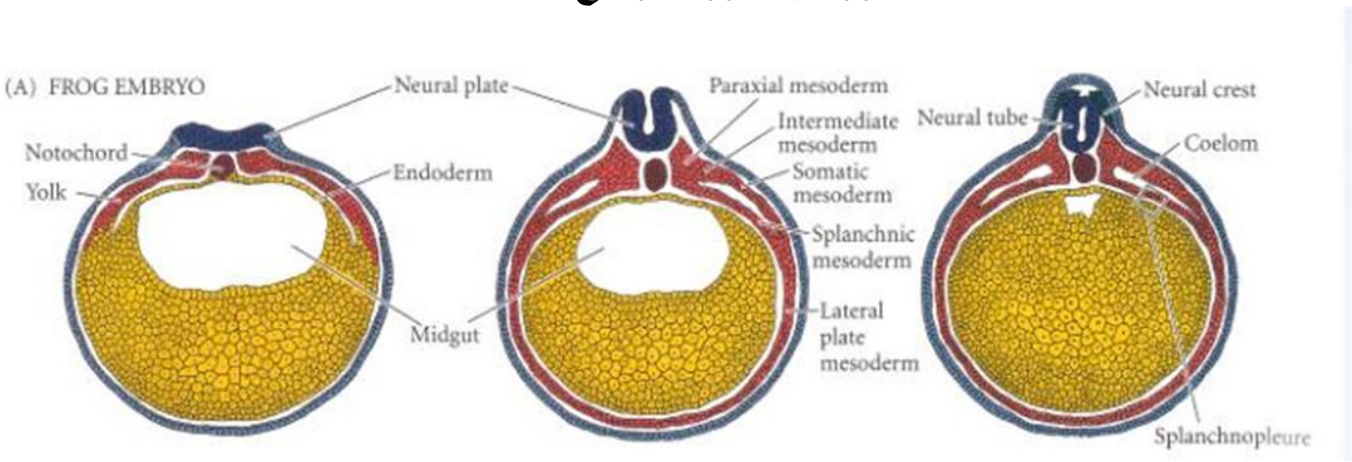


Figure 25 : Post-gastrula stages of toad embryo

اطوار مابعد الجاستروله للضفدعه

Early developmental stages of Aves

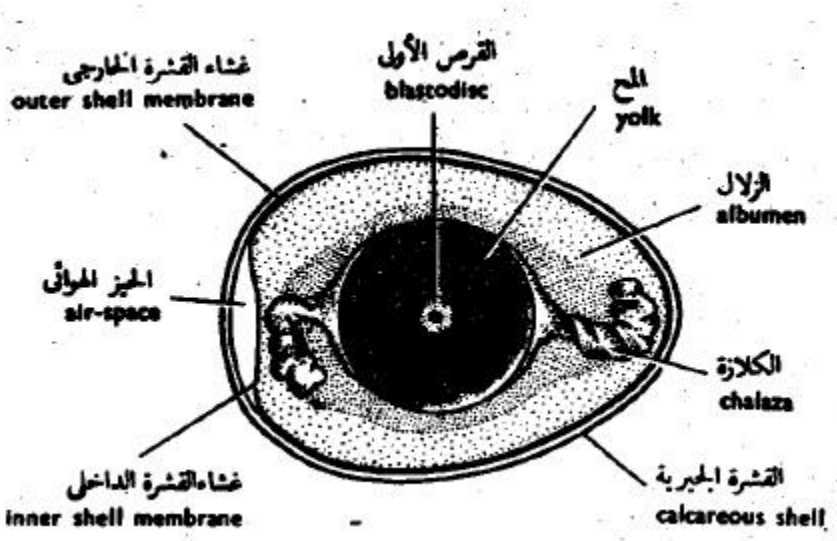


Figure 26 : Hen's egg بيضه الدجاجه

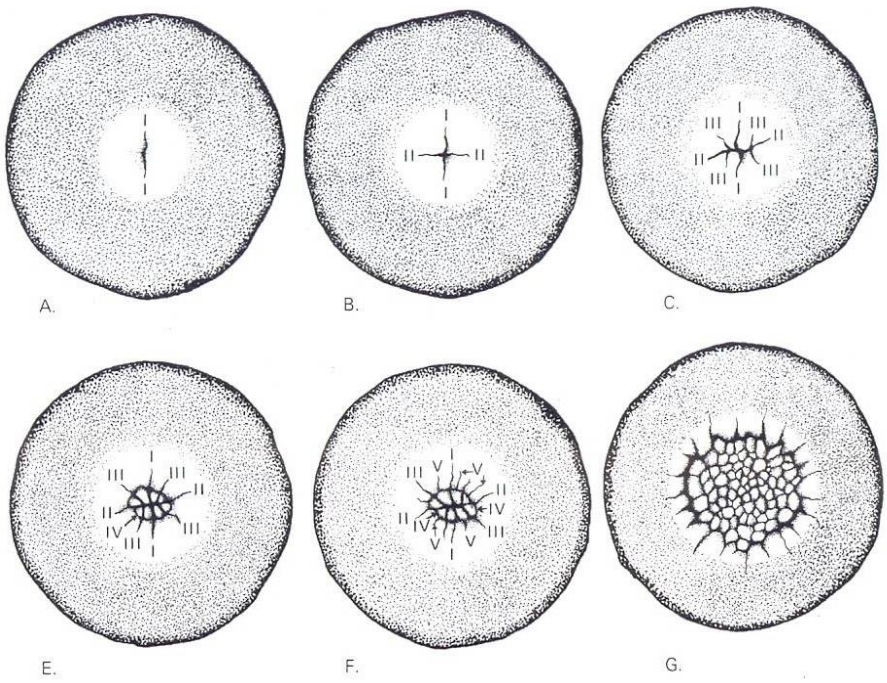
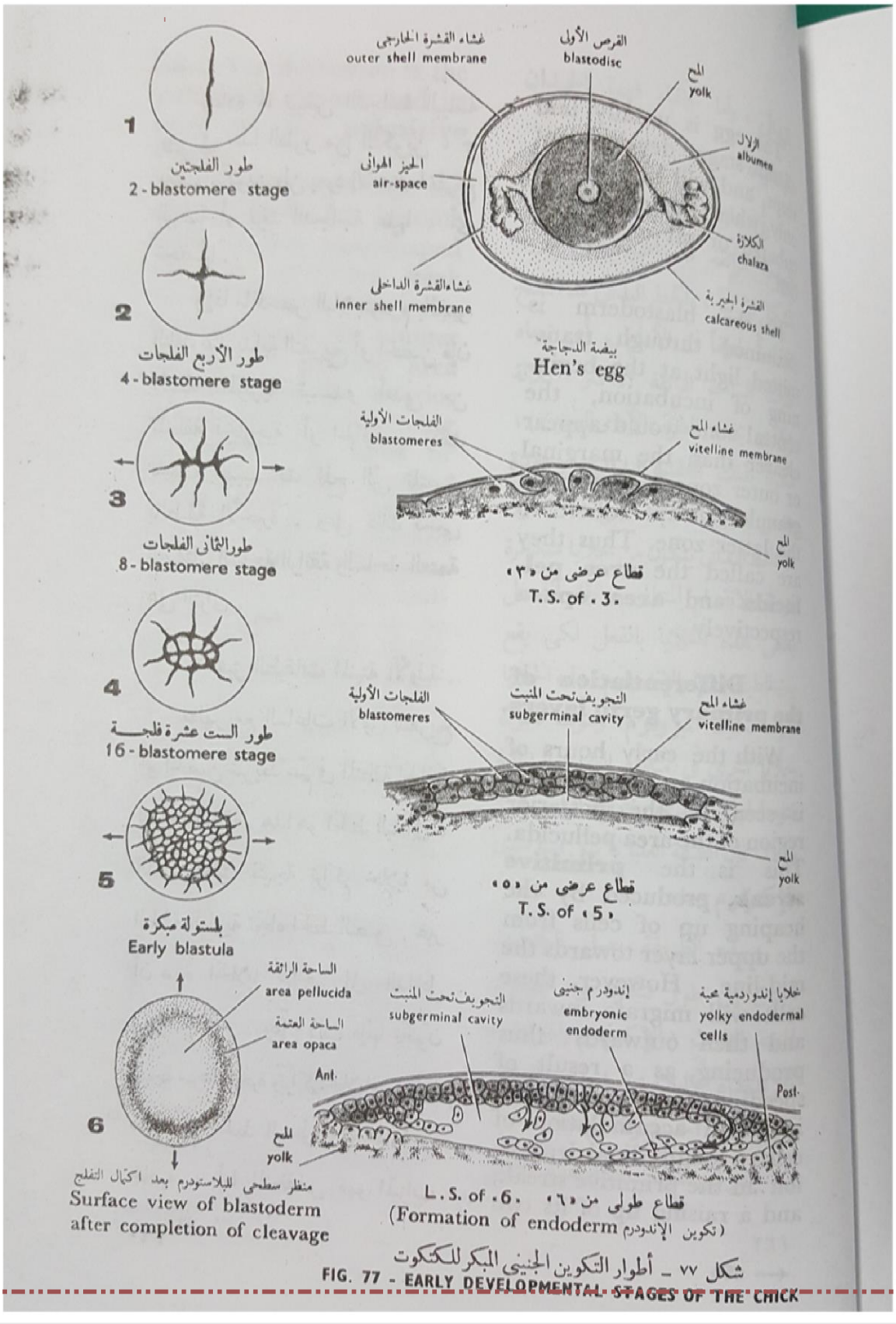


Figure 27: Early developmental stages of Aves

التطور المبكر للطيور (التفلج والبلاستوله)



