e- MUSEUM

DEPARTMENT OF ZOOLOGY
MIRANDA HOUSE
UNIVERSITY OF DELHI

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PREFACE

The purpose of digitizing the Museum of the Department of Zoology, Miranda House is to preserve the decades-old specimens of invertebrates and vertebrates kept here. The museum includes specimens from various phyla, such as Porifera, Cnidaria, Helminthes, Annelids, Arthropods, Molluscs, Echinoderms, and Chordates. It also includes skeletons of various vertebrates and their histological slides. This e-museum will provide online access to the collections and exhibits of the physical museum at the Department of Zoology, Miranda House, allowing students to view and learn about the specimens on display from anywhere in the world. The experience has been designed to be more engaging and accessible. Additionally, it serves as a way to preserve and share the heritage and historical animal specimens that are at risk of deterioration or destruction in a physical museum setting. This e- museum can also provide online research tools and resources for scholars and educators.

The digitization process of the museum was started as a DBT Star College Student Project, which involved both faculty and students. The process of completing the e-museum included capturing high-resolution images, adding taxonomic classification, identifying features, and other key characteristics of the organism. We hope that this effort will contribute to the learning of all with the ease of a few clicks.

Dr. Nisha Vashishta
Dr. Pooja Suman
Dr. Yasha Yadav

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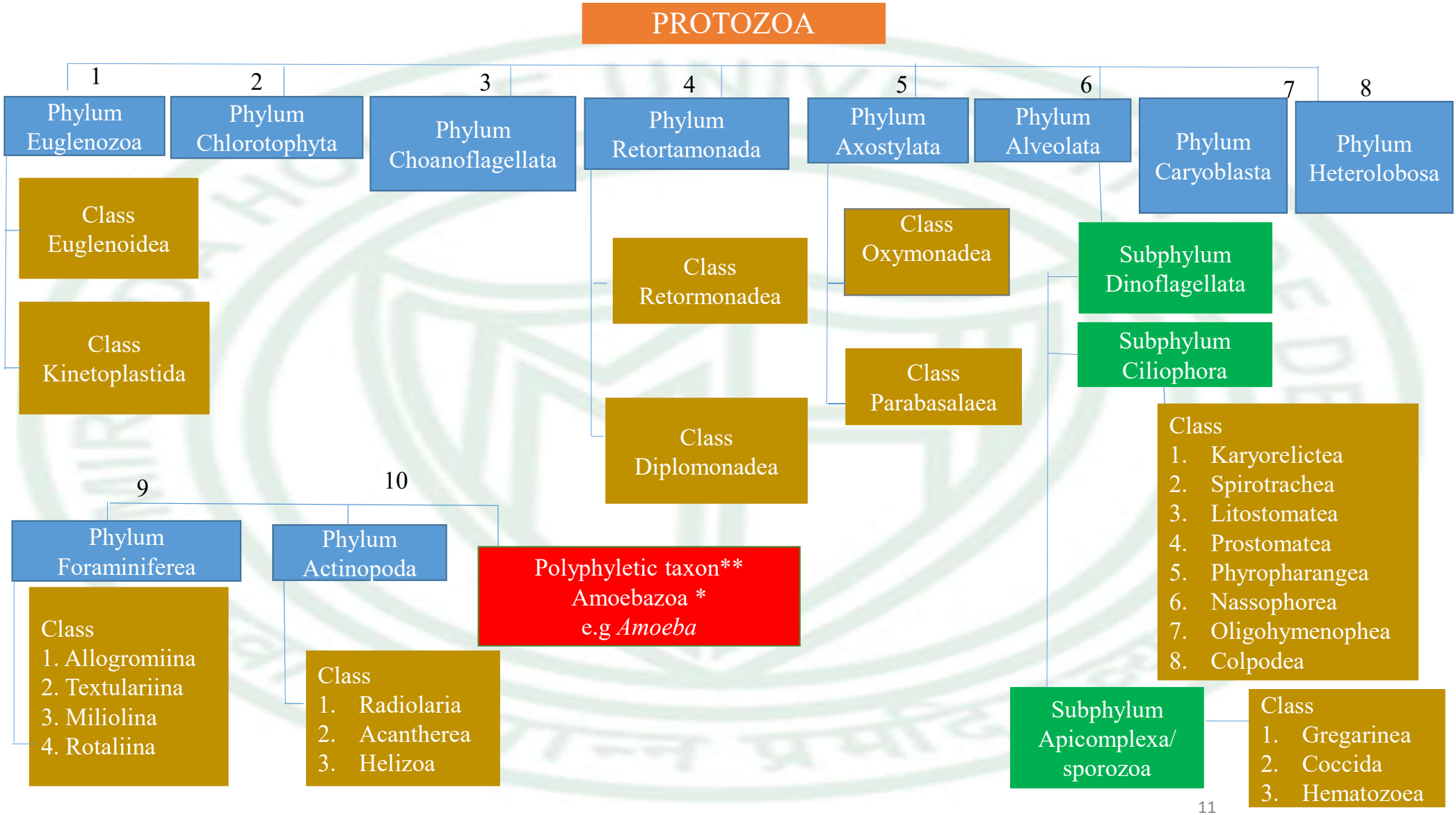
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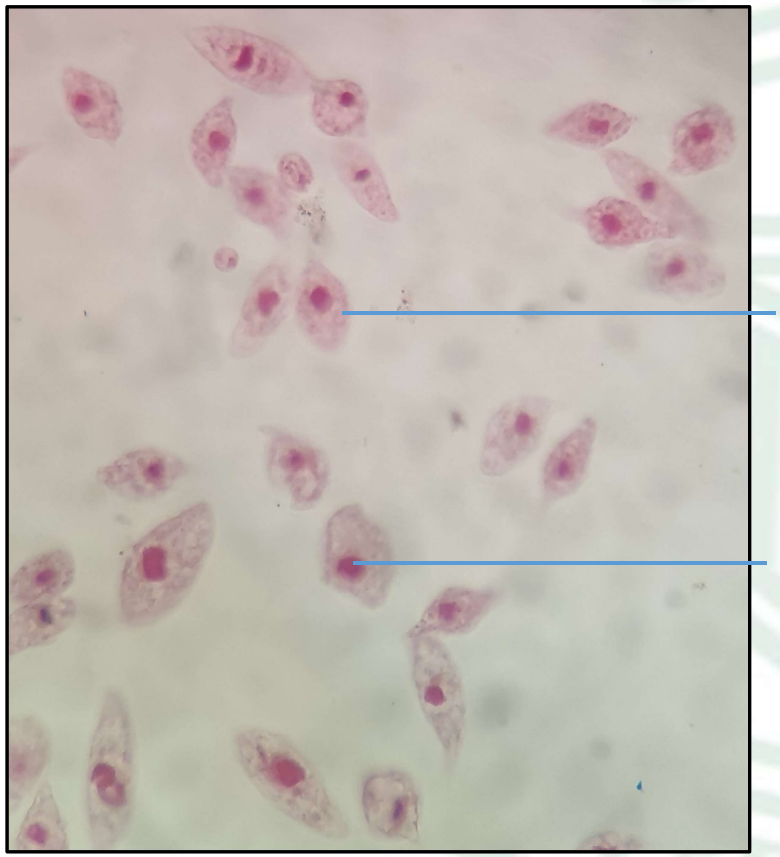
e.g *Amoeba*

Euglena



10x Magnification

CLASSIFICATION:

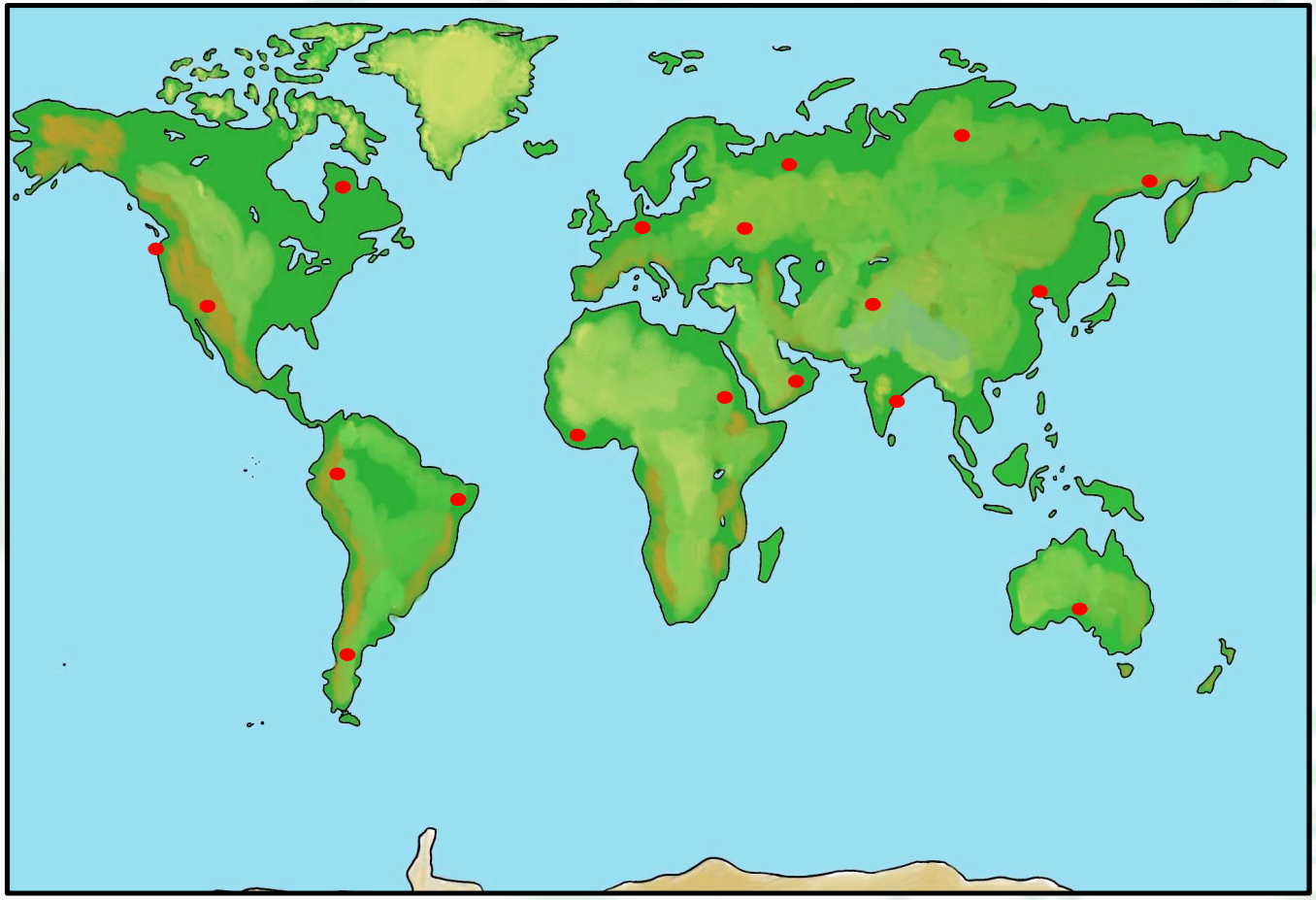
Phylum: Euglenozoa (Unicellular Protista with two flagella)
Class: Euglenoidea (flagellated autotrophic species)
Genus: *Euglena*

IDENTIFYING FEATURES:

- Body is spindle shaped covered with hard but flexible pellicle.
- Two flagella are present, one remains within the reservoir and other is long used for locomotion.
- Photosensitive eyespot or stigma is present at the base of the long flagellum
- Shows heterotrophic mode of nutrition, undergoes photosynthesis through chloroplast present in complete cell giving it green color.

VIDEO LINK:

- https://www.youtube.com/watch?v=UWSBcaJE6x4
- https://www.youtube.com/watch?v=9nxoSRasq2Q



Geographical Distribution: Found worldwide

Habitat: It is solitary flagellate found in fresh water ponds, ditches, slow running streams. Also found in moist soil.

Paramecium

40x Magnification

CLASSIFICATION:

Phylum: Alveolata (are united on the basis of similar ribosomal DNA sequence and pellicular alveoli)

Subphylum: Ciliophora (Monophyletic taxon having cell organism with cilia)

Class: Nassophorea (Transverse Microtubule ribbons tangential to the basal bodies with well developed kinetodesma, MT bundles form a complex, basket-shaped cytopharynx [nasse])

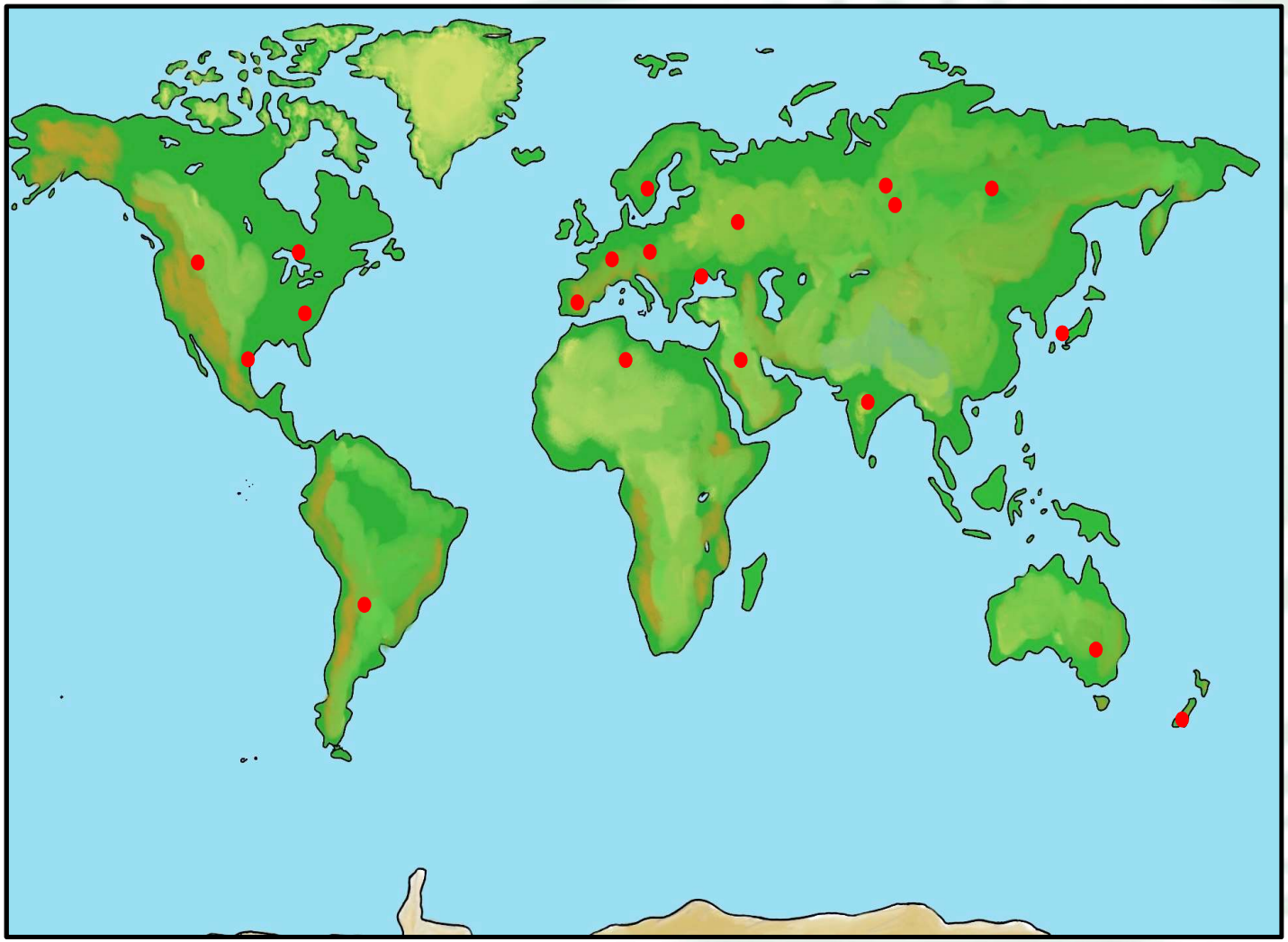
Genus: *Paramecium* (slipper animalcule)

IDENTIFYING FEATURES:

- Elongated slipper like ciliate with blunt and broad anterior end and pointed posterior end.
- Body is asymmetrical covered with thin and flexible pellicle.
- Longitudinally arranged uniform length cilia are present all over the body that moves synchronously.
- Anterior and posterior contractile vacuole present.
- Food vacuole also present.

VIDEO LINK:

- https://www.youtube.com/watch?v=mh7KOtQTXrw
- https://www.youtube.com/watch?v=WFpBRfLtbIo



Geographical Distribution: Found worldwide

Habitat: Found in fresh-water ponds, lakes, ditches, rivers and streams.

Amoeba

40x Magnification

CLASSIFICATION:

Polyphyletic Taxon: Amoebozoa (Cells with pseudopodia that lacks microtubules)

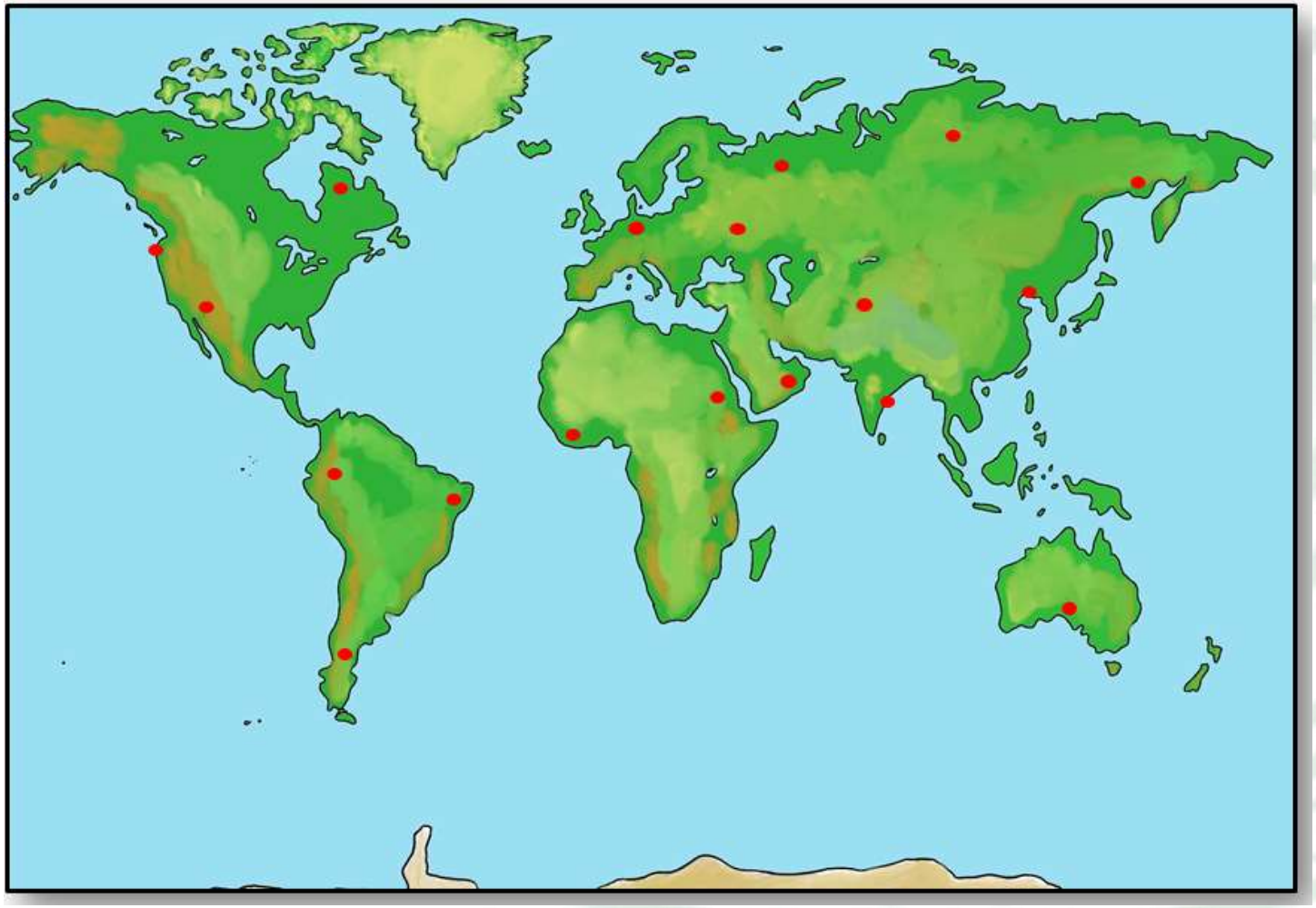
Genus: *Amoeba* (Lobosea with lobopodia)

IDENTIFYING FEATURES:

- Irregular or asymmetrical animal with translucent protoplasm.
- Protoplasm includes ectoplasm and endoplasm.
- Nucleus, food vacuole and contractile vacuole present in endoplasm.
- Pseudopodia is present for locomotion.
- Body is covered with thin, delicate and permeable Plasmalemma.

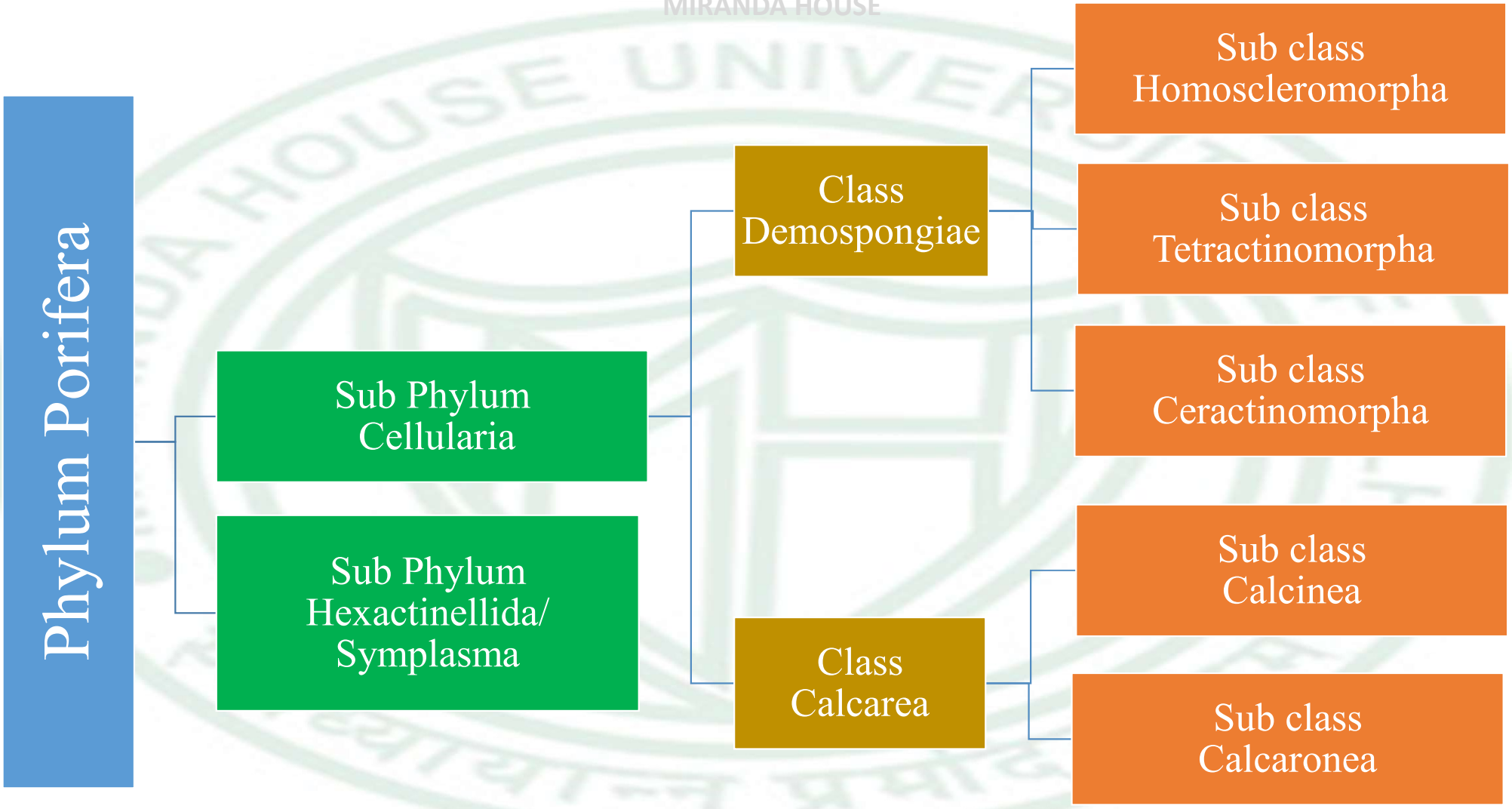
VIDEO LINK:

https://www.youtube.com/watch?v=4XlzCe5gDu0
https://www.youtube.com/watch?v=OLev09qBkGk
https://www.youtube.com/watch?v=03RSkpqvYpU&t=14s



Geographical Distribution: It is present all over the world

Habitat: Found in fresh-water ponds, lakes, ditches, rivers and streams. It is abundantly found in water rich in organic bacteria and vegetation decay



Sycon

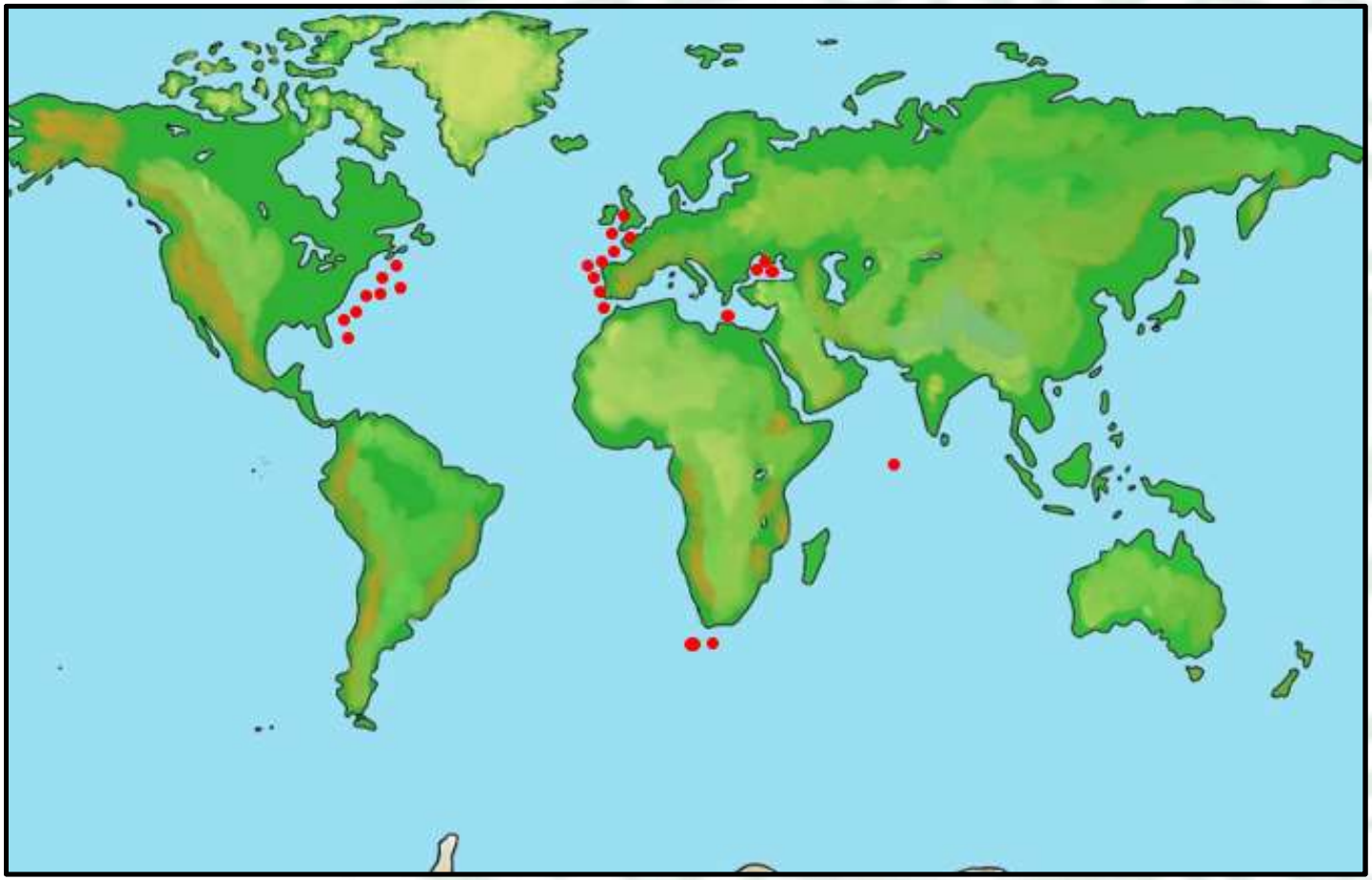
CLASSIFICATION:

Phylum: Porifera (presence of ostia and osculum, diploblastic organization with mesoglea, presence of choanocytes, spongocoel, spicules and spongin fibres)
Sub-phylum: Cellularia (body is largely composed of cellular tissue.)
Class: Calcarea (calcareous spicules, which can be triaxon, tetraxon and monoaxon.)
Sub-class: Calcaronea (triaxon and tetraxon spicules with one ray longer.)
Genus: *Sycon* (*Scypha*)

IDENTIFYING FEATURES:

- **Sycon** are creamy yellow in color and delicate-looking.
- Hairy, needle-like spines (called spicules) cover their bodies.
- Body – vase like, more or less separate at the base. Osculum is surrounded by large monoaxon spicules, forming a collar around it.

VIDEO LINK: https://youtu.be/rsovsonFzPI



Geographical Distribution: It is small, solitary or colonial marine sponge, found attached to the rocks and other substrate in shallow water

Habitat: It is small, solitary or colonial marine sponge, found attached to the rocks and other substrate in shallow water

Hyalonema

CLASSIFICATION:

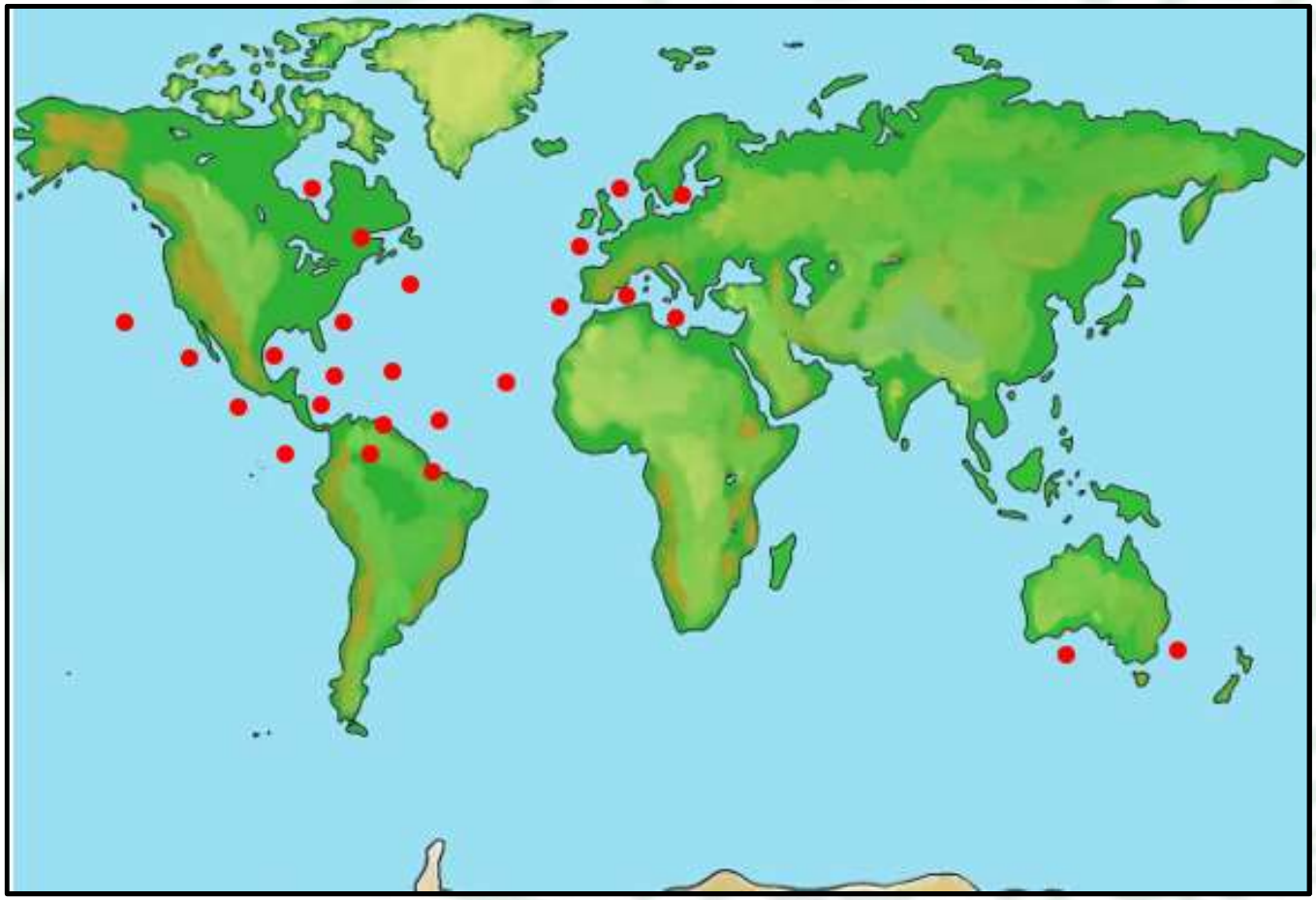
Phylum: Porifera (presence of choanocytes, skeleton made up of calcareous or siliceous spicules or horny spongin fibers)
Sub phylum: Symplasma / Hexactinellida (glass sponges; have syncytial tissues, spicules are siliceous in nature)
Genus: *Hyalonema* (glass rope sponge)

IDENTIFYING FEATURES:

- It has a rounded or oval body with a spirally twisted root tuft.
- Spicules of root tuft continue through the sponge body as an axis or **collumella** and projects above as a **gastral cone**
- Middle columella has symbiotic polyps (*Epizoanthus* and *Zoanthid Palythoa*)

VIDEO LINK:

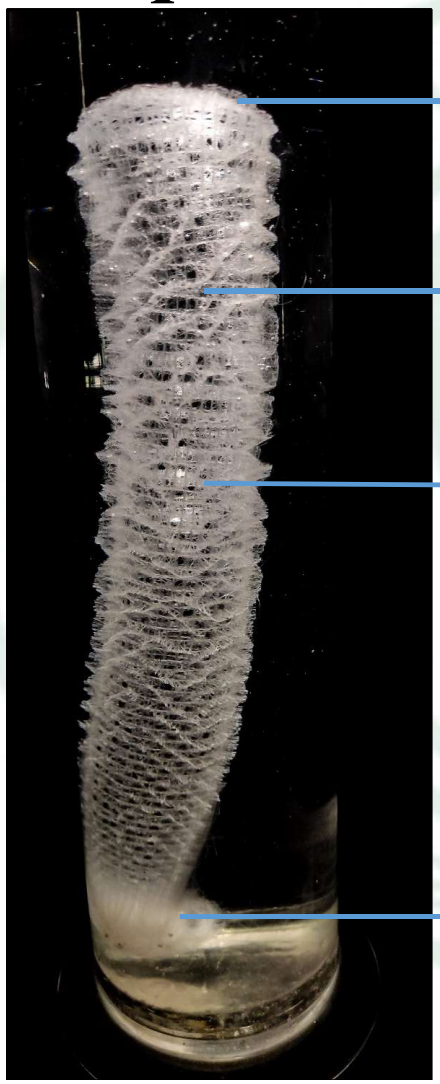
- https://youtu.be/0hT77L7JQ30
- https://www.youtube.com/watch?v=m8a0oNsDEx8&t=21s&ab_channel=BlueWorldTV



Geographical Distribution: Mostly found in new coastal regions of England, Europe and North America

Habitat: *Hyalonema* is a marine form found 10-15 meters deep in sea

Euplectella



CLASSIFICATION:-

Phylum: Porifera (Cylindrical body, radially symmetrical, holoblastic cleavage, cellular grade of organisation)

Class:-Hexactinellida (Siliceous spicules, six rays intersecting at right angles, rapidly conducting electrical impulses)

Genus:-*Euplectella* (Venus Flower Basket)

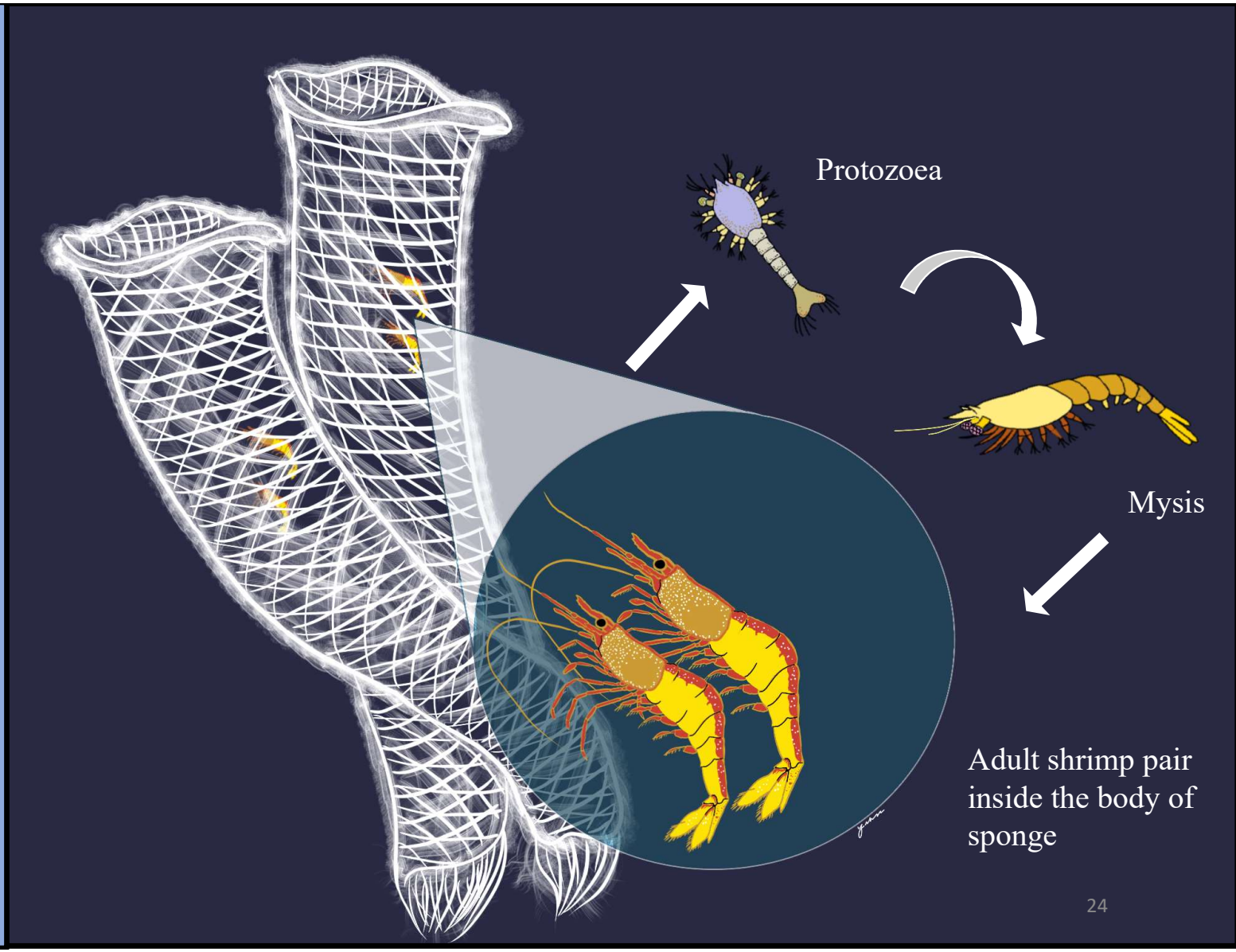
IDENTIFYING FEATURES:-

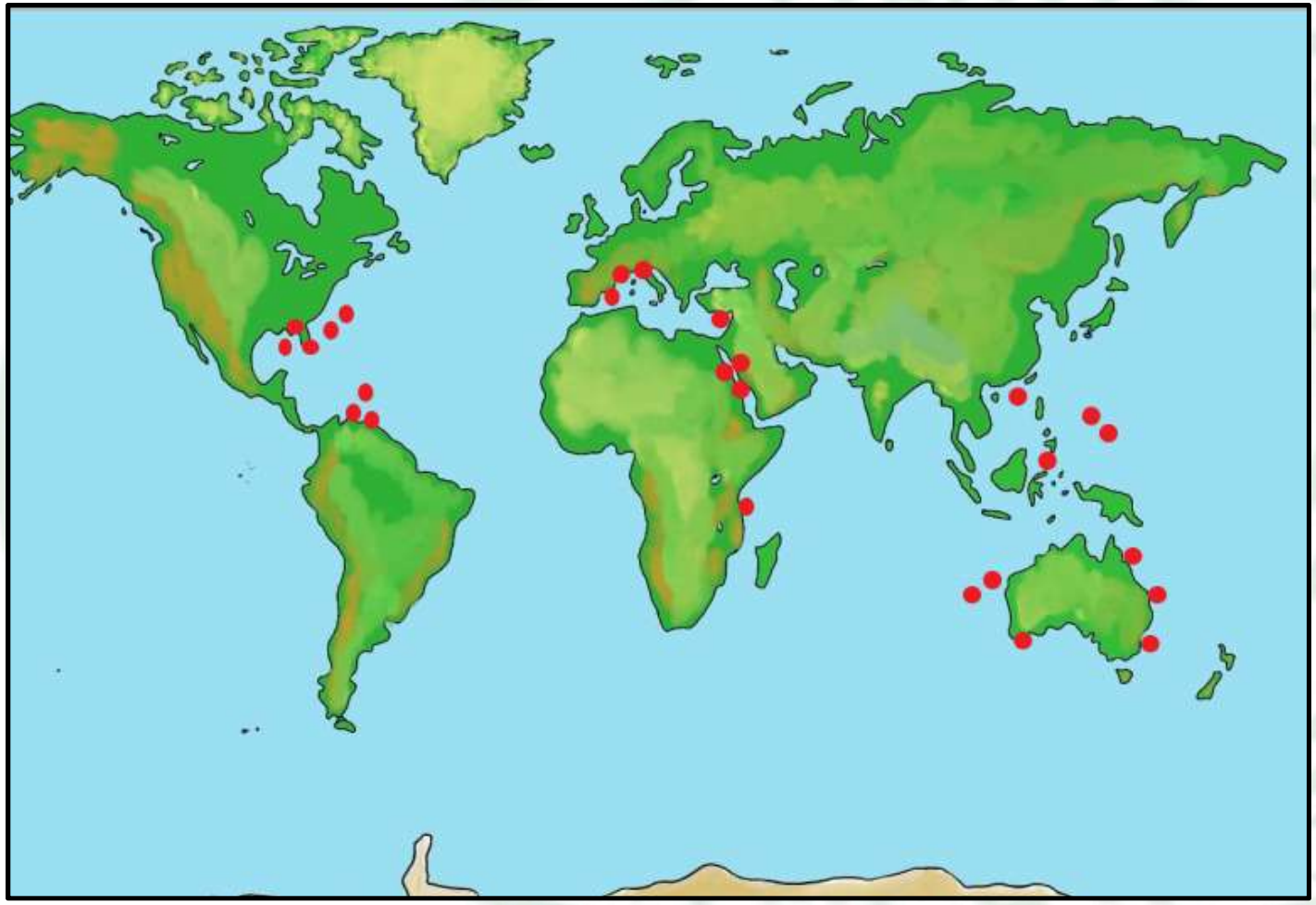
- The skeleton is made up of triaxon spicules.
- Silica spicules gives them a glassy appearance.
- The body is cylinderical and basket like connected to the sea bottom by the tuft of fibres.
- Numerous apertures perforates the body which is not actual ostia but are parietal gaps.
- Osculum is covered with oscular sieve plate.

VIDEO LINK:

https://www.youtube.com/watch?v=ujKbWHCrRlw&ab_channel=SanDiegoMesaCollegeMarineBiologyStudents

Euplectella, shows commensalism with shrimp, *Spongicola*. Young shrimp pair enters the body of this glass sponge when they are small in size. They find protection and continuous source of food, growing bigger in size and reproducing within the sponge body. Their larval stages emerge out of the eggs laid and leave the cavity of the sponge body but as the adults have grown bigger they cannot leave. Thus, they remain in the cavity of *Euplectella*, till they die, symbolising "Union till death". Hence, the sponge is given as a wedding gift in Japan.

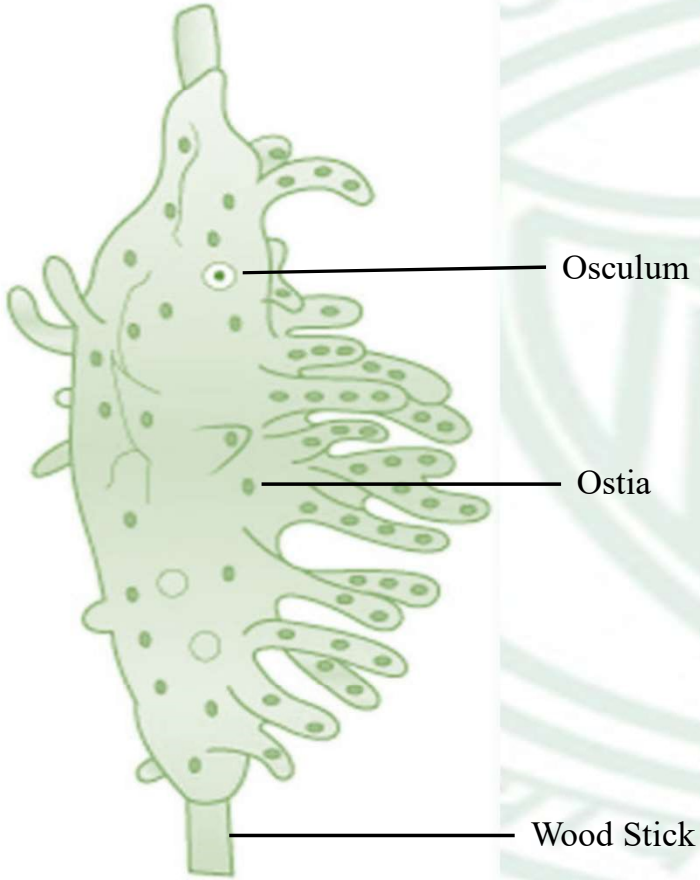




Geographical Distribution: Western Pacific Ocean, Atlantic Ocean, parts of Indian Ocean.

Habitat: Rocky areas of benthic sea floor

Spongilla



CLASSIFICATION:

Phylum : Porifera (Acoelomate , diploblastic , cellular level of organization , radial symmetrical, porous body)

Subphylum : Cellularia (cellular organization, epidermis with pinacocytes , mesoglea of collagenous matrix , myocytes present)

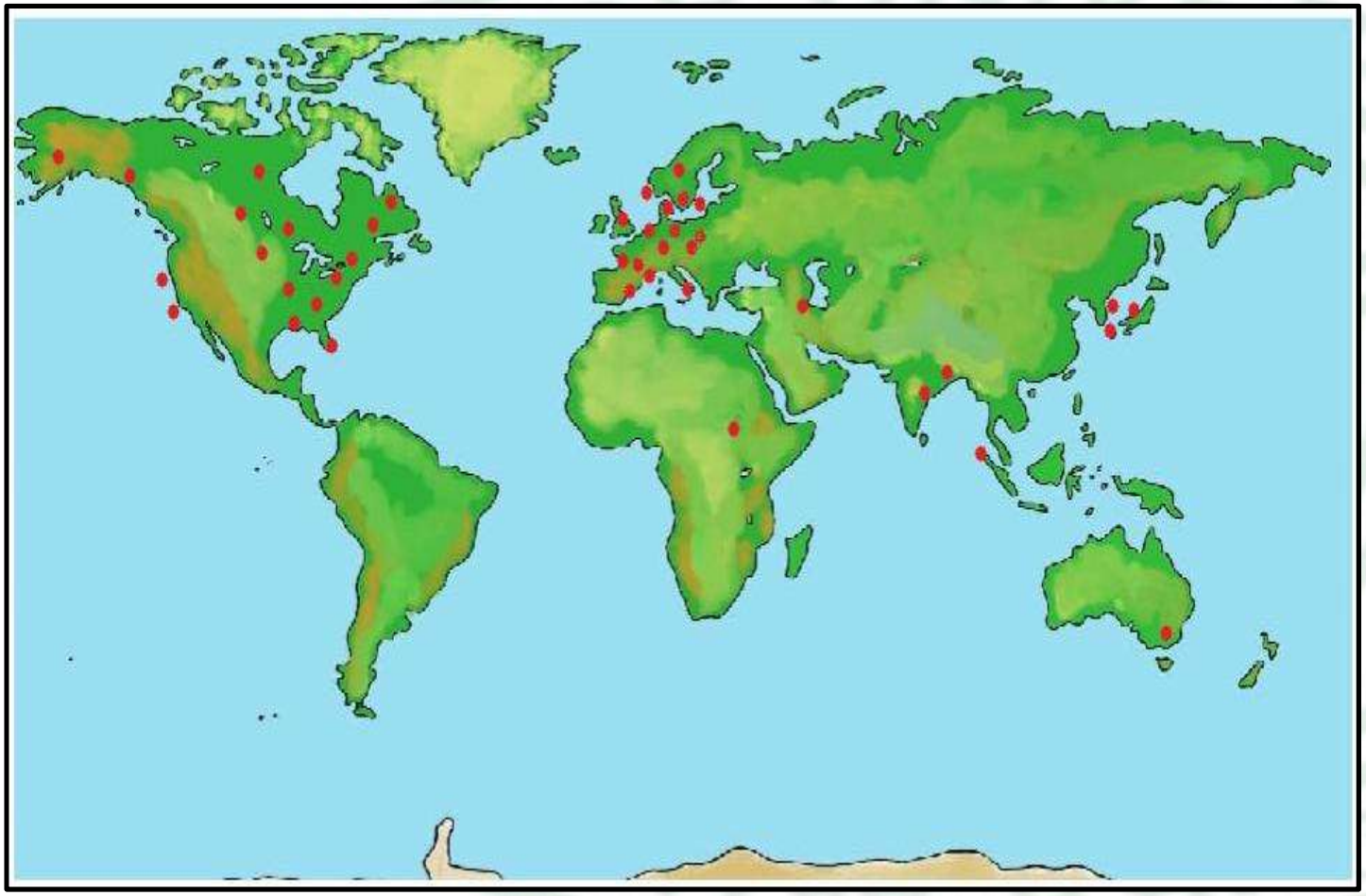
Class : Demospongiae (Soft and elastic body , skeleton made of silica spicules and spongin or both , mostly marine)

Genus : *Spongilla*

IDENTIFYING FEATURES:

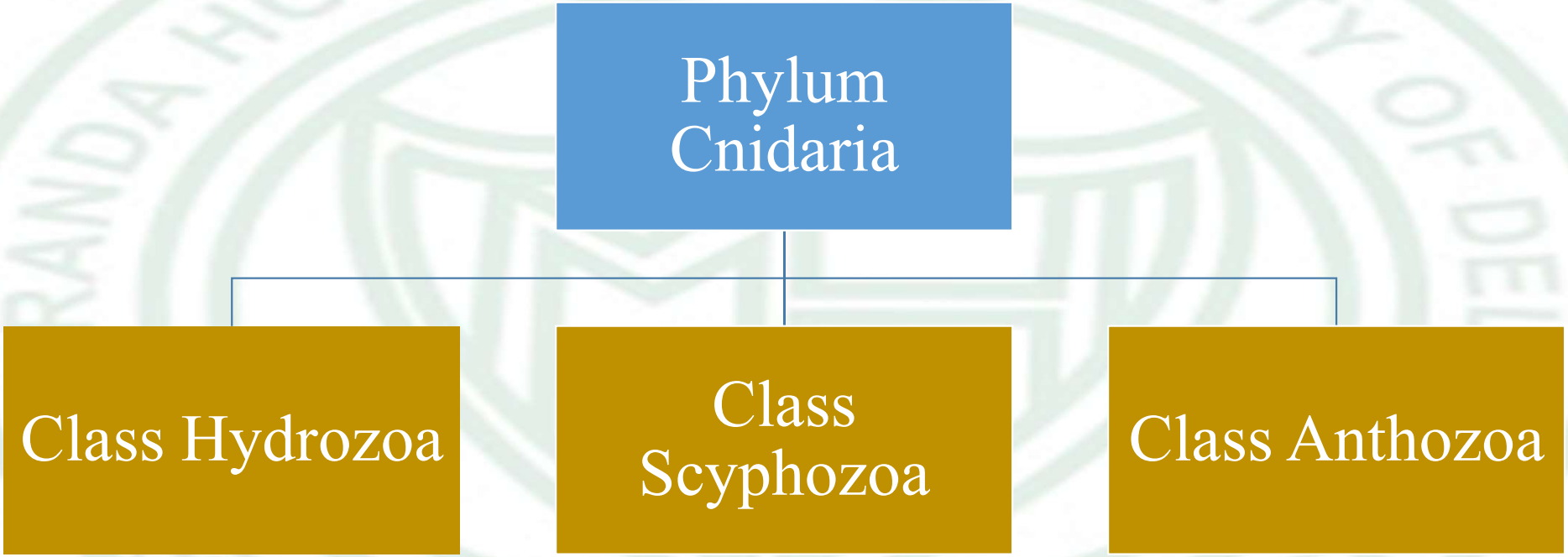
- It lives in symbiotic relationship with a green algae *Zoochlorella* due to which colony appear green in colour.
- Outer surface is soft textured and Skeleton consists of **siliceous spicules** which are embedded in **spongin fibres**

VIDEO LINK: https://youtu.be/8CpRQMwEEqk

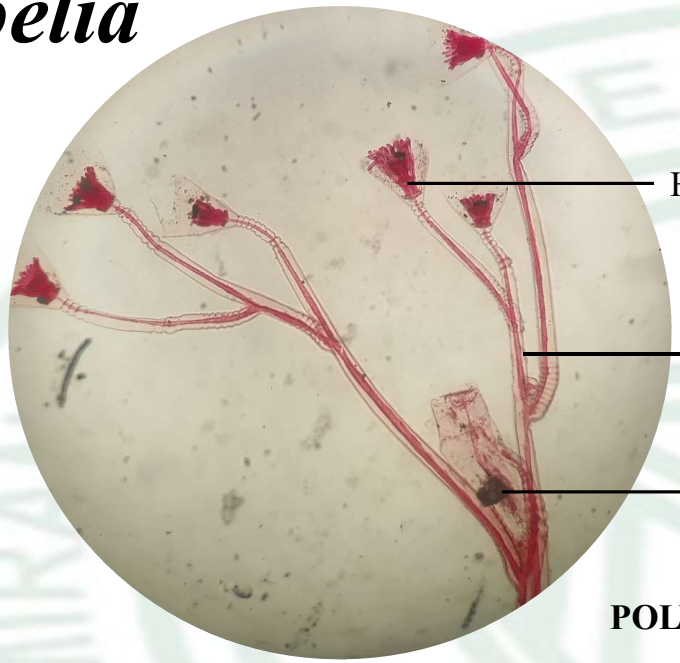


Geographical Distribution: Mainly found in freshwater streams of North America and Europe.

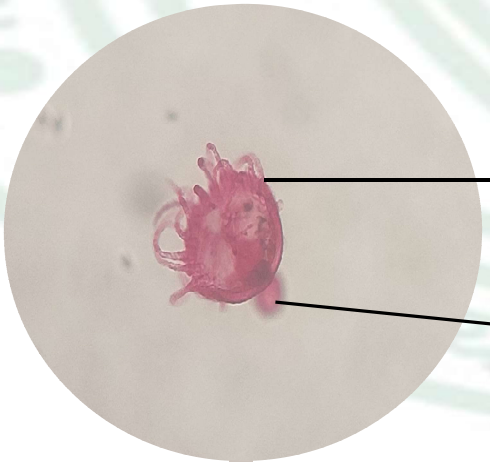
Habitat: Common freshwater sponge, Colonial and found in lakes , slow streams


Phylum Cnidaria
Class Hydrozoa
Class Scyphozoa
Class Anthozoa

Obelia



POLYP



MEDUSA

CLASSIFICATION:

Phylum: Cnidaria (multicellular, tissue grade, diploblastic and acoelomate)

Class: Hydrozoa (both polyp and medusa form, true velum, non-cellular mesoglea)

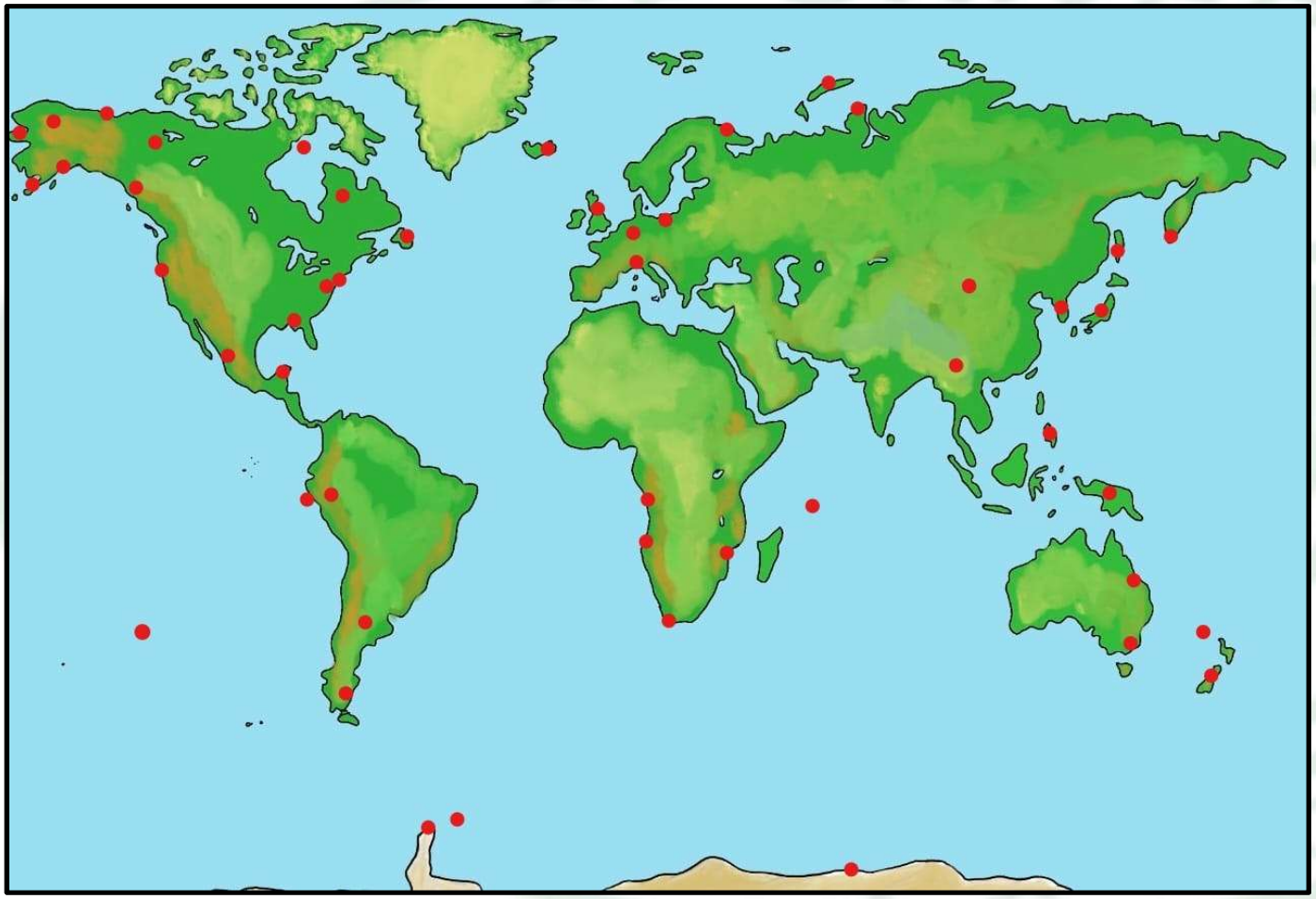
Genus: *Obelia*

IDENTIFYING FEATURES:

- It forms a whitish or light brown plant-like fur in the sea, so called as Sea-fur.
- The colony of ***Obelia*** consists of basal horizontal portion called as the **hydrorhiza** which is attached to the substratum and number of vertical branches known as **hydrocauli** arising from the **hydrorhizha**.
- **Medusa** is bell shaped with a concave and a convex side. It is provided with marginal tentacles, four radial canals, a ring canal, four gonads borne on the radial canals and hanging central manubrium on the concave side.

VIDEO LINK-

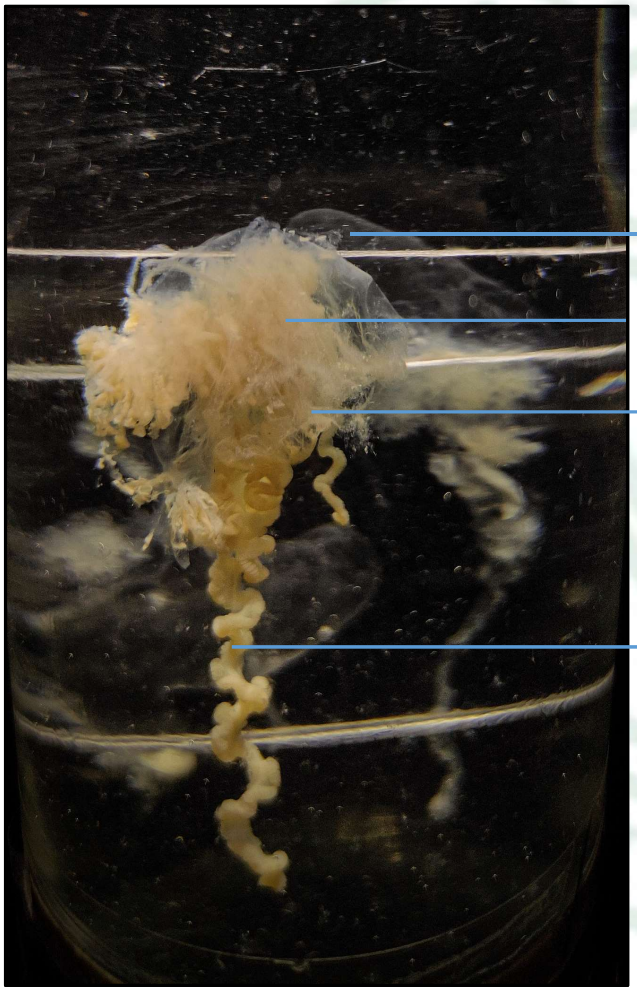
https://www.gettyimages.in/detail/video/microscopic-view-of-obelia-colonies-on-surface-of-stock-video-footage/143514561



Geographical Distribution: Cosmopolitan in distribution, except high Arctic and Antarctic seas

Habitat: Colonial marine, sedentary, found attached to rocks and sea weeds in shallow waters

Physalia



CLASSIFICATION:

Phylum: Cnidaria (Tissue grade, Acoelomate, Diploblastic Presence of Nematocysts)

Class: Hydrozoa (Presence of hydroids and Crespedote medusa)

Order: Siphonophora (polymorphic colonies with various polypoid and medusoids)

Genus: *Physalia* (Portuguese Man o' War)

IDENTIFYING FEATURE:

- Gas filled pneumatophore/float is present which helps in swimming.
- Ventrally the float contains budding coenosarcs from which dactylozooids, gastrozooids, gonozooids and gonodendra hang down, arranged in groups (cormidia)
- Tentacles are large bearing stinging batteries of nematocysts

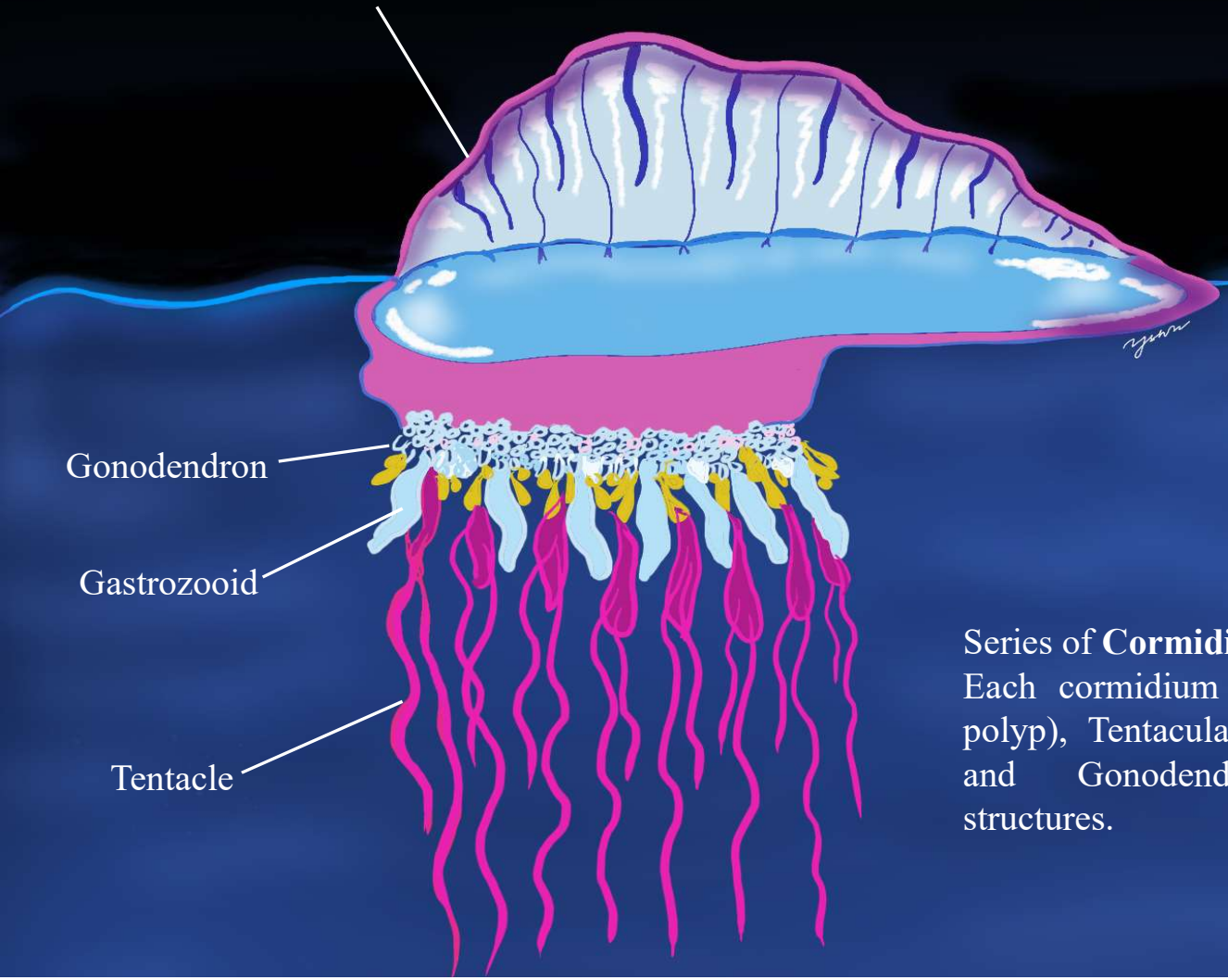
VIDEO LINK:

https://www.youtube.com/watch?v=gr1ps0ooDhU&ab_channel=BBC

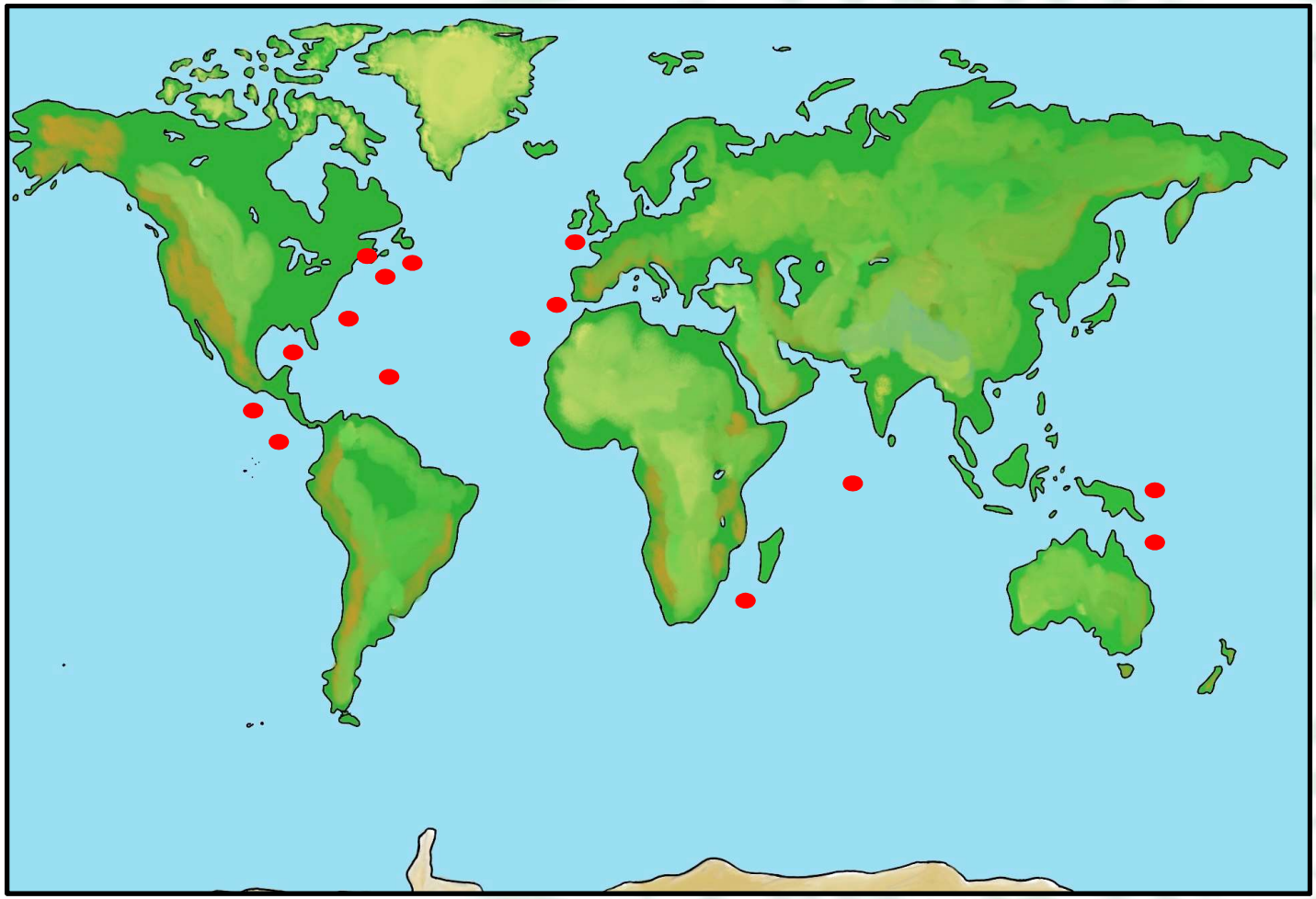
Pneumatophore/float- Gas filled, helps in buoyancy

Portuguese man o' war

(called so as it resembles the 18th century Portuguese war ship at full sail)



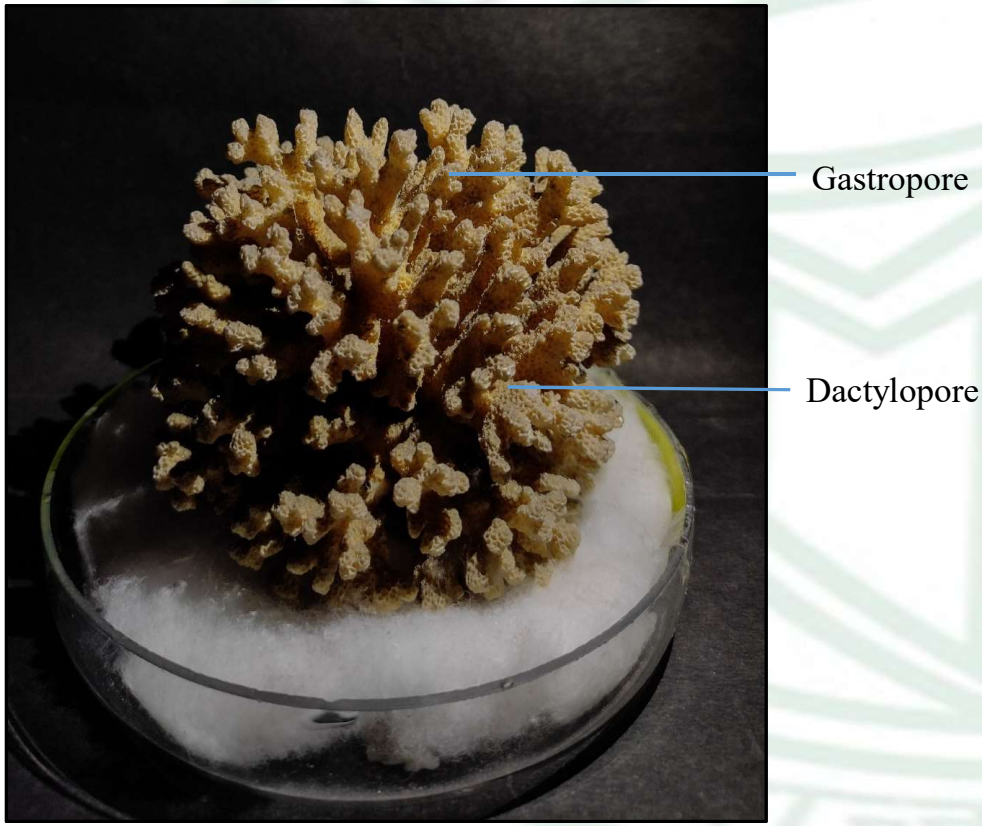
Series of **Cormidia** arranged under the float
Each cormidium consists of Gastrozooid (feeding polyp), Tentacular Palpon (tentacle bearing polyp) and Gonodendron (compound reproductive structures.



Geographical Distribution: Found in the Atlantic ocean, Sargasso sea, Caribbean sea, Atlantic and Western Pacific ocean.

Habitat: Marine, colonial, pelagic animal of tropical, sub tropical seas

Millepora



CLASSIFICATION

Phylum- Cnidaria (Diploblastic, radially symmetrical, stinging cells called cnidocytes are present, single body cavity called coelenteron present)

Class- Hydrozoa (mesoglea is non-cellular, polyps without stomodaeum and septa, craspedote medusa, gonads of epidermal origin)

Genus - *Millepora* (Fire coral/Stinging coral)

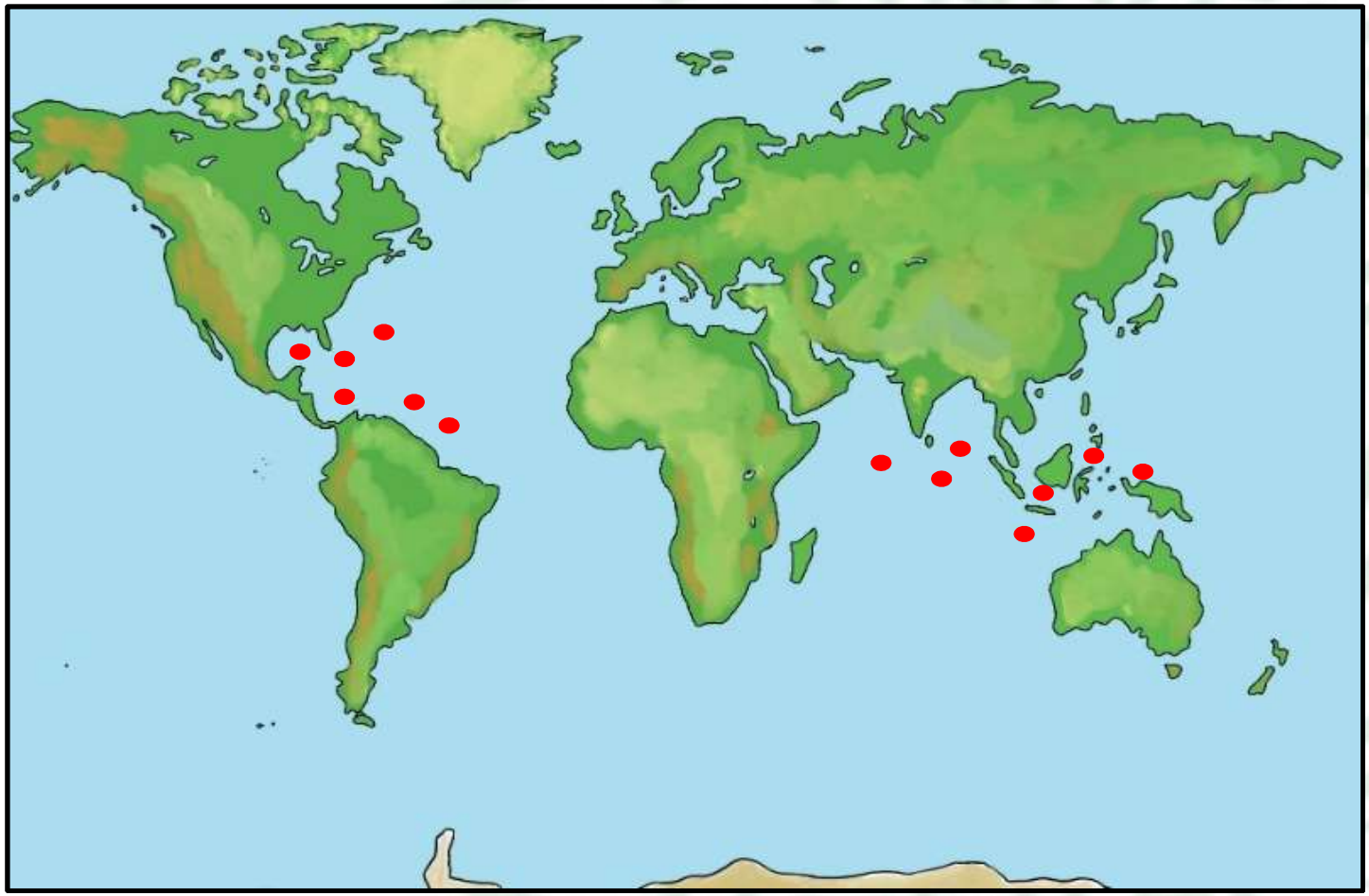
IDENTIFYING FEATURES:

➢Branched hydroid colony with highly branched anastomosing hydrorhiza, forming a broad basal mass encrusting rocks.