شكل ٧٧ ـ أطوار التكوين الجنينى المبكر للكتكوت

FIG. 77 - EARLY DEVELOPMENTAL STAGES OF THE CHICK

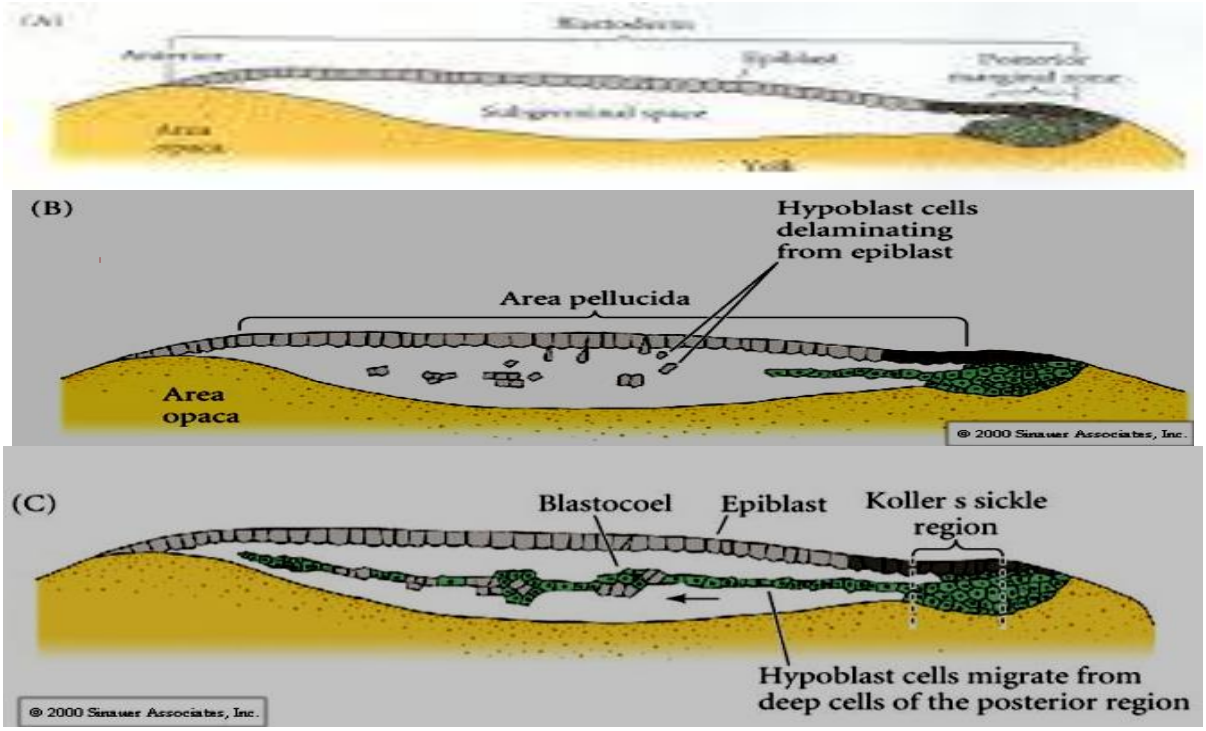


Figure 28: Blastulation

تكوين البلاستوله

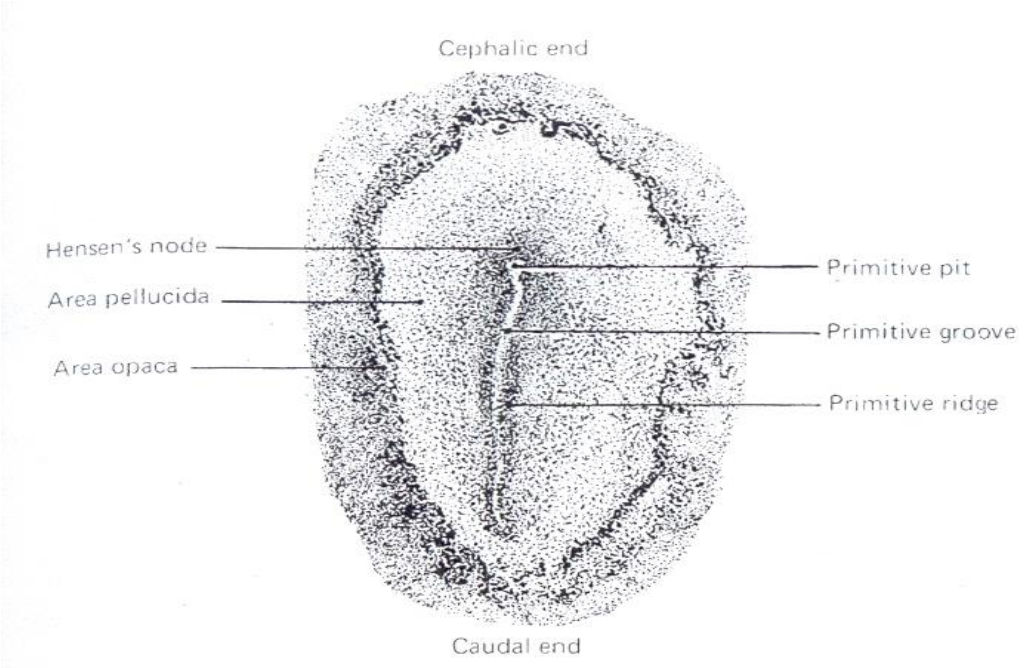


Figure 29: Dorsal view of entire chick embryo about 16 hours of incubation in the primitive-streak stage

منظرظهرى داخل جنين ١٦ ساعه

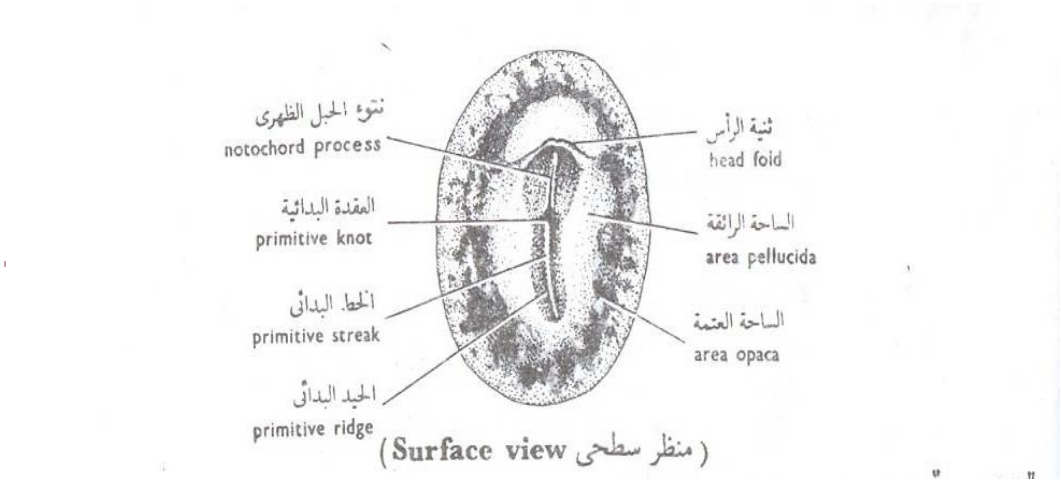


Figure 30: Dorsal view of entire chick embryo about 20 hours of incubation

منظر ظهرى لجنين ٢٠ ساعه

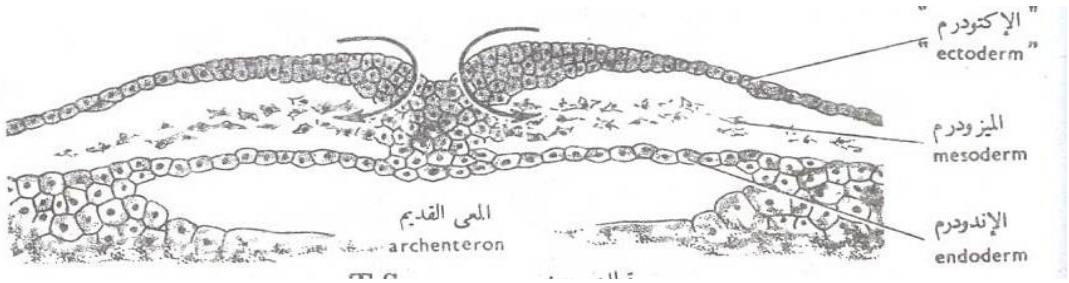


Figure 31: T.S. of chick embryo about 20 hours of incubation

Formation of mesoderm

قطاع عرضى لجنبين ٢٠ ساعه (تكوين الميزوديرم)