➢Colony covered by calcareous perisarc (coenosteum) having numerous pores (both gastropores and dactylopores)

VIDEO LINK:

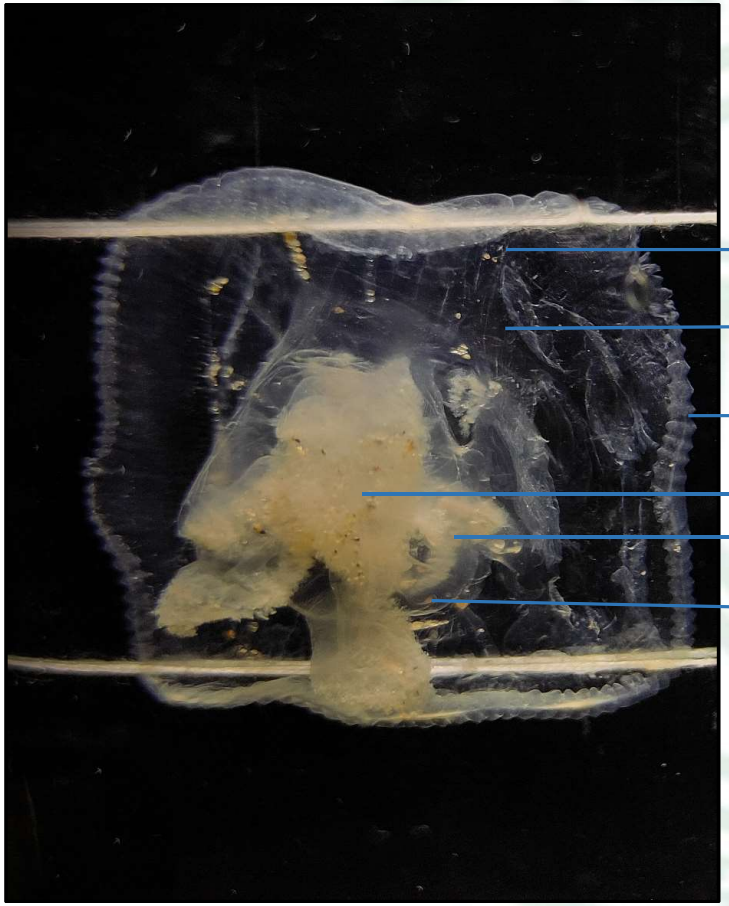
https://www.youtube.com/watch?v=Lpd5HRPKNAc&authuser=4



<u>Geographical Distribution</u>: found in Pacific, Atlantic and Indian Ocean

<u>Habitat</u>: Shallow water coral forms a broad basal mass encrusting rocks

Aurelia



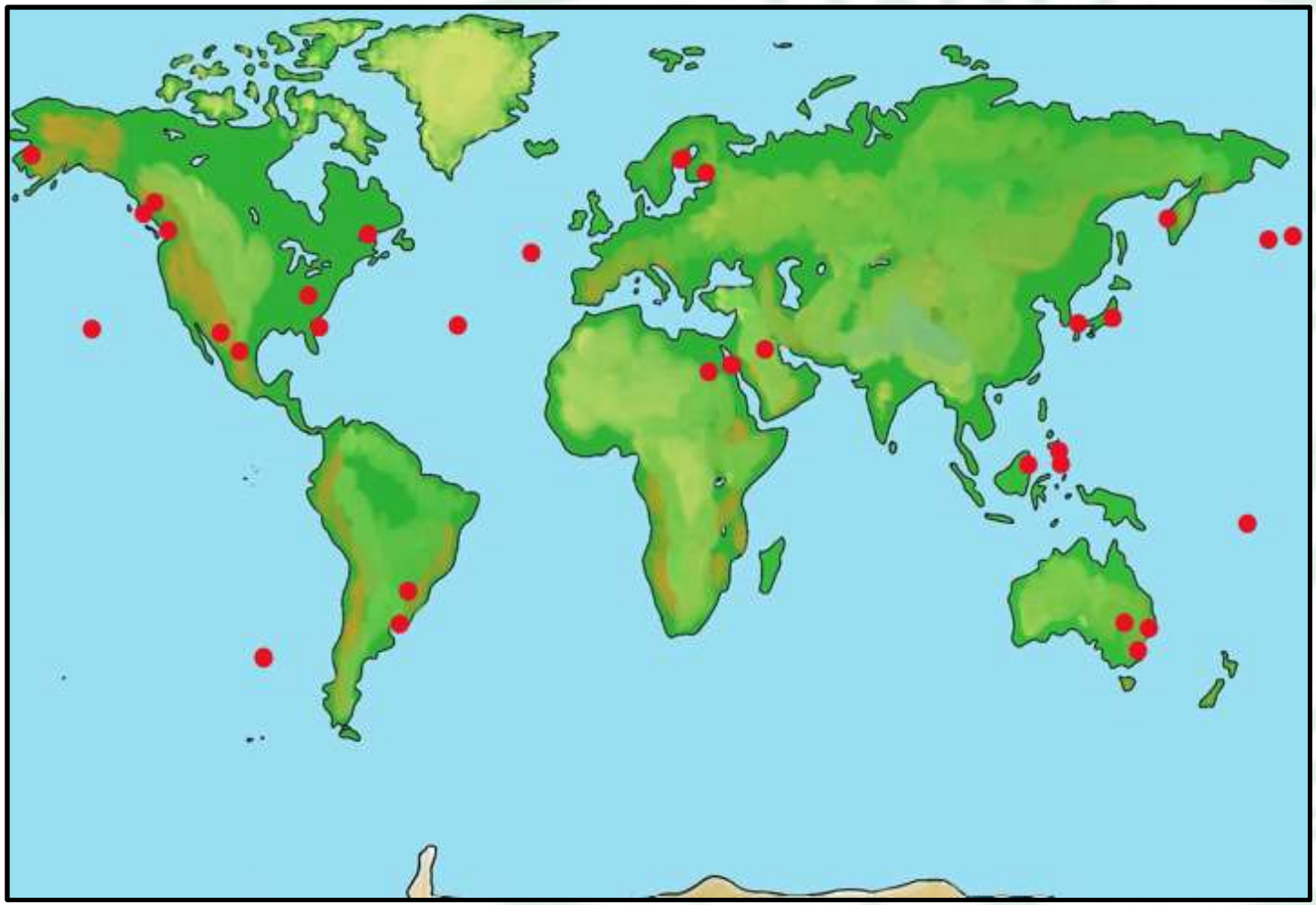
CLASSIFICATION:

Phylum: Cnidaria (diploblastic, radially symmetrical, presence of hypostome, nematocysts)
Class: Scyphozoa (exclusively medusoid, polyps absent, umbrella shaped medusae without velum)
Order: Semaeostomae (mouth is square, umbrella is flat, saucer-shaped, tentaculocysts-8)
Genus: *Aurelia* (Moon jelly)

IDENTIFYING FEATURES:

- Body is flattened saucer-shaped bell with eight marginal lobes.
- Four **horse shoe shaped gonads** lie on the floor of gastric pouches are reddish or pinkish in colour.
- Mouth present in centre of subumbrellar surface with four corners of mouth drawn into **four** long **oral arms**.
- Short **tentacles** present along the margin of the umbrella.

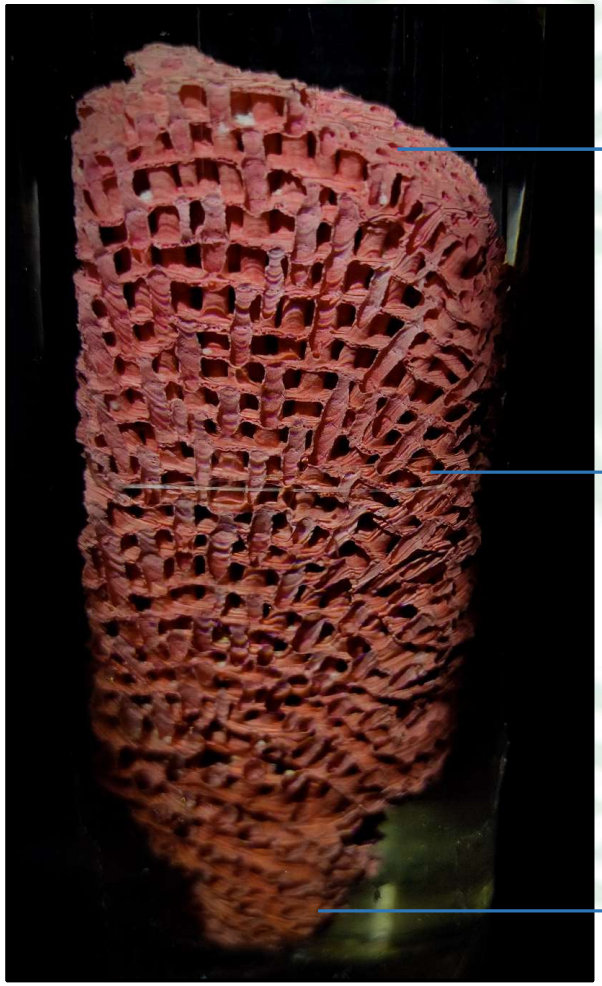
VIDEO LINK: https://youtu.be/ZrDfBMRbNOI



Geographical Distribution: cosmopolitan in distribution, coastal waters of all oceans.

Habitat: Solitary, Marine jelly- fish

Tubipora



CLASSIFICATION:

Phylum- Cnidaria (tissue level of organization, free swimming planula larva, diploblastic, presence of cnidoblast containing nematocyst)

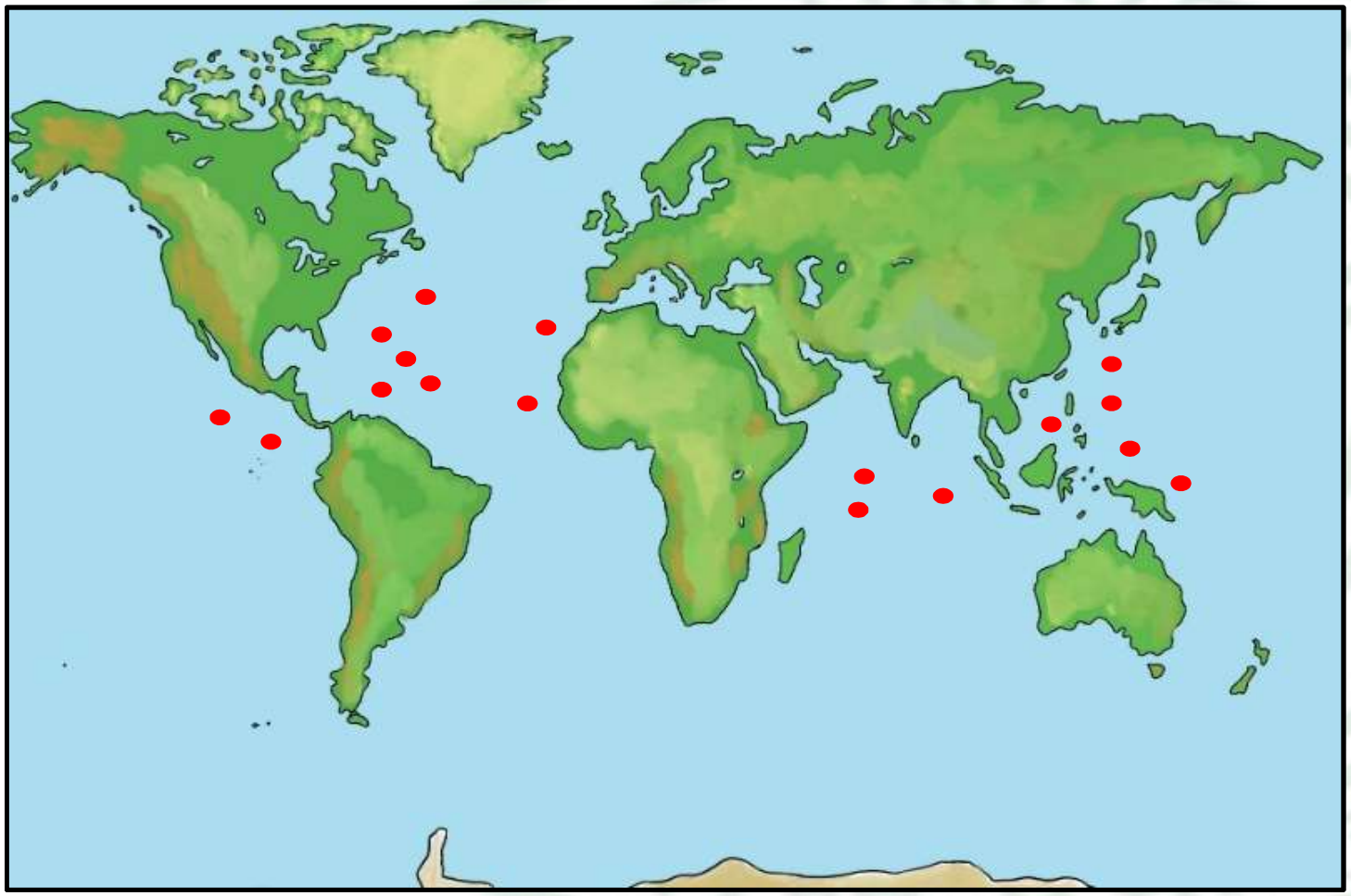
Class- Anthozoa (skeleton of calcium carbonate, only polyp form present)

Genus-*Tubipora* (Organ pipe coral)

IDENTIFYING FEATURES:

- Long, parallel upright polyps, or stalks, supported by a skeleton of rigid tubes of calcium carbonate.
- Transverse platforms formed by the fusion of skeletal material unites the polyps at definite intervals.

VIDEO LINK:
https://www.youtube.com/watch?v=ZiULxLLP32s&t=19s&ab_channel=NationalGeographic



Geographical Distribution: Found in Atlantic, Indian and Pacific Oceans.

Habitat: Marine colonial polypoid of warm waters.

Corallium

CLASSIFICATION:

Phylum – Cnidaria (Tissue level of organization , diploblastic , acoelomate)

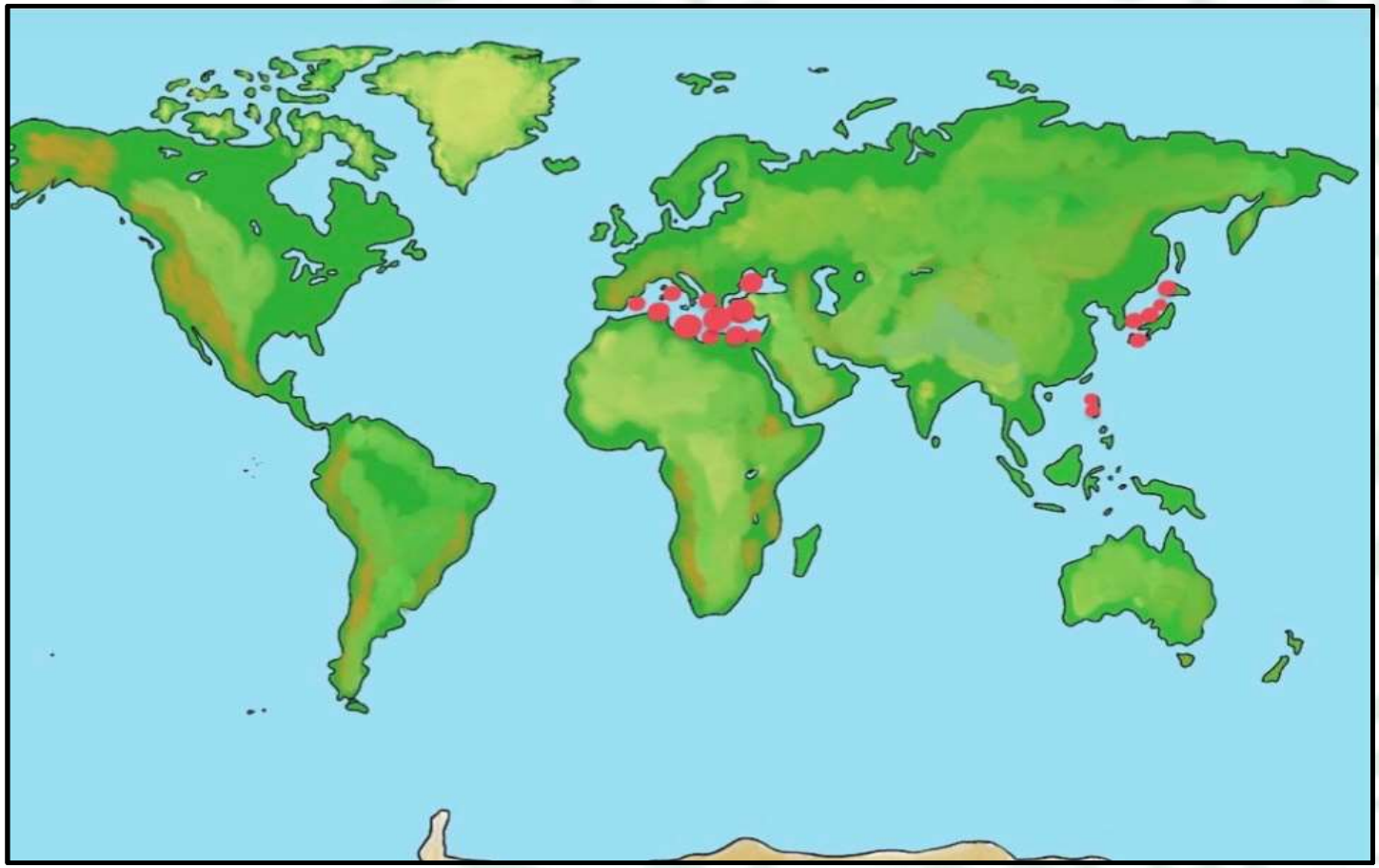
Class -Anthozoa (Only polypoid generation , sedentary , solitary or colonial)

Genus –*Corallium* (Red coral)

IDENTIFYING FEATURES:

- Red colored appearance
- It is branched
- Dimorphic colony- Autozooids (nutritive zooid with tentacles) and siphonozooids (no tentacles, large cilia in a groove to maintain the current of water)
- The coenosarc gets calcified and hard and is bright red in colour

VIDEO LINK: https://youtu.be/eaECB23smAs



Geographical Distribution: Found in Mediterranean Sea and Off coast of Japan.

Habitat: Colonial, marine form, grows on rocky sea bottom in dark crevices.

Alcyonium

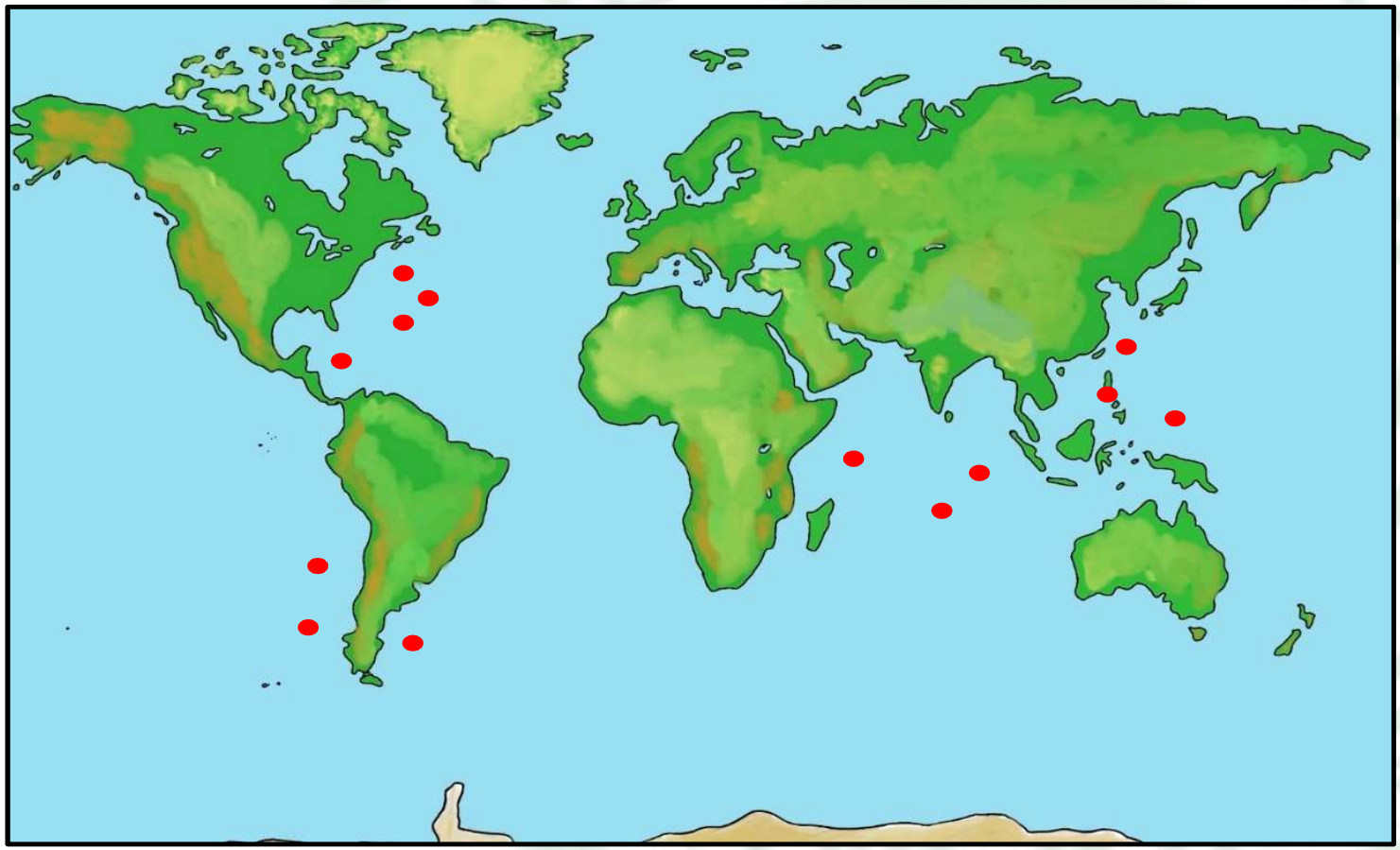
CLASSIFICATION

Phylum- Cnidaria (multicellular, tissue level, acoelomate)
Class- Anthozoa (marine, polypoid, medusa stage absent)
Genus- *Alcyonium* (Dead man's finger)

IDENTIFYING FEATURES

- Body consist of polyps which resemble the shape of a star, known as Anthocodia, present only in distal part.
- Mouth of each anthocodium surrounded by eight pinnate tentacles

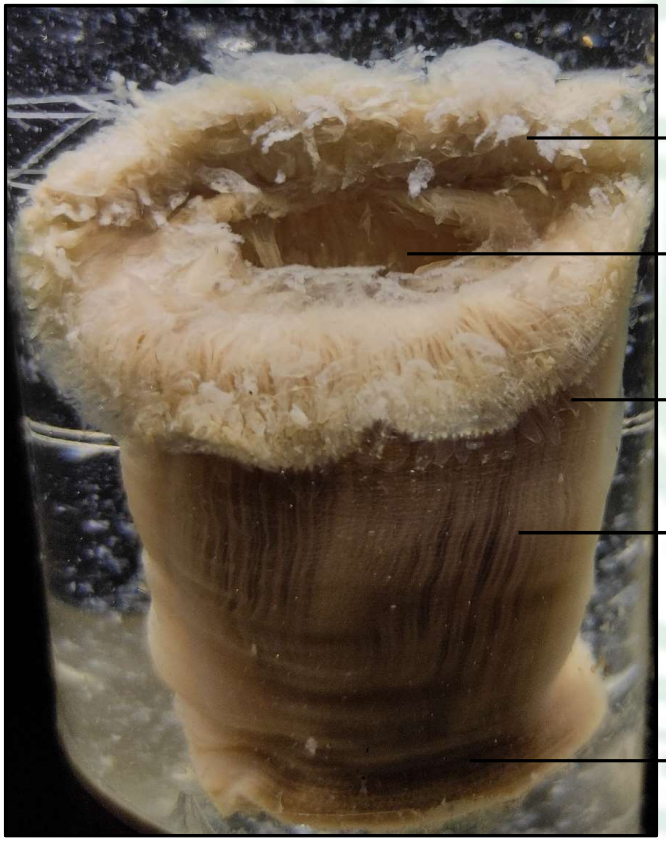
VIDEO LINK- https://youtu.be/ArkMaRYBGWY



<u>Geographical Distribution</u>: Cosmopolitan in distribution, found mainly Atlantic, Pacific and Indian Oceans .

<u>Habitat</u>: Marine, sedentary colonial form

Metridium



CLASSIFICATION:

Phylum: Cnidaria (Diploblastic , biradial symmetry , polymorphism , metagenesis)

Class : Anthozoa (only polyp form , cellular mesoglea , endodermal gonads)

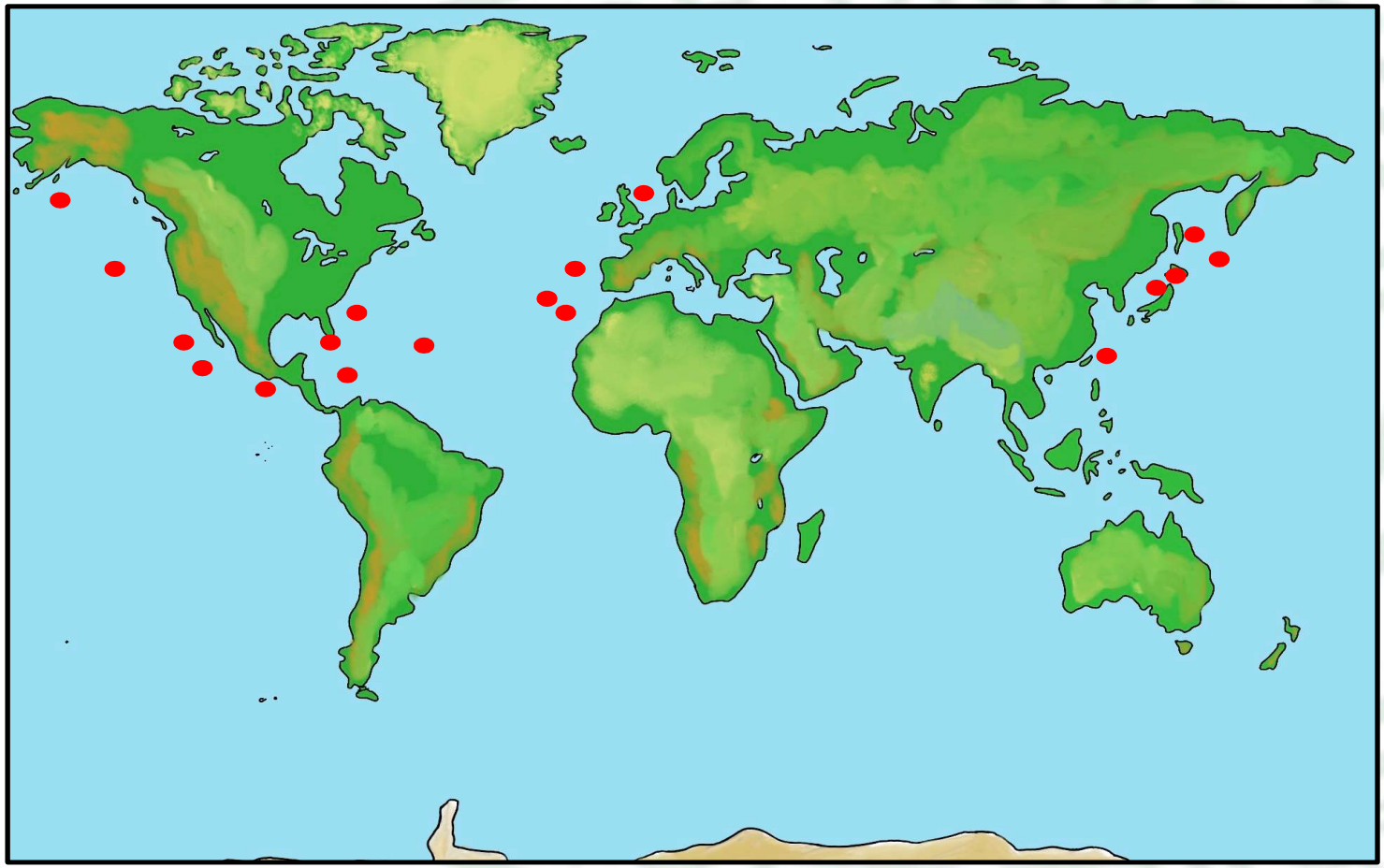
Genus : *Metridium* (Sea Anemone)

IDENTIFYING FEATURES:

- Body is distinguished into 3 regions – Oral disc , column (Scapus) and pedal disc
- Oral disc is expanded as flat disc called as capitulum which is surrounded with several marginal tentacles around mouth for feeding and defense
- Capitulum and scapus are separated by a prominent fold like structure called collar and a shallow grove called as fossa

VIDEO LINK :

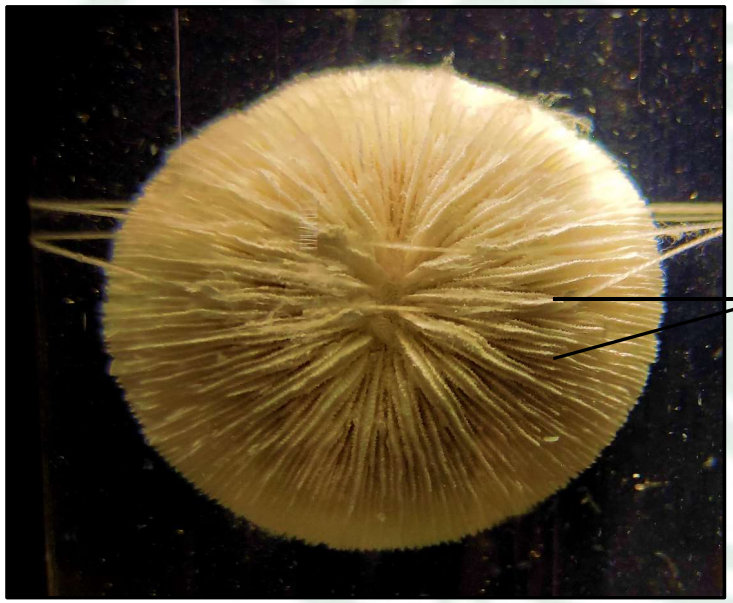
https://www.youtube.com/watch?v=0aUA8BvylZg&t=59s&ab_channel=Zorak



Geographical Distribution: Eastern Pacific Ocean, Atlantic Ocean, Coast of North Japan, North east China.

Habitat: Marine, solitary, sessile found attached to the rocks.

Fungia



CLASSIFICATION:

Phylum: Cnidaria (Multicellular, tissue grade, diploblastic and acoeleomate)

Class: Anthozoa (Exclusively marine; polypoid; medusoid stage absent)

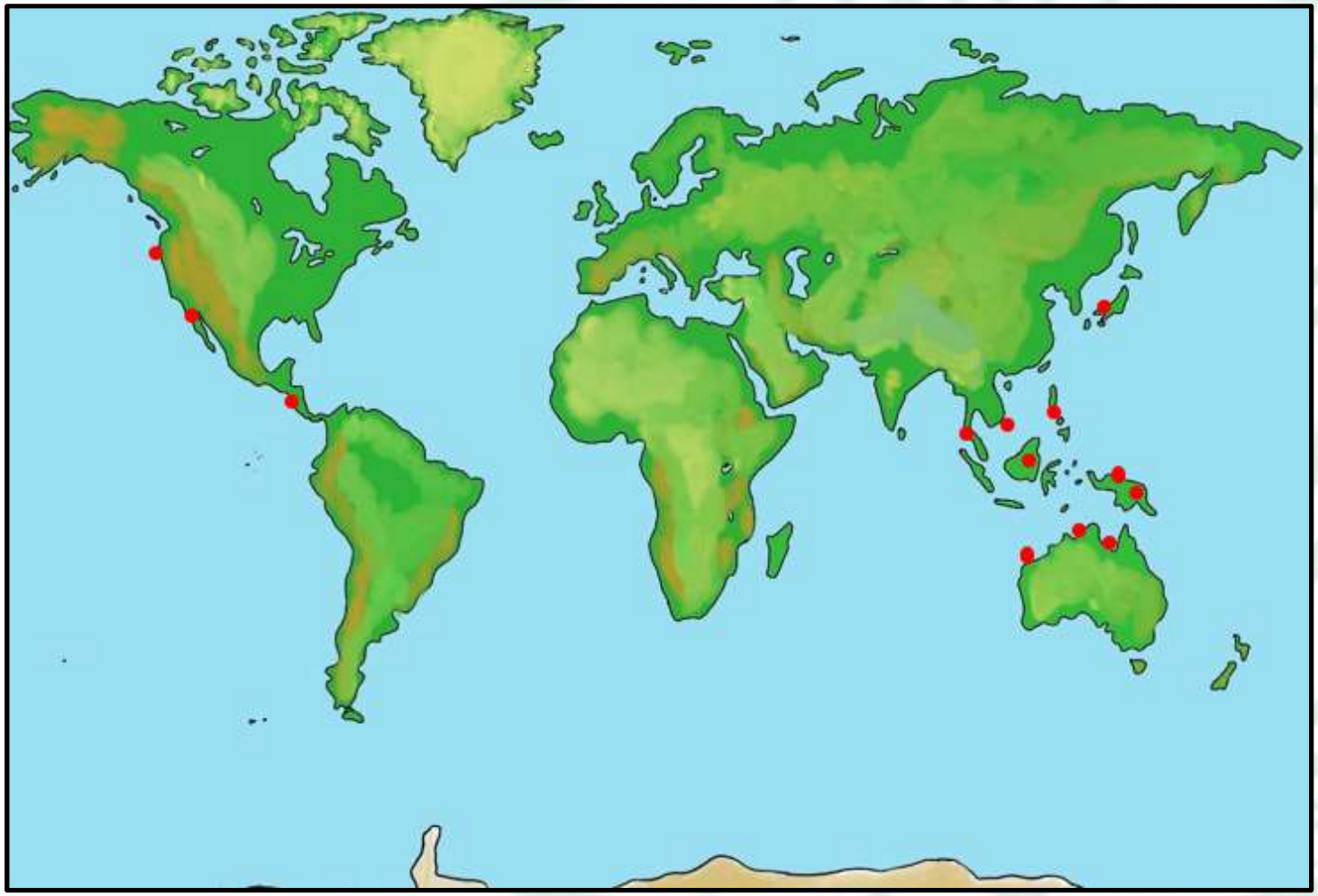
Genus: *Fungia* (Mushroom coral)

IDENTIFYING FEATURE:

- It has a discoidal corallite, with upper convex and lower concave surface
- It has numerous septa that are connected to each other by synaptacula which are small calcareous rods.
- Its theca or cup is only found on the lower surface

VIDEO LINK:

https://www.youtube.com/watch?v=ZbUjuonSkYw&ab_channel=TidalGardens



Geographical Distribution: Gulf of California, western and central Pacific Ocean

Habitat: Marine, Solitary coral

Meandrina

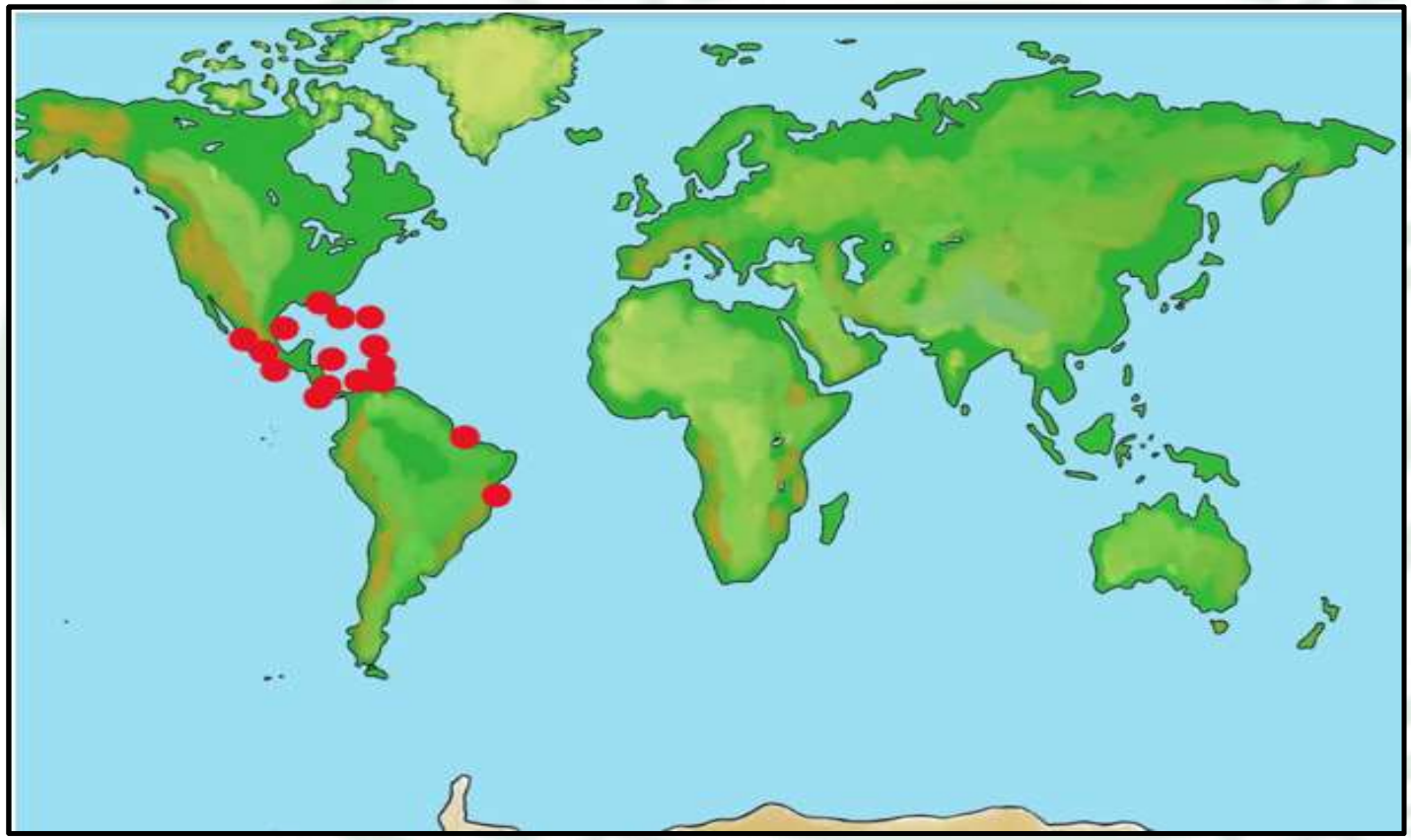
CLASSIFICATION:

Phylum – Cnidaria (tissue grade level of organization, diploblastic, acoelomate)
Class – Anthozoa (only polypoid generation , sedentary, solitary or colonial)
Genus – *Meandrina* (brain coral, maze coral)

IDENTIFYING FEATURES:

- The specimen contains ridges and grooves resembling the human brain with a confluent corallite.
- Its surface has numerous sinuous ridges and grooves running parallel with each other
- Colonies are rounded or oval in shape

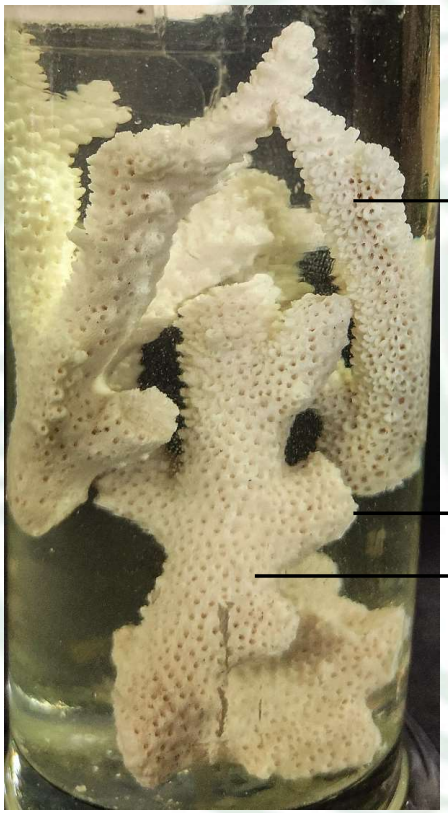
VIDEO LINK - https://youtu.be/NPM7vkLaQvs*



Geographical Distribution: West Indies, Coast of Florida

Habitat: Marine, colonial form, encrusting large rocky areas to form round masses of limestone

Madrepora



CLASSIFICATION:

Phylum: Cnidaria (Tissue level organization, diploblastic and radial symmetry)

Class:Anthozoa (only polyp phase is present,polyp with septae and pharynx is present)

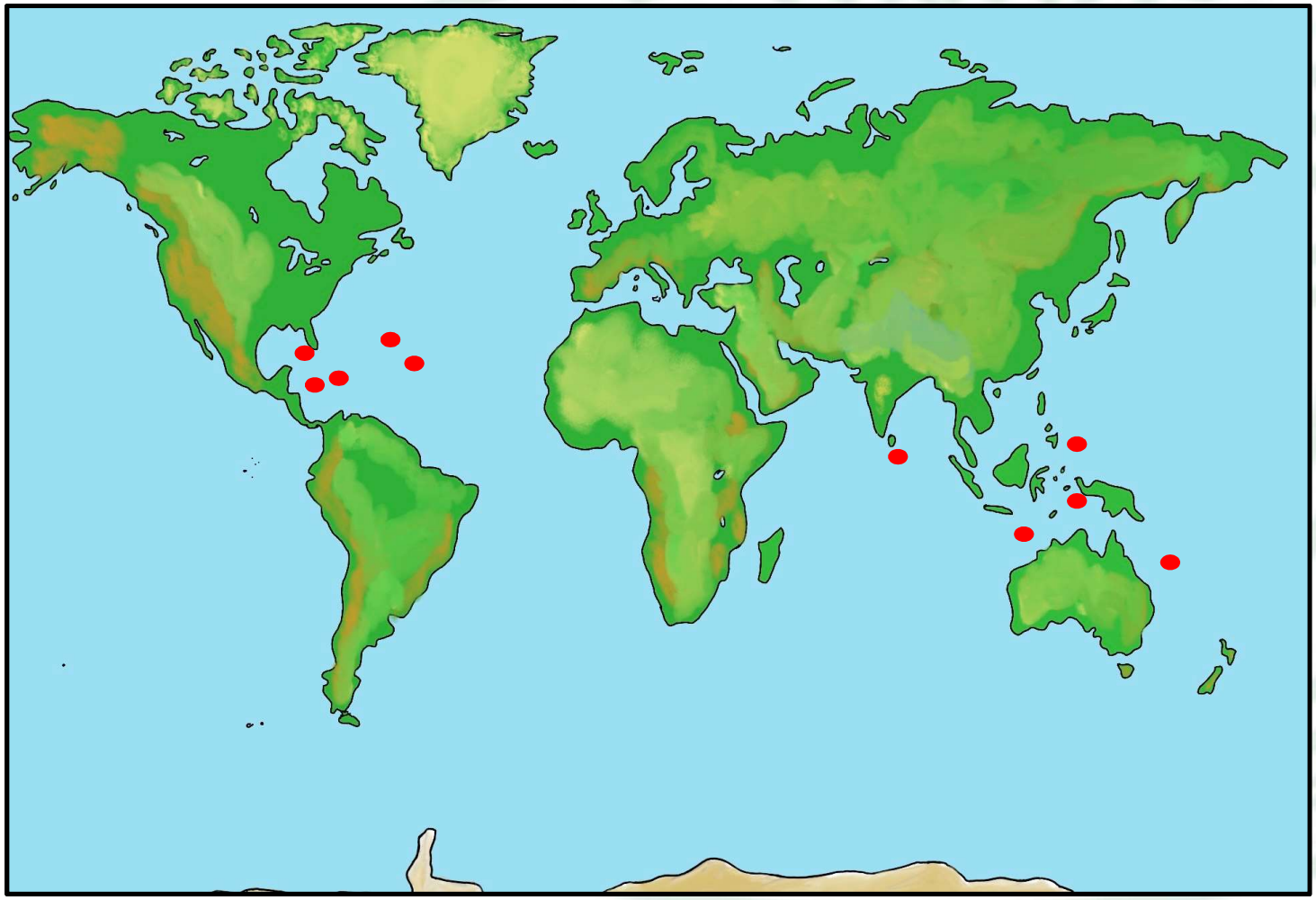
Genus: *Madrepora* (*Acropora*)

IDENTIFYING FEATURES:

- Colony is branched with small polyps in cylindrical cups separated by perforated coenosteum
- Terminal and lateral polyps contain six and twelve tentacles respectively

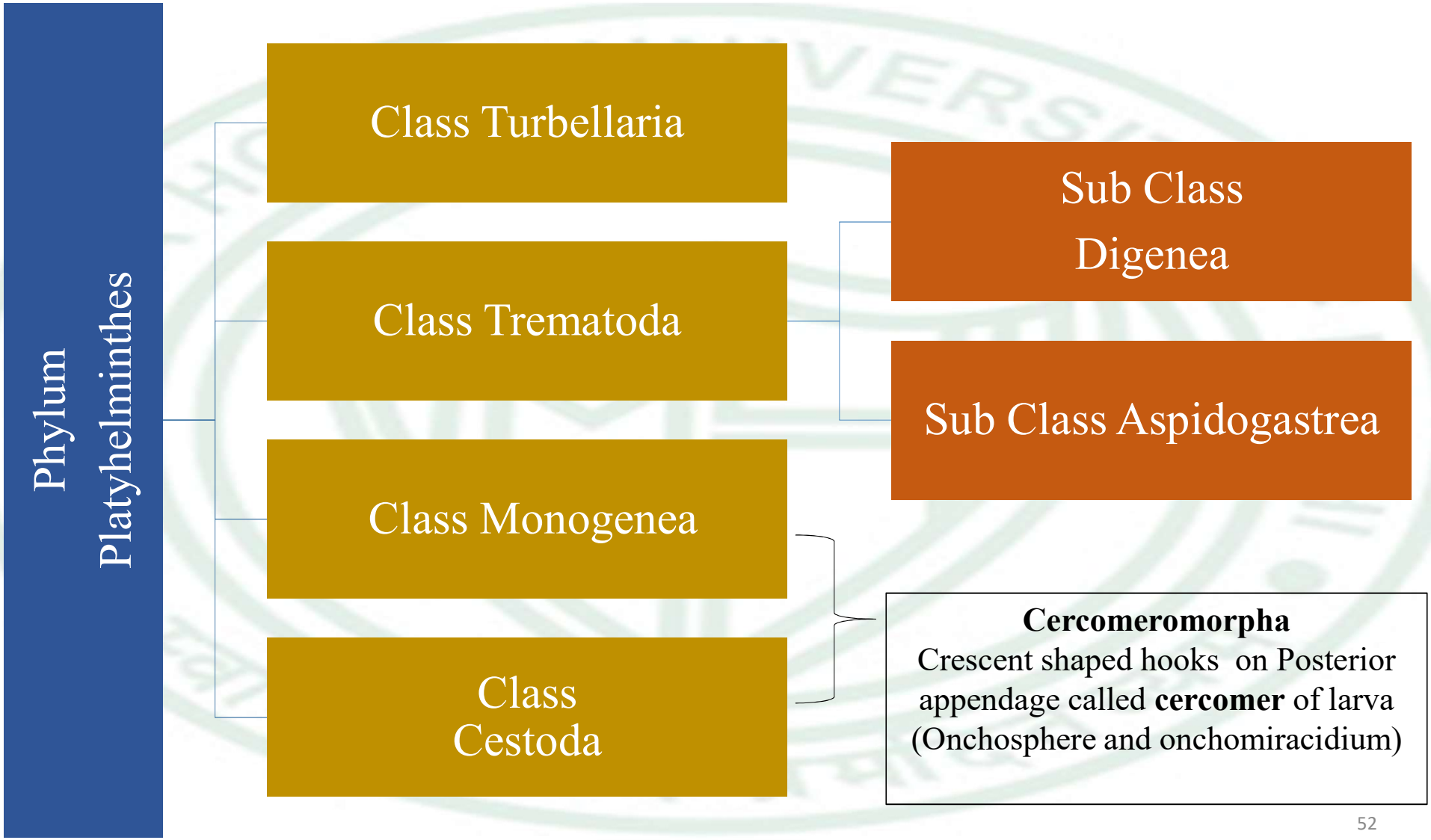
VIDEO LINK:

https://youtu.be/ZiULxLLP32s



Geographical Distribution: West Indies, Coast of Florida, Australian seas.