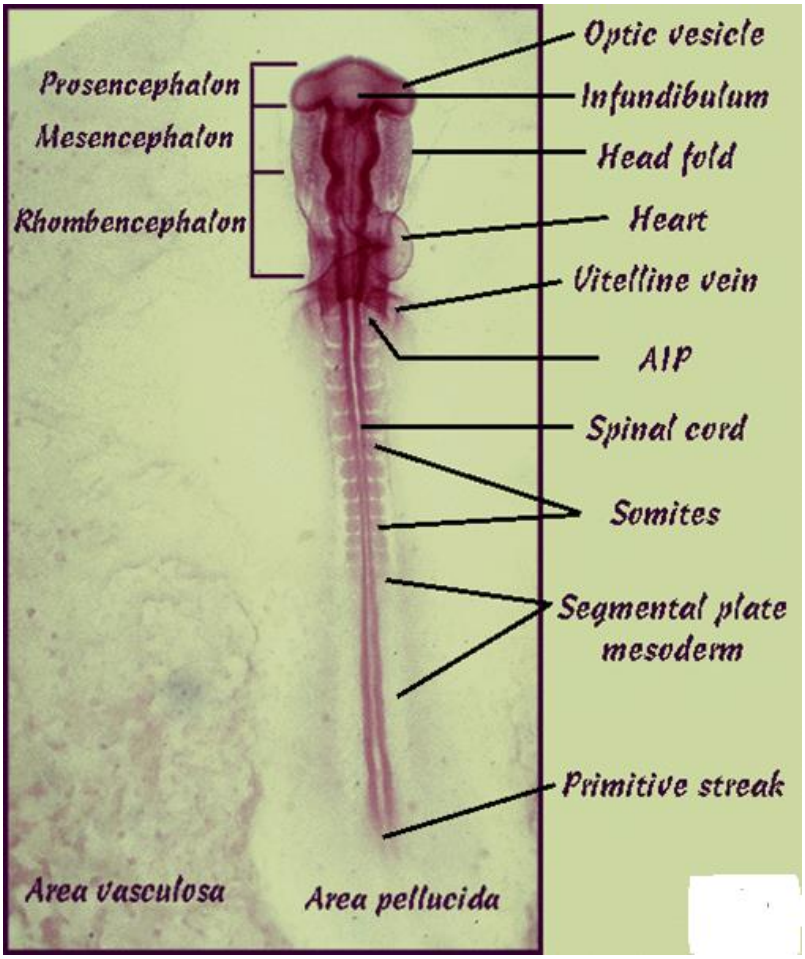


Figure 32: Dorsal view of entire chick embryo about 33 hours of incubation

منظهر ظهری لجنین ۳۳ ساعه

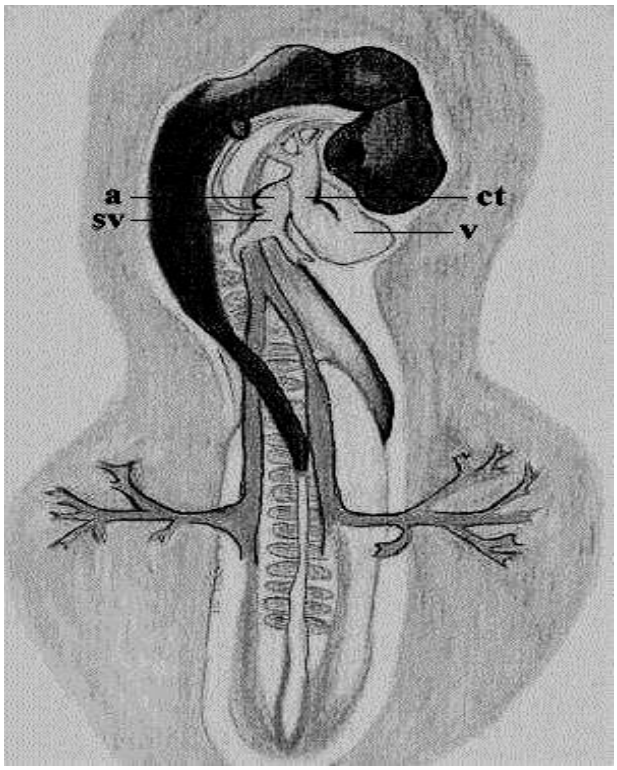


Figure 33: Dorsal view of entire chick embryo about 48 hours of incubation

منظر ظهرى لجنين ٤٨ ساعه

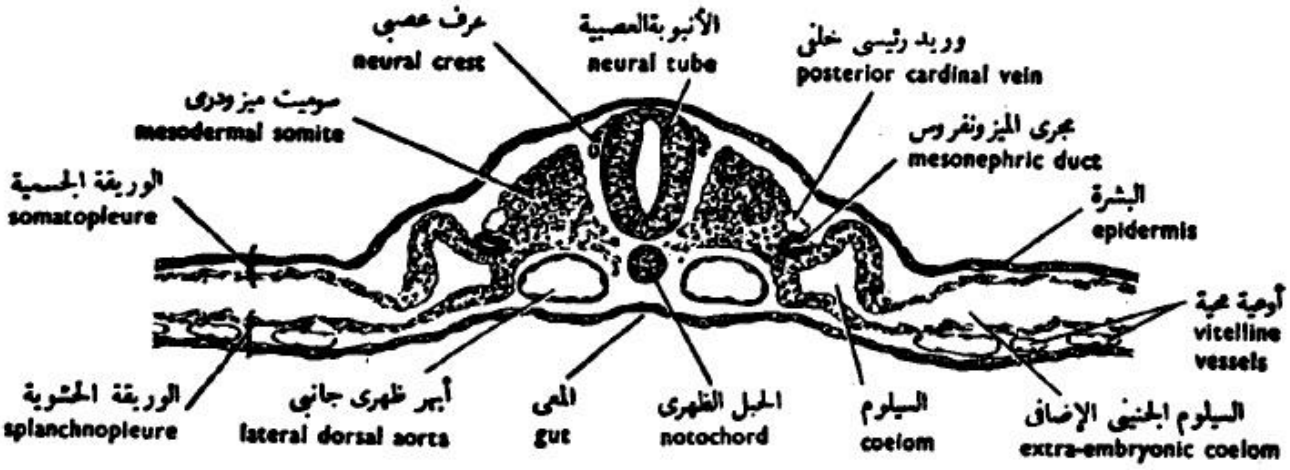


Figure 34: T.S. in trunk region of chick embryo about 48 hours of incubation

قطاع عرضى فى جذع جنين ٤٨ ساعه

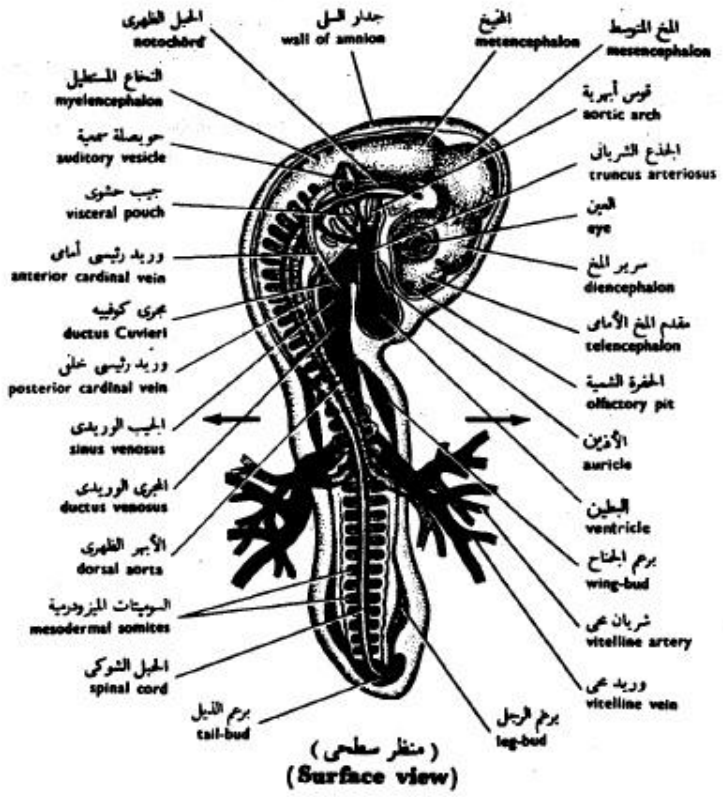


Figure 35: Dorsal view of entire chick embryo about 72 hours of incubation

منظر ظهرى لجنين ٧٢ ساعه

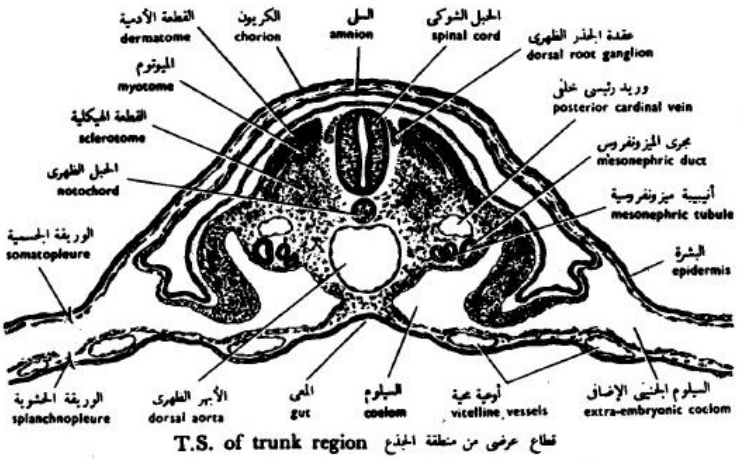
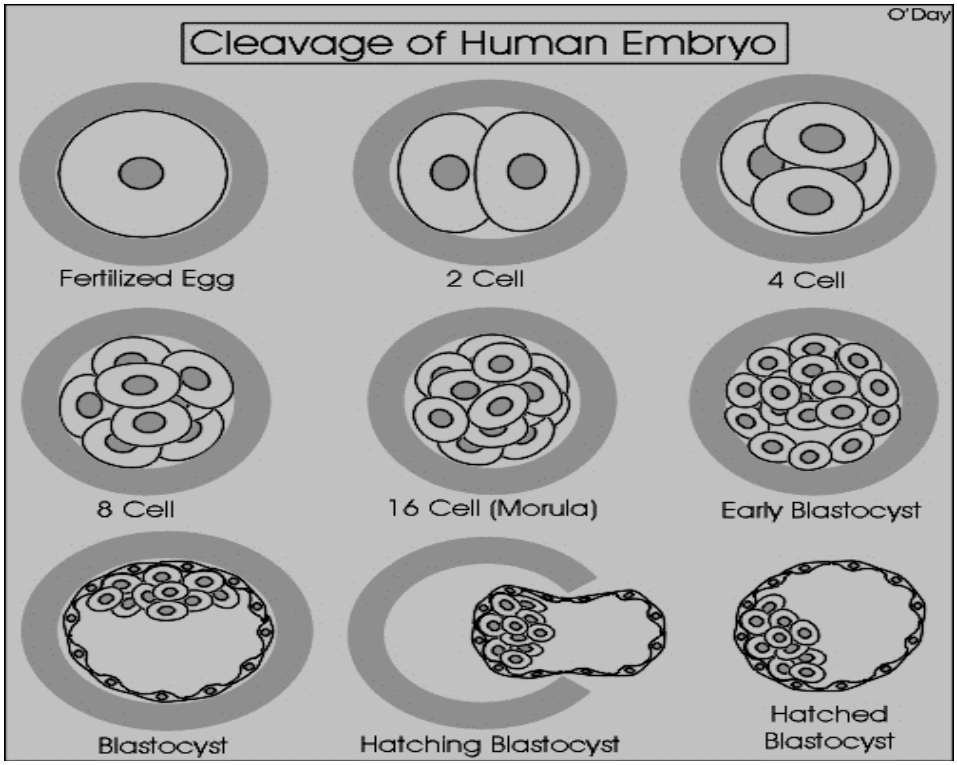


Figure 36: T.S. of chick embryo about 72 hours of incubation

قطاع عرضى لجنين ٧٢ ساعه

Early developmental stages of Mammals (human)

التطور المبكر للثدييات



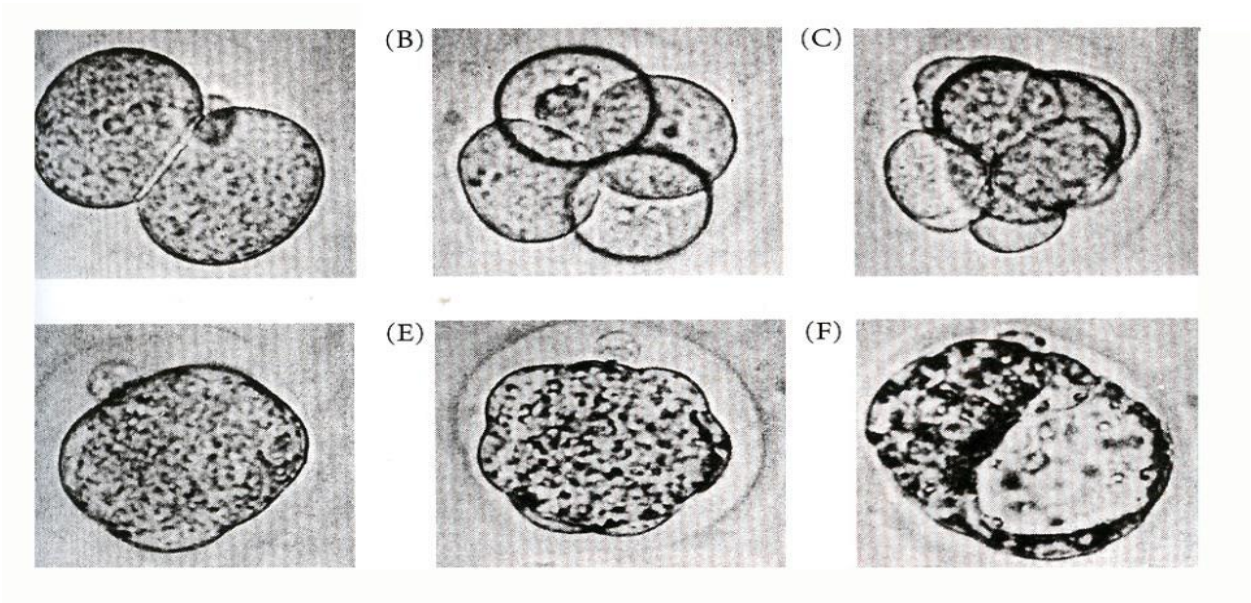


Figure 37٦: Early developmental stages of Mammals (human)

المـــــــــــــــــراجـــــــــــــــــــــع

المراجـــع العربية:

١- أحمد حماد الحسيني و إميل شنودة دميان (١٩٩٢): بيولوجية الحيوان العملية (الجزء الأول)- الطبعة الخامسة عشر – دار المعارف -القاهرة.

٢- الفريد ف. هوتنر (١٩٦٨): الأساسيات في علم تكوين الجنين للفقاريات– مؤسسة فرانكلين .

٣- مني فريد عبد الرحمن (٢٠٠٤): أطلس علم الأجنة ، المكتبة الاكاديمية - القاهرة.

المراجـــــع الاجنبية:

1- Bruce M. Carlson (1996) : Patten's foundations of embryology.

sixth edition, The McGraw. Hill Companies, Inc.

١- G. S. sandhu, Sharad Srivastava and C.K. Arora (2005): A text book of embryolog. Anmd publications PVT. LTD.

3-Scott F. Gilbert (2016): Development Biology, SinSinauer Associates, Inc.Publishers Sunderland, Massachusett. Ninth edition.

Egyptian Fauna

Practical Part

Zoology Department - Faculty of Science

2022-2023

Ecology
The Egyptian Fauna
(Practical part)

The Egyptian environment includes many types of animals, which are collectively called the **Fauna** to distinguish them from the plants, which are called **Flora**.

These animals differ in their habitat, some of them live in water such as fishes, some mammals and reptiles, some live in both land and water such as amphibians, and others live in the air such as birds or on land such as reptiles and mammals.

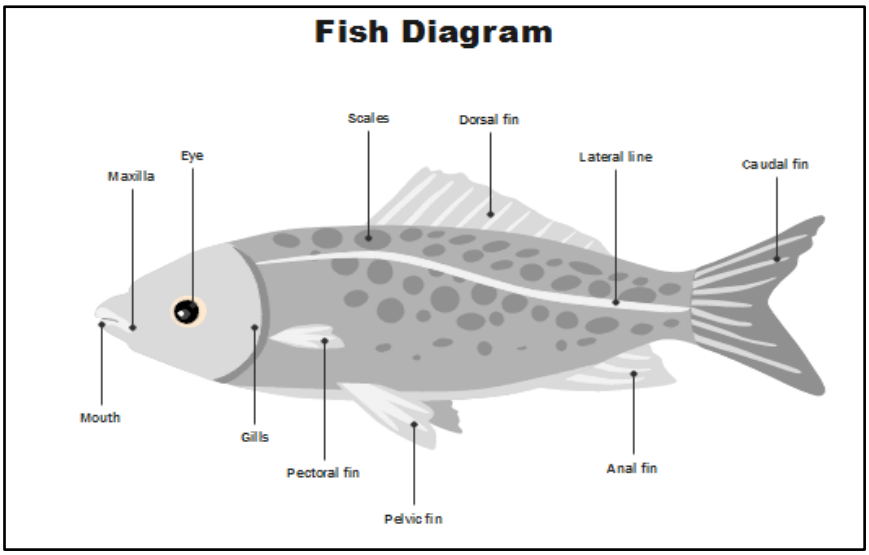
In the practical part of this course, we will study the classification, description, and the ecology of animals in the different classes of vertebrates in the Egyptian Fauna as follows:

1- Chondrichthyes (Cartilaginous fishes)
2- Osteichthyes (Bony fishes)
3- Reptilia (Reptiles)
4- Aves (Birds)
5- Mammalia (Mammals)

Fishes

Fishes including cartilaginous and bony fishes are aquatic. Most of cartilaginous fishes are marine that live in seas and oceans, while bony fishes are both fresh and marine that can be found in seas, oceans, rivers, and lakes.

Fish body consists of three parts: **head**, **trunk**, and **tail**. It has special characteristics from which it can be identified and described as follows:



Fish description key:

1- **Body shape**: - Cylindrical
- Dorsoventrally depressed (from top to bottom)
- Bilaterally compressed (from side to side)

2- **Body colour**: (Dorsal surface - Ventral surface)

3- **Scales**: (Present - Absent)

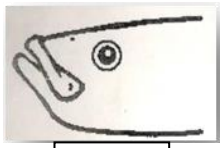
4- **Head**: a- size (small - medium - large)

b- shape (cylindrical - dorsoventrally depr. - bilaterally comp.)

c- eyes (size - shape "round/oval" - position on the head)

d- mouth: - position (terminal - dorsal - ventral)
- size (narrow - wide)


terminal


dorsal


ventral

e- nostrils: (one or two on each side - size)

f- spiracles: (a pair behind the eyes) **"Cartilaginous fishes"**

g- Teeth: (present - absent)

h- Barbles: (present – absent)
(type and number: nasal - maxillary - mandibular)

i- Gill slits: (number - position)

operculum **"bony fishes"**:

(attached - separated)

(Overlapped - non overlapped)

5- **Trunk**: a- size (small - medium - large)

b- shape (cylindrical - dorsoventrally dep. - bilaterally comp.)

c- fins:

Paired : <u>pectoral fins</u>

(with "week - strong" spine or without)

<u>pelvic fins</u>

a- with spine or not (week - strong)

b- position to pectoral : Anterior / posterior

single : <u>dorsal fin:</u> (One or two parts) fin rays / adipose

<u>anal fin:</u> (long / short)

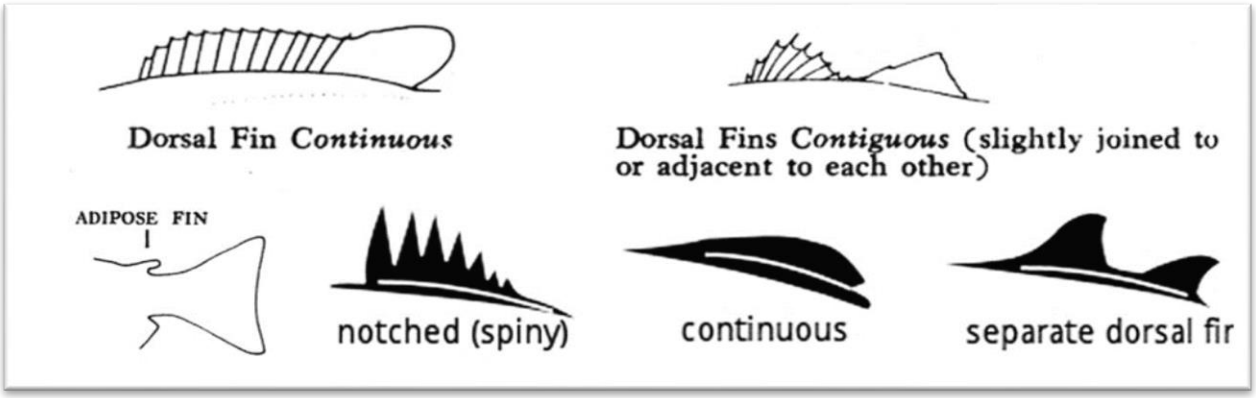
<u>caudal fin:</u>

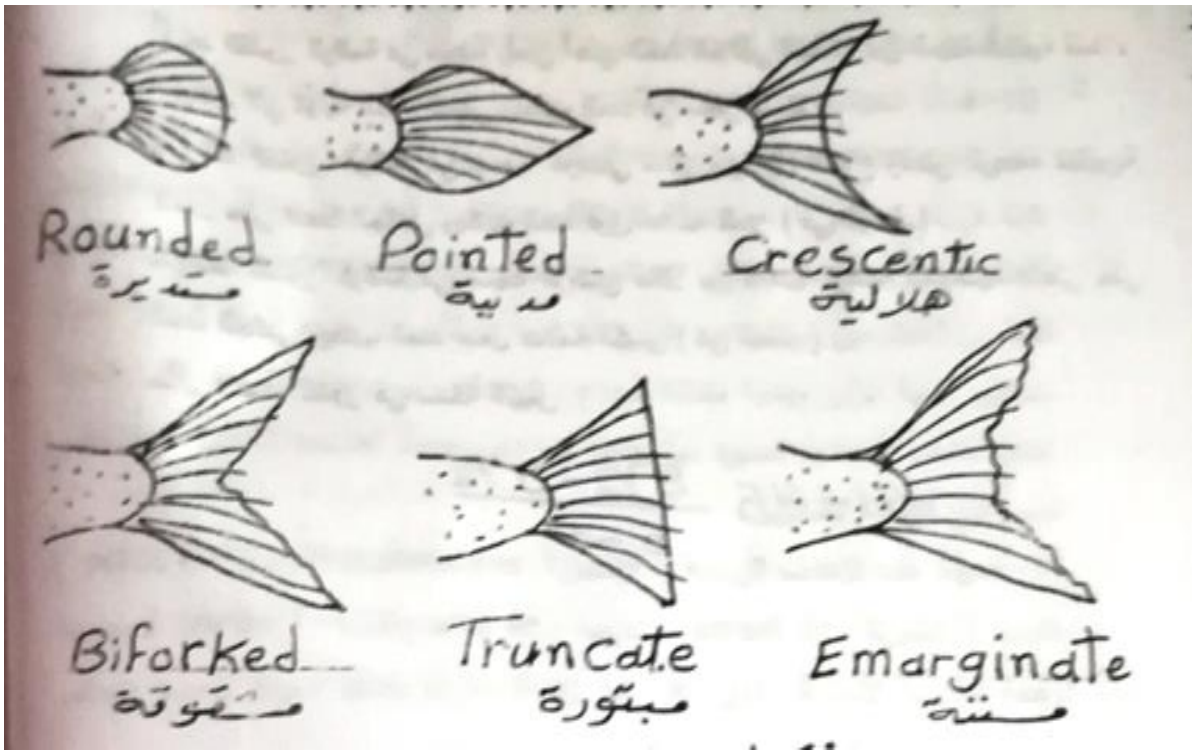
(Biforked, truncate, rounded, Crescentic, …etc.)

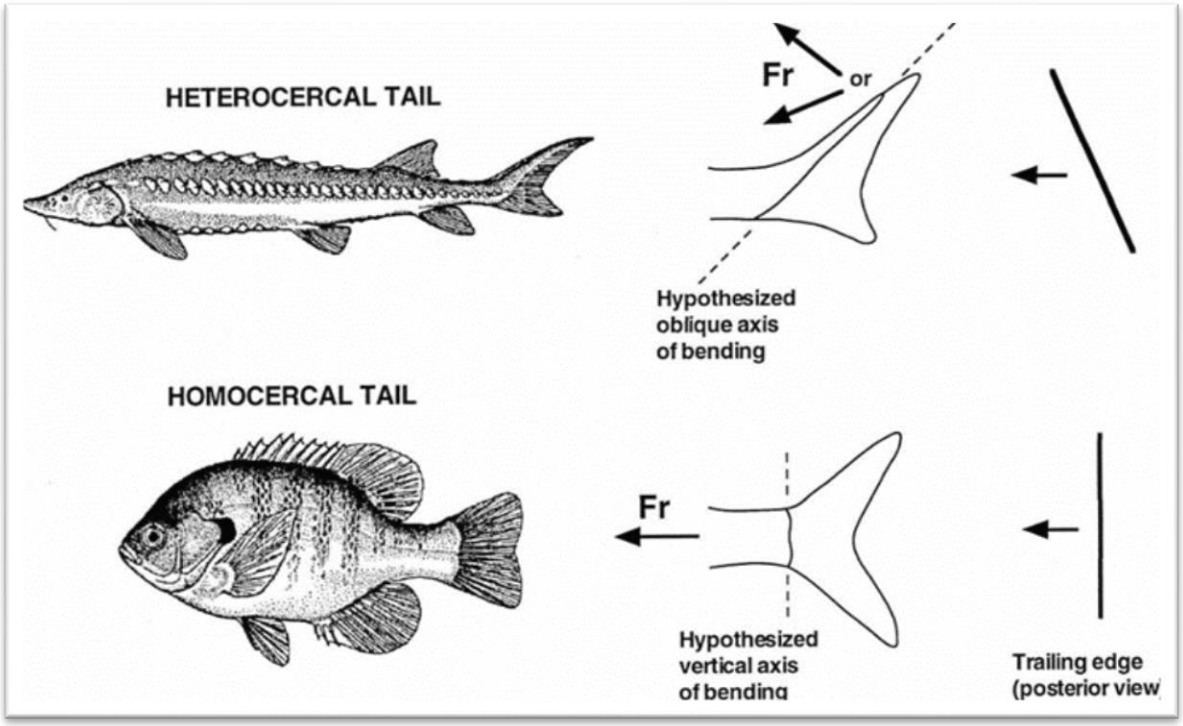
d- Lateral line (one or two on each side)

6- **Tail:** (homogeneous / heterogeneous)

7- **Comment:** (Ecology and Habitat - Nutrition - Adaptation - Reproduction).

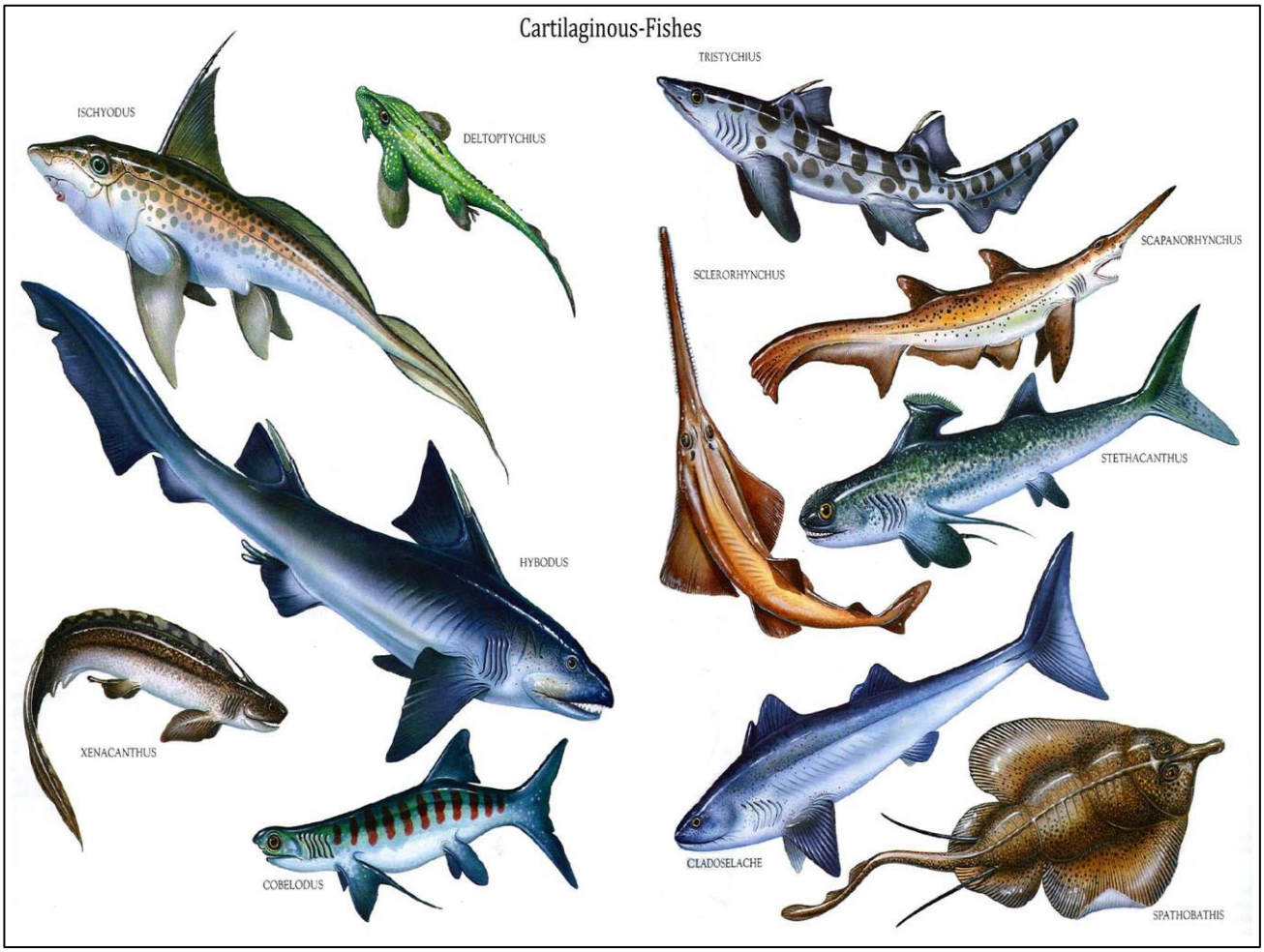



Rounded
مستديرة
Pointed
مدببة
Crescentic
هلالية
Biforked
مشقوقة
Truncate
مبتورة
Emargindate
مستنة