Habitat: Marine, colonial form


Phylum Platyhelminthes
Class Turbellaria
Class Trematoda
Class Monogenea
Class Cestoda
Sub Class Digenea
Sub Class Aspidogastrea
Cercomeromorpha
Crescent shaped hooks on Posterior appendage called cercomer of larva (Onchosphere and onchomiracidium)

Fasciola hepatica

CLASSIFICATION:

Phylum: (dorsoventrally flattened, triploblastic, bilateral symmetry

Class: Trematoda (unsegemented body, cuticle present).

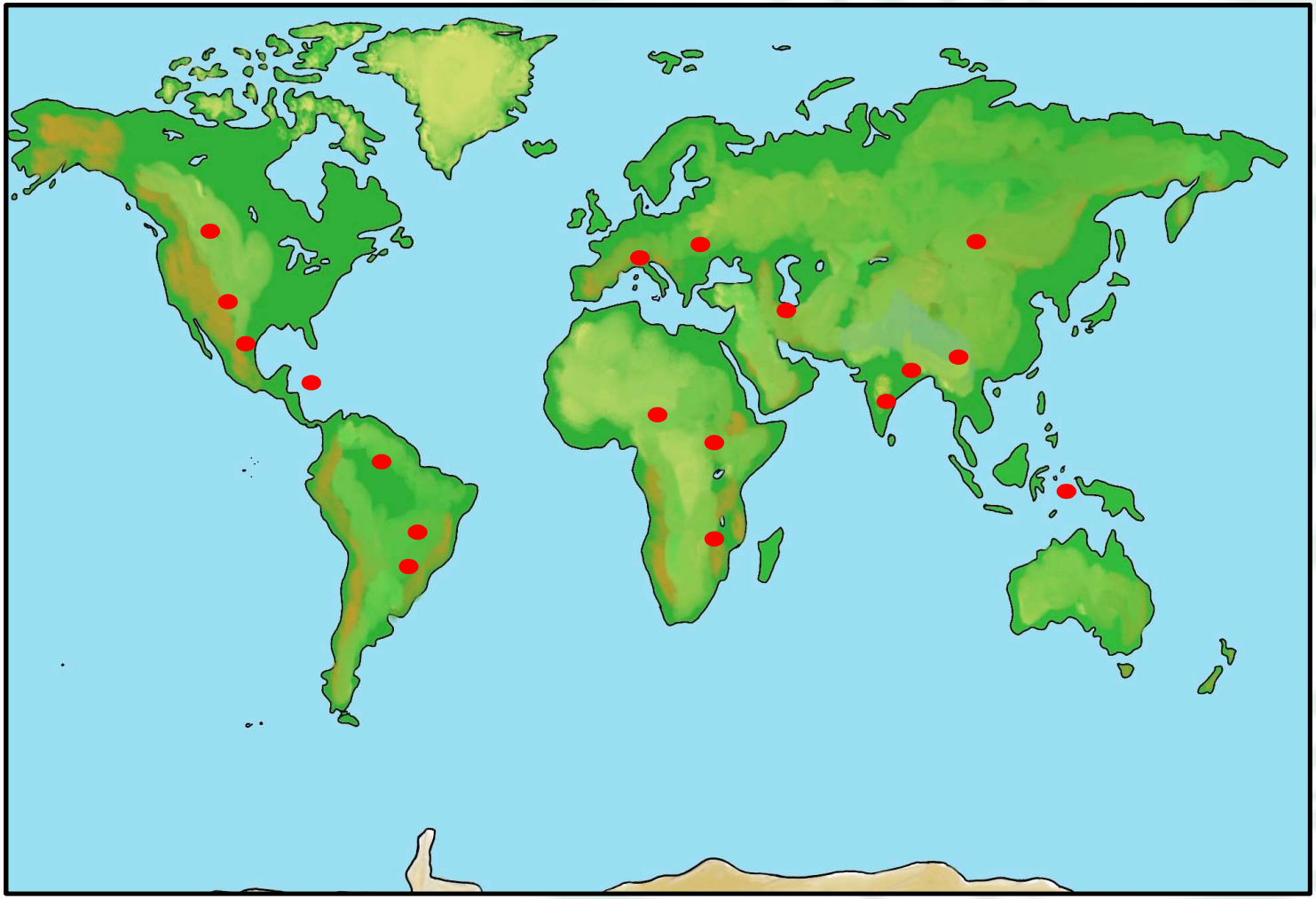
Order: Plagiorchiida

Genus: *Fasciola* (Liver Fluke)

IDENTIFYING FEATURES:

- Unsegmented flattened leaf like body
- Two suckers- oral and ventral sucker (acetabulum), No anus.
- Extensive network of flame cells ends in excretory pore which opens at extreme posterior end

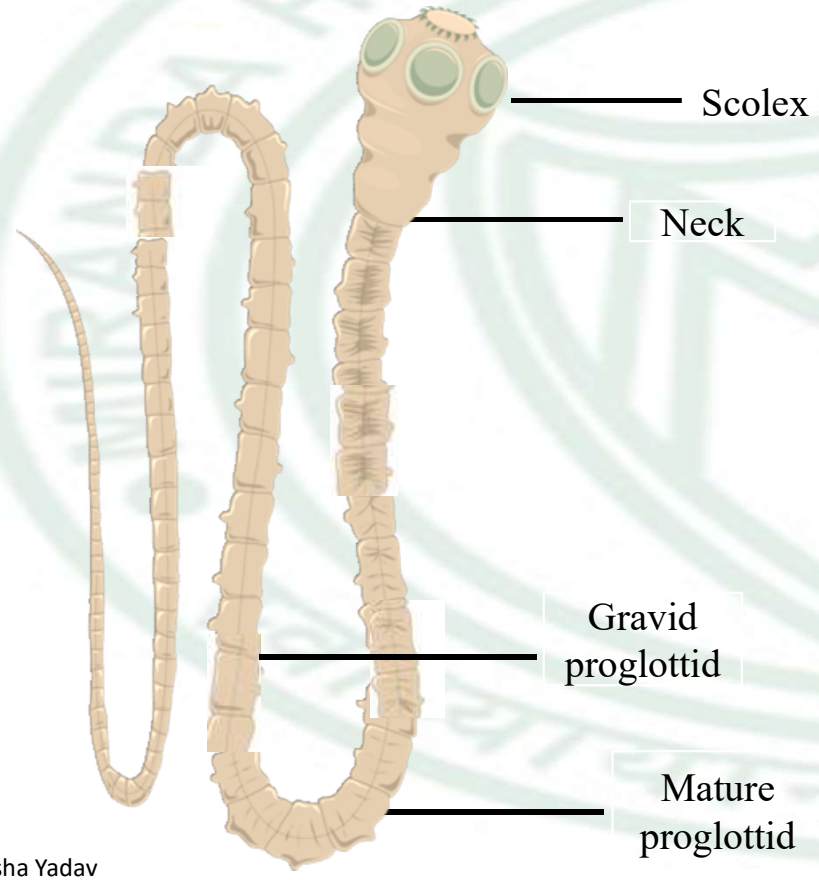
VIDEO LINK: https://youtu.be/ZnJEgmWoOpw



<u>Geographical Distribution</u>: Cosmopolitan, found in all inhabited continents, where sheep and cattle are raised

<u>Habitat</u>: Endoparasite of Liver of Sheep and cattle, inter,ediate host is snail of genus – *Planorbis, Bulinus, Lymnaea*

Taenia solium



CLASSIFICATION:

Phylum : Platyhelminthes (Acoelomate, multicellular, triploblastic, dorsoventrally flattened, bilaterally symmetrical)

Class: Cestoda (Endoparasite, absence of mouth, gut and anus)

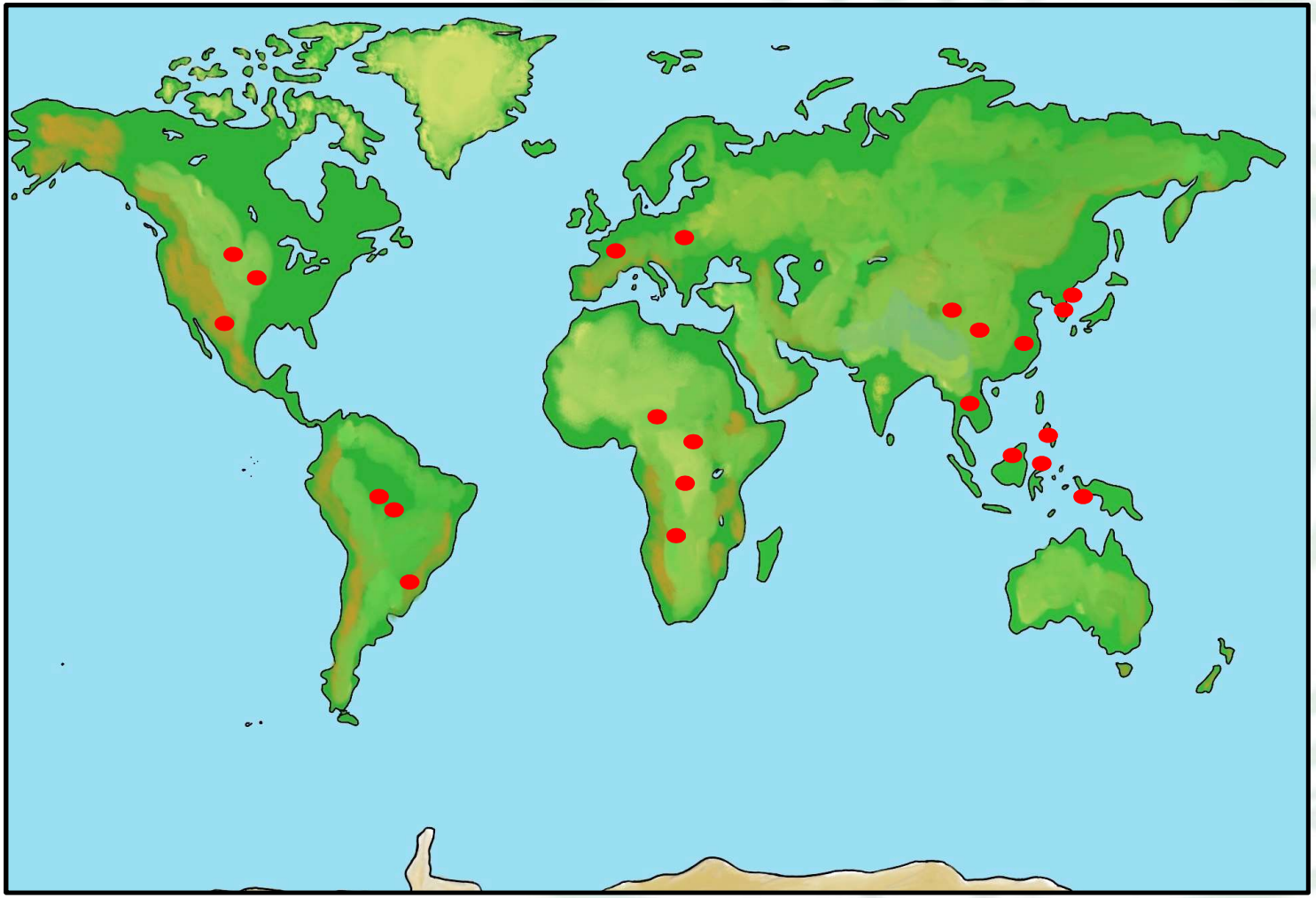
Genus : *Taenia* (Tapeworm)

IDENTIFYING FEATURES:

- Ribbon like segmented body
- Body divisible into scolex, neck and strobila.
- Scolex has 4 suckers and 2 rows of hooks (rostellum)
- Strobila has 3 types of proglottids- Immature, mature and Gravid
- Gravid proglottids are shed via a process called apolysis

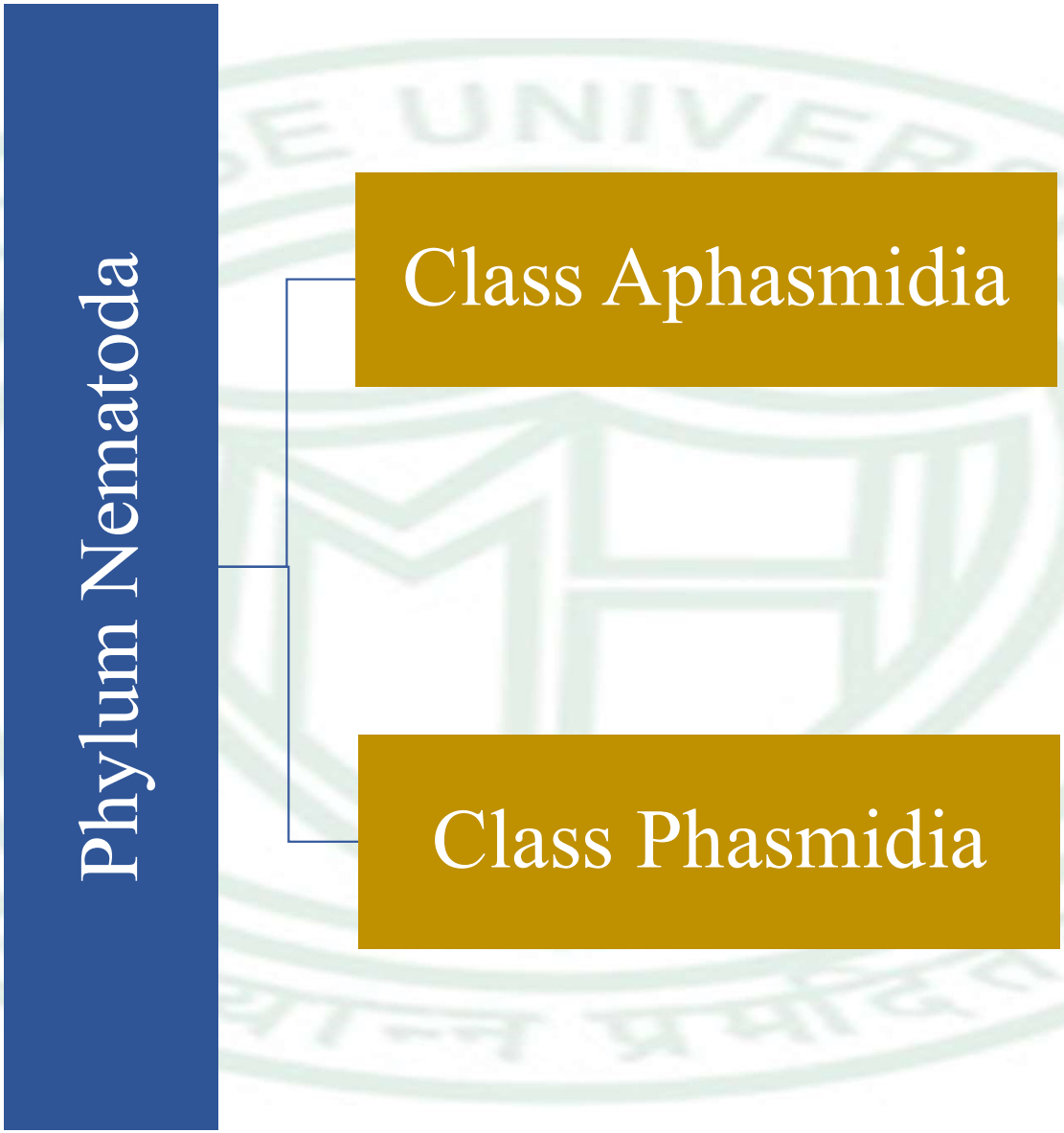
VIDEO LINK:

https://youtu.be/fpmvYEicO84

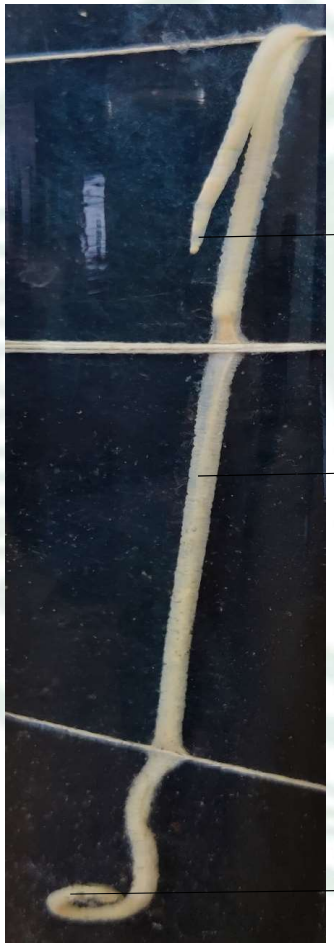


Geographical Distribution: Cosmopolitan, where humans live in close contact with pigs and eat undercooked pork

Habitat: Endoparasite of Gut in Humans and Intermediate host is Pig


Phylum Nematoda
Class Aphasmidia
Class Phasmidia

Ascaris lumbricoides



CLASSIFICATION:

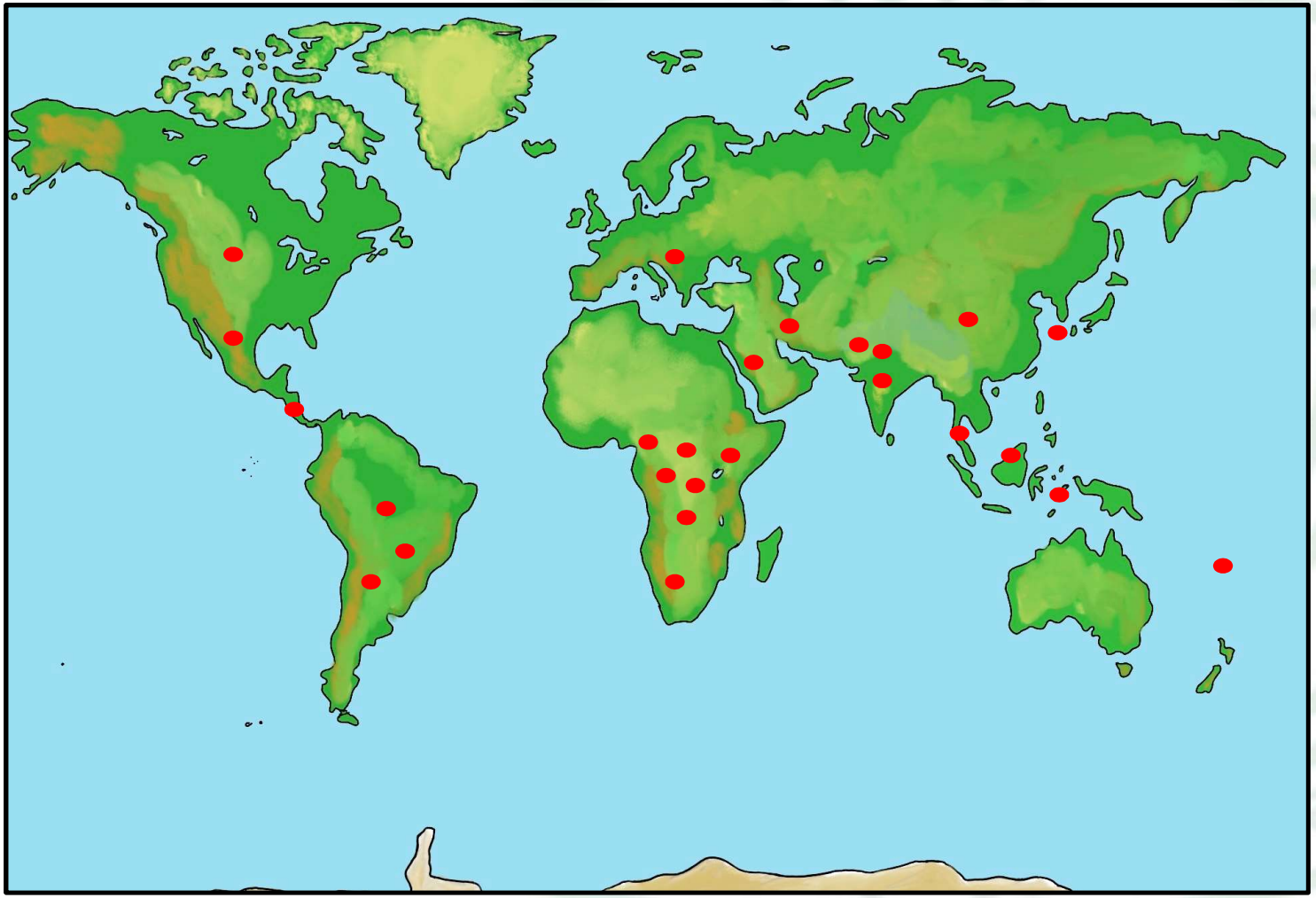
Phylum : Nematoda (Pseudocoelomate, multicellular, triploblastic, tube within a tube body plan, bilaterally symmetrical, unsegmented body tapering at both ends)
Class: Phasmidia (Phasmids present, Amphids pore like)
Genus : *Ascaris* (round worm)

IDENTIFYING FEATURES:

- Elongated cylindrical body with tapering ends. Mouth surrounded by three lips. Four longitudinal lines run through the body (mid dorsal, mid ventral and 2 lateral)
- Ventrally present excretory pore
- In male the reproductive tract opens in rectum, hence a common opening cloaca present. The posterior end is curved. Penial setae emerge out of cloacal opening.
- Female is straight and blunt, anus is present at posterior end. Female reproductive tract opens in Vulva.

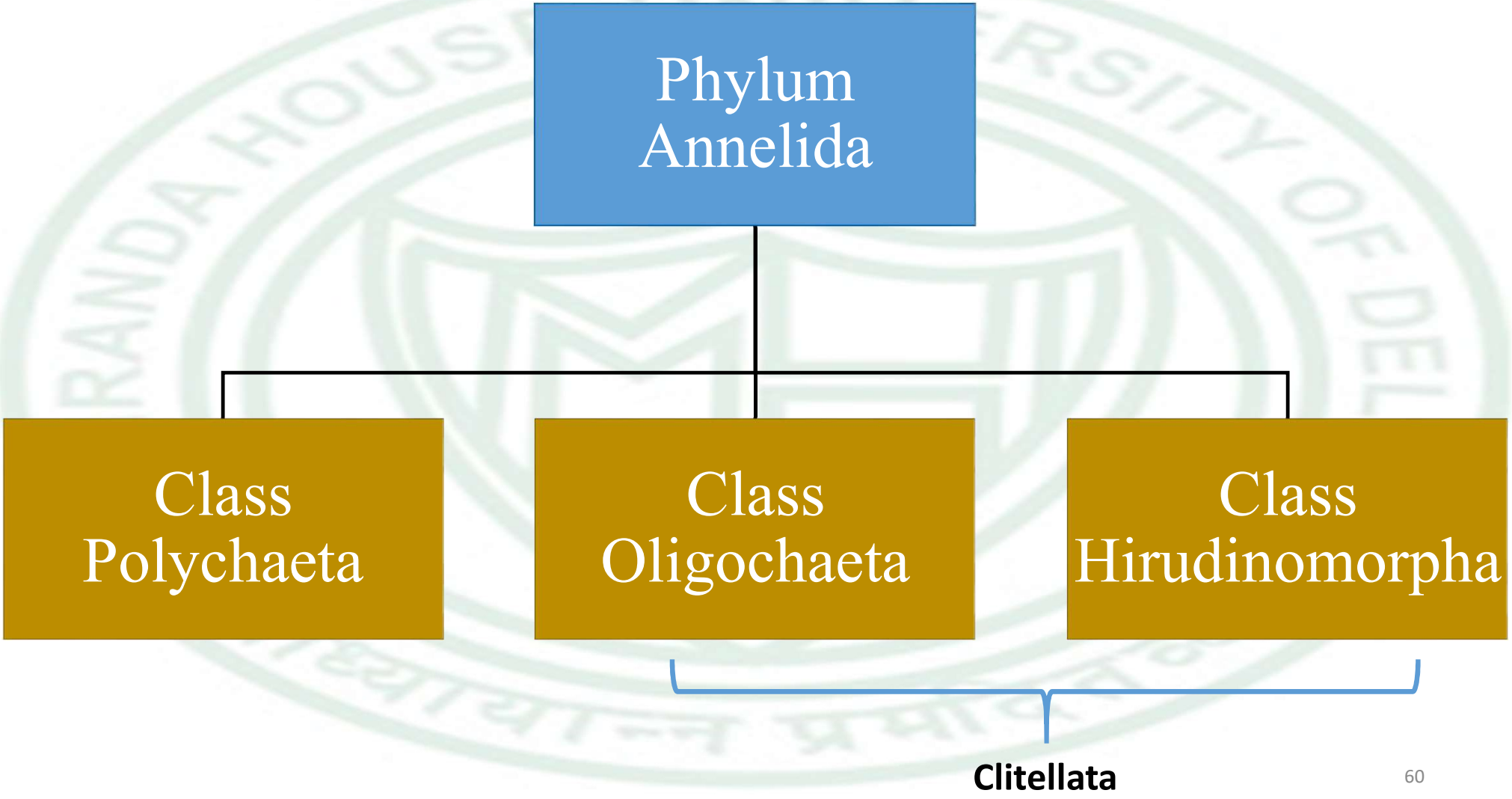
VIDEO LINK:

https://www.youtube.com/watch?v=uzwcCKJgLkE



Geographical Distribution: Cosmopolitan, widely distributed in tropical and sub tropical areas

Habitat: Endoparasite of Gut in Humans


Phylum
Annelida
Class
Polychaeta
Class
Oligochaeta
Class
Hirudinomorpha
Clitellata

Nereis and *Heteronereis*

Heteronereis

CLASSIFICATION:

Phylum: Annelida (Triploblastic, Bilateral symmetry, True Coelomate, Elongated, Metamerically segmented body, unjointed appendages)

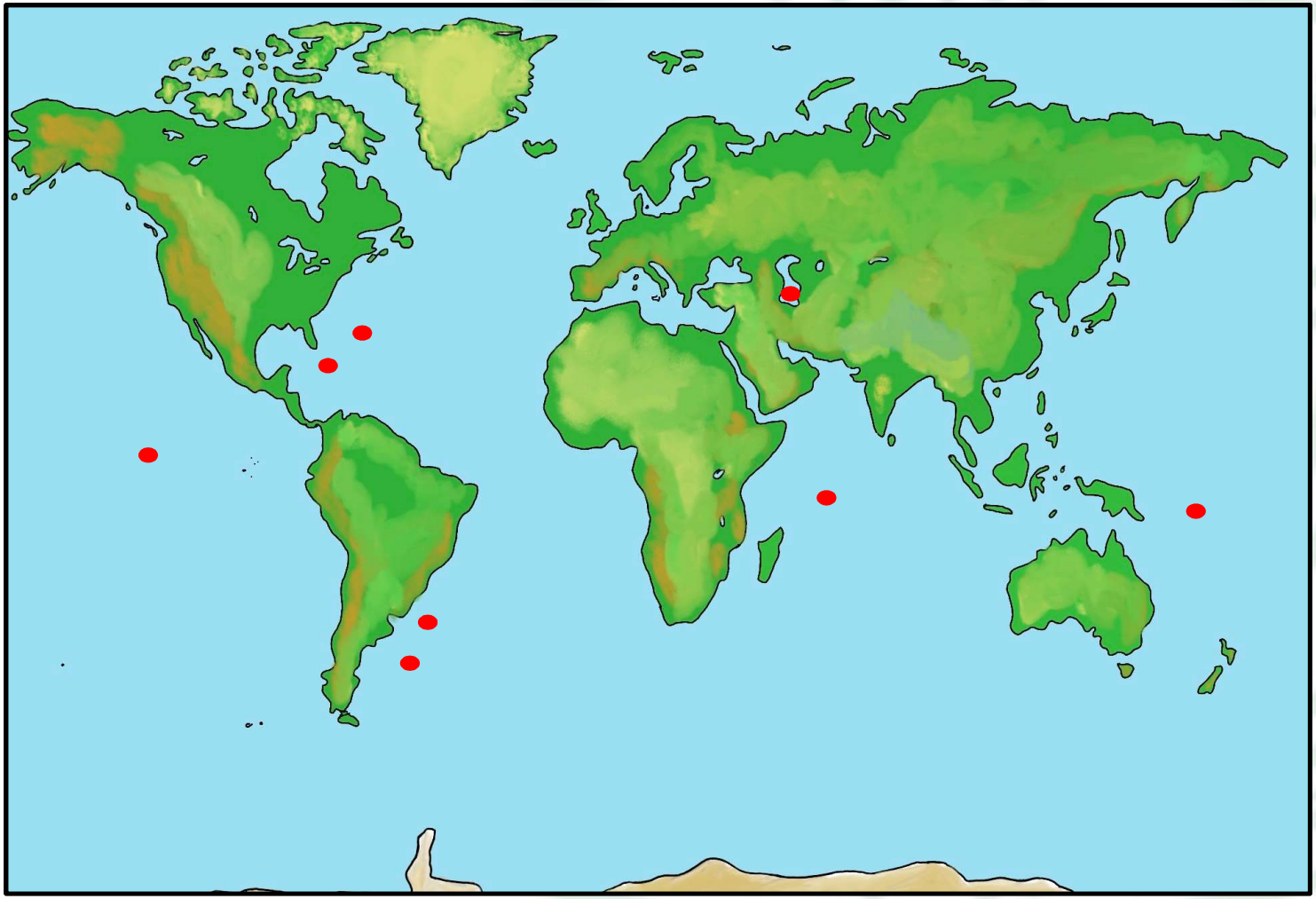
Class: Polychaeta (Presence of numerous setae, clitellum absent)

Genus: *Nereis, Heteronereis* (sexual stage of *Nereis*)

IDENTIFYING FEATURES

- *Nereis* : cylindrical body that is metamerically segmented.
- Body is divided into Prostomium, Trunk, Pygidium. Anterior region is sensory (Head) bearing eyes, prostomial palps, tentacles- prostomial and peristomial.
- Parapodia present, differentiated into notopodium and neuropodium
- *Heteronereis* (Sexual Phase): the body is divisible into two distinct regions; an anterior non sexual region that is called as Atoke and a posterior sexual region called as Epitoke.

VIDEO LINK- https://youtu.be/vE9I3c-ic_o



Geographical Distribution: Cosmopolitan

Habitat: Marine, free swimming, crawling, nocturnal, carnivorous, lives temporarily burrows of sand

Sabella

CLASSIFICATION:

Phylum: Annelida (bilaterally symmetrical, triploblastic, true coelomate, metamerically segmented, vermiform)

Class: Polychaeta (has many bristles, numerous setae, trochophore larva)

Order: Sedentaria(tube –dwelling and burrowing forms ,less developed head)

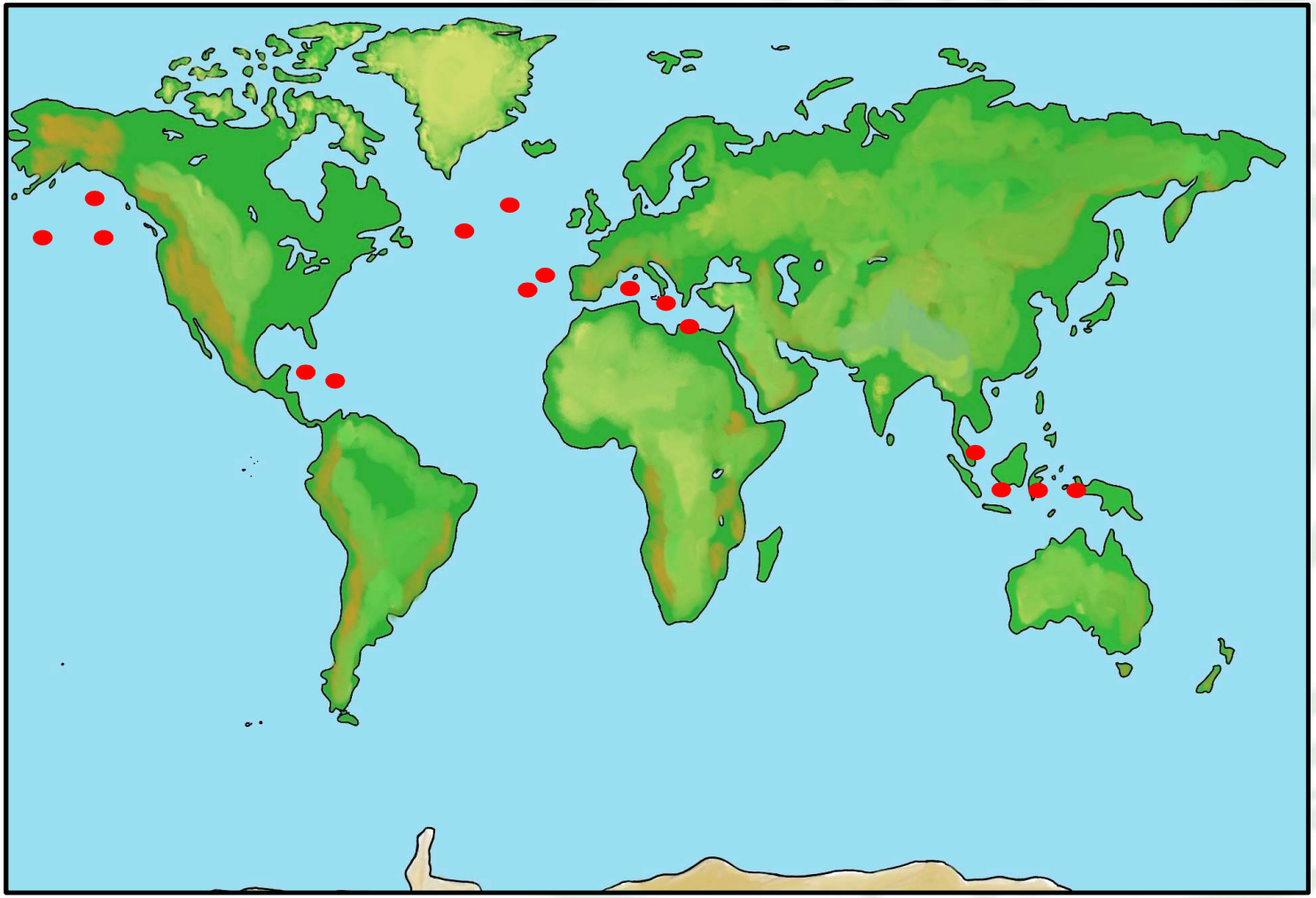
Genus: *Sabella* (tubeworms , fan worm)

IDENTIFYING FEATURES :

- Body divided into prostomium, trunk and pygidium
- Prostomium has modified palps/ feathered gills.
- Single funnel shaped operculum with serrated circumference and red and white rays
- Head bearing red, white ,orange or yellow coloured crown of radioles

VIDEO LINK :

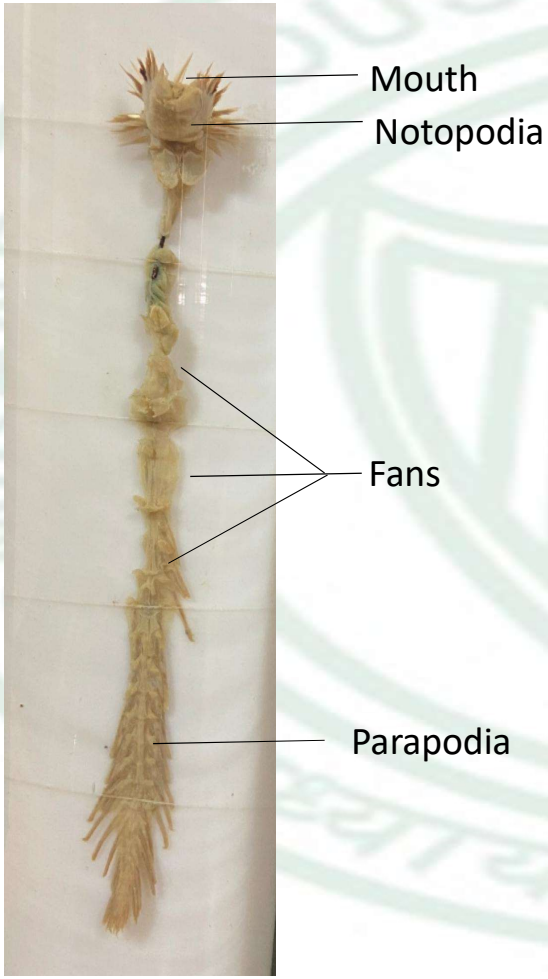
https://www.youtube.com/watch?v=U0e4pXYLPX4



Geographical Distribution: North East Atlantic, North Pacific (USA), Europe.