HETEROCERCAL TAIL
Fr
or
Hypothesized
oblique axis
of bending
HOMOCERCAL TAIL
Fr
Hypothesized
vertical axis
of bending
Trailing edge
(posterior view

Cartilaginous fishes

Class: Chondrichthyes



❖ **Example 1:** *Scyliorhinus canicula* كلب السمك

Kingdom	:	Animalia	
Subkingdom:		Eumetazoa	
Phylum	:	Chordata	
Subphylum	:	Vertebrata	
Class	:	Chondrichthyes	
Subclass	:	Elasmobranchii (Selachii)	صفائحية الخياشيم
Order	:	Pleurotremata	جانبية الخياشيم
Family	:	Scyliorhinidae	
e.g.	:	*Scyliorhinus canicula*	

www.alamy.com - C8Y3YF

❖ **Example 2:** *Rhinobatus granulatus* المحراث

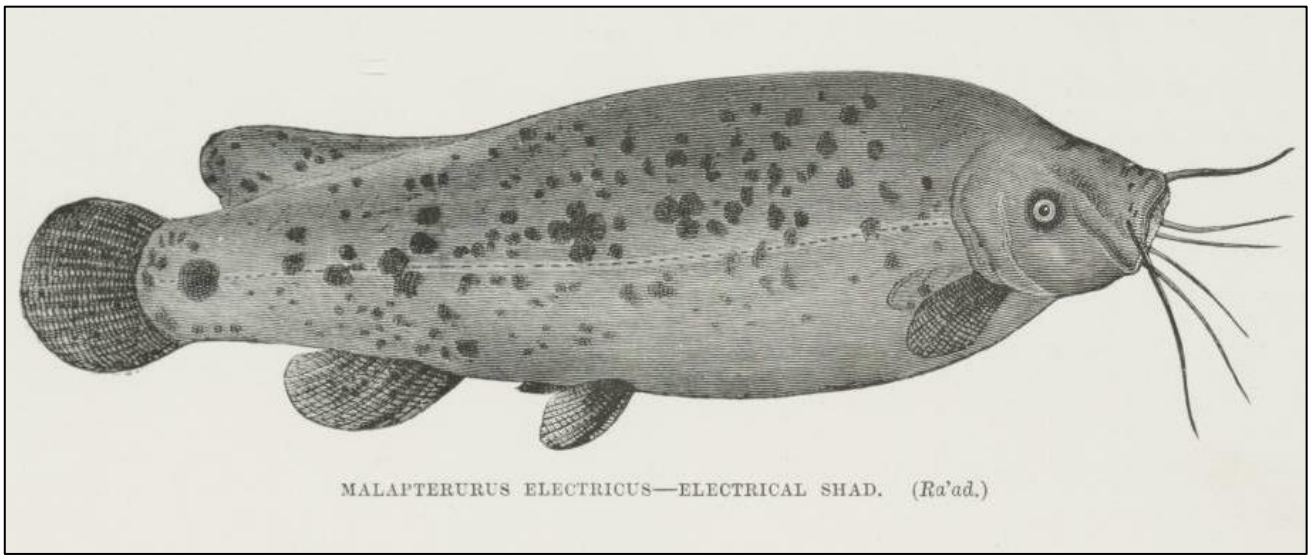
Kingdom	:	Animalia	
Subkingdom:		Eumetazoa	
Phylum	:	Chordata	
Subphylum	:	Vertebrata	
Class	:	Chondrichthyes	
Subclass	:	Elasmobranchii (Selachii)	صفائحية الخياشيم
Order	:	Hypotremata	بطنية الخياشيم
Family	:	Rhinobatidae	
e.g.	:	*Rhinobatus granulatus*	

Bony fishes

Class: Osteichthyes

❖ **Example 1:** *Malapterurus electricus* الرعاش

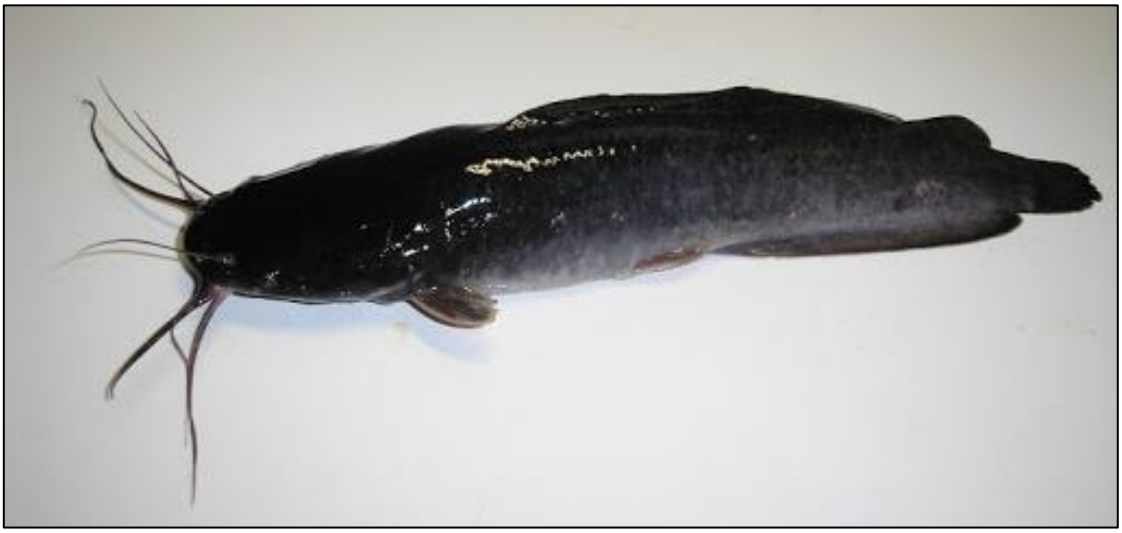
Kingdom	:	Animalia
Subkingdom:		Eumetazoa
Phylum	:	Chordata
Subphylum	:	Vertebrata
Class	:	Osteichthyes
Subclass	:	Teleostei
Order	:	Siluriformes
Family	:	Malapteruridae
e.g.	:	*Malapterurus electricus*

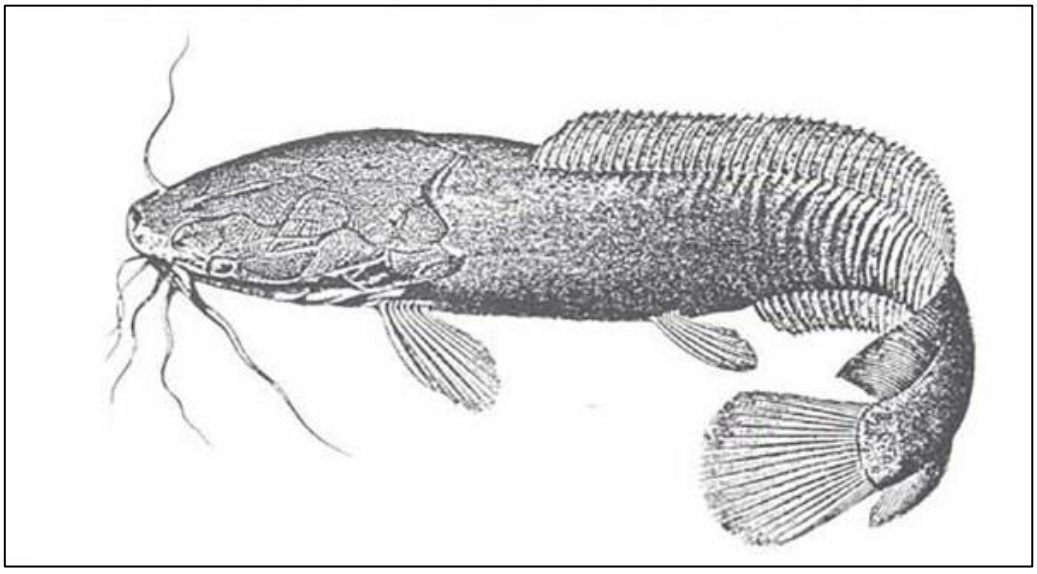


MALAPTERURUS ELECTRICUS—ELECTRICAL SHAD. (*Ra'ad.*)

❖ **Example 2:** *Clarias lazera* القرموط

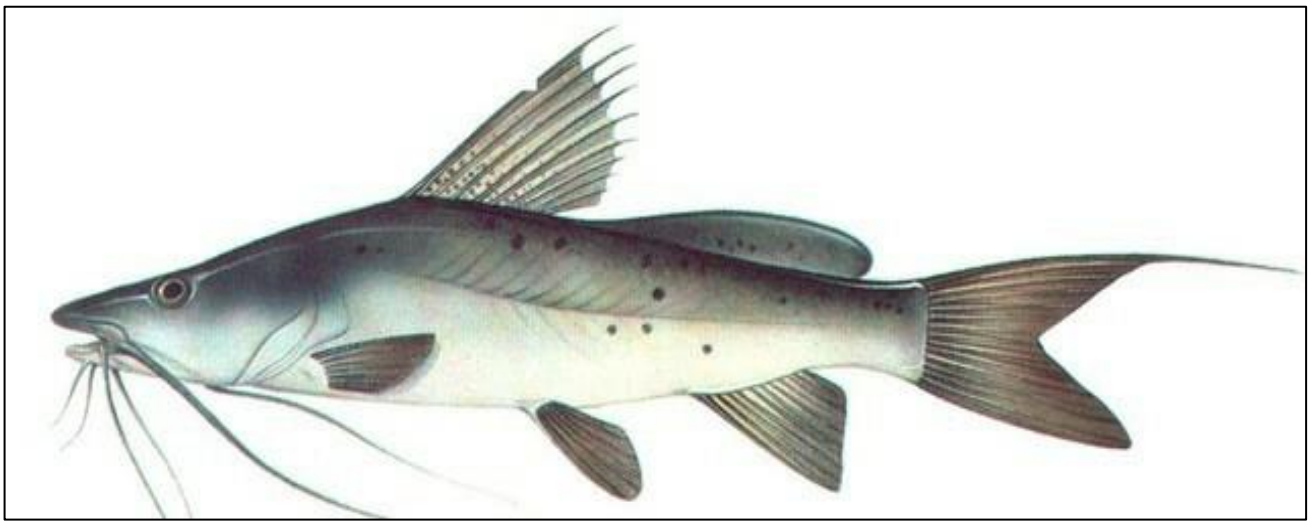
Kingdom	:	Animalia
Subkingdom:		Eumetazoa
Phylum	:	Chordata
Subphylum	:	Vertebrata
Class	:	Osteichthyes
Subclass	:	Teleostei
Order	:	Siluriformes
Family	:	Clariidae
e.g.	:	*Clarias lazera*





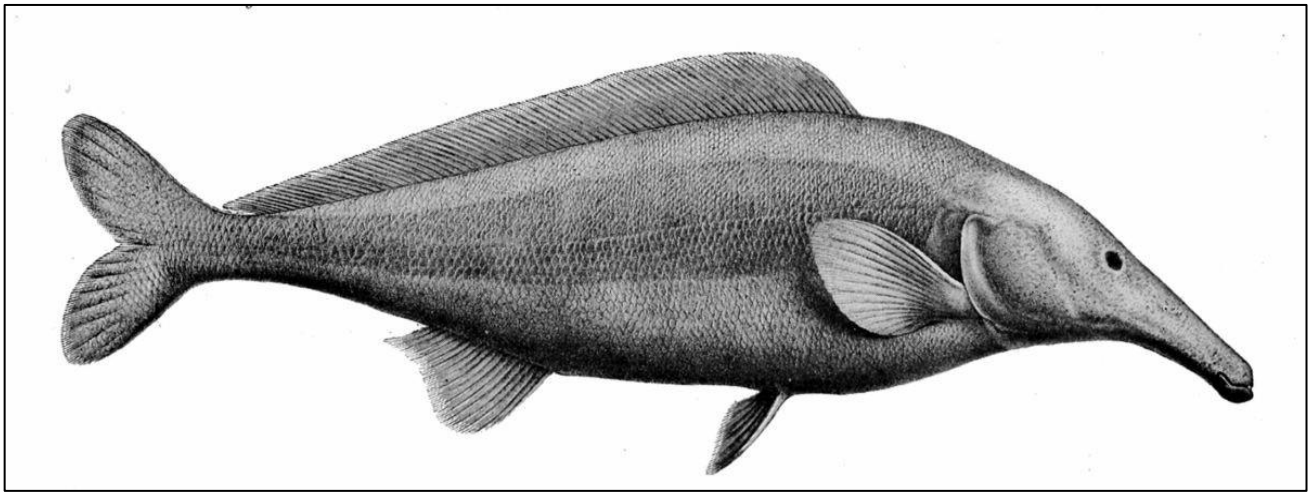
❖ **Example 3:** *Bagrus bayad* البياض

Kingdom	:	Animalia
Subkingdom:		Eumetazoa
Phylum	:	Chordata
Subphylum	:	Vertebrata
Class	:	Osteichthyes
Subclass	:	Teleostei
Order	:	Siluriformes
Family	:	Bagridae
e.g.	:	*Bagrus bayad*



❖ **Example 4:** *Mormyrus kannume* القنومة

Kingdom	:	Animalia
Subkingdom:		Eumetazoa
Phylum	:	Chordata
Subphylum	:	Vertebrata
Class	:	Osteichthyes
Subclass	:	Teleostei
Order	:	Osteoglossiformes
Family	:	Mormyridae
e.g.	:	*Mormyrus kannume*



❖ **Example 5:** *Echenis remora* الريمورا "قملة الدرفيل"

Kingdom : Animalia

Subkingdom: Eumetazoa

Phylum : Chordata

Subphylum : Vertebrata

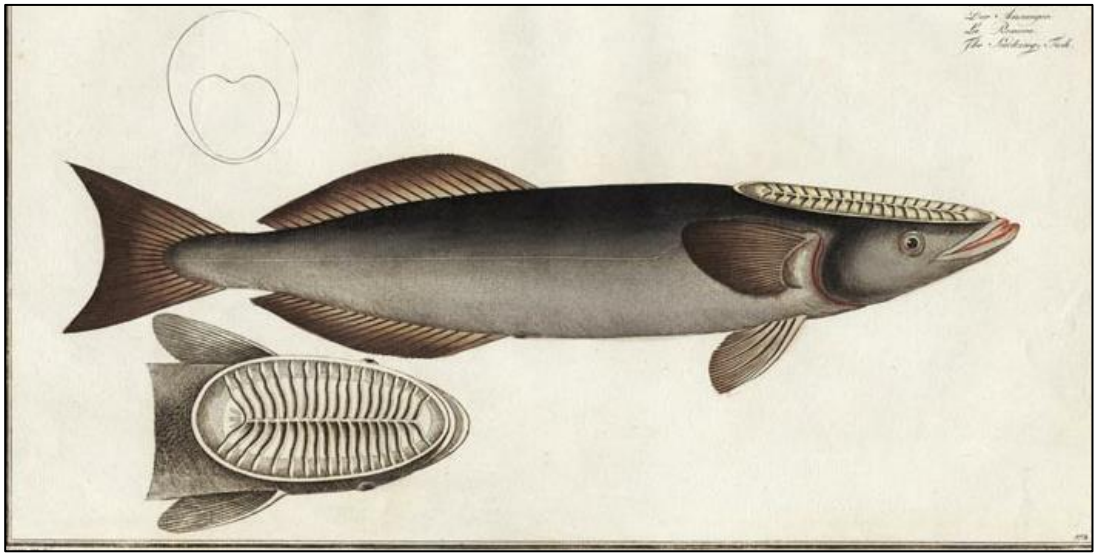
Class : Osteichthyes

Subclass : Teleostei

Order : Perciformes (Discocephali)

Family : Echeneidae

e.g. : *Echenis remora*



❖ **Example 6:** *Anguilla vulgaris* ثعبان السمك

Kingdom	:	Animalia
Subkingdom:		Eumetazoa
Phylum	:	Chordata
Subphylum	:	Vertebrata
Class	:	Osteichthyes
Subclass	:	Teleostei
Order	:	Anguilliformes
Family	:	Anguillidae
e.g.	:	*Anguilla vulgaris*

❖ **Example 7:** *Trigla sp.* الفرخة

Kingdom	:	Animalia
Subkingdom:		Eumetazoa
Phylum	:	Chordata
Subphylum	:	Vertebrata
Class	:	Osteichthyes
Subclass	:	Teleostei
Order	:	Antheriniformes (Percimorphi)
Family	:	Triglidae
e.g.	:	*Trigla sp.*

❖ **Example 8:** *Soleia sp.* سمكة موسى

Kingdom : Animalia

Subkingdom: Eumetazoa

Phylum : Chordata

Subphylum : Vertebrata

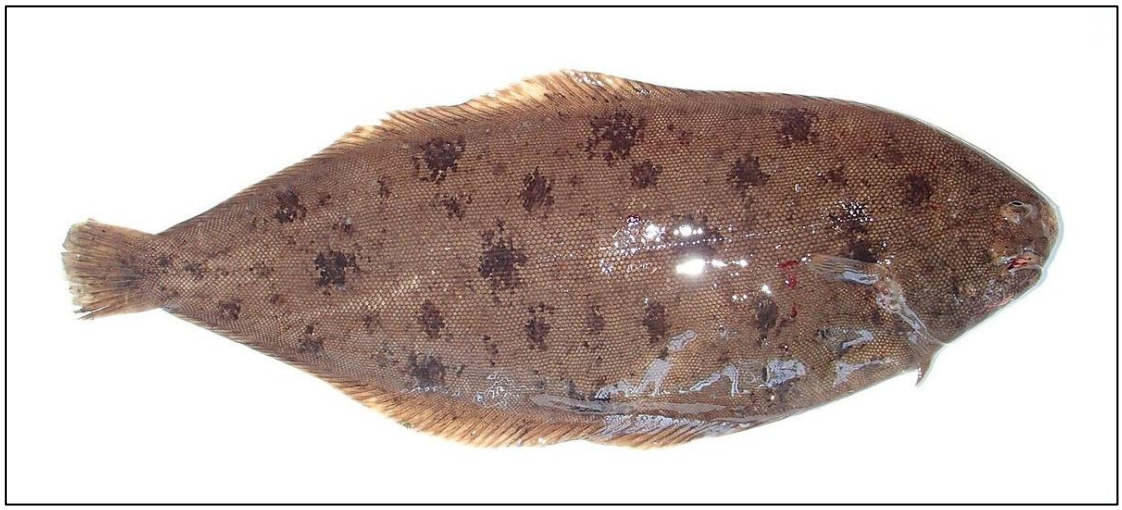
Class : Osteichthyes

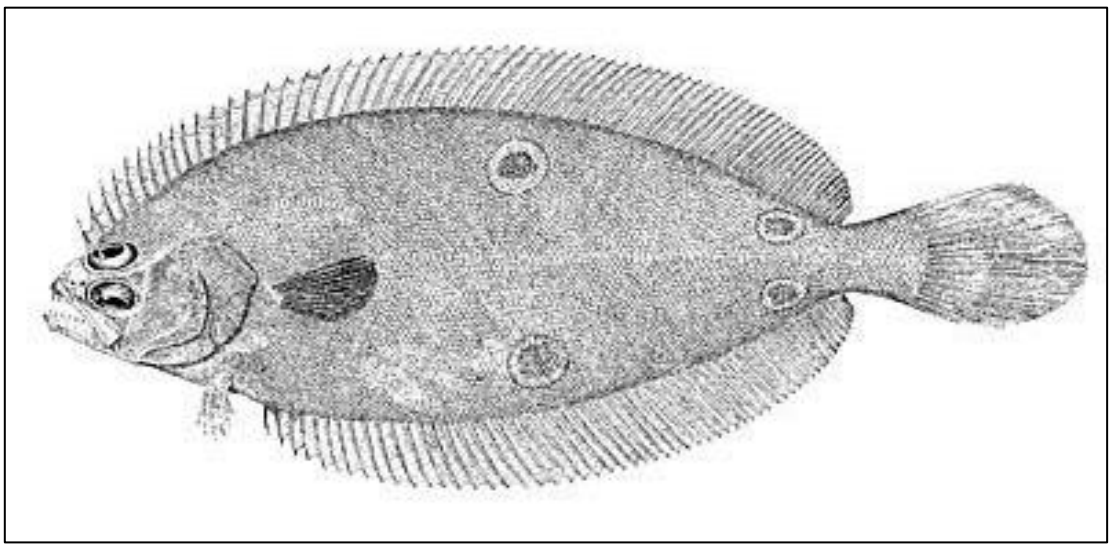
Subclass : Teleostei

Order : Pleuronectiformes (Heterostomata)

Family : Soleidae

e.g. : *Soleia sp.*





❖ **Example 9:** *Hydrocyon forskalii* كلب الملوحة

Kingdom	:	Animalia
Subkingdom:		Eumetazoa
Phylum	:	Chordata
Subphylum	:	Vertebrata
Class	:	Osteichthyes
Subclass	:	Teleostei
Order	:	Characiformes
Family	:	Characidae
e.g.	:	*Hydrocyon forskalii*

Reptiles

Reptile description key:

1- **Body shape**: - Cylindrical
- Dorsoventrally depressed (from top to bottom)
- Bilaterally compressed (from side to side)

2- **Body colour**: (Dorsal surface - Ventral surface)

3- **Scales**: (Present - Absent)

if present: Large / small

❖ **Body regions (Head, neck, trunk, tail):**

4- **Head**: a- size (small - medium - large)

b- shape (cylindrical - dorsoventrally dep. - bilaterally comp.)