Habitat: tubiculous worm, tubes (calcareous tubes formed of mucin) are attached to shells and other marine objects.

Chaetopterus



CLASSIFICATION:

Phylum: Annelida (triploblastic coelomate metamerically segmented)

Class: Polychaeta (Setae, numerous, clitellum absent)

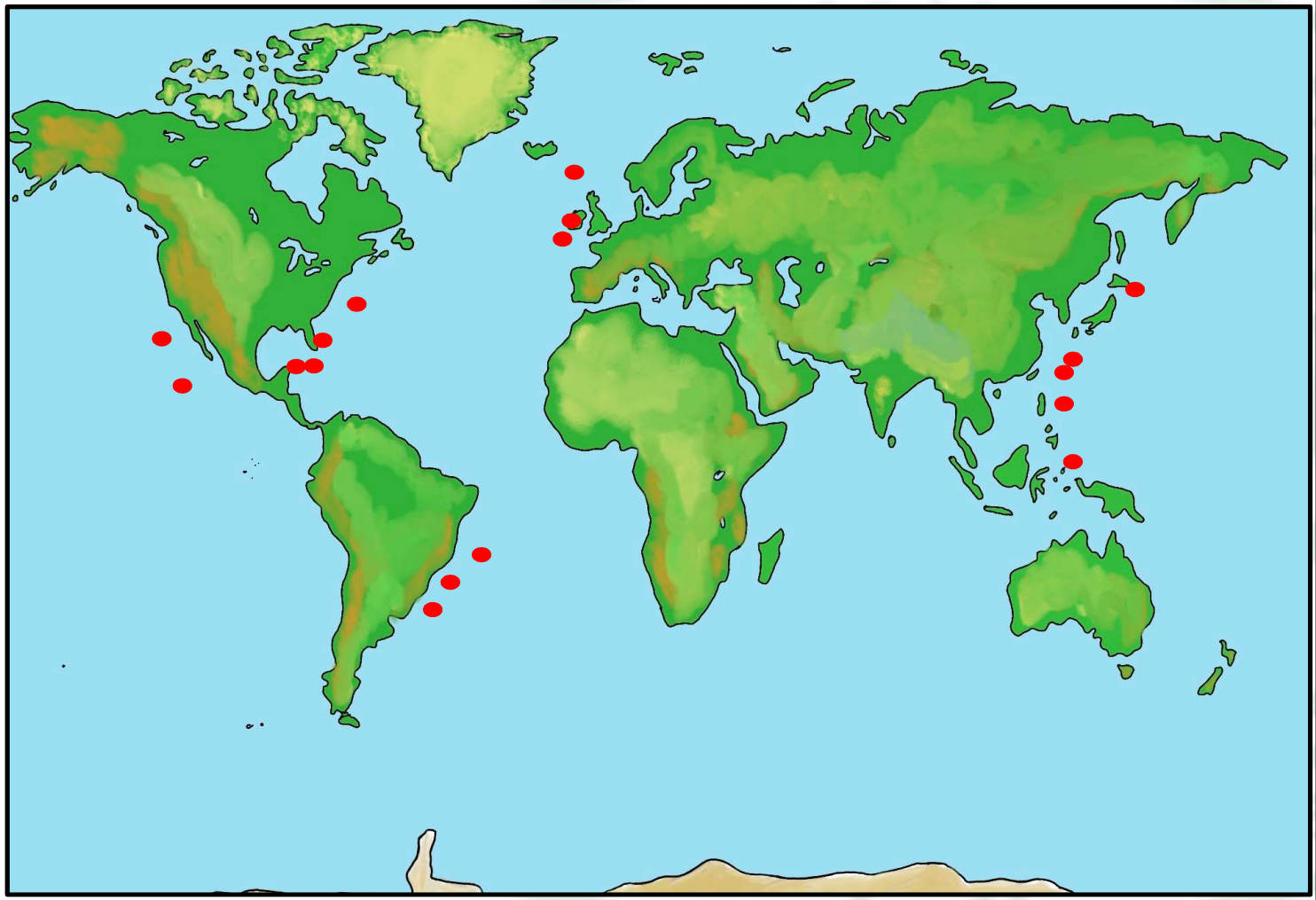
Genus: *Chaetopterus* (parchment tube worm)

IDENTIFYING FEATURES :

- Body is divided into 3 distinct regions
- Anterior region consists of 15-20 segments parapodia, prostomium, peristomial collar (cirri and mouth).
- Middle region consists of five segments: Anterior most, produced into great wings, a pair of sucker and fans(fused notopodia).
- Posterior region consists of 11-30 similar segments without setae.

VIDEO LINK-

https://www.youtube.com/watch?v=zNvx19UD1HM&ab_channel=MDSeaGrant



Geographical Distribution: Atlantic ocean, Indian and Pacific ocean, both temperate and tropical areas

Habitat: marine tubiculous worm found on sub littoral mudflats

Pheretima

CLASSIFICATION:

Phylum- Annelida : Triploblastic, Bilateral symmetry, metamerism, setae, Non chitinous body.

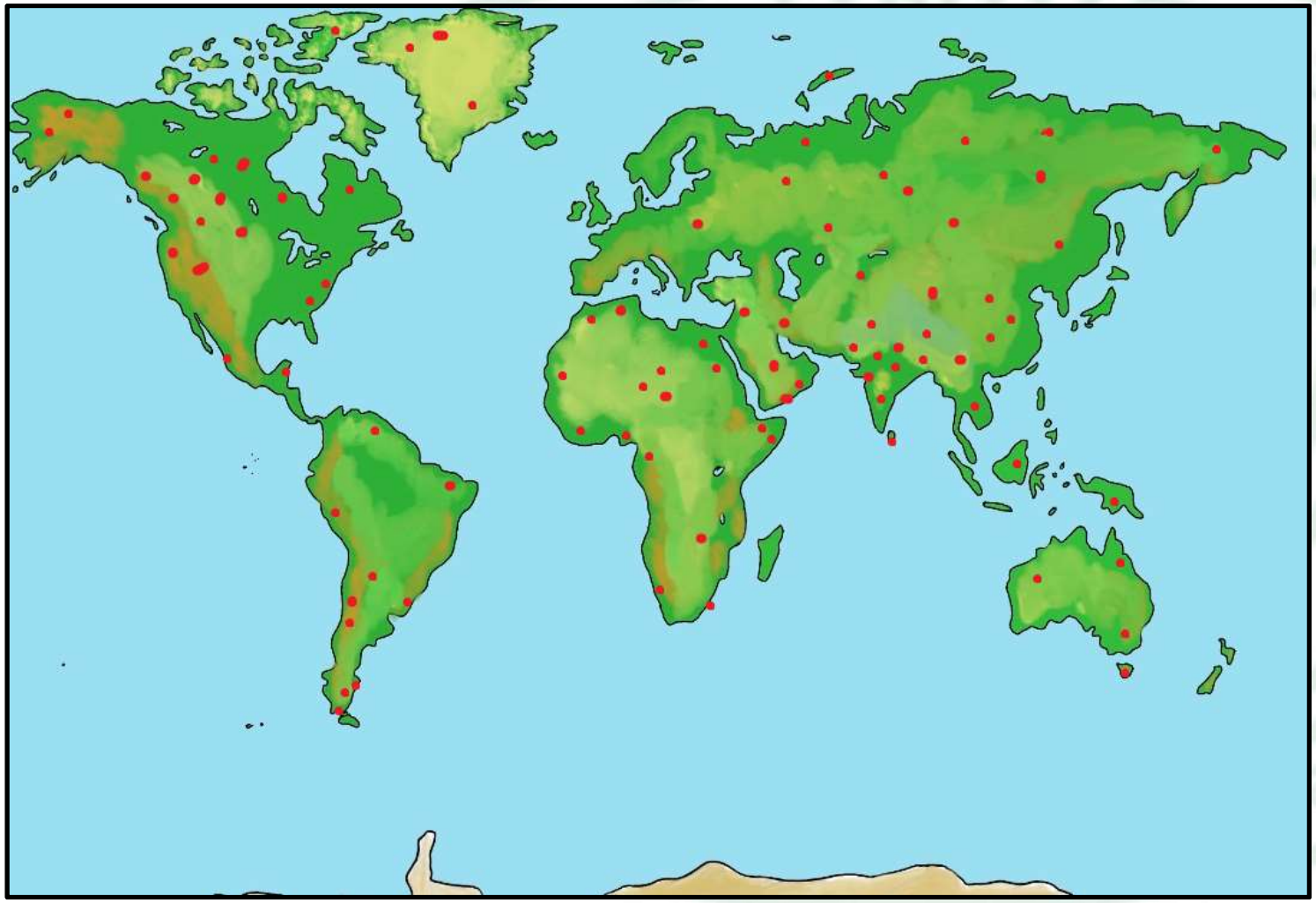
Class- Oligochaeta (Presence of Clitellum)

Genus- *Pheretima* (Earthworm)

IDENTIFYING FEATURES :

- Long, cylindrical body, divided into prostomium, trunk and oygidium
- Spermathecal pores (laterally) on 5/6, 6/7, 7/8 and 8/9 segmental grooves.
- Presence of Clitellum (in reproductively active worm) in the segments 14 to 16.
- Female genital pore between 14/15th segment (ventrally)
- Male genital pores on 17th segment (ventrally)
- Pygidium bears anus

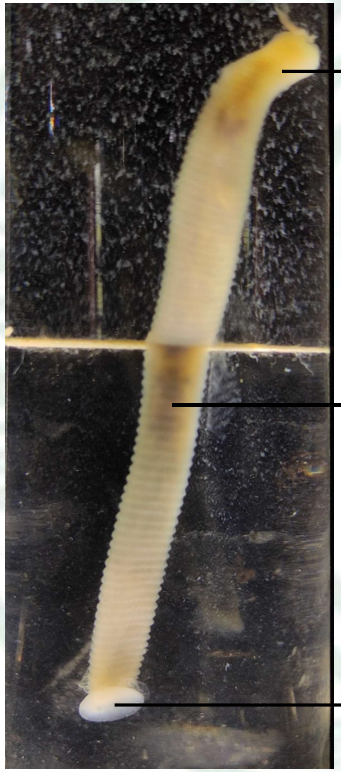
VIDEO LINK - https://youtu.be/mGduwRgp14Q



Geographical Distribution: Cosmopolitan

Habitat: ground dwelling, found in moist soil

Hirudinaria



CLASSIFICATION

Phylum: Annelida (Triploblastic, vermiform, coelomate, metamerically segmented)

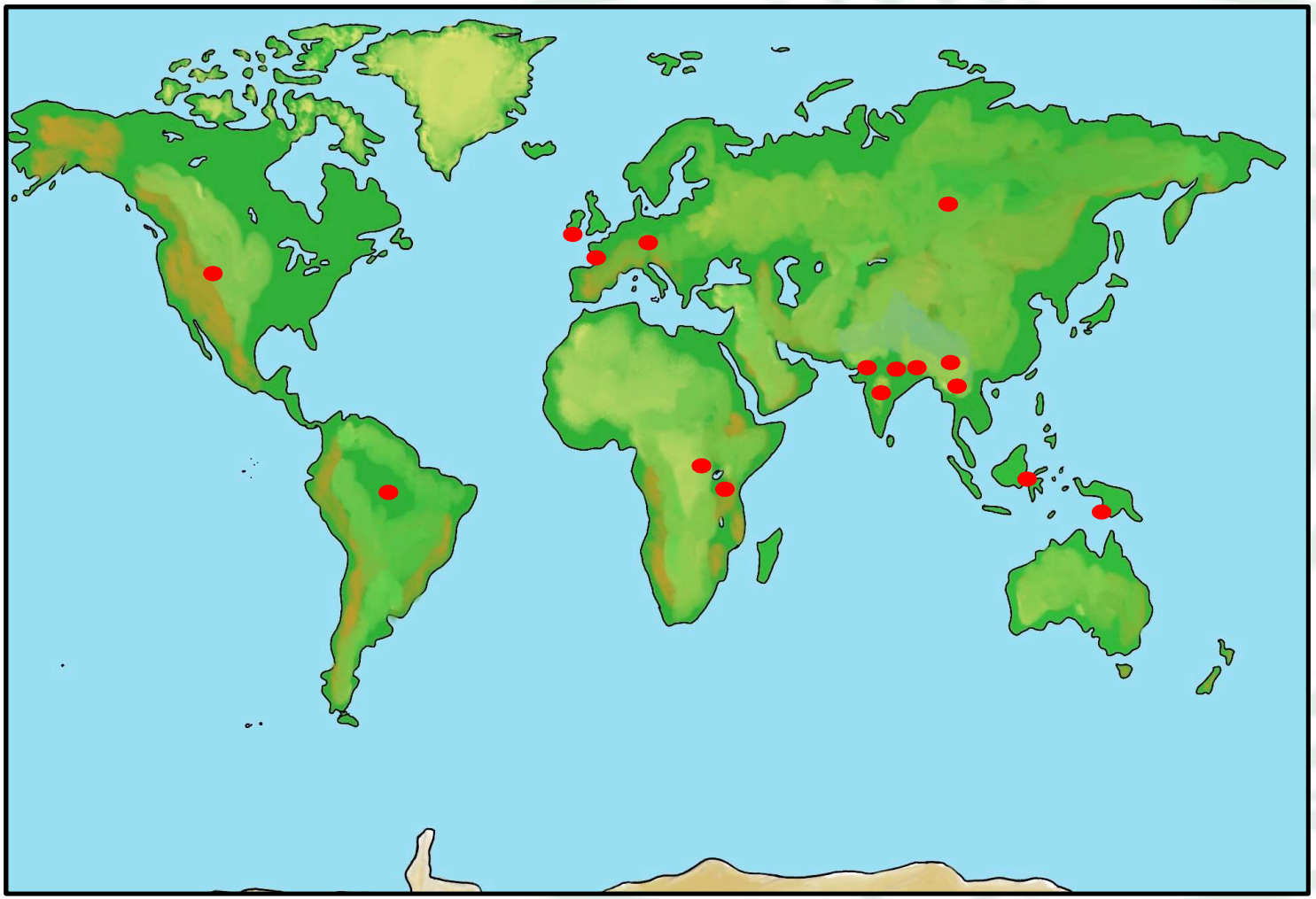
Class: Hirudinea (Body having definite number of segments , parapodia and setae are absent , presence of anterior and posterior sucker)

Genus: *Hirudinaria* (Leech)

IDENTIFYING FEATURES

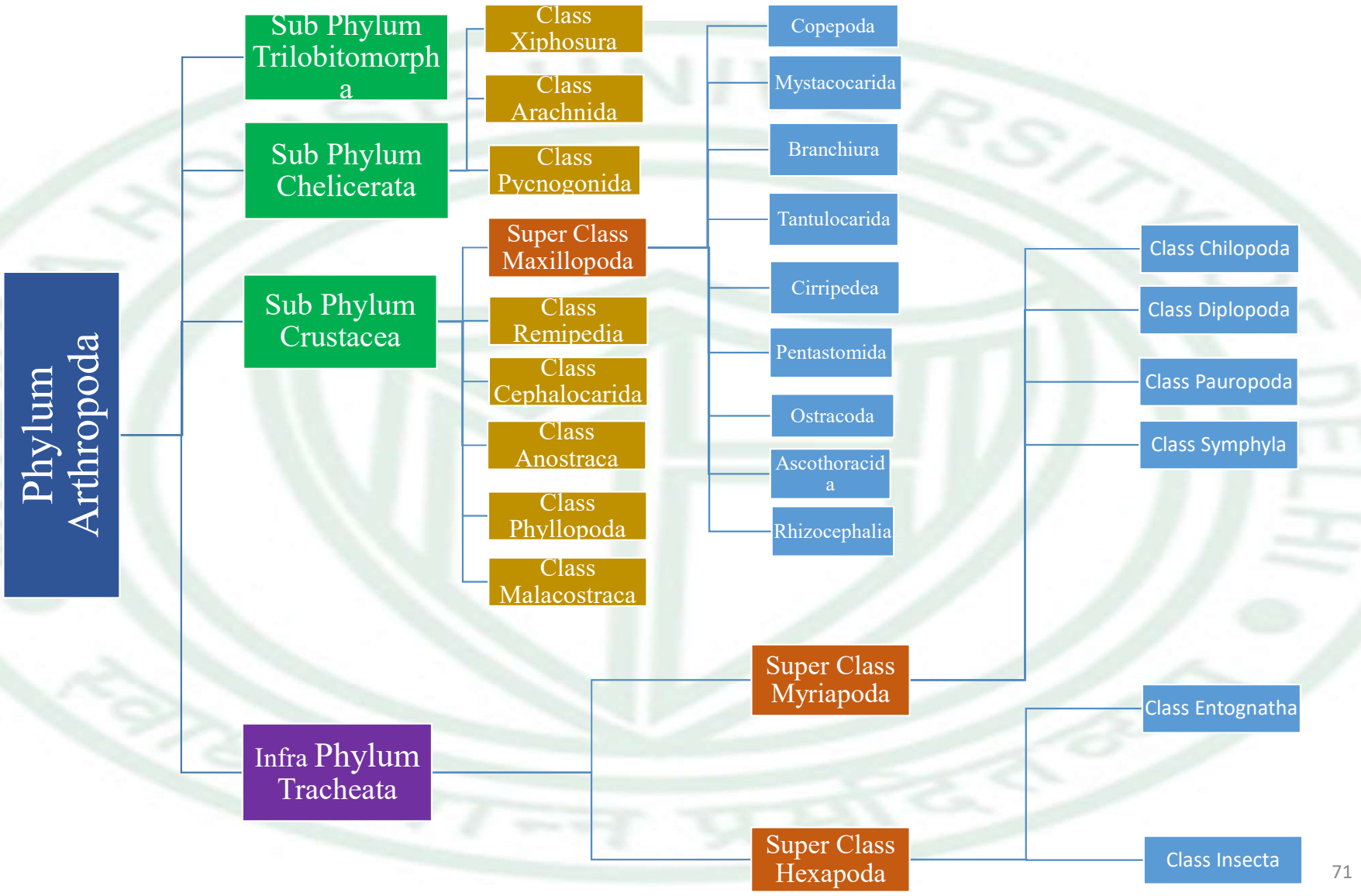
- Have dorsoventrally flattened , metamerically segmented elongated body (33 segments further divided into annuli)
- Suckers- anterior sucker surrounds a tri-radiate mouth, posterior is muscular and disc shaped, used for adhesion and locomotion.
- Clitellum appears during the breeding season

VIDEO LINK
https://www.youtube.com/watch?v=pr5UAK4_x7w&ab_channel=MANASDAS



Geographical Distribution: Cosmopolitan, abundantly found in India and Myanmar

Habitat: Sanguivorous, found in freshwater ponds, lakes and moist swampy areas.


Phylum Arthropoda
Sub Phylum Trilobitomorpha
Sub Phylum Chelicerata
Sub Phylum Crustacea
Infra Phylum Tracheata
Class Xiphosura
Class Arachnida
Class Pycnogonida
Super Class Maxillopoda
Class Remipedia
Class Cephalocarida
Class Anostraca
Class Phyllopoda
Class Malacostraca
Copepoda
Mystacocarida
Branchiura
Tantulocarida
Cirripedea
Pentastomida
Ostracoda
Ascothoracida
Rhizocephalia
Super Class Myriapoda
Super Class Hexapoda
Class Chilopoda
Class Diplopoda
Class Pauropoda
Class Symphyla
Class Entognatha
Class Insecta

Palamnaeus

Pedipalp
mesosoma
Walking leg
Metasoma
Ampulla
Sting

Dorsal view

Mouth
Sternum
Genital operculum
Pectine
Stigmata
Pleural membrane

Ventral view

CLASSIFICTION:

Phylum : Arthropoda (metamerically segmented, jointed appendages, body cavity haemocoel)

Subphylum : Chelicerata (main appendages are chelicerae and pedipalp, body divided into prosoma and opisthosoma)

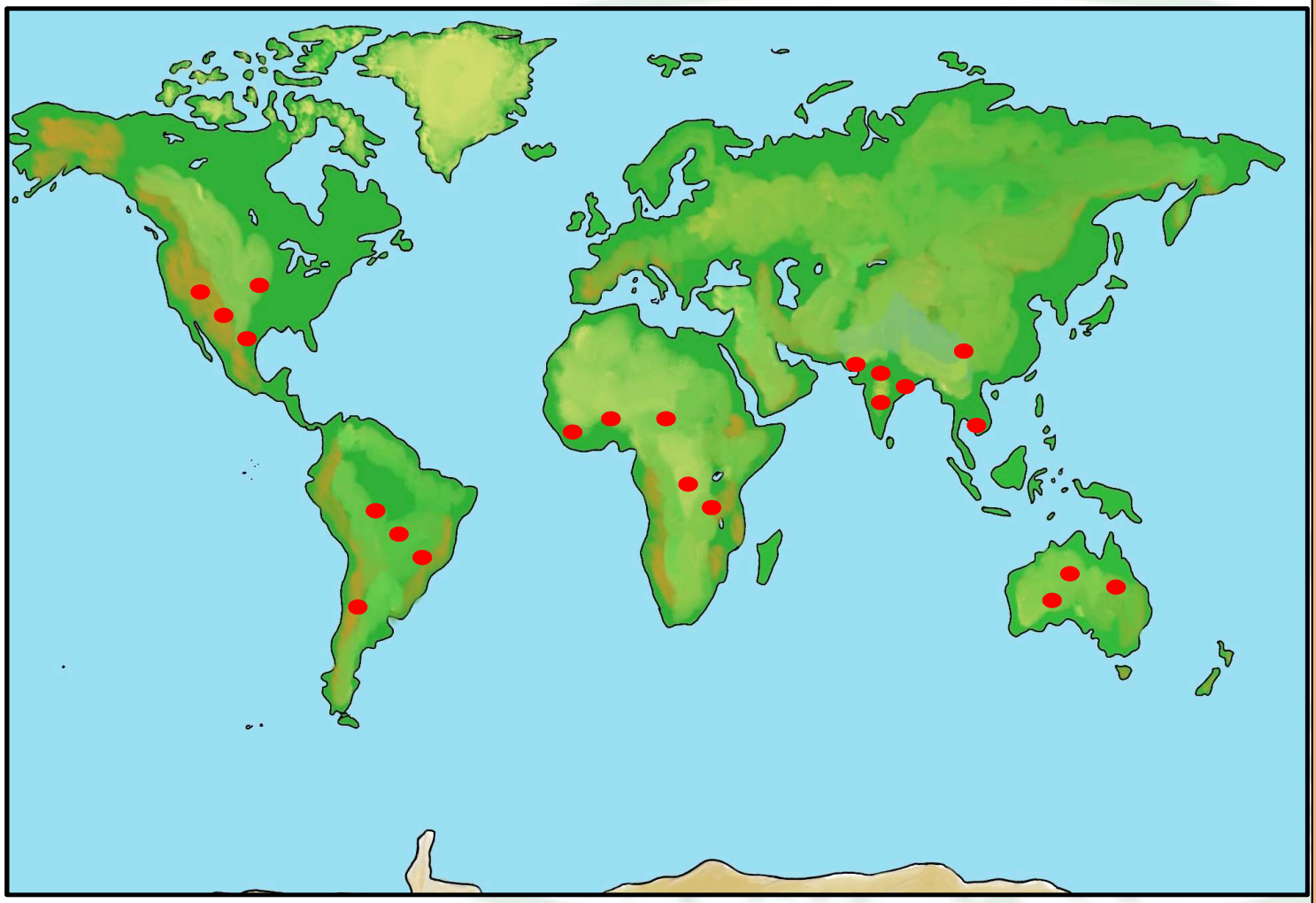
Class : Arachnida (Terrestrial or aquatic arthropods with book-lungs or trachea and without antennae, mandibles and jaws)

Genus : *Palamnaeus*

IDENTIFYING FEATURE:

- Body divided into **prosoma, mesosoma and metasoma**.
- **Prosoma** is covered by **carapace** that bears pair of median eyes & 2-5 pairs of lateral eyes
- Pair of grasping pedipalps and narrow, segmented tail often carried in a characteristic forward curve over the bank ending with a venomous stinger.

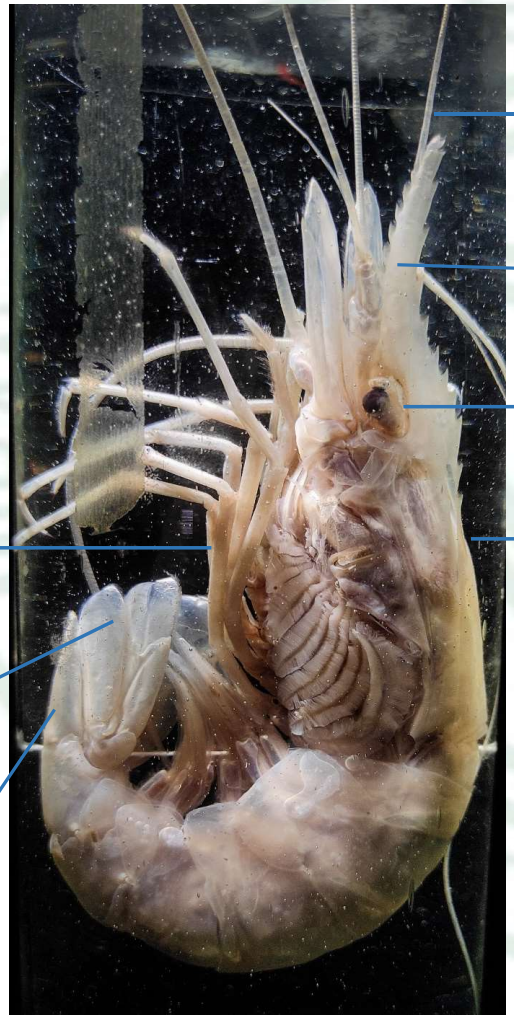
VIDEO LINK: https://youtube.com/watch?v=WhZZOfc-k4U&feature=share



Geographical Distribution: Tropical and sub-tropical countries of the world. They are fairly common in India especially on the slopes of hills and most prevalent in coastal areas of Maharashtra, Assam, Rajasthan and the deccan

Habitat: Deserts and semi arid regions, under logs, rocks.

Palaemon



CLASSIFICATION:

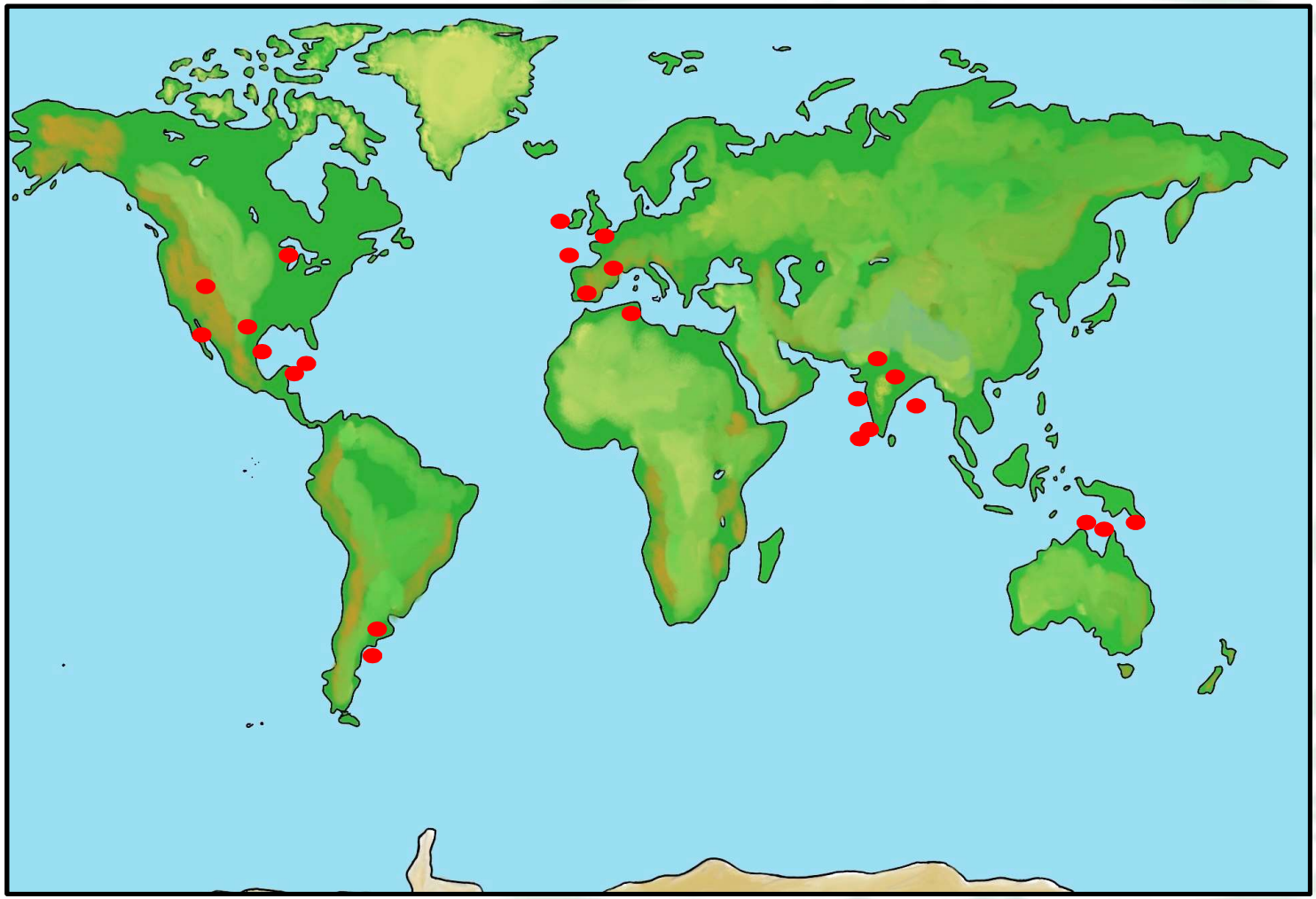
Phylum: Arthropoda (triploblastic, metamerically segmented, jointed appendages ,body cavity haemocoel)
Subphylum: Crustacea (thick exoskeleton head fused with thorax to form cephalothorax)
Class: Malacostraca (body is distinctly segmented)
Genus: *Palaemon* (prawns)

IDENTIFYING FEATURES:

➢Body is divided into anterior known as cephalothorax and the posterior part is known as abdomen.
➢Cephalothorax consists of head (five segments), thorax (eight segments) and carapace which covers the whole cephalothorax
➢Abdomen is the posterior part of the body which consists of six segments ending in Telson. Abdomen bears 5 pairs of biramous pleopods and a pair of uropods.

VIDEO LINK:

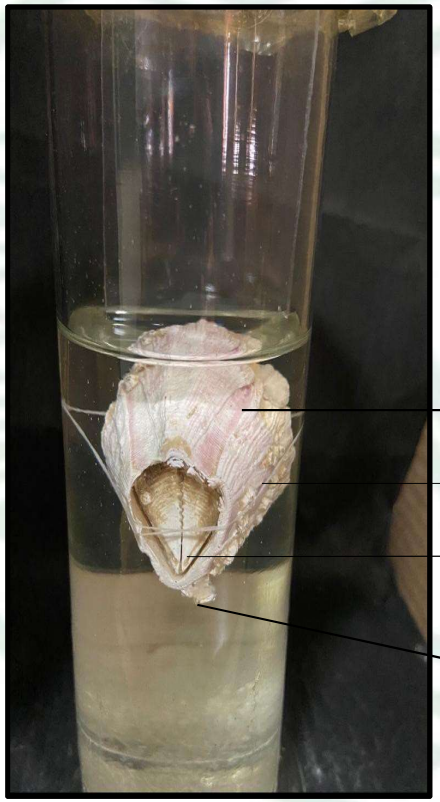
https://www.youtube.com/watch?v=E1_kbXflKfU&ab_channel=Vidya-mitra



Geographical Distribution: commonly found in India, North western Europe, U.S.A

Habitat: Found in freshwater ponds, streams and lakes.

Balanus



CLASSIFICATION:

Phylum: Arthropoda (triploblastic, bilateral symmetry, jointed appendages , open circulatory system)

Subphylum: Crustacea (segmented body with hard exoskeleton carapace, respiration via gills, cephalothorax present)

Super Class: Maxillopoda (small size, feed by means of maxillae)

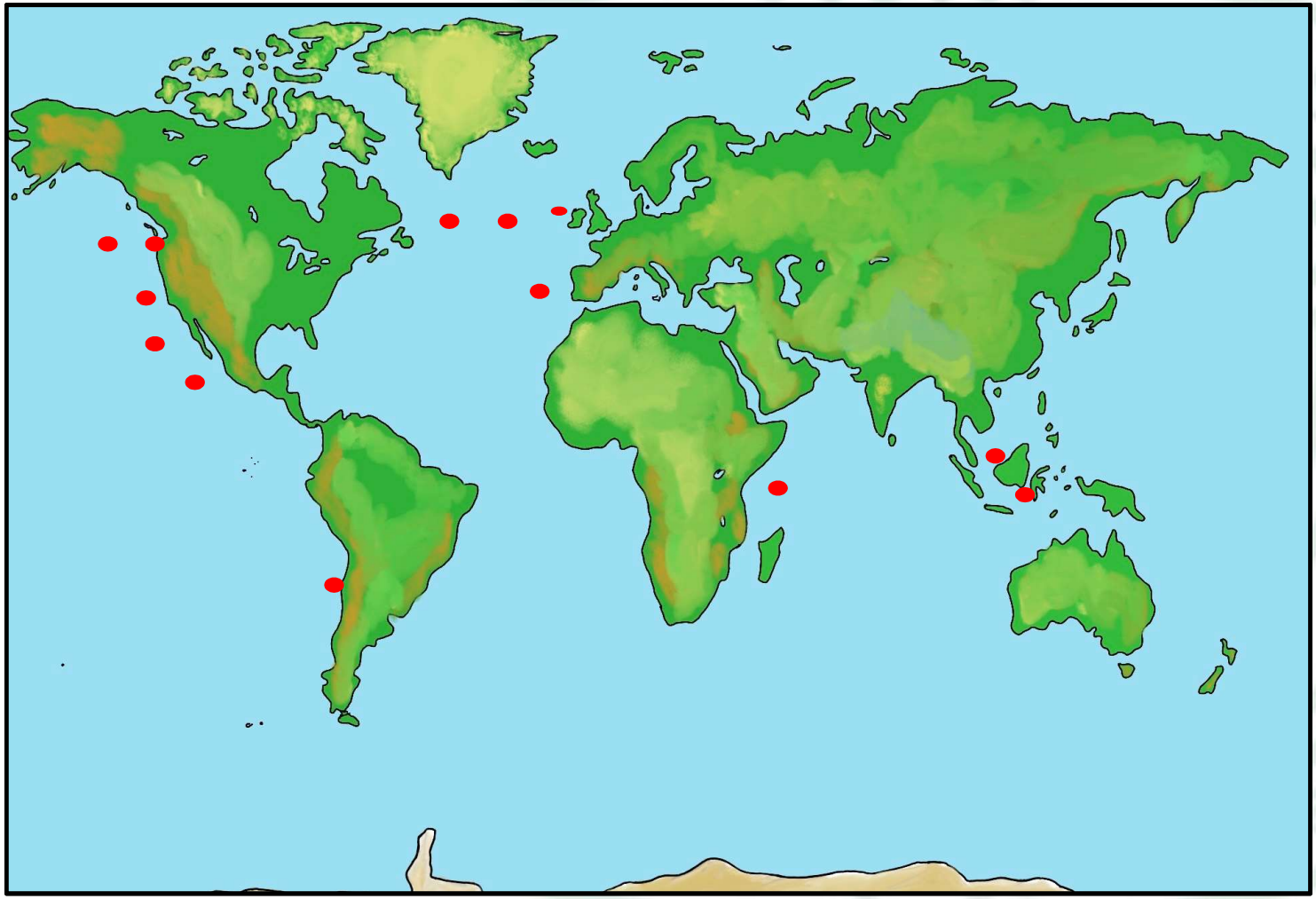
Class: Cirripedia (sessile, hermaphrodite, carapace encloses entire body)

Genus: *Balanus* (rock barnacle)

IDENTIFYING FEATURES:

- Conical shaped shell contains the organism, fixed to hard surface with many wall plates with a small opening at the top.
- Body enclosed in calcareous shell consisting of 6 plates.
- Thoracic legs [cirri] protrude out of the shell to collect food particles

VIDEO LINK:
https://www.youtube.com/watch?v=lfnkFxg1gMw&ab_channel=DeepLook



Geographical Distribution: Cosmopolitan in distribution but especially common in Eastern pacific, Northern Atlantic Oceans

Habitat: Marine, attached to rocks and molluscan shells between tide-marks in shallow water.