(Triangular مثلثة - cordate قلبية الشكل)

c- eyes (size - shape "round/oval" - position on the head)

d- mouth: - position (terminal mostly)
- size (narrow - wide)
- teeth (present - absent)

e- nostrils: (one on each side - size)

f- **Tympanic membrane**: (as a cleft - covered with scales)

5- **Neck**: (long - short)

6- **Trunk**:

a- Fore limbs (Weak – strong) / (Number of fingers)
(Claws "weak-strong")

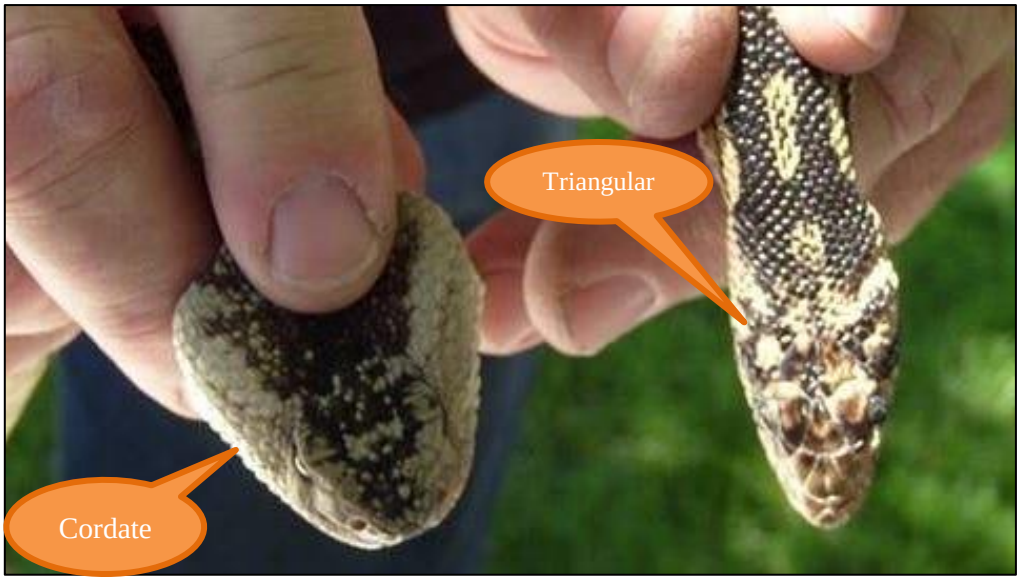
b- Hind limbs (Weak – strong) / (Number of fingers)
(Claws "weak-strong")

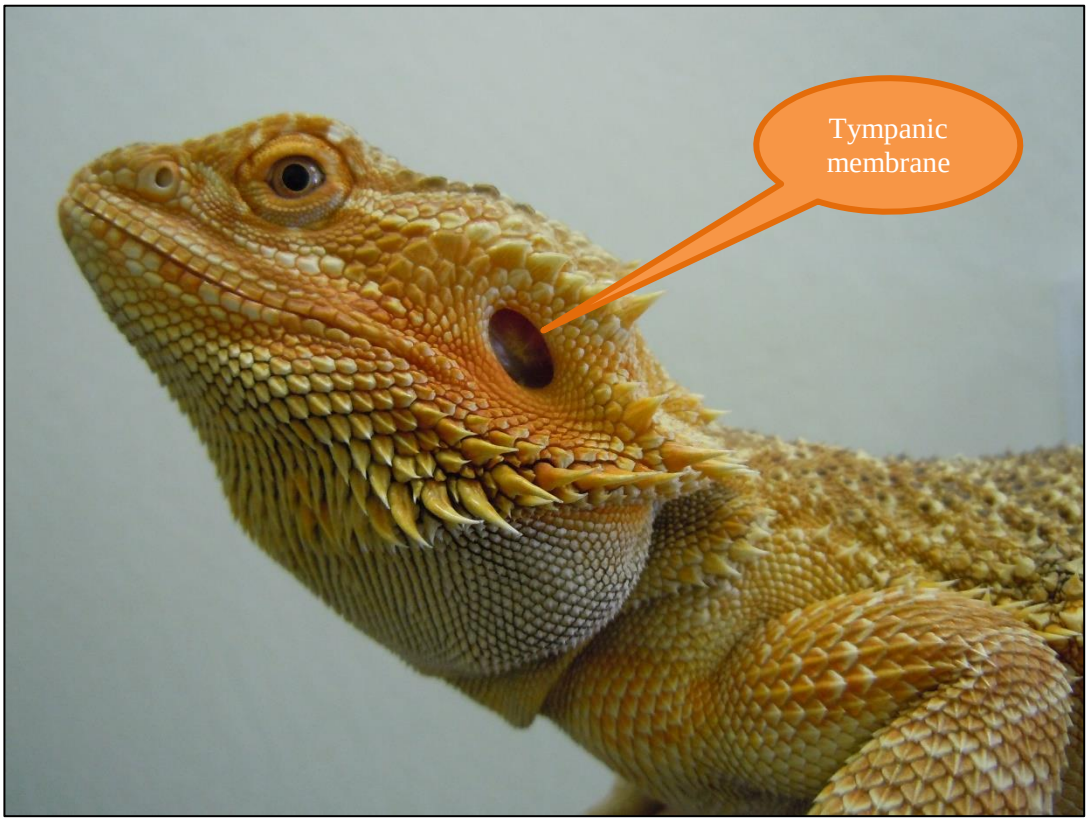
c- Length: (Front limb to Hind limb "longer/shorter/equal")

d- Cloacal opening: (longitudinal - transverse)

7- **Tail:** (the tail is "longer - shorter - equal" to the rest of the body)

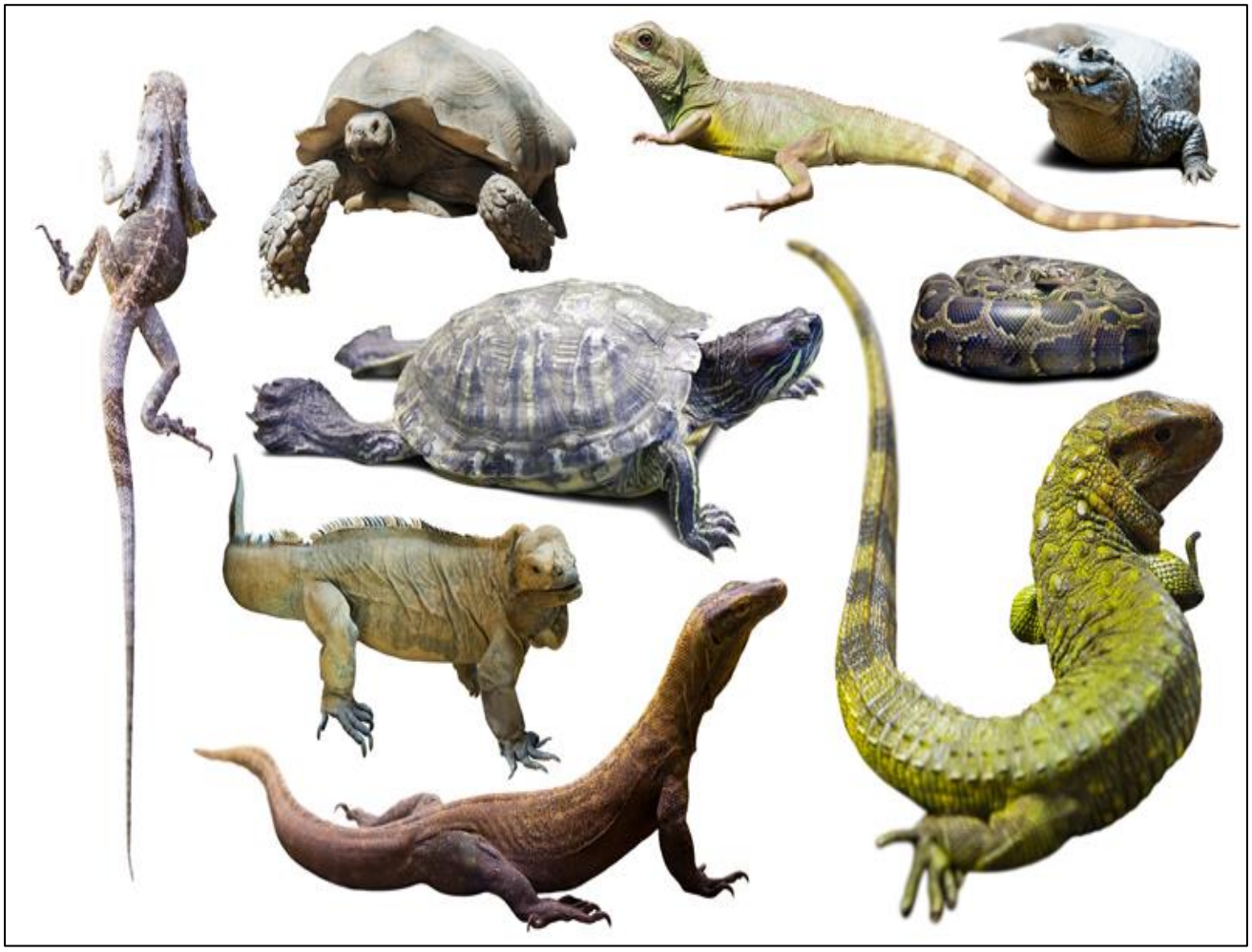
8- **Comment:** (Ecology and Habitat - Nutrition - Adaptation - Reproduction).


Triangular
Cordate


Tympanic membrane

Reptiles

Class: Reptilia



❖ **Example 1:** *Hemidactylus turcicus* البرص المنزلي

Kingdom	:	Animalia
Subkingdom:		Eumetazoa
Phylum	:	Chordata
Subphylum	:	Vertebrata
Class	:	Reptilia
Subclass	:	Diapsida
Order	:	Squamata
Suborder	:	Lacertilia
Family	:	Gekkonidae
e.g.	:	*Hemidactylus turcicus*

❖ **Example 2:** *Chalcides ocellatus* الدفان الكبير

Kingdom	:	Animalia
Subkingdom:		Eumetazoa
Phylum	:	Chordata
Subphylum	:	Vertebrata
Class	:	Reptilia
Subclass	:	Diapsida
Order	:	Squamata
Suborder	:	Lacertilia
Family	:	Scincidae
e.g.	:	*Chalcides ocellatus*

❖ **Example 3:** *Mabuya quinquetaeniata* سحلية الحدائق

Kingdom	:	Animalia
Subkingdom:		Eumetazoa
Phylum	:	Chordata
Subphylum	:	Vertebrata
Class	:	Reptilia
Subclass	:	Diapsida
Order	:	Squamata
Suborder	:	Lacertilia
Family	:	Scincidae
e.g.	:	*Mabuya quinquetaeniata*

❖ **Example 4:** *Agama stellio* الحردون

Kingdom : Animalia

Subkingdom: Eumetazoa

Phylum : Chordata

Subphylum : Vertebrata

Class : Reptilia

Subclass : Diapsida

Order : Squamata

Suborder : Lacertilia

Family : Agamidae

e.g. : *Agama stellio*

❖ **Example 5:** *Varanus griseus* الورل

Kingdom : Animalia

Subkingdom: Eumetazoa

Phylum : Chordata

Subphylum : Vertebrata

Class : Reptilia

Subclass : Diapsida

Order : Squamata

Suborder : Lacertilia

Family : Varanidae

e.g. : *Varanus griseus*

❖ **Example 6:** *Chamaeleon vulgaris* الحرباء

Kingdom : Animalia

Subkingdom: Eumetazoa

Phylum : Chordata

Subphylum : Vertebrata

Class : Reptilia

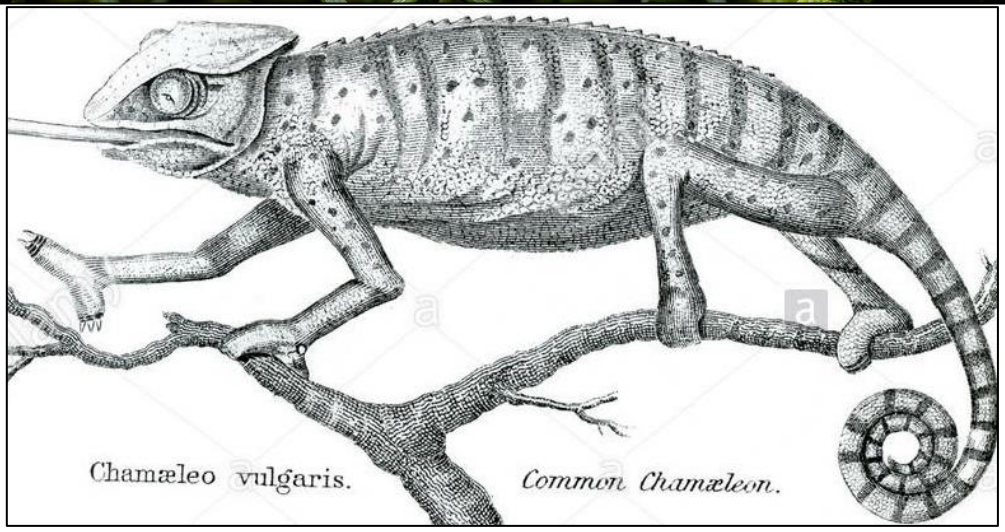
Subclass : Diapsida

Order : Squamata

Suborder : Rhiptoglossa

Family : Chamaeleonidae

e.g. : *Chamaeleon vulgaris*



❖ **Example 7:** *Cerastes cerastes* الأفعى المقرنة

Kingdom	:	Animalia
Subkingdom:		Eumetazoa
Phylum	:	Chordata
Subphylum	:	Vertebrata
Class	:	Reptilia
Subclass	:	Diapsida
Order	:	Squamata
Suborder	:	Ophidia
Family	:	Viperidae
e.g.	:	*Cerastes cerastes*