Eupagurus

CLASSIFICATION:

Phylum: Arthropoda (Metamerically segmented; chitinous exoskeleton; jointed appendages; haemocoel body cavity)

Sub Phylum: Crustacea (bi-ramous appendages; two pair of antennae; hard exoskeleton(carapace))

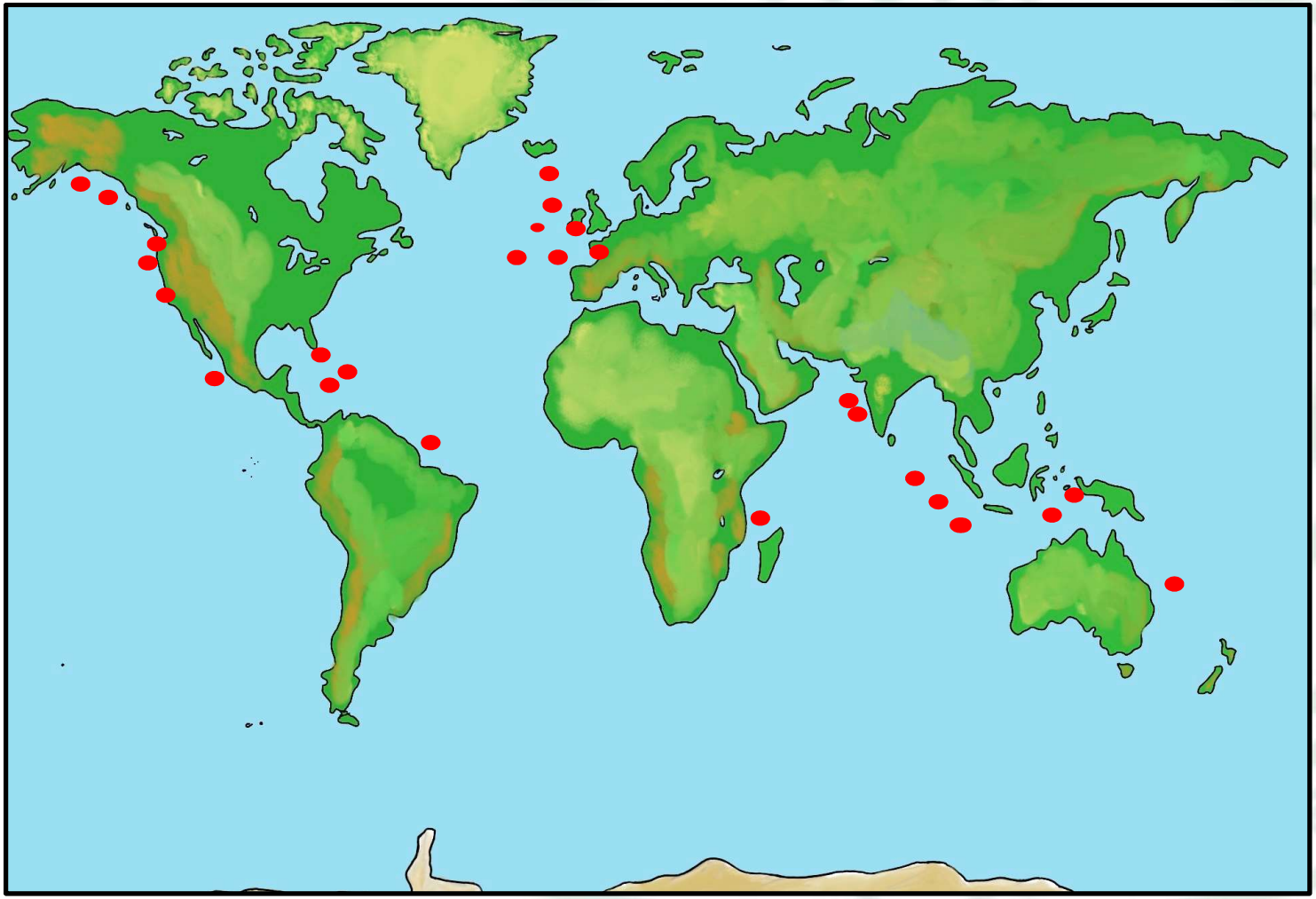
Class: Malacostraca (body with 20-21 segments; mandible with palp; presence of 3 tagmata)

Genus: *Eupagurus* (hermit crab)

IDENTIFYING FEATURES:

- Cephalothorax is conical and hard; abdomen is smooth and sharply curved.
- The cephalothorax bears a pair of stalked compound eyes, a pair of biramous antennule and a pair of uniramous antennae
- The abdomen is smooth, sharply curved un-segmented and bears 3 greatly reduced pleopods, a stumpy telson and a pair of small uropods

VIDEO LINK: https://youtu.be/8dIyfv1_r7k



Geographical Distribution: Cosmopolitan, common in north Atlantic waters, Western coast of North America, Western coast of Indian Peninsula

Habitat: sandy- or muddy-bottomed marine waters, occasionally seen on land

Scolopendra

CLASSIFICATION-

Phylum – Arthropoda (segmented body , bilateral symmetry , open type circulation and haemocyanin as the respiratory pigment)

Subphylum – Myriapoda (many pairs of legs , two body section, one pair of antennae on head and simple eyes)

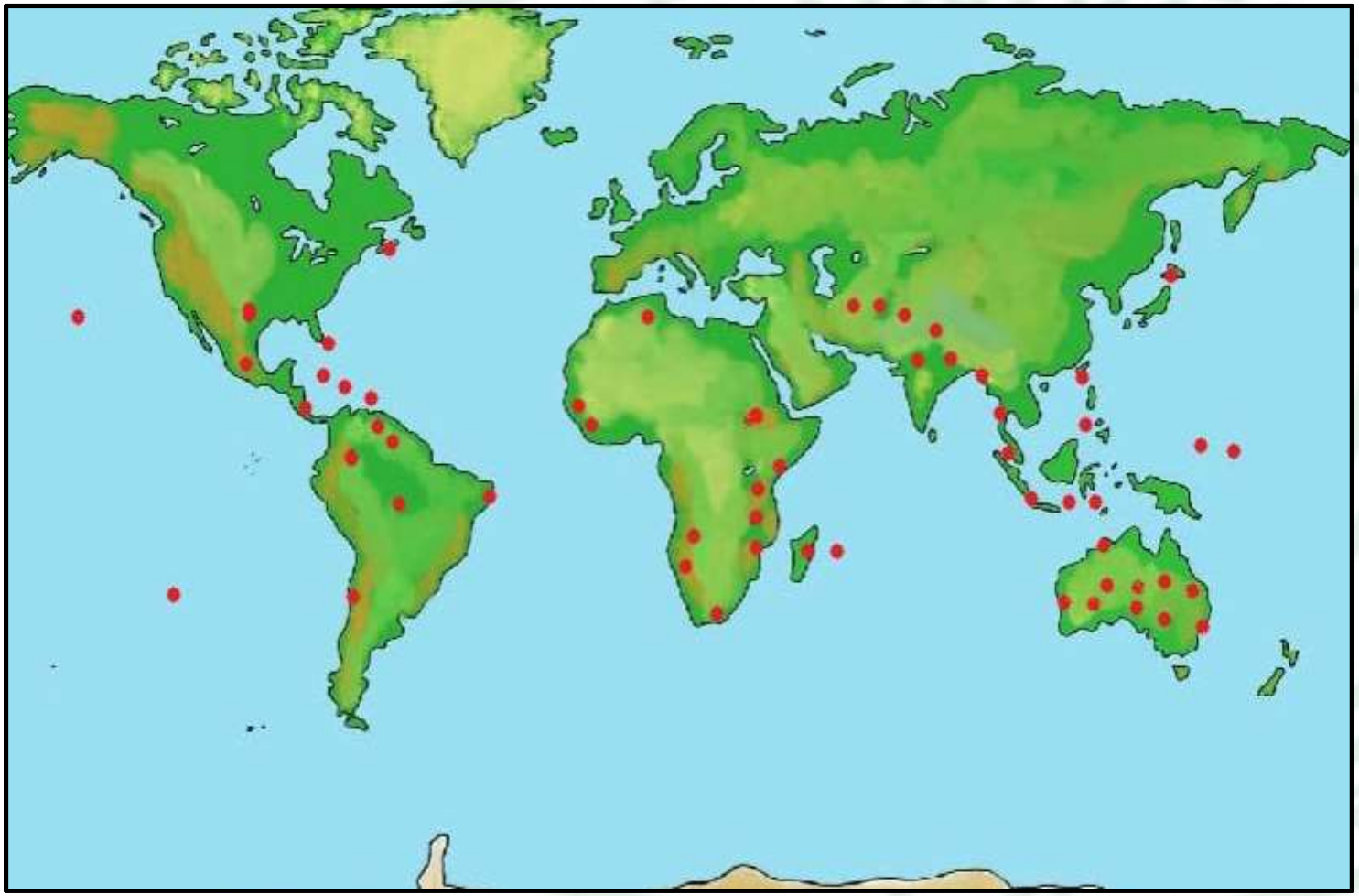
Class – Chilopoda (flattened body , segmented trunk with pairs of legs , first pair modified in poisonous legs)

Genus – *Scolopendra*

IDENTIFYING FEATURES

- Body is elongated, dorsoventrally flattened and segmented
- Body divided into **head** and **trunk**
- Each segmented trunk bears a pair of walking legs
- The front legs are modified into venom bearing maxillepeds used in hunting for food .
- Mandibles are present for seizing.

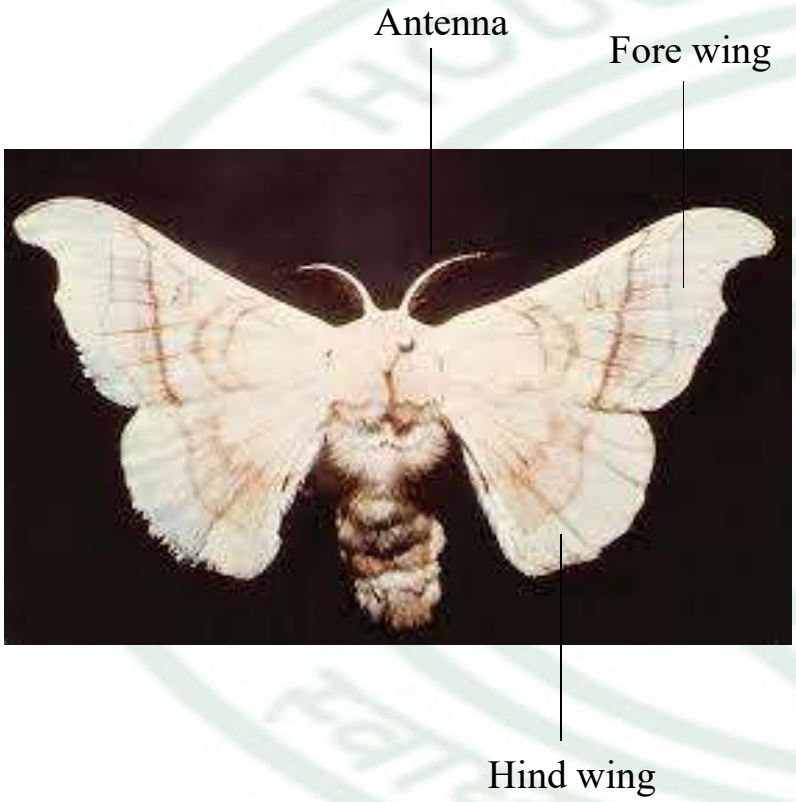
VIDEO LINK- https://youtu.be/ox33ig8tcN4



Geographical Distribution: Cosmopolitan

Habitat: Found in swampy places under bark, stones, decaying wood

Bombyx



CLASSIFICATION:

Phylum- Arthropoda (triploblastic, bilaterally symmetrical, coelomate, segmented organ system level of organization, body is divided into head, thorax, and abdomen, has jointed appendages which help in locomotion.)

Superclass- Hexapoda (3 pairs of legs in thorax, usually 2 pairs of wings present with muscles for flight.)

Class- Insecta (Ectognathous mouthparts, compound eyes and ocelli present.)

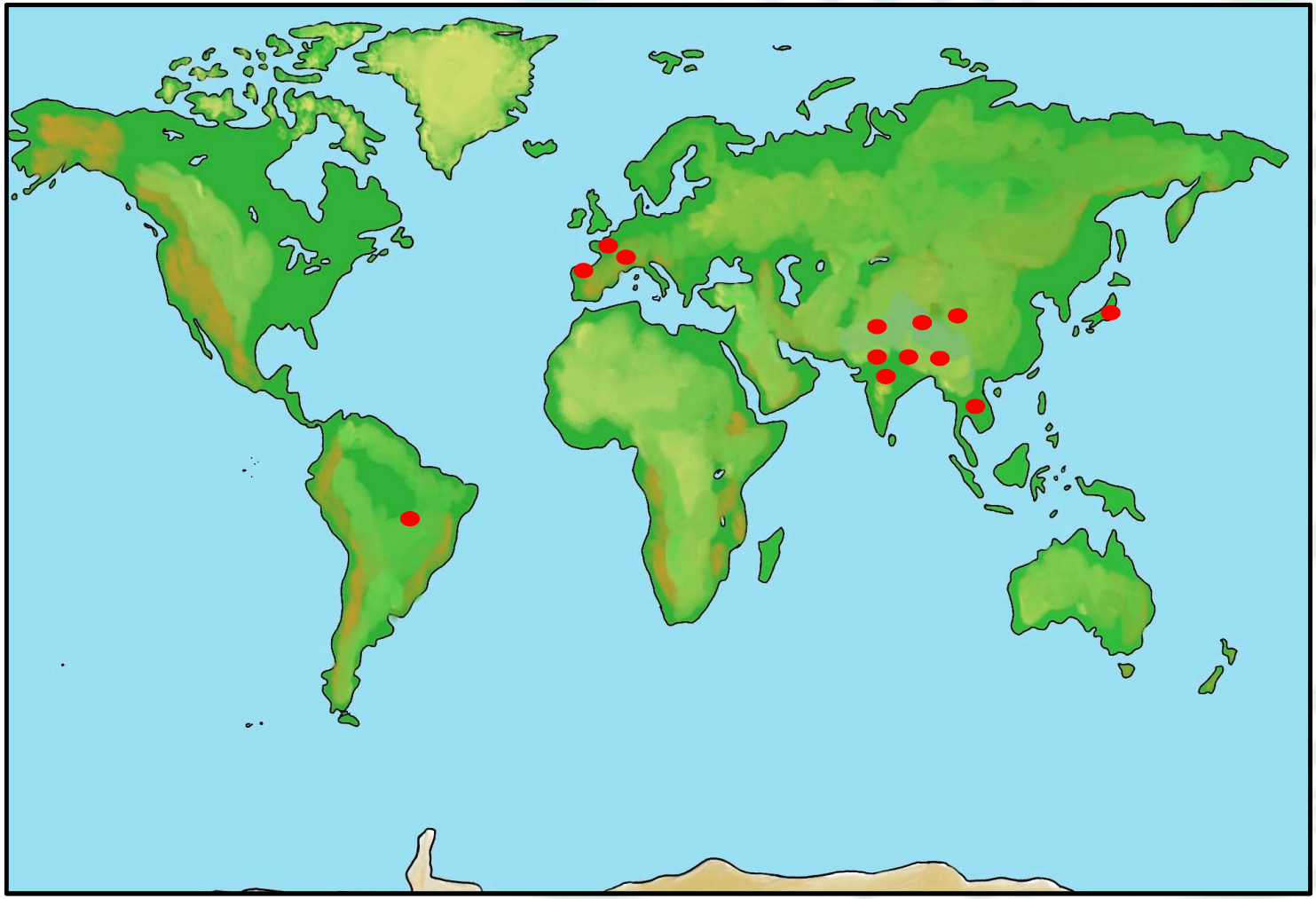
Order- Lepidoptera (mandibles absent, maxillae form a coiled proboscis for sucking, wings usually covered by scales.)

Genus- *Bombyx* (silkworm)

IDENTIFYING FEATURES:

- The adults moths have a 4 cm wingspan. They are buff-colored, but have thin brown lines on their whole bodies
- Head parts bear a pair of compound eyes, a pair of branched or feathery antennae and the siphoning mouth parts

VIDEO LINK: https://youtu.be/KA7_N8qU4ew



Geographical Distribution: China, India, Bangladesh, Cambodia, Japan, Parts of Europe, Brazil.

Habitat: Mulberry tree

Periplaneta

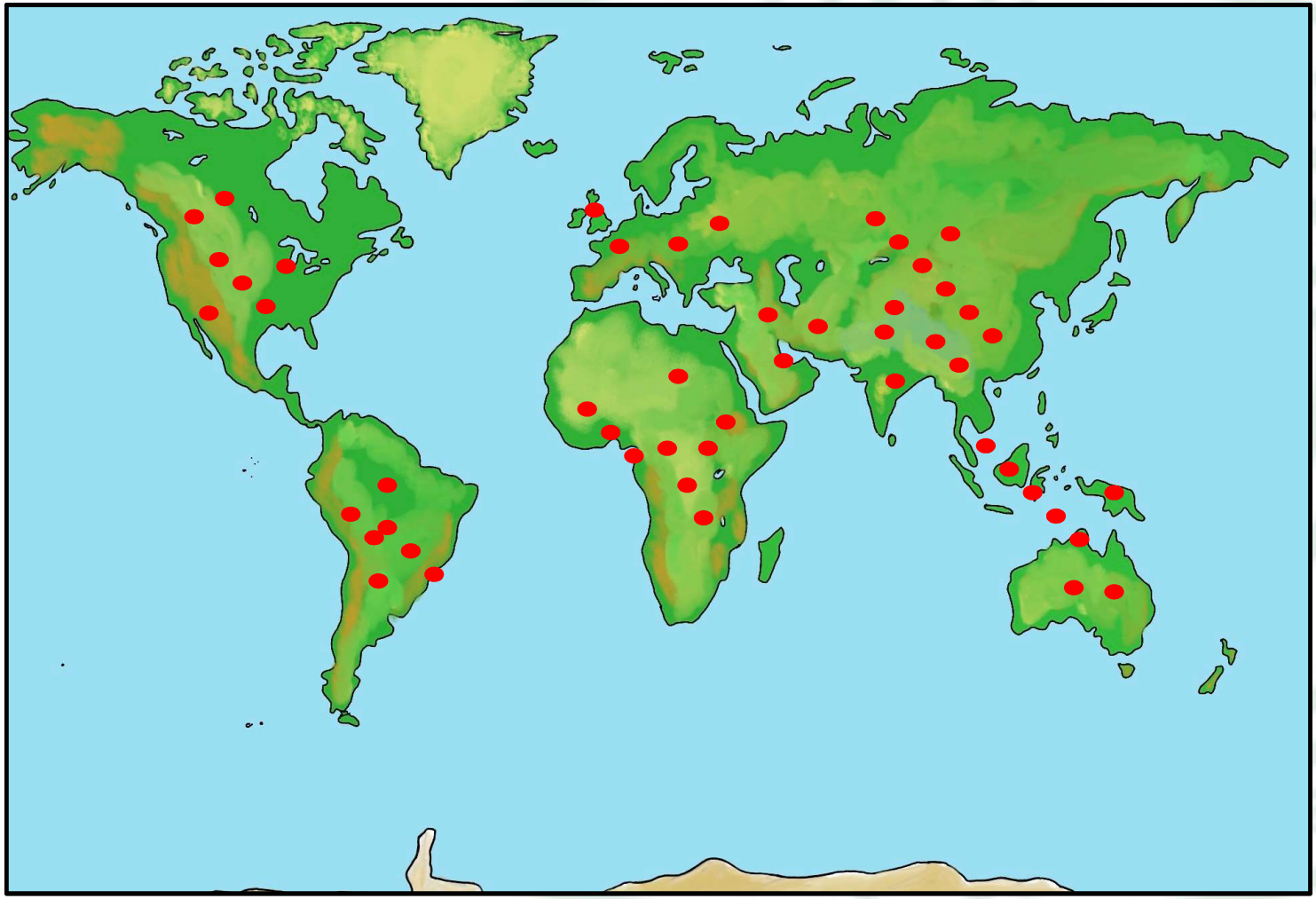
CLASSIFICATION:

Phylum- Arthropoda (triploblastic, bilaterally symmetrical, coelomate, segmented organ system level of organization, body is divided into head, thorax, and abdomen, has jointed appendages which help in locomotion.)
Superclass- Hexapoda (3 pairs of legs in thorax, usually 2 pairs of wings present with muscles for flight.)
Class- Insecta (Ectognathous mouthparts, compound eyes and ocelli present.)
Order- Blattaria (fast, usually nocturnal omnivorous runners)
Genus- *Periplaneta* Cockroach)

IDENTIFYING FEATURES:

- Body divided into head, thorax and abdomen
- Ventral surface - Antenna and eyes prominent in head, Head contains biting and chewing type Three pairs of legs in thorax.
- Dorsal surface- Fore wings and hind wings visible

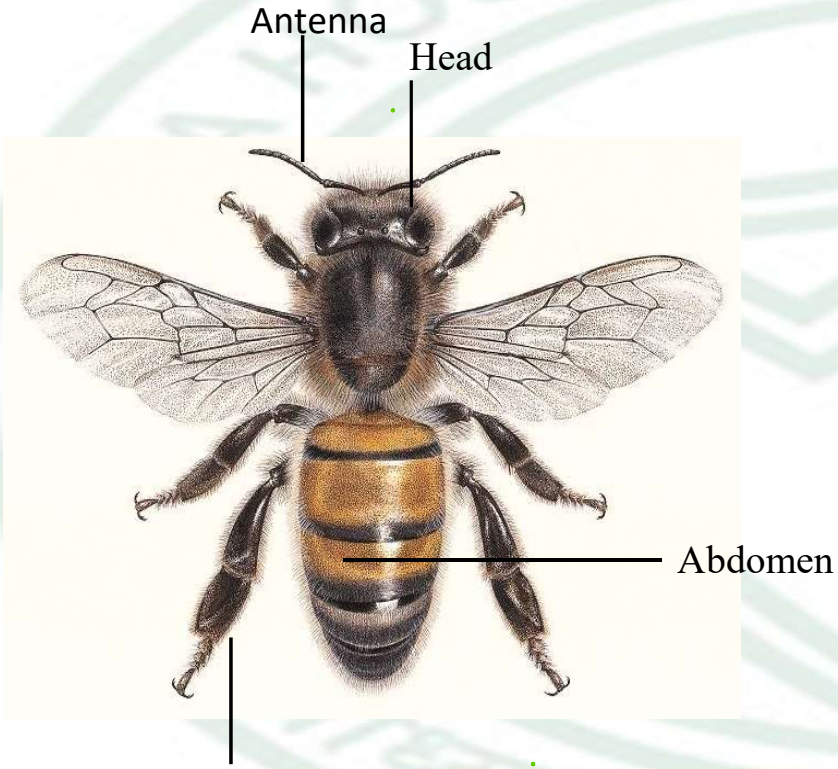
VIDEO LINK: https://youtu.be/fLpIM1HV_ZY



Geographical Distribution: Cosmopolitan

Habitat: Damp but warm places and generally found in kitchens, sewage, leaf litter, rotting woods, etc.

Apis



CLASSIFICATION:

Phylum- Arthropoda (triploblastic, bilaterally symmetrical, coelomate, segmented organ system level of organization, body is divided into head, thorax, and abdomen, has jointed appendages which help in locomotion.)

Superclass- Hexapoda (3 pairs of legs in thorax, usually 2 pairs of wings present with muscles for flight.)

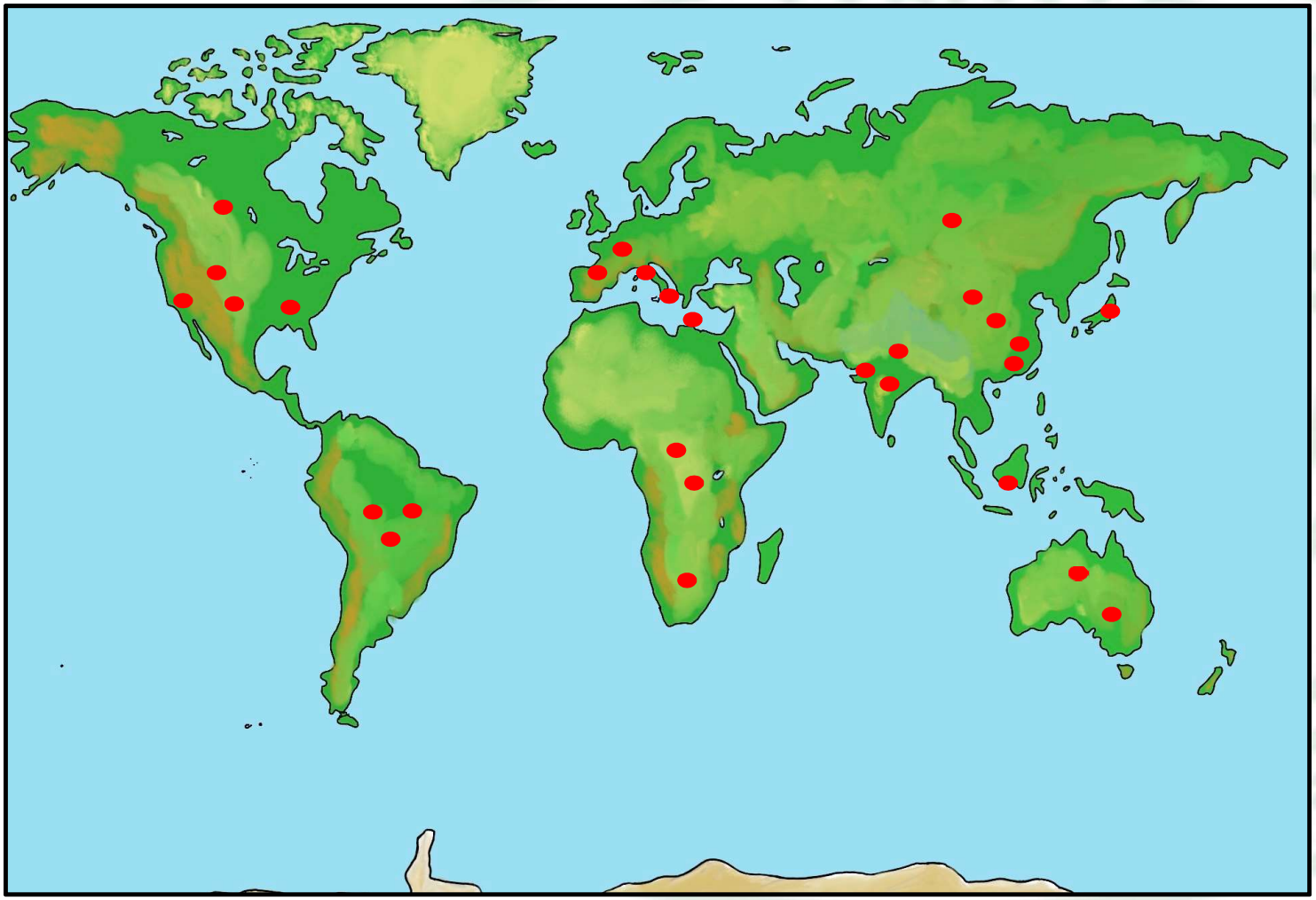
Class- Insecta (Ectognathous mouthparts, compound eyes and ocelli present.)

Genus *: Apis*

IDENTIFYING FEATURES :

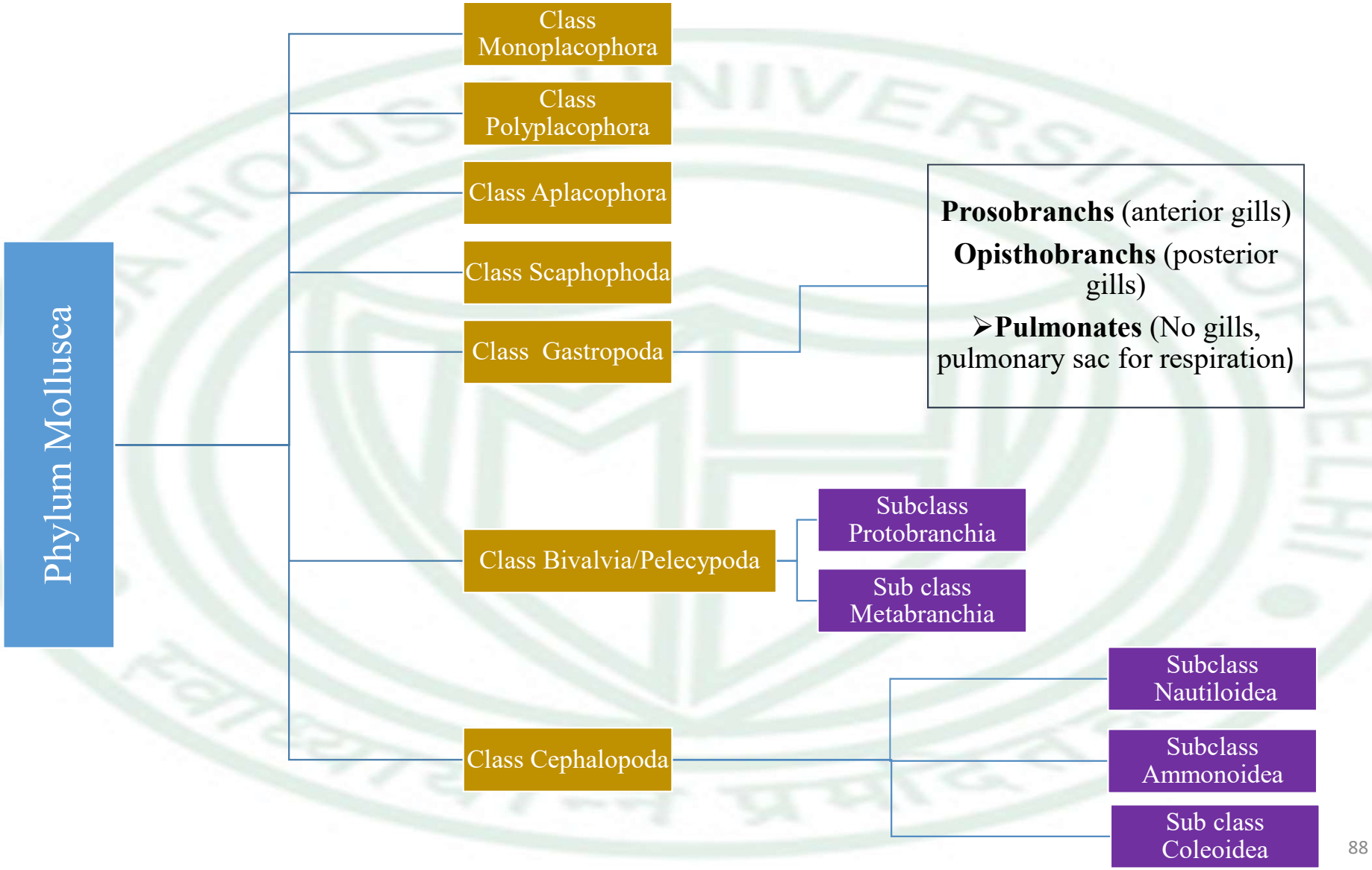
- The colony includes the following individuals: A Queen (Functional female), the Drones (Males) and Workers (Sterile females).
- Its body is divided into three distinct regions: Head, Thorax and Abdomen.
- The mouth parts of honeybee are modified for lapping and chewing.The mouth parts include labrum, mandibles, labium and maxillae.

VIDEO LINK-
https://www.youtube.com/watch?v=9ePic3dtykk&t=3s&ab_channel=NationalGeographic

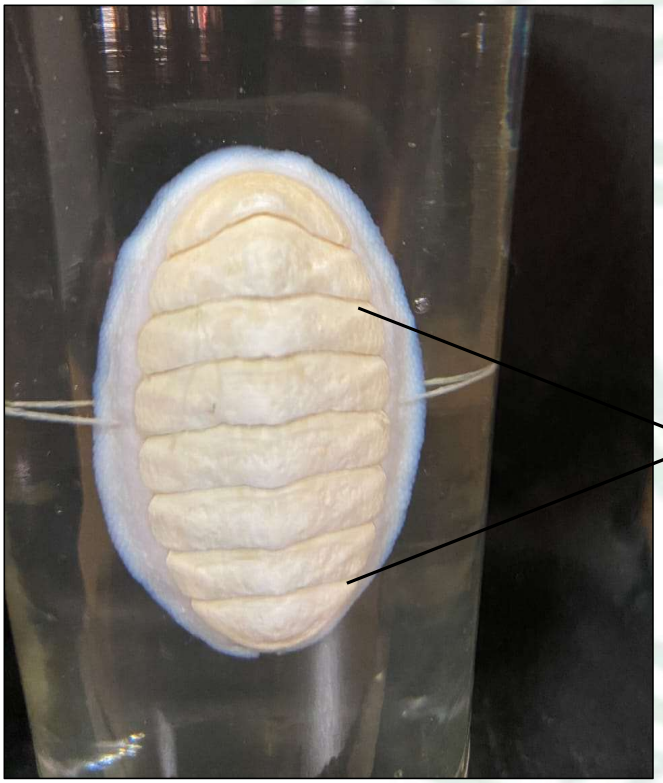


Geographical Distribution: Cosmopolitan

Habitat: found around flowering plants, such as in meadows, open wooded areas, and gardens


Phylum Mollusca
Class Monoplacophora
Class Polyplacophora
Class Aplacophora
Class Scaphophoda
Class Gastropoda
Prosobranchs (anterior gills)
Opisthobranchs (posterior gills)
➢Pulmonates (No gills, pulmonary sac for respiration)
Class Bivalvia/Pelecypoda
Subclass Protobranchia
Sub class Metabranchia
Class Cephalopoda
Subclass Nautiloidea
Subclass Ammonoidea
Sub class Coleoidea

Chiton



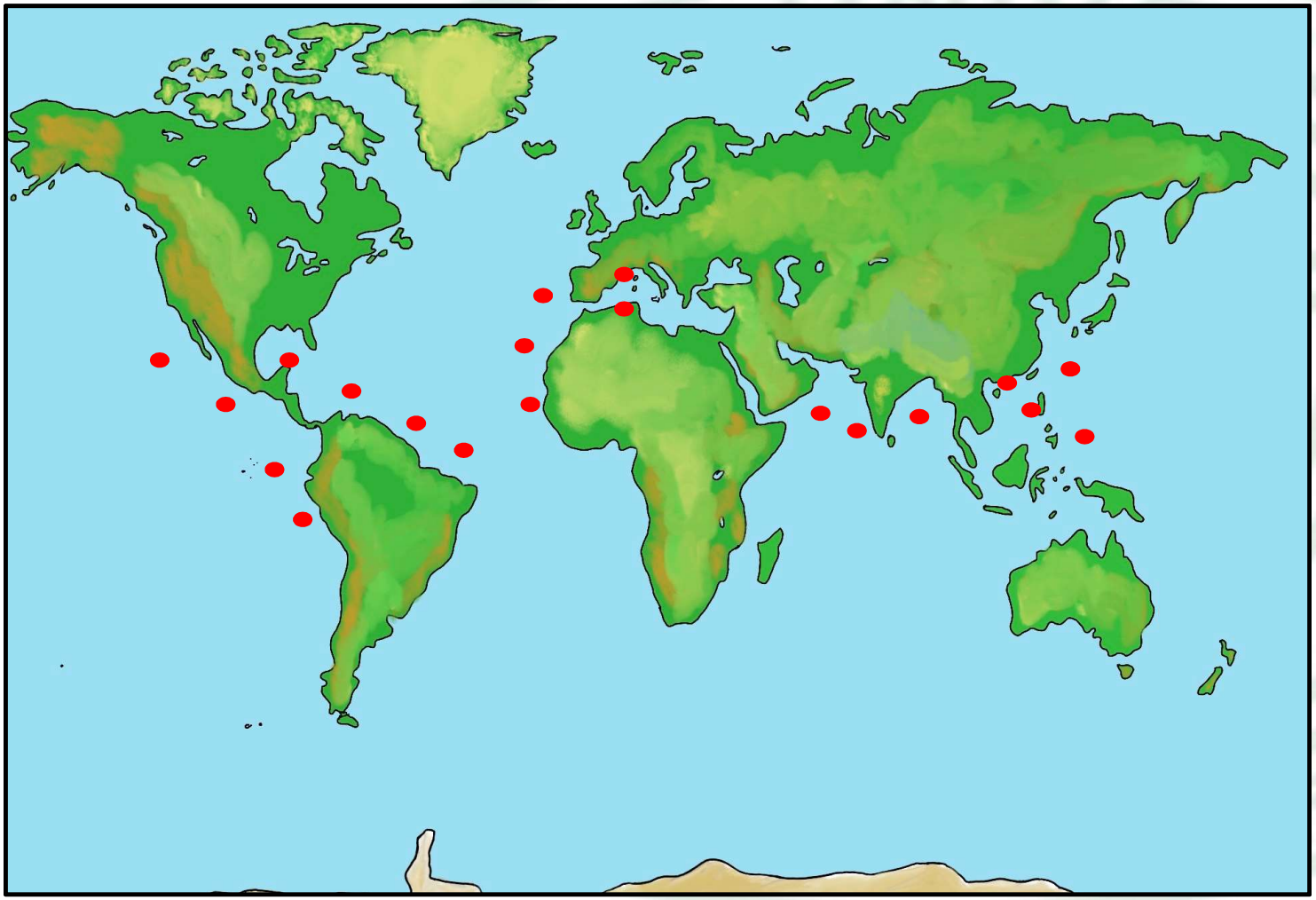
CLASSIFICATION:

Phylum: Mollusca:(Body unsegmented, bilaterally symmetrical and consist of head, foot, mantle and visceral mass)
Class: Polyplacophora: (shell composed of a series of eight calcareous pieces; foot flat and ventral)
Genus: *Chiton*

INDENTIFYING FEATURES:

- Elongate or oval, dorsoventrally flattened, bilaterally symmetrical ,marine
- Dorsal view shows 8 shell plates, Mantle-edge stiffened (called the girdle)
- Ventral view- Mouth opening, centrally placed sole like foot encircled by ctenidia (gills), Anal opening at the posterior most end

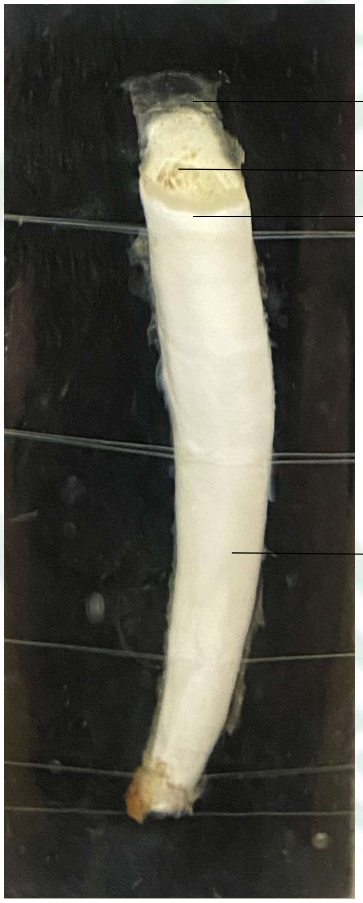
VIDEO LINK: https://www.youtube.com/watch?v=XmtVvITSUUw&ab_channel=DeepMarineScenes



Geographical Distribution: Cosmopolitan, more common in tropical seas.

Habitat: Marine, found attached to rocks in shallow coastal areas, sluggish herbivores feeding mainly on algae

Dentalium



CLASSIFICATION:

Phylum: Mollusca (Body unsegmented, bilaterally symmetrical and consists of head, foot, mantle and visceral mass)

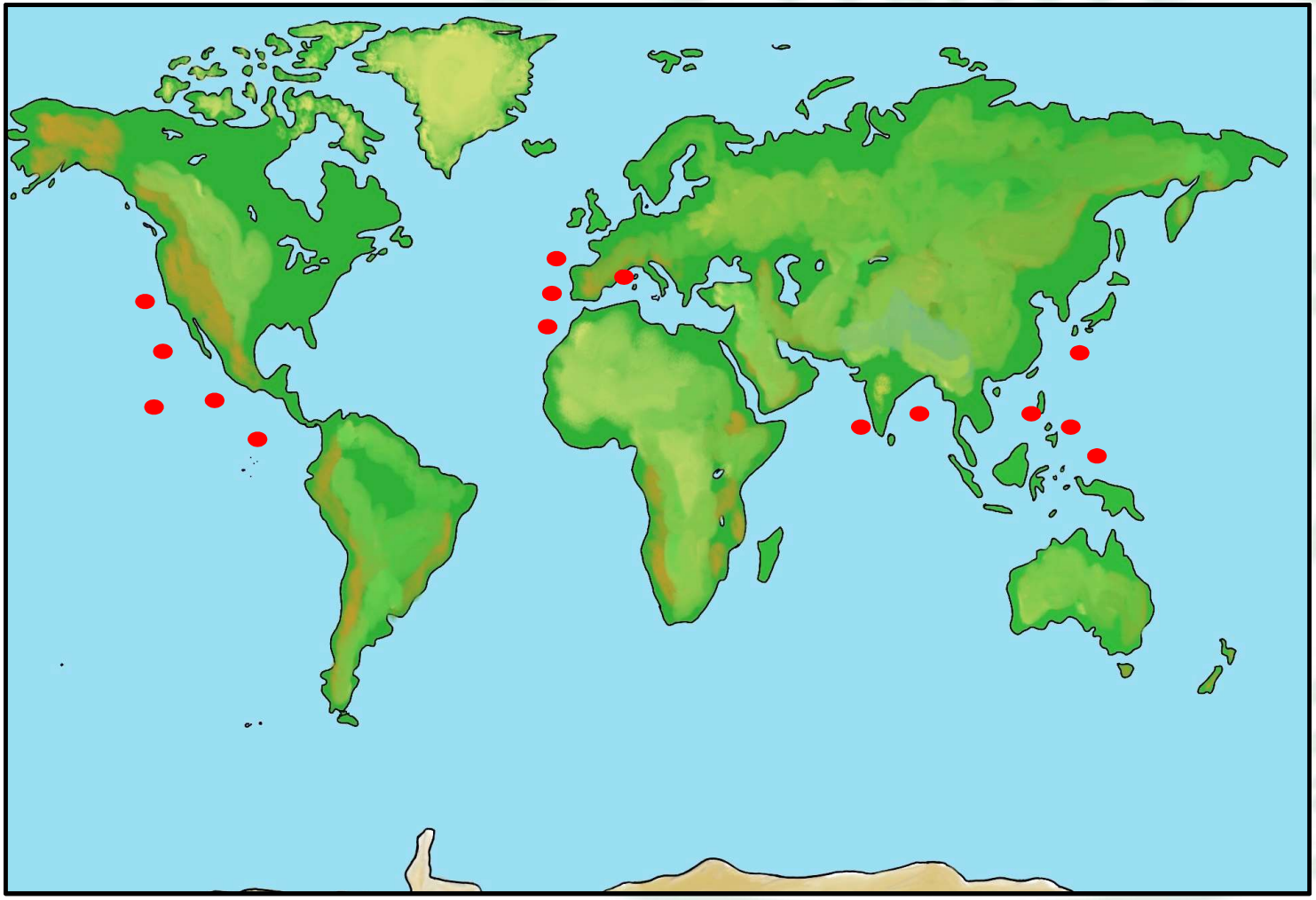
Class: Scaphopoda (Shell composed of a series of eight calcareous pieces; foot flat and ventral)

Genus: *Dentalium* (tusk shell)

IDENTIFYING FEATURES:

- Soft body of the animal is enclosed in a elephant tusk shaped shell.
- Head and foot project out from the anterior aperture of the shell.
- Head bears a mouth surrounded by filiform tentacles called **captacula** with sucker like ends**.**

VIDEO LINK: https://www.youtube.com/watch?v=9djK36b2_VA&ab_channel=RavineshR



Geographical Distribution: Found in coastline of Europe, Pacific coast and Indian ocean.