❖ **Example 8:** *Naja haje* الناشر المصري "الكوبرا"

Kingdom : Animalia

Subkingdom: Eumetazoa

Phylum : Chordata

Subphylum : Vertebrata

Class : Reptilia

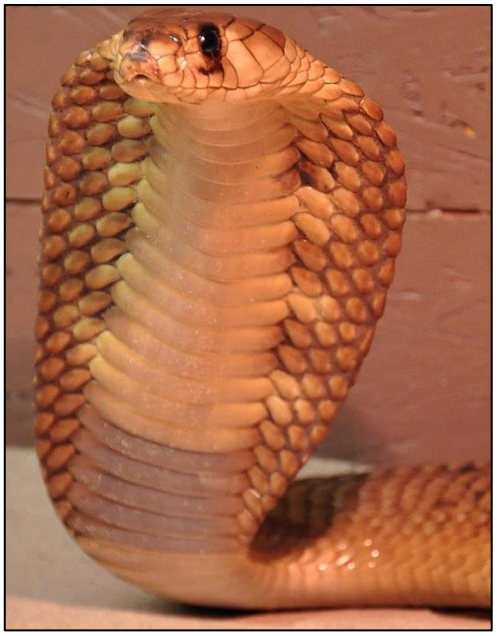
Subclass : Diapsida

Order : Squamata

Suborder : Ophidia

Family : Colubridae

e.g. : *Naja haje*



❖ **Example 9:** *Testudo leithi* السلحفاة الأرضية

Kingdom : Animalia

Subkingdom: Eumetazoa

Phylum : Chordata

Subphylum : Vertebrata

Class : Reptilia

Subclass : Anapsida

Order : Chelonia

Family : Testudinidae

e.g. : *Testudo leithi*

Birds

Bird description key:

1- **Body shape**: (Spindle-shape)

2- **Feather colour**: (Dorsal surface - Ventral surface - lateral sides)

(if it has several colors, each part is mentioned)

Body regions (Head, neck, trunk, tail)

3- **Head**:
- a- size: (small - medium - large)
- b- shape: (mostly rounded)
- c- eyes: (size - shape "round/oval" - position on the head)
- d- mouth:
  - surrounded by horny beak (V-shaped)
  - size: (small - medium - large)
  - teeth: absent
- e- Beak:
  - (blunt - sharp)
  - (strong- weak)
  - (straight - curved)
- f- nostrils: (one on each side on dorsal side of beak - size - shape)
- g- ear opening: (appeared clearly - covered with feathers)

4- **Neck**: is cylindrical and flexible: (long - short) / (thin - thick)

5- **Trunk**: (Generally compact and spindle-shaped)

Size: (small - medium - large)

- a- Fore limbs (modified into wings)
  - size: (small - medium - large)
  - feather length: (long - short)
- b- Hind limbs (Normal legs for walking, swimming, & perching)
  - digits: (number - size - with membrane or not)
  - claws: (weak-strong) / (sharp - blunt)
- c- Cloacal opening: (longitudinal - transverse)

6- **Tail:** (the tail is small with two oil glands)

Comment: (Ecology and Habitat - Nutrition - Adaptation - Reproduction).

Birds

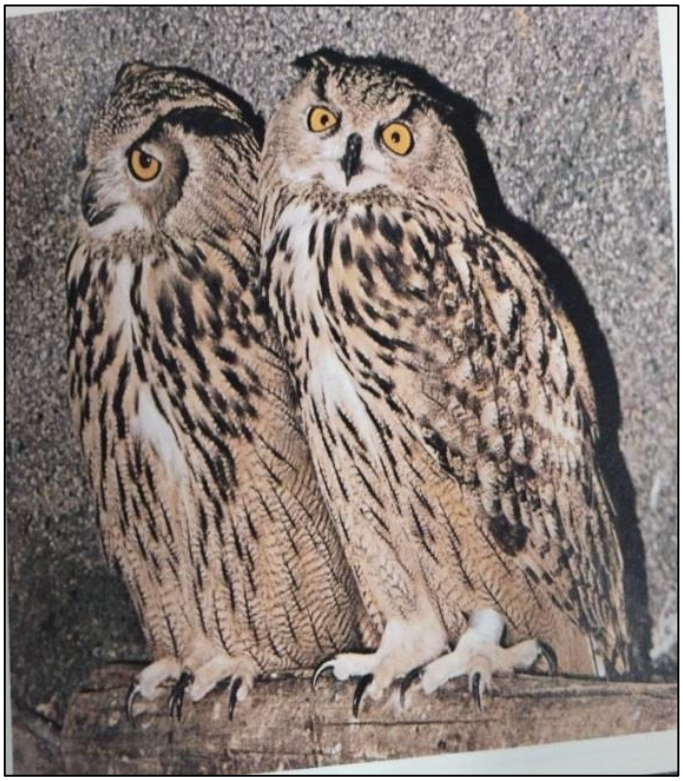
Class: Aves

❖ **Example 1:** *Columba livia domestica* الحمامة المنزلية

Kingdom	:	Animalia
Subkingdom:		Eumetazoa
Phylum	:	Chordata
Subphylum	:	Vertebrata
Class	:	Aves
Subclass	:	Neornithes
Order	:	Columbiformes
Family	:	Columbidae
e.g.	:	*Columba livia domestica*

❖ **Example 2:** *Bobu ascalaphus* البومة المقرنة

Kingdom	:	Animalia
Subkingdom:		Eumetazoa
Phylum	:	Chordata
Subphylum	:	Vertebrata
Class	:	Aves
Subclass	:	Neornithes
Order	:	Strigiformes
Family	:	Strigidae
e.g.	:	*Bobu ascalaphus*



❖ **Example 3:** *Ceryle rudis* صياد السمك الأبقع

Kingdom	:	Animalia
Subkingdom:		Eumetazoa
Phylum	:	Chordata
Subphylum	:	Vertebrata
Class	:	Aves
Subclass	:	Neornithes
Order	:	Coraciiformes
Family	:	Alcedinidae
e.g.	:	*Ceryle rudis*

❖ **Example 4:** *Falco tinnunculus* العوسق المصري

Kingdom	:	Animalia
Subkingdom:		Eumetazoa
Phylum	:	Chordata
Subphylum	:	Vertebrata
Class	:	Aves
Subclass	:	Neornithes
Order	:	Falconiformes
Family	:	Falconidae
e.g.	:	*Falco tinnunculus*

❖ **Example 5:** *Gallinula chloropus* دجاجة الماء

Kingdom : Animalia

Subkingdom: Eumetazoa

Phylum : Chordata

Subphylum : Vertebrata

Class : Aves

Subclass : Neornithes

Order : Gruiformes

Family : Rallidae

e.g. : *Gallinula chloropus*

❖ **Example 6:** *Larus ridibundus* النورس أسود الرأس

Kingdom : Animalia

Subkingdom: Eumetazoa

Phylum : Chordata

Subphylum : Vertebrata

Class : Aves

Subclass : Neornithes

Order : Charadiformes

Family : Laridae

e.g. : *Larus ridibundus*

Mammals

Mammals' description key:

1- **Body shape & size**: (elongated anteriorly, broad posteriorly)

2- **Hair colour**: (Dorsal surface - Ventral surface - lateral sides)
(if it has several colors, each part is mentioned)

Body regions (Head, neck, trunk, tail)

3- **Head**:
- a- size: (small - medium - large)
- b- shape: (mostly rounded or oval)
- c- eyes: (size - shape "round/oval" - position on the head)
- d- mouth: - surrounded by fleshy lips شفاه لحمية
  - size: (small - medium - large)
  - position: (terminal - subterminal)
  - shape: (crescentic - transverse slit-like)
  - teeth: (present - absent)
- e- nostrils: (one on each side on dorsal side of mouth - size - shape)
- f- ear: surrounded by (movable - immovable) pinna صوان الاذن

4- **Neck**: is cylindrical and flexible: (long - short) / (thin - thick)

5- **Trunk**: (Generally compact and spindle-shaped)

Size: (small - medium - large)

- a- Fore limbs (Hands)
  - size: (small - medium - large)
  - digits: (number - size - with membrane or not)
  - claws: (weak-strong) / (sharp - blunt)
- b- Hind limbs
  - digits: (number - size - with membrane or not)
  - claws: (weak-strong) / (sharp - blunt)
- c- Cloacal opening: (longitudinal - transverse)

6- **Tail:** (Cylindrical) / (long - short) / (straight - curved)

Comment: (Ecology and Habitat - Nutrition - Adaptation - Reproduction).

Mammals

Class: Mammalia

❖ **Example 1:** *Felis catus* القط المنزلي

Kingdom	:	Animalia
Subkingdom:		Eumetazoa
Phylum	:	Chordata
Subphylum	:	Vertebrata
Class	:	Mammalia
Subclass	:	Eutheria
Order	:	Carnivora
Family	:	Felidae
e.g.	:	*Felis catus*

❖ **Example 2:** *Mus musculus* الفأر المنزلي

Kingdom	:	Animalia
Subkingdom:		Eumetazoa
Phylum	:	Chordata
Subphylum	:	Vertebrata
Class	:	Mammalia
Subclass	:	Eutheria
Order	:	Rodentia
Family	:	Muridae
e.g.	:	*Mus musculus*

❖ **Example 3:** *Jaculus jaculus* الفأر الصحراوي الوثاب (الجربوع)

Kingdom : Animalia

Subkingdom: Eumetazoa

Phylum : Chordata

Subphylum : Vertebrata

Class : Mammalia

Subclass : Eutheria

Order : Rodentia

Family : Jaculidae

e.g. : *Jaculus jaculus*

❖ **Example 4:** *Cavia porcallus* خنزير غينيا

Kingdom	:	Animalia
Subkingdom:		Eumetazoa
Phylum	:	Chordata
Subphylum	:	Vertebrata
Class	:	Mammalia
Subclass	:	Eutheria
Order	:	Rodentia
Family	:	Caviidae
e.g.	:	*Cavia porcallus*

❖ **Example 5:** *Erinaceus auritus* القنفذ

Kingdom	:	Animalia
Subkingdom:		Eumetazoa
Phylum	:	Chordata
Subphylum	:	Vertebrata
Class	:	Mammalia
Subclass	:	Eutheria
Order	:	Insectivora
Family	:	Erinacidae
e.g.	:	*Erinaceus auritus*

❖ **Example 6:** *Cercopithecus aethiops* القرد الأفريقي

Kingdom	:	Animalia
Subkingdom:		Eumetazoa
Phylum	:	Chordata
Subphylum	:	Vertebrata
Class	:	Mammalia
Subclass	:	Eutheria
Order	:	Primata
Family	:	Cercopithecidae
e.g.	:	*Cercopithecus aethiops*