Habitat: Marine, found in sand at deeper parts of the ocean

Pila

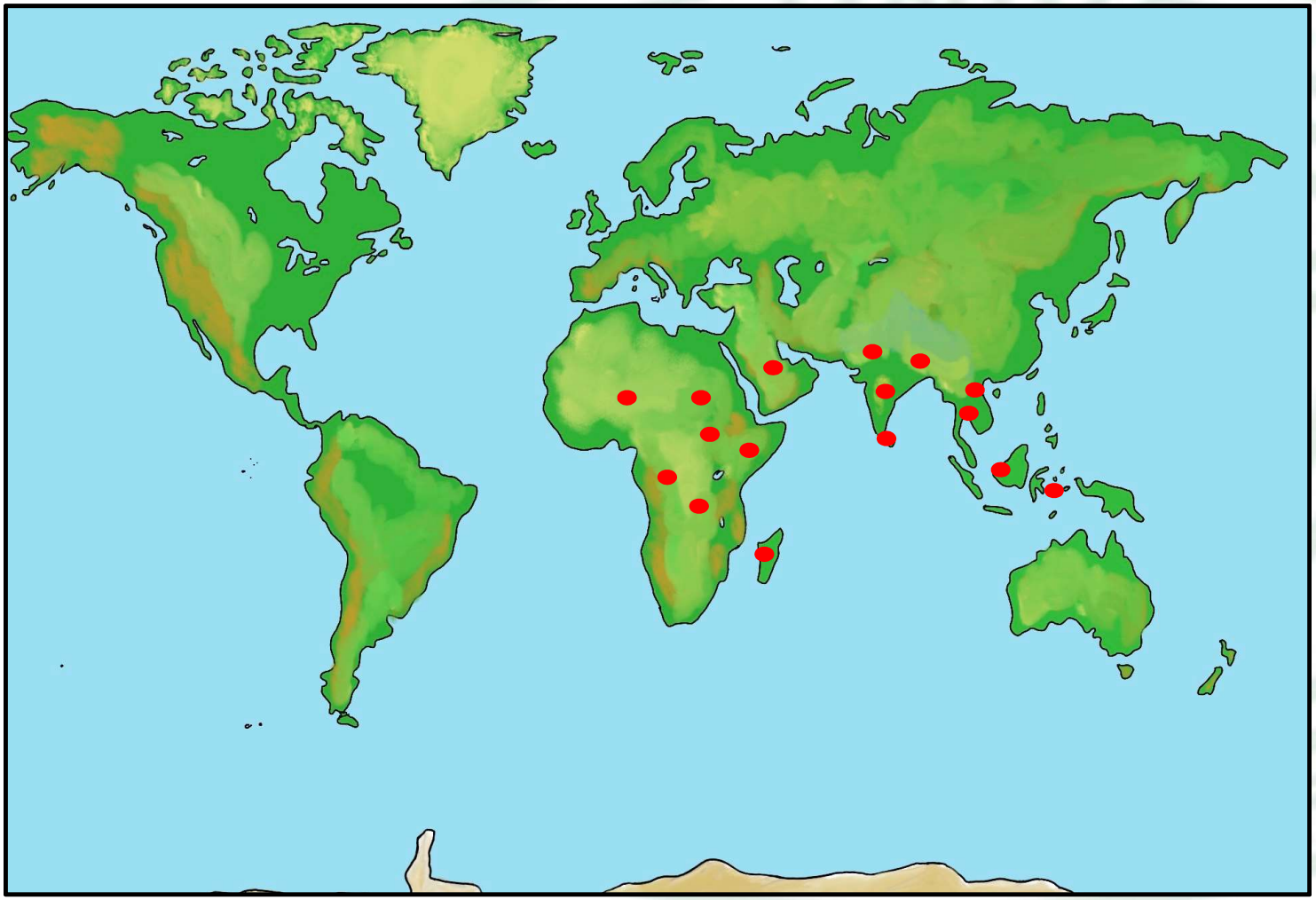
CLASSIFICATION:

Phylum: Mollusca (soft bodied, mantle with significant cavity, presence of radula)
Class: Gastropoda (body unsegmented and generally with a univalve, spirally coiled shell)
Genus: *Pila* (Apple snail)

IDENTIFYING FEATURES:

- Soft bodied animal enclosed in spirally coiled shell
- Body is divided into head, foot and visceral mass
- Head bears mouth, two pairs of contractile tentacles and a pair of eyes
- The aperture or mouth is closed by a well developed operculum
- Broad, flat foot is present for locomotion

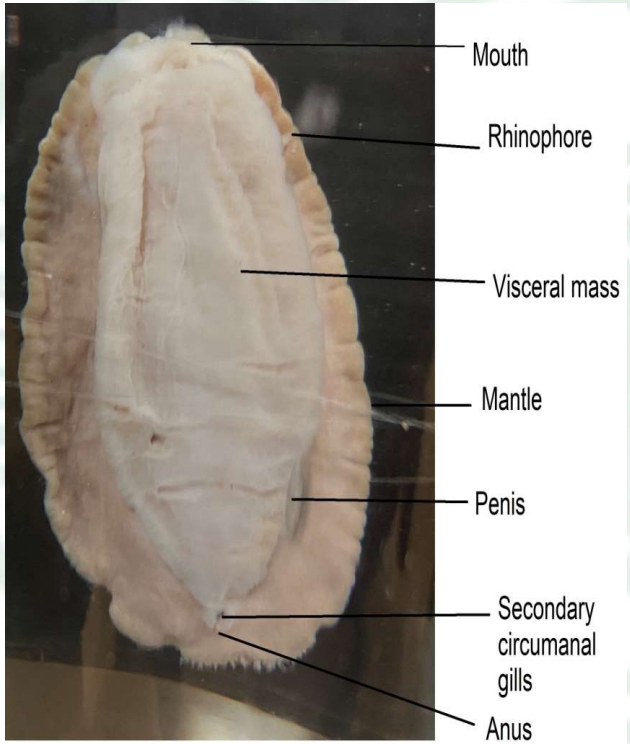
VIDEO LINK: https://youtu.be/MOPBzJ8IGfY



Geographical Distribution: Oriental (India, Myanmar, Sri lanka, Malaysia, Indonesia and Ethiopian region (Africa, S. Arabia, Madagascar)

Habitat: Found in freshwater ponds, lakes and streams.

Doris



CLASSIFICATION:

Phylum: Mollusca (Triploblastic, bilaterally symmetrical, mantle and radula present, body differentiated into head, foot, mantle and visceral mass)

Class: Gastropoda (torsion is seen, well developed head with eyes and tentacles, radula present)

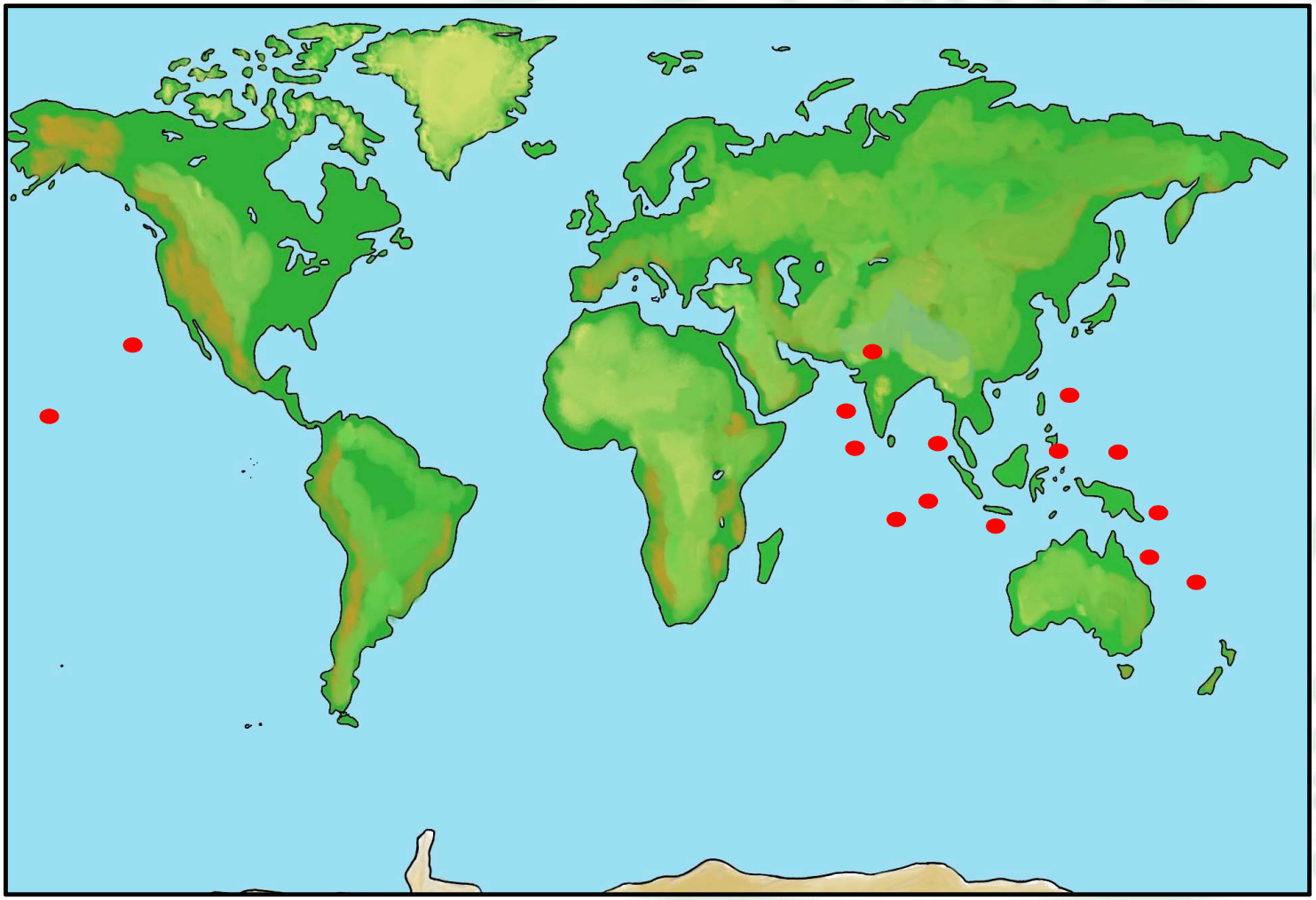
Genus: *Doris* (Sea lemon)

IDENTIFYING FEATURES:

•Oval body covered with a tough , pigmented mantle beset with calcareous spicules and bearing papillae or tubercles on dorsal side

• A circlet of feathery , retractile secondary gills called cerata surrounding the anus

VIDEO LINK-
https://www.youtube.com/watch?v=WcbADJ1bxH4&ab_channel=KarenPatterson



Geographical Distribution: Indian and Pacific Ocean

Habitat: Marine, sluggish animal found between growing sea weeds or over rocks.

Helix

CLASSIFICATION:

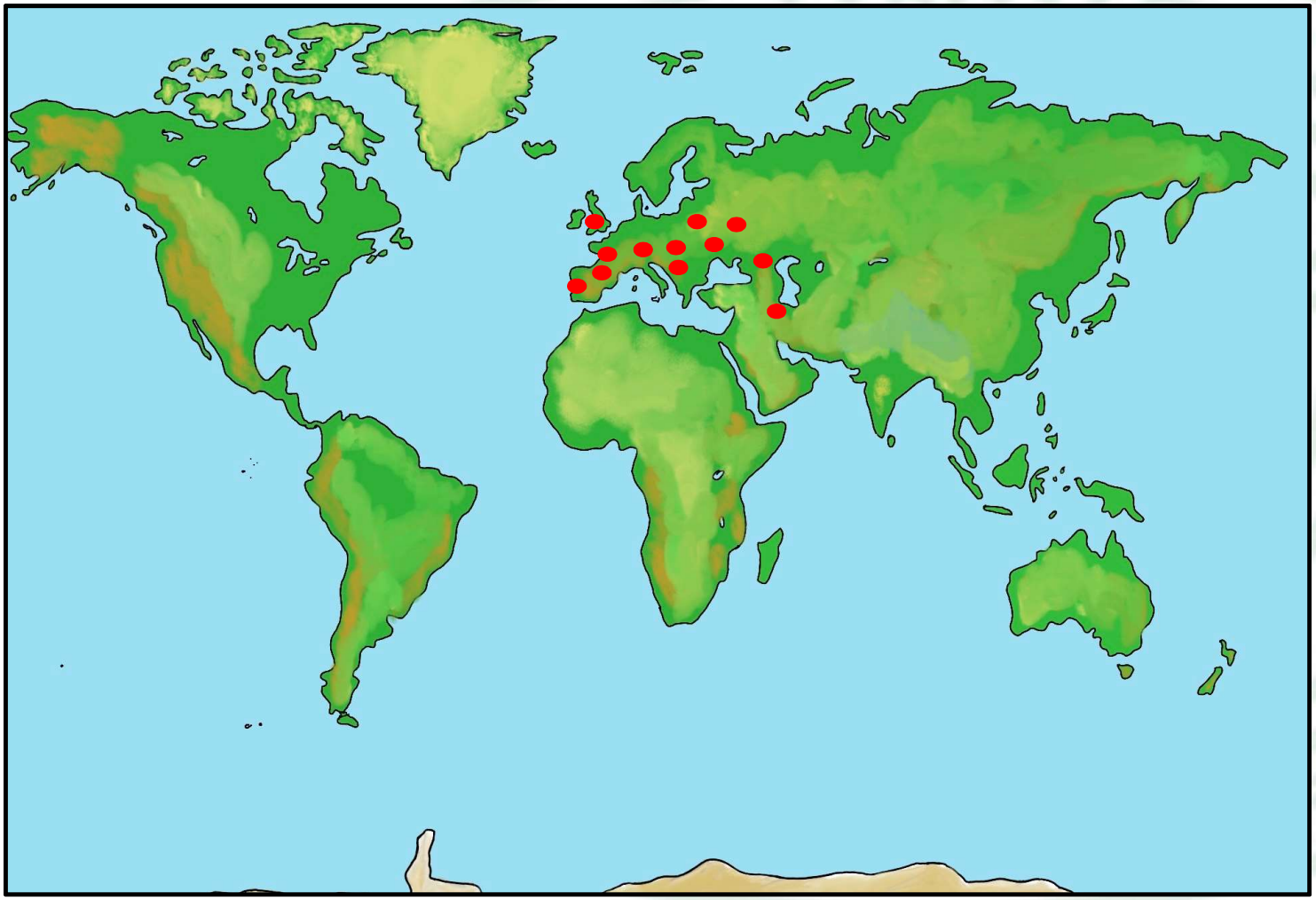
Phylum: Mollusca (Body unsegmented, bilaterally symmetrical, consists of head, foot, mantle and visceral mass)
Class: Gastropoda (Asymmetrical spirally coiled shell, visceral mass spirally coiled, exhibit torsion)
Genus: *Helix* (Garden snail)

IDENTIFYING FEATURES:

- Body is enclosed in a shell (spirally coiled, with low conical spire) and consist of head, foot, mantle and visceral hump
- The head of the snail has two pairs of tentacles, the upper and larger pair contain the eyes, and the lower pair are used to feel the ground in front
- Well developed foot is present

VIDEO LINK:

https://www.youtube.com/watch?v=AGv56trMOAY&ab_channel=interArchtive



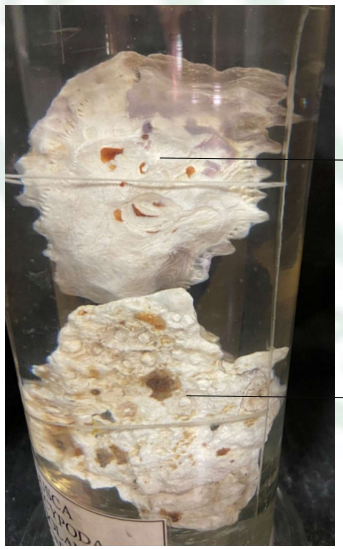
Geographical Distribution: Native to Palearctic region mainly Europe and Mediterranean region

Habitat: Terrestrial, found in damp soil and swampy areas, Nocturnal

Ostrea

Left valve inner surface

Right valve inner surface



Left valve outer surface

Right valve outer surface

CLASSIFICATION :

Phylum: Molluscs (soft bodied, aquatic forms , bilaterally symmetrical, unsegmented)

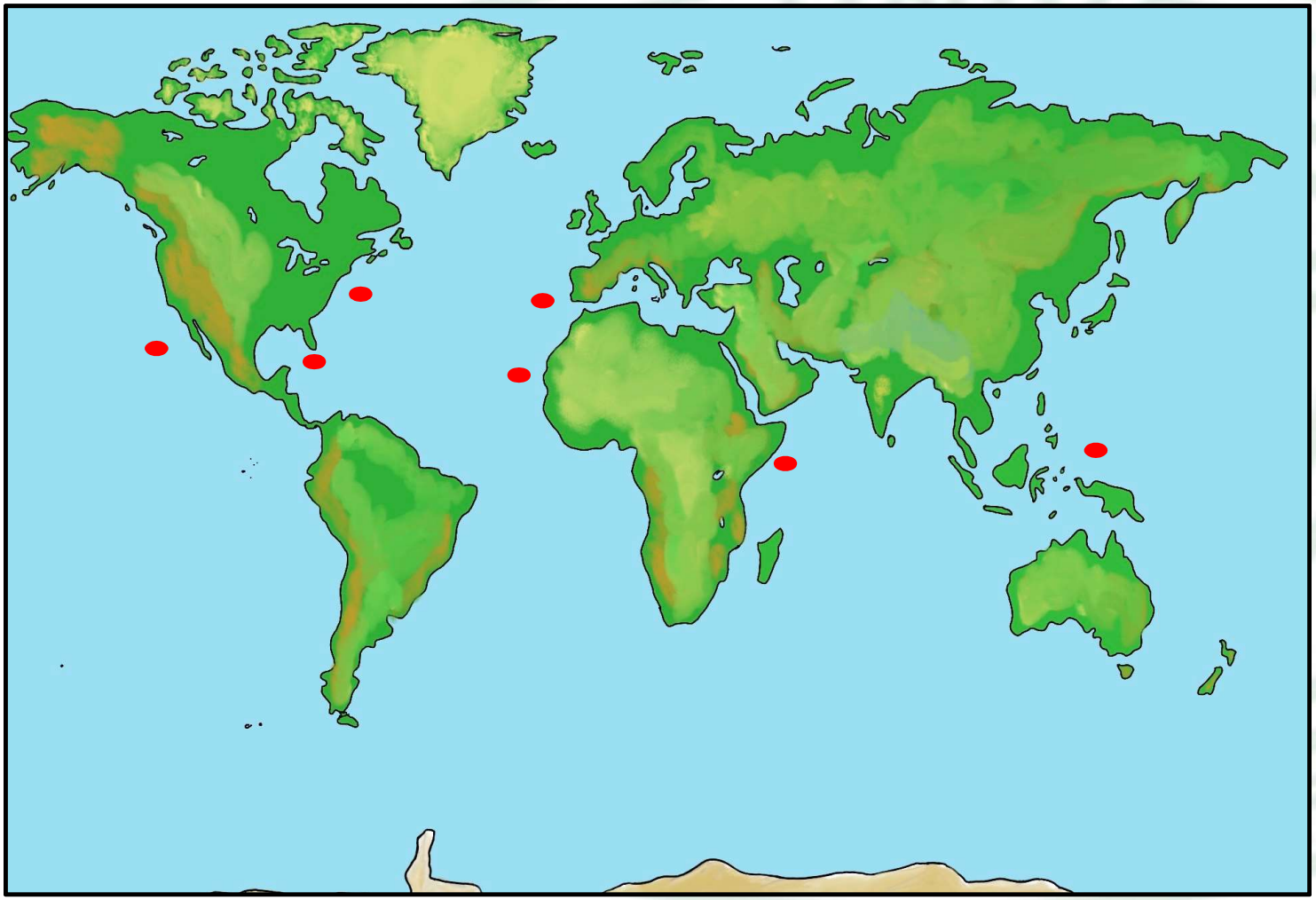
Class: Bivalvia (radula , head and eyes are lost, hatchet shaped foot , paired gills)

Genus: *Ostrea* (edible oyster or flat oyster)

IDENTIFYING FEATURES:

- Two valves of the shell are unequal , the left being largest, thick, convex and permanently attached to the substratum. The right valve is smaller, thinner and flattened.
- Shell surface is coarse , irregular and ruffled

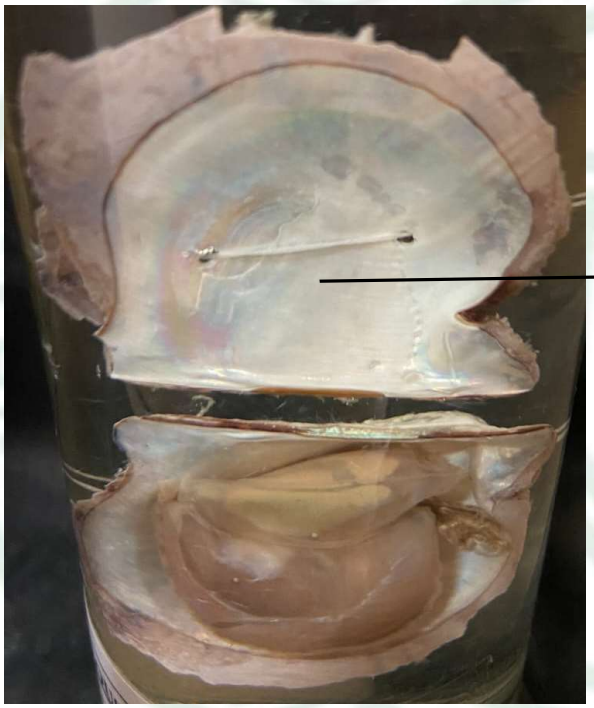
VIDEO LINK : https://youtu.be/fK7w9016Tuw



Geographical Distribution: It is found in Atlantic and Pacific coasts , Indian and Gulf of Mexico.

Habitat: Marine, sedentary animal found attached to the rocks and stones

Pinctada



CLASSIFICATION:

Phylum : Mollusca (Unsegmented body , bilaterally symmetrical and consists of head, foot , mantle and visceral mass)

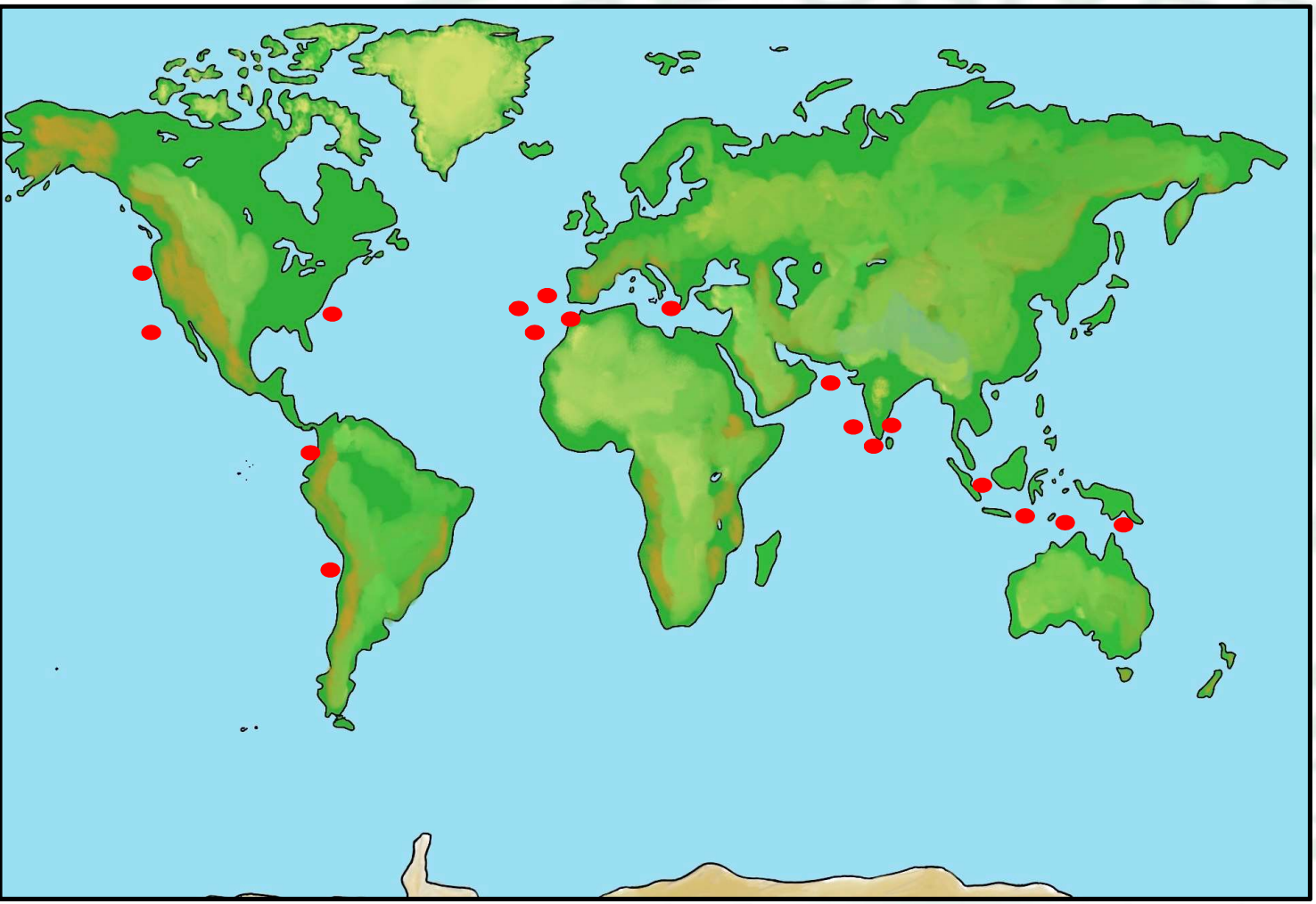
Class : Bivalvia (Bivalved shell , body laterally compressed, head not distinct)

Genus : *Pinctada* (Indian pearl oyster)

IDENTIFYING FEATURES:

- The shell valves are unequal (left shell valve larger). The hinge-line is straight produced at each end into short ear or wing-like processes
- The surface of the shell valves is ruffled bearing radiating bands and terminating into finger like projections.

VIDEO LINK : https://www.youtube.com/watch?v=934totJgo_U&ab_channel=WorldOfPaspaley



Geographical Distribution: widely distributed except in temperate zones, common in Indian coastline, Pacific and Atlantic coast

Habitat: Marine, sedentary, filter feeder

Sepia

CLASSIFICATION:

Phylum : Mollusca (unsegmented, bilaterally symmetrical and provided with visceral mass, foot, shell, and mantle).

Class : Cephalopoda (head well developed with eye and radula. Foot represented by arms and tentacles).

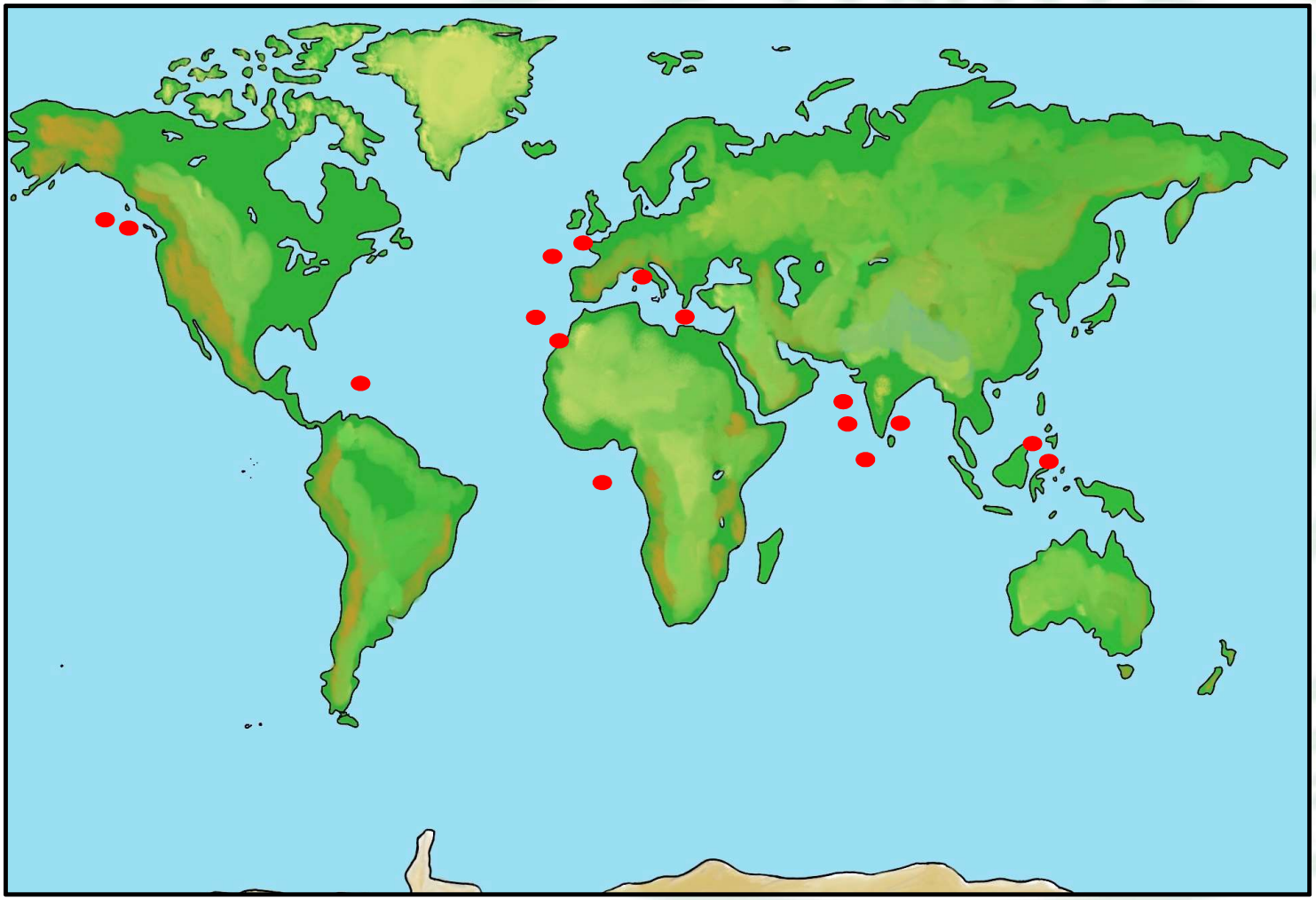
Genus : *Sepia*

IDENTIFYING FEATURES:

- They have **5 pairs of arms**, 4 short and 1 long (tentacles). Shorter arms have suckers throughout, longer arms have suckers at the tip.
- Has lateral fin all around visceral hump
- **Hectocotylized arm- left fourth arm** in males is modified into spoon shaped structure to transfer spermatophores into female's mantle cavity
- Shell is internal (phragmocone) enclosed in shell sac.

VIDEO LINK:

https://www.youtube.com/watch?v=xPAM7Ho3qcI&ab_channel=DeepMarineScenes



Geographical Distribution: Cosmopolitan, common in India, Europe, Mediterranean

Habitat: Marine, found in shallow waters, nocturnal carnivore

Octopus

CLASSIFICATION:

Phylum: mollusc (body unsegmented, bilaterally symmetrical, consist of head, foot ,mantle, and visceral mass)

Class :Cephalopoda (thick exoskeleton ,head fused with the thorax to cephalothorax)

Genus: *Octopus*

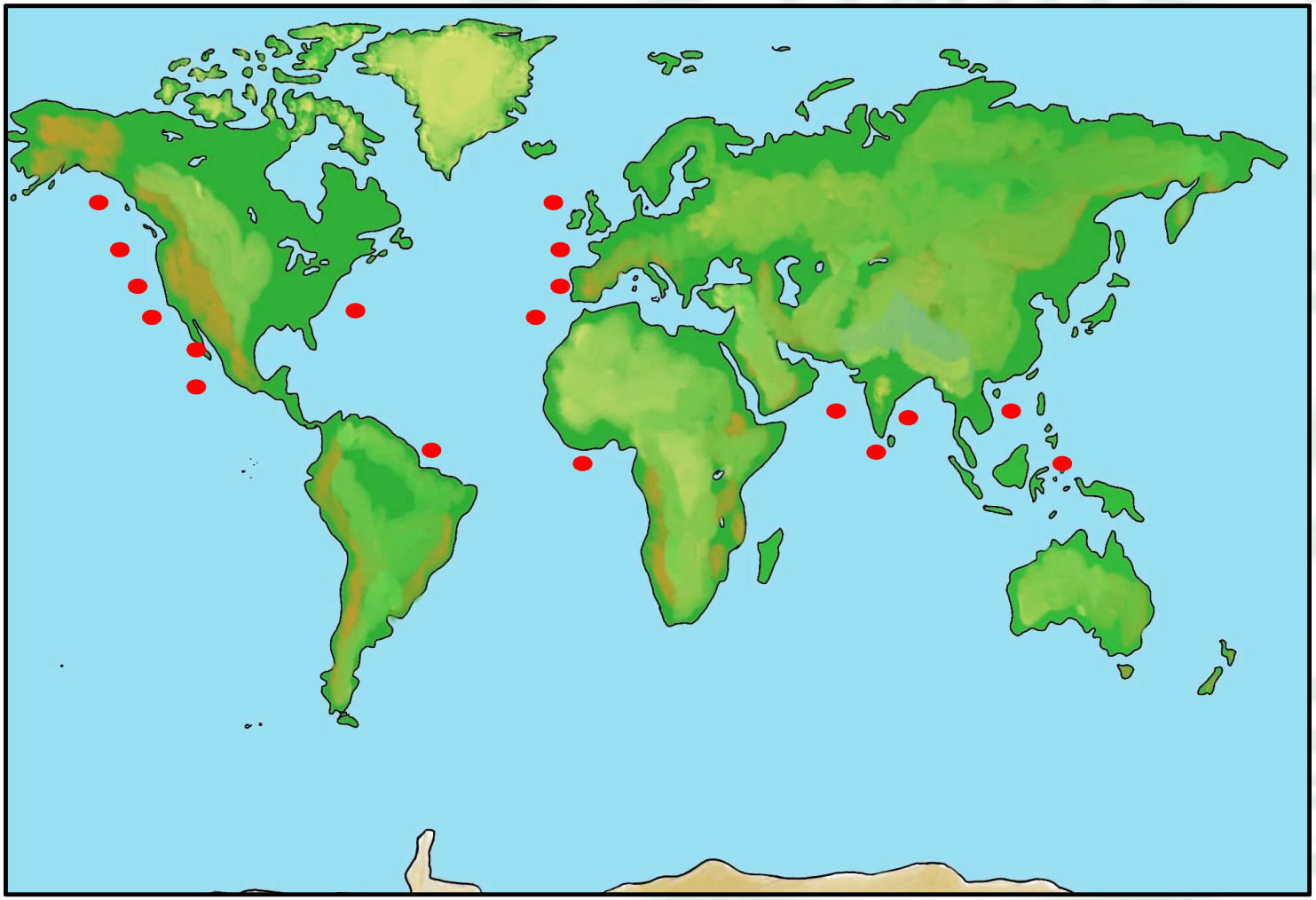
IDENTIFYING FEATURES:

- Body divided into head and trunk
- Head bears a pair of eyes and 8 equal arms bearing suckers, with webbing at base that surrounds the mouth
- **Hectocotylized arm- Right third arm** in males is modified into spoon shaped structure to transfer spermatophores into female's mantle cavity

VIDEO LINK:

https://www.youtube.com/watch?v=mFP_AjJeP-M

https://www.youtube.com/watch?v=4fkQZrfeYXQ&ab_channel=NationalGeographic



Geographical Distribution: Cosmopolitan, common in Indian Ocean. Eastern Pacific, Atlantic coasts

Habitat: Marine, bottom dwelling, nocturnal

Nautilus

CLASSIFICATION:

Phylum: Mollusca (tissue level grade body,triploblastic, coelomate, unsegmented, mantle present)

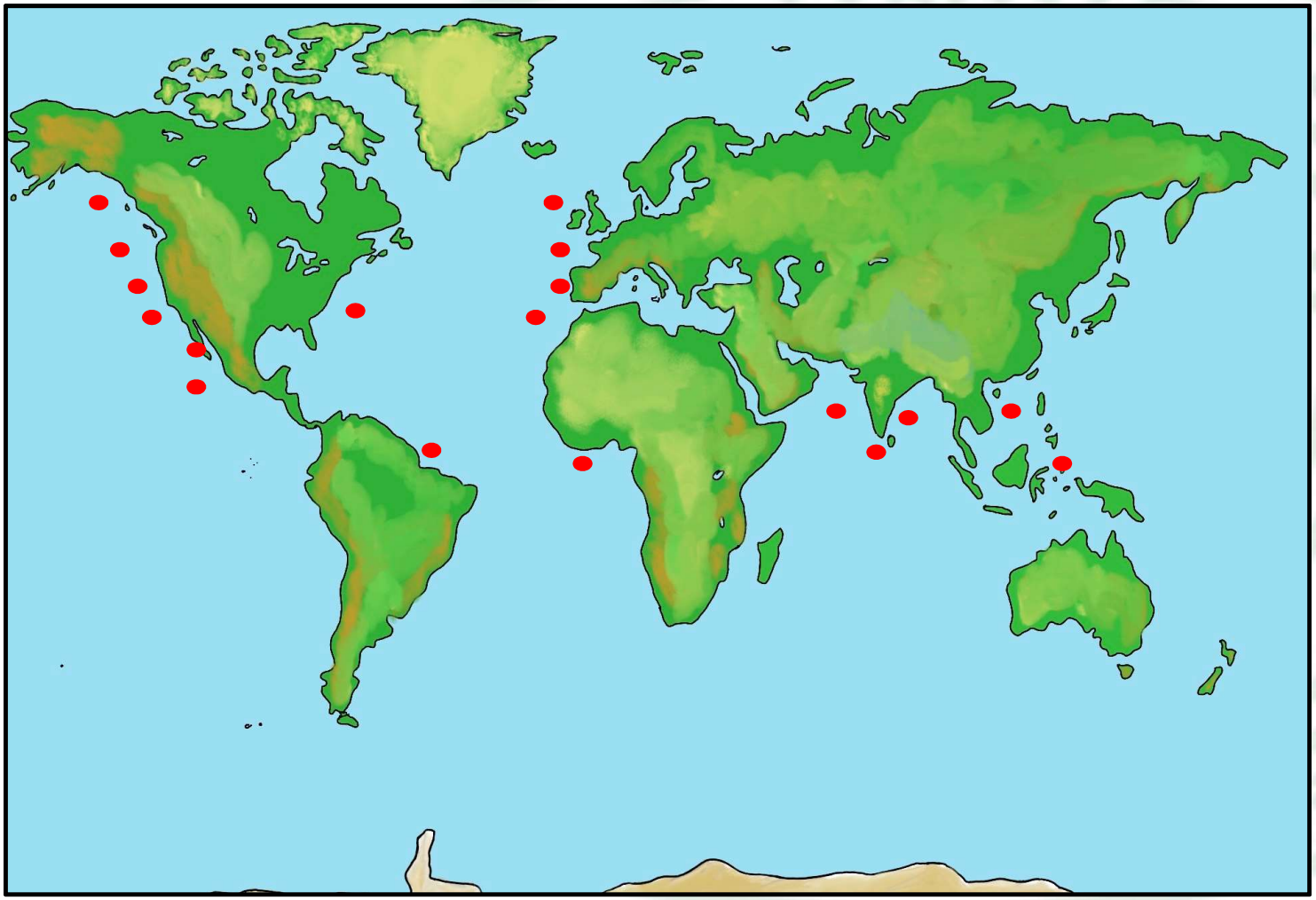
Class: Cephalopoda (marine, dorsoventrally elongated body form, shell external/internal or absent, well develped head with distinct large eyes, dioecious, direct development)

Genus : *Nautilus*

IDENTIFYING FEATURES:

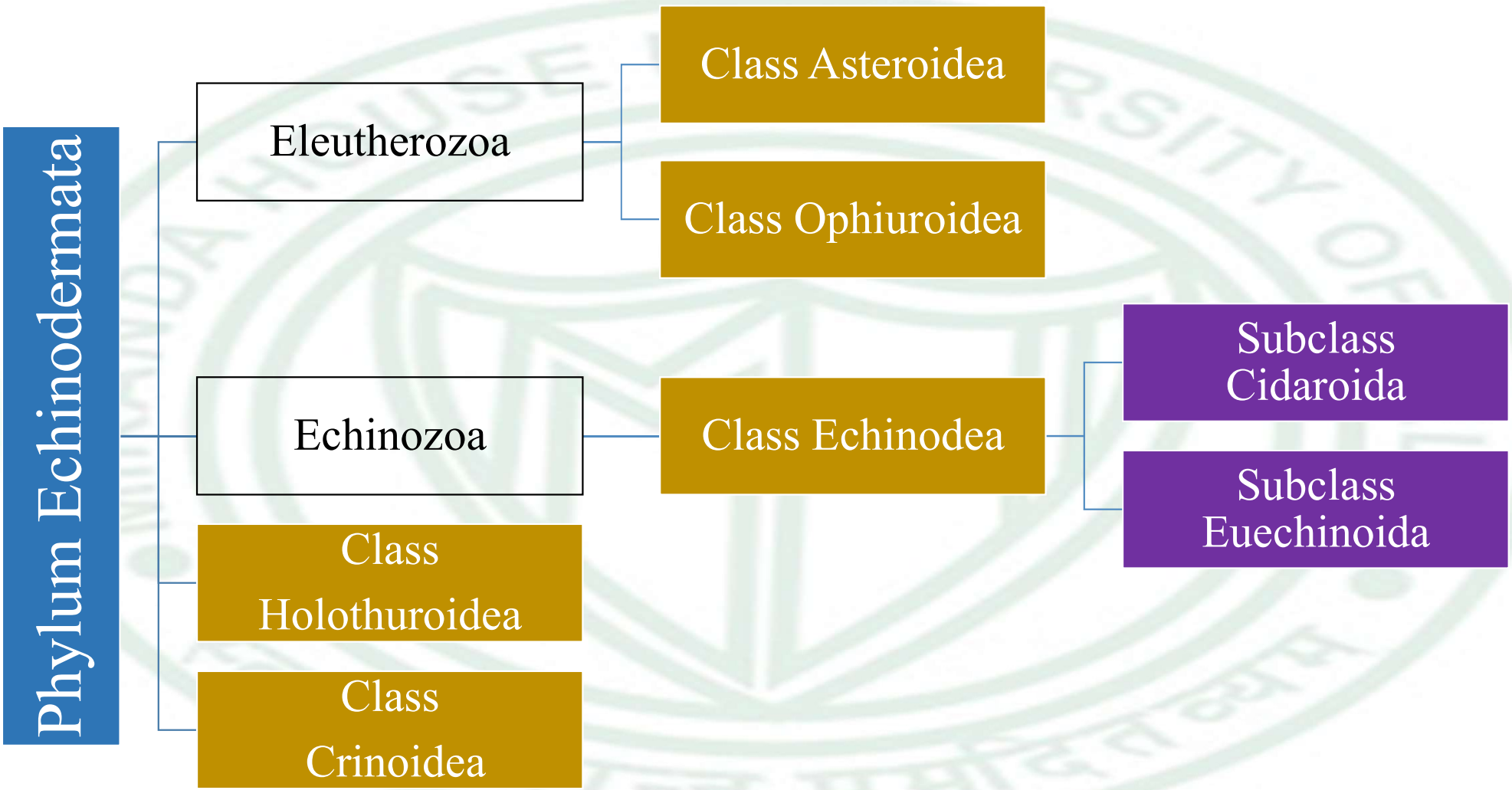
- Shell is spirally coiled and is divided into many chambers that are filled with air [for floating]except the animal chamber, transverse septa are perforated in the middle and via the perforation emerges a cord mantle called siphuncle.
- Mouth surrounded with multiple rows of retractile tentacles, suckers absent on the arms.
- Stripes of yellow and brown on outer surface of the shell and pearly inner surface of shell.

VIDEO LINK: https://youtu.be/nRCqD5vdUJs



Geographical Distribution: Commonly found in western Pacific Ocean and coastal areas of Indian ocean etc.

Habitat: Marine, found in shallow seas near coral reefs


Phylum Echinodermata
Eleutherozoa
Class Asteroidea
Class Ophiuroidea
Echinozoa
Class Echinodea
Subclass Cidaroida
Subclass Euechinoida
Class Holothuroidea
Class Crinoidea

Ophiura

CLASSIFICATION:

Phylum: Echinodermata (pentaradially symmetrical, coelomate with spiny skin and water vascular system)

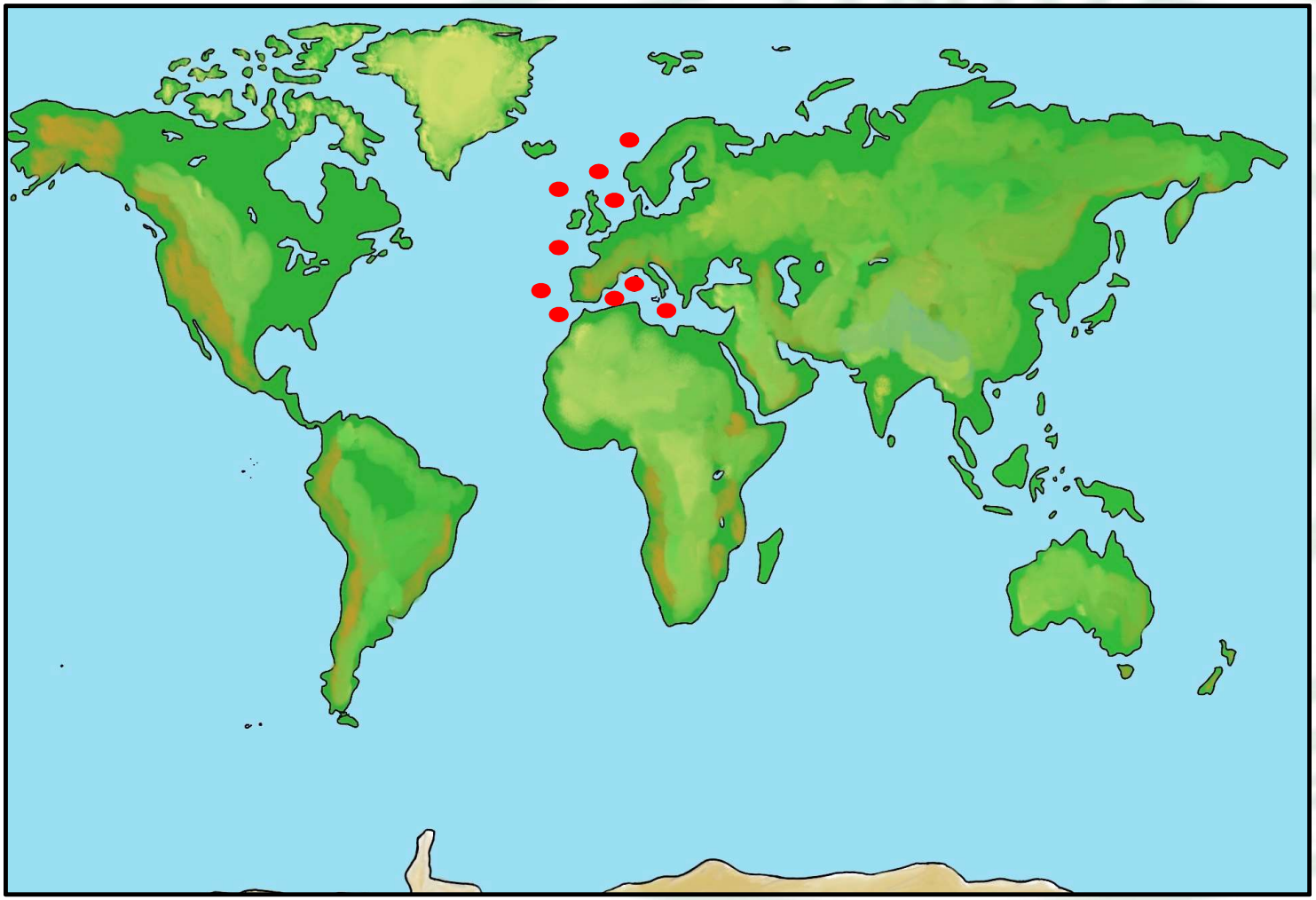
Class: Ophiuroidea (Oral and aboral surfaces distinct; bases of the arms distinctly marked off from the disc; ambulacral grooves, anus and intestine absent; madreporite on the oral surface)

Genus: *Ophiura* (Brittle star)

IDENTIFYING FEATURES:

- Large disc and relatively short arms.
- Arms are distinctly marked from central disc, arms bear small spines
- Four genital bursae are present between each inter radius.

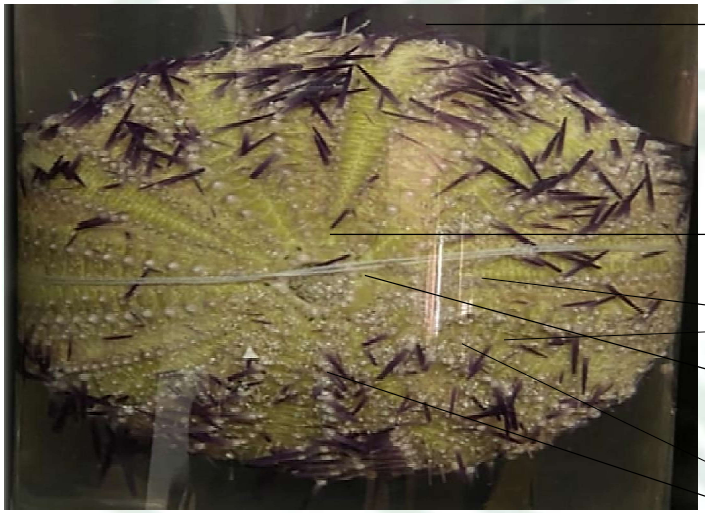
VIDEO LINK - https://youtu.be/5rckF8coPZA



Geographical Distribution: North east Atlantic Ocean, North Sea, Mediterranean Sea

Habitat: Found on sandy bottoms in the neritic zone

Echinus



CLASSIFICATION:

Phylum: Echinodermata (radially symmetrical, pentaradiate coelomate with spiny skin and water vascular system)

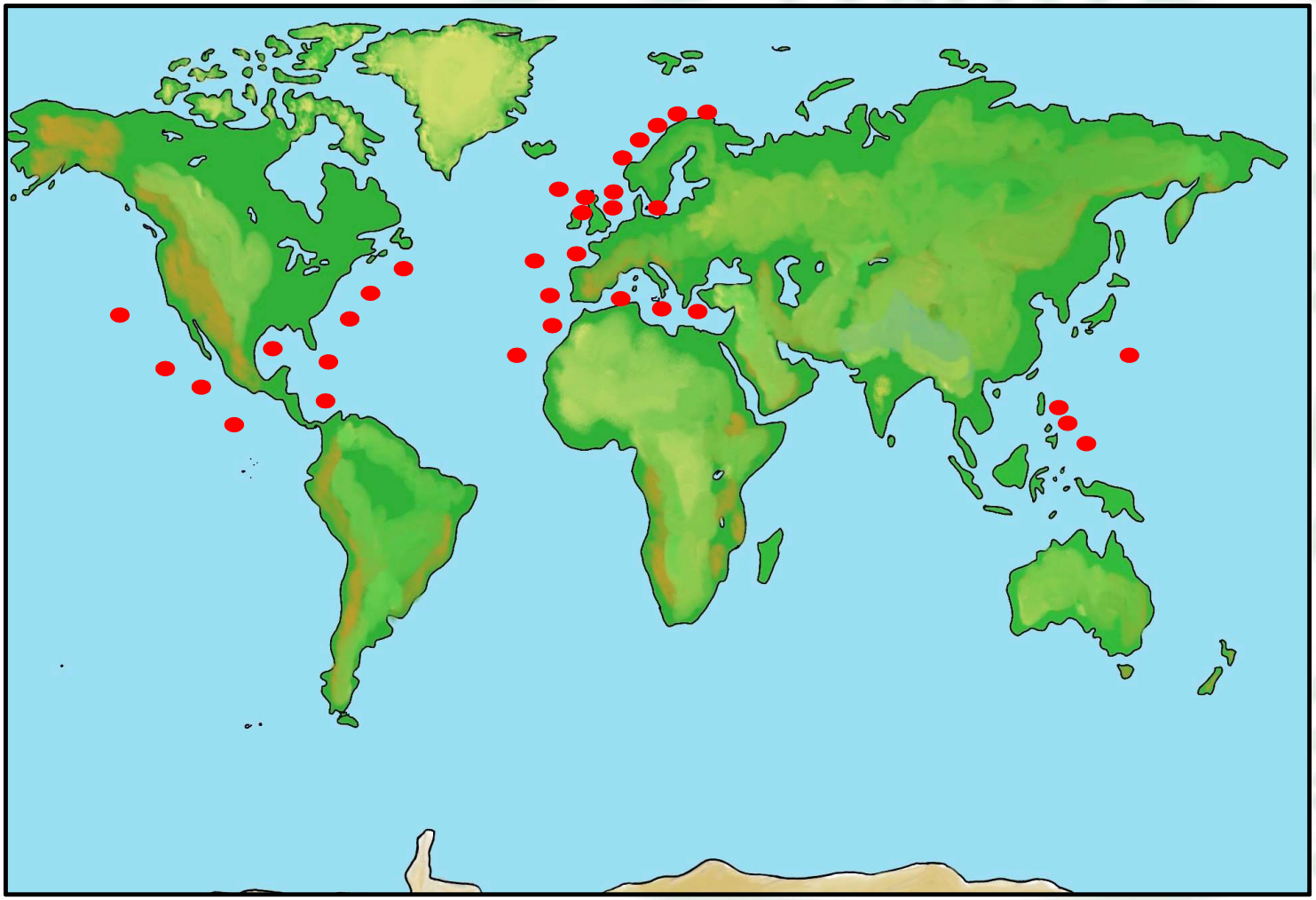
Class: Echinoidea (body spherical, enclosed in a shell or test, ambulacral grooves and anus absent, pedicellariae)

Sub Class – Euechinoidea (ambulacral plates are compound, each formed of 3 or more primary plates)

IDENTIFYING FEATURES:

- Body is in globular in shape, somewhat flattened at the two poles forming distinct oral and aboral poles
- Entire surface of the animal except the peristome and periproct is covered with spines articulated to the shell
- Mouth is surrounded by soft membrane known as peristome, through the mouth project the five teeth of Aristotle's lantern

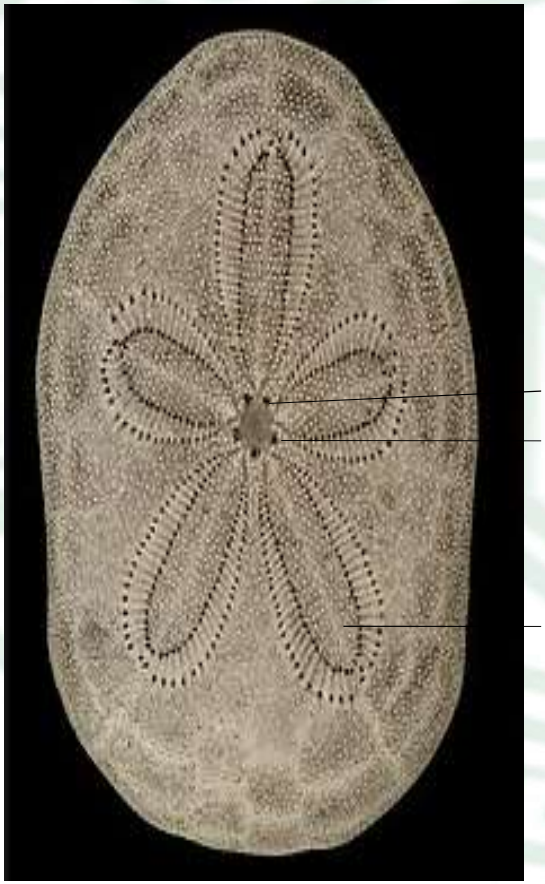
VIDEO LINK - https://www.youtube.com/watch?v=K4-DD265LQk&ab_channel=DeepMarineScenes



Geographical Distribution: Atlantic ocean, Mediterranean sea, Pacific Ocean

Habitat: Marine benthic animal found in inter tidal zone

Clypeaster



CLASSIFICATION:

Phylum: Echinodermata (triploblastic, pentamerous radial symmetry)

Class: Echinoidea (body spherical, disc-like, oval or heart shaped, chewing apparatus, separate sexes)

Sub Class – Euechinoidea (ambulacral plates are compound, each formed of 3 or more primary plates)

Genus: *Clypeaster*

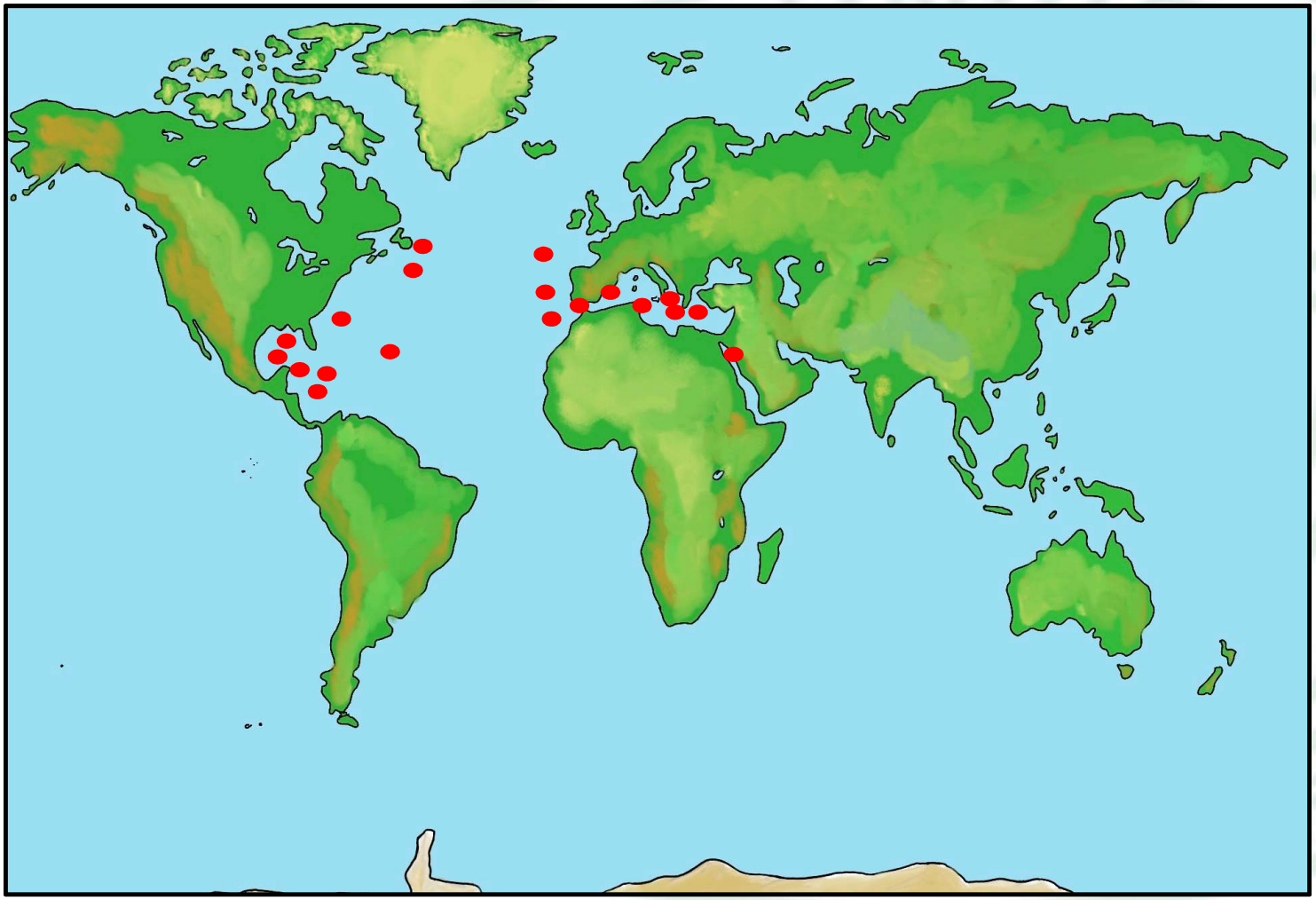
IDENTIFYING FEATURES:

➢Flattened, oval shield with radial symmetry covered with dense brown spine

➢Mouth is central in position and present on the concave oral surface. From it radiate five ambulacral grooves which possess locomotor suckered tube feet. Anus lies on the oral surface

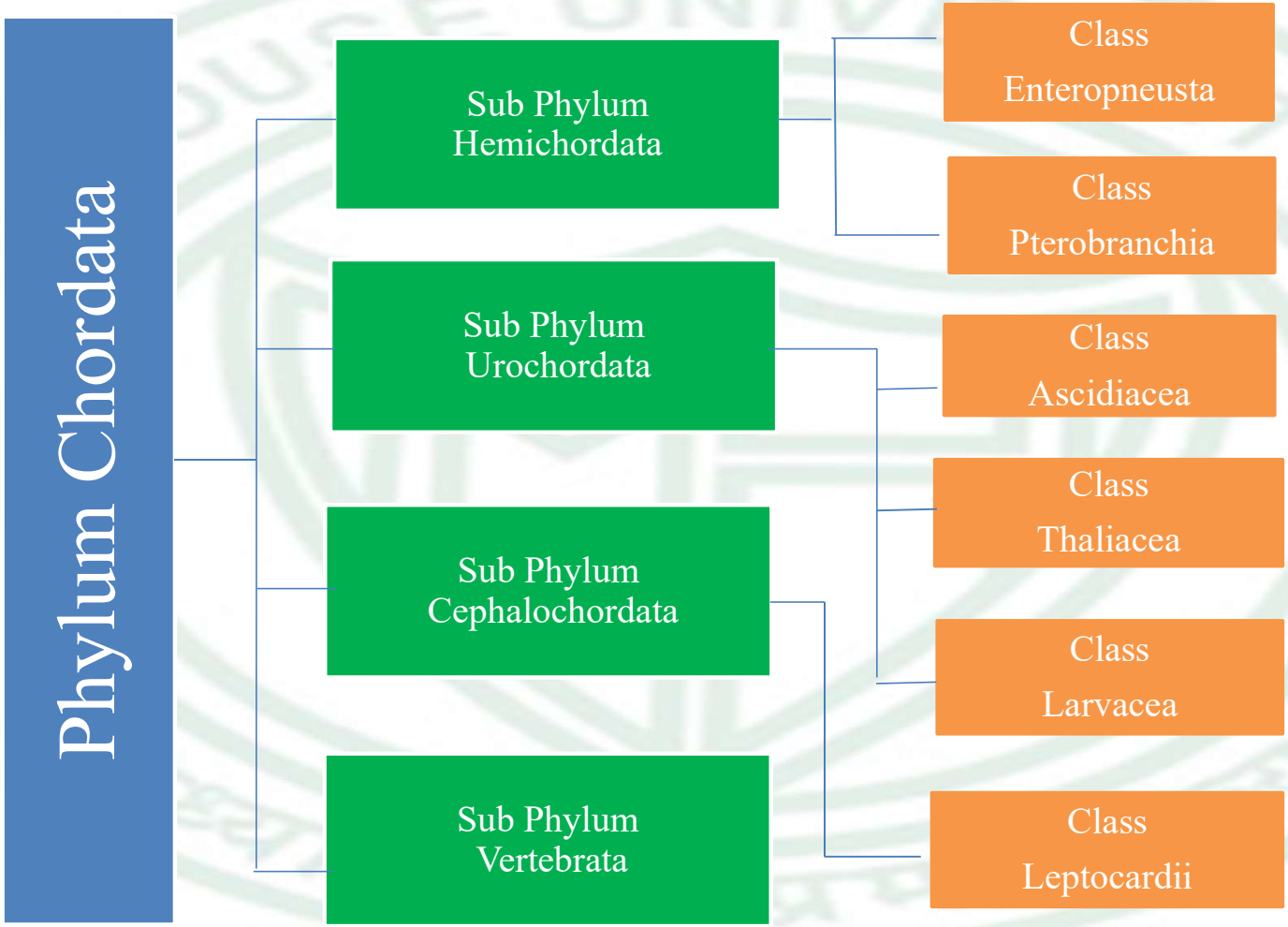
➢Aristotle's Lantern (masticatory apparatus) is present whose teeth project out of mouth.

VIDEO LINK - https://youtu.be/DOEdJrFe9gYIUCN



Geographical Distribution: Atlantic ocean, Caribbean sea, Mediterranean, Red Sea.

Habitat: Marine, found buried in sandy bottom


Phylum Chordata
Sub Phylum Hemichordata
Sub Phylum Urochordata
Sub Phylum Cephalochordata
Sub Phylum Vertebrata
Class Enteropneusta
Class Pterobranchia
Class Ascidiacea
Class Thaliacea
Class Larvacea
Class Leptocardii

Balanoglossus

CLASSIFICATION:

Phylum- Chordata (Deuterostome, Presence of notochord, nerve chord and pharyngeal gill slits)

Subphylum- Hemichordata (Small soft bodied, marine, notochord confined to head region and sexes are separate)

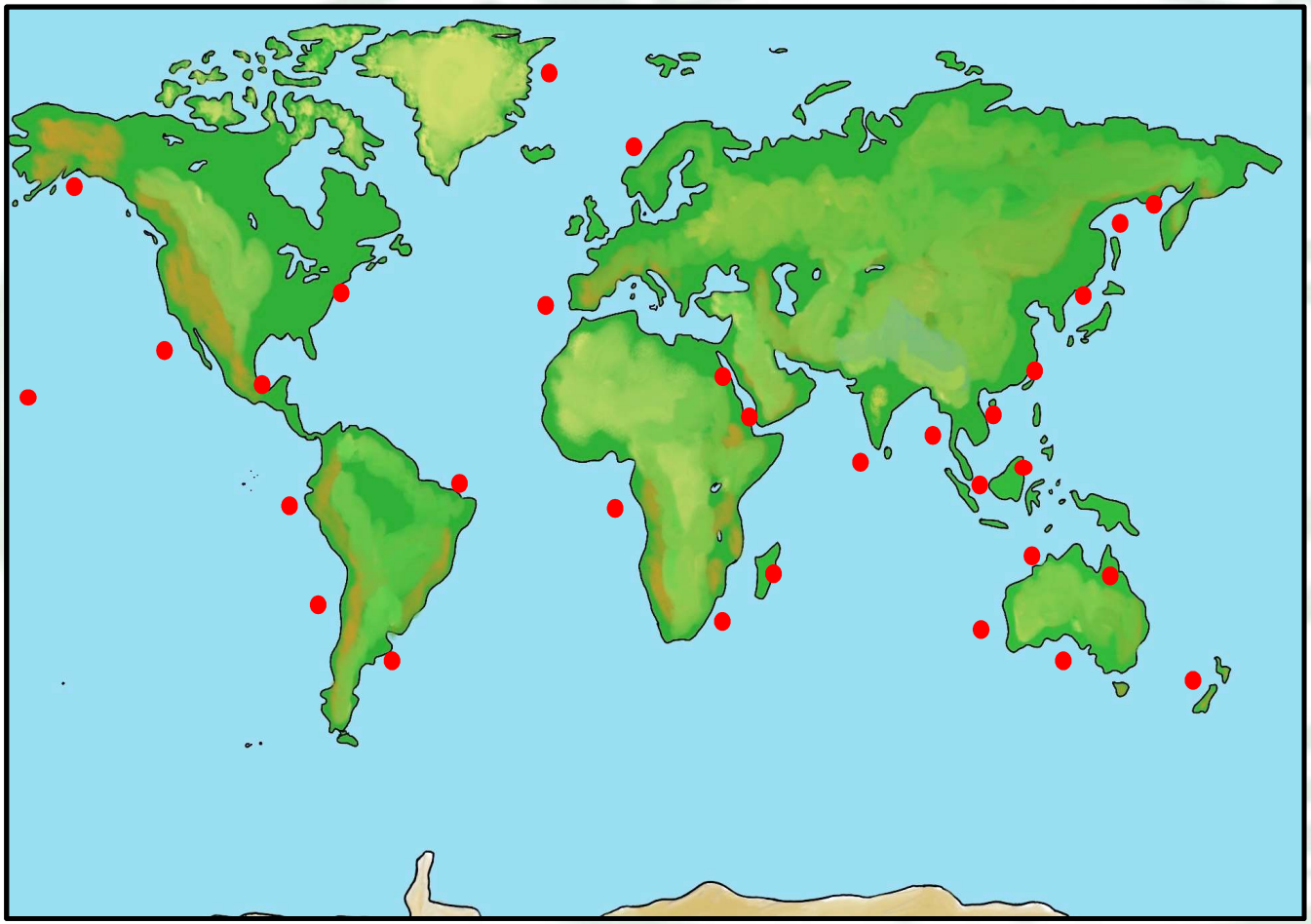
Class - Enteropneusta (Solitary form, straight alimentary canal, two rows of caeca, numerous gill slits, mouth and anus at opposite ends)

Genus - *Balanoglossus* (Acorn worm)

IDENTIFYING FEATURES:

➢Body divisible into proboscis, collar and trunk with genital wings.

VIDEO LINK: https://www.youtube.com/watch?v=s53Wn5O0J0M
https://www.youtube.com/watch?v=TcJmWpmSNeg



<u>Geographical Distribution</u>: Cosmopolitan.

<u>Habitat</u>: Swims freely in marine water essentially well adapted for living in burrowing muddy bottom and tubicolous.

Herdmania

CLASSIFICATION:

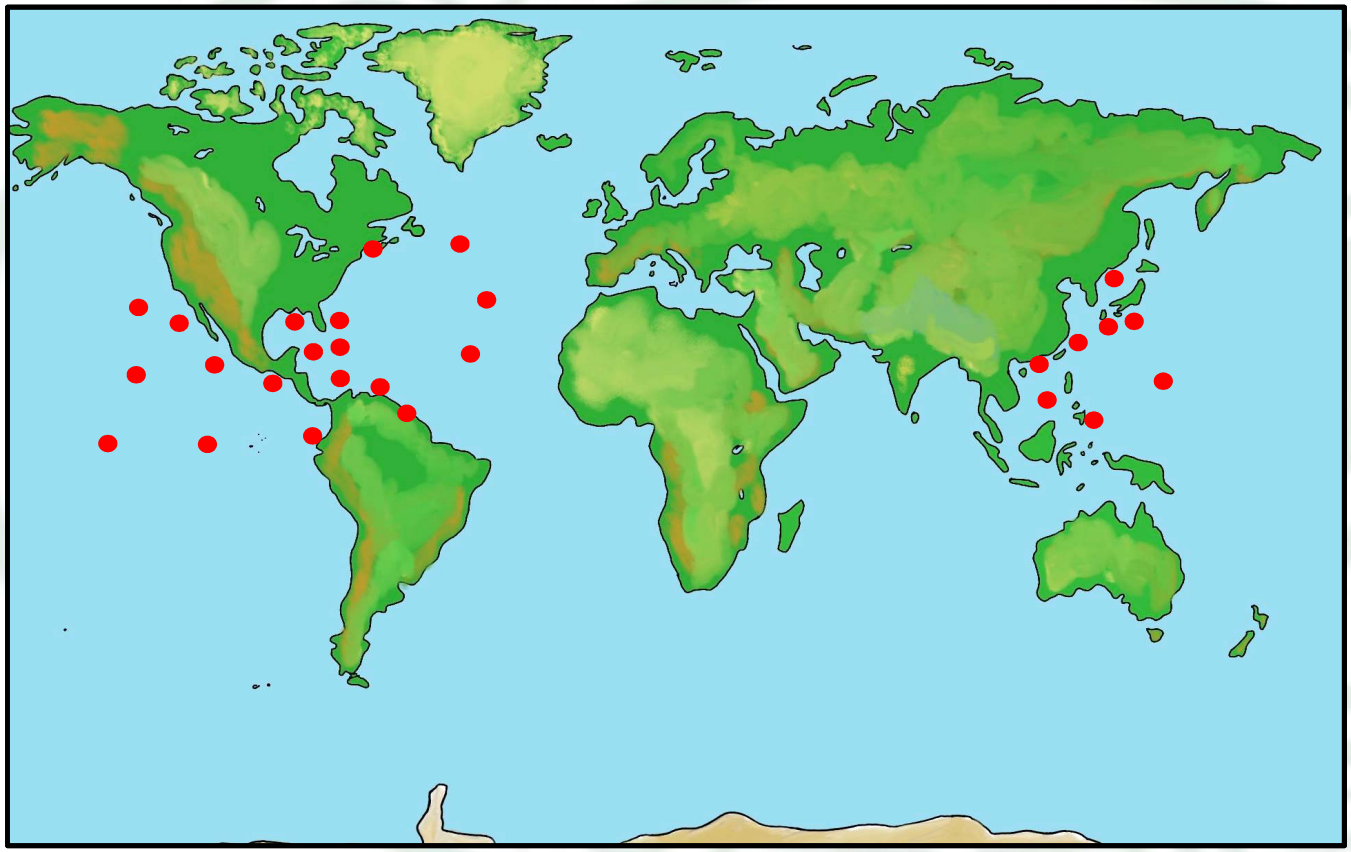
Phylum- Chordata (Deuterostome, Presence of notochord, nerve chord and pharyngeal gill slits)
Subphylum- Urochordata (marine, solitary or colonial, free-swimming or fixed, notochord confined to tail region at larval stage, basket like pharynx)
Class- Ascidiacea (Solitary form, well developed and permanent test)
Genus- *Herdmania* (Sea Squirt)

IDENTIFYING FEATURES:

➢Body with thick, leathery transparent test or tunic at anterior end and foot for the attachment at posterior end.
➢Branchial and Atrial aperture present for entrance and exit of water stream after circulating through body.

VIDEO LINK:

https://www.youtube.com/watch?v=luWibG1opD8
https://www.youtube.com/watch?v=_rTOQO-M724
https://www.youtube.com/watch?v=DKe_gMg4CKM



Geographical Distribution: Atlantic, Pacific and Caribbean seas.

Habitat: Sessile and solitary.

Pyrosoma

CLASSIFICATION:

Phylum- Chordata (Deuterostome, presence of notochord, nerve cord and pharyngeal gill slits)

Subphylum- Urochordata (Marine, Solitary or colonial, free swimming or fixed, notochord confined to tail region at larval stage, basket like pharynx)

Class- Thaliacea (Pelagic, circular muscle bands present, shows alternation of generation, tunic thin and permanent)

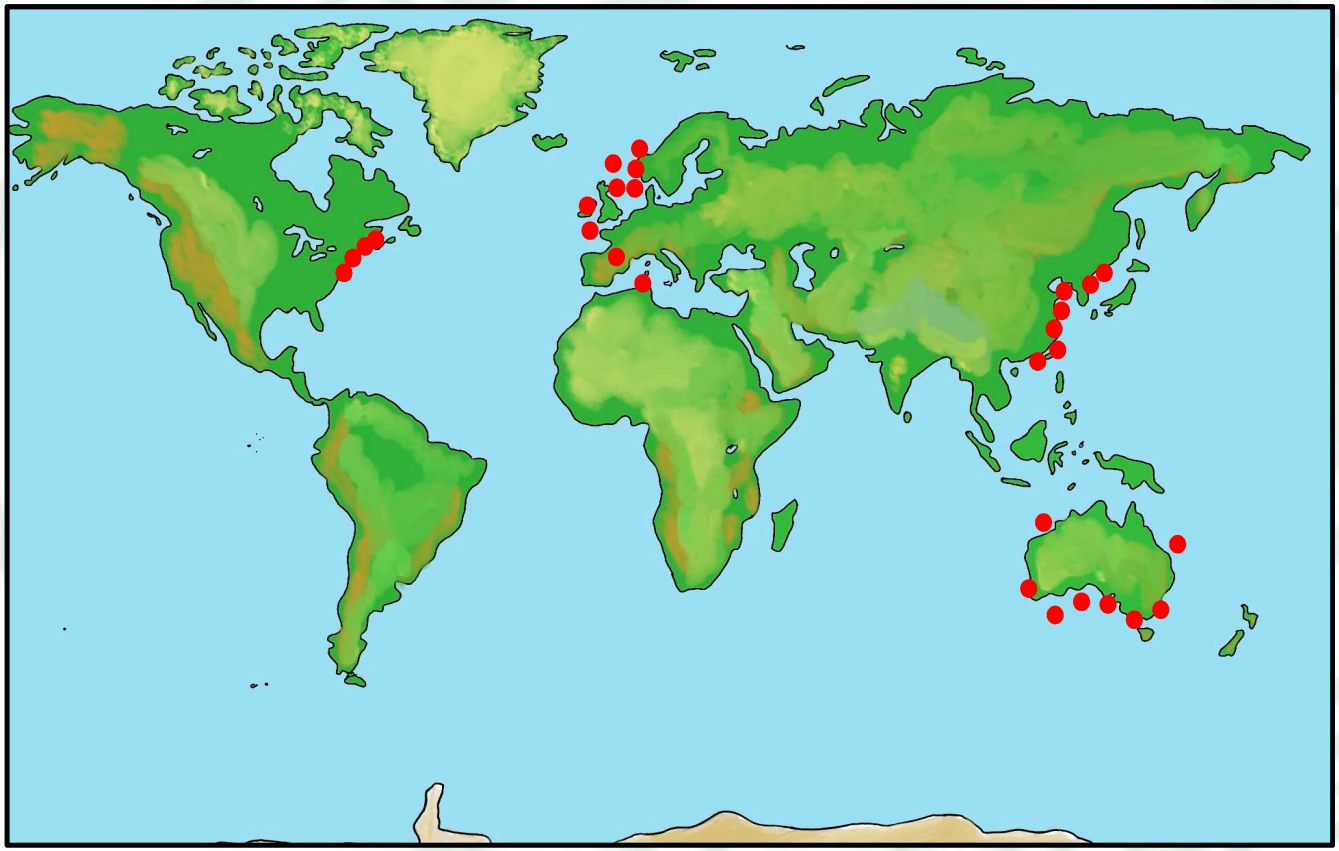
Genus- *Pyrosoma*

IDENTIFYING FEATURES:

- Body consist of a number of individuals associated to form elongated barrel-shaped colony.
- Body covered with test processes and have terminal opening.

VIDEO LINK:

https://www.youtube.com/watch?v=FNhsHYU91OA
https://www.youtube.com/watch?v=MPkakSsbGYw

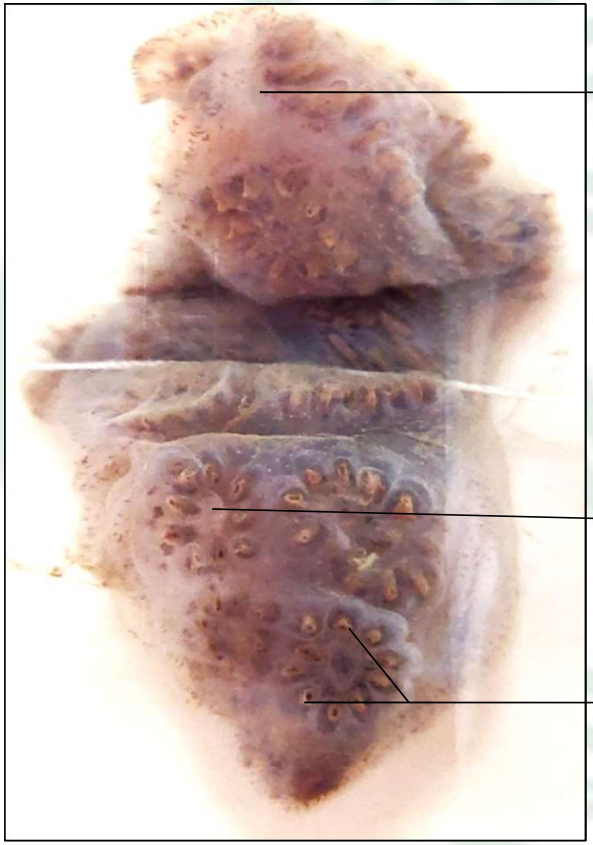


Geographical Distribution:

Tropical and subtropical.

Habitat: Pelagic, colonial, in warm sea.

Botryllus



CLASSIFICATION:

Phylum -Chordata (Deuterostome, presence of notochord, nerve cord and pharyngeal gill slits)

Subphylum – Urochordata (marine, solitary or colonial, free-swimming or fixed, notochord confined to tail region at larval stage, basket like pharynx)

Class- Ascidiacea (Solitary or colonial forms, well developed and permanent test)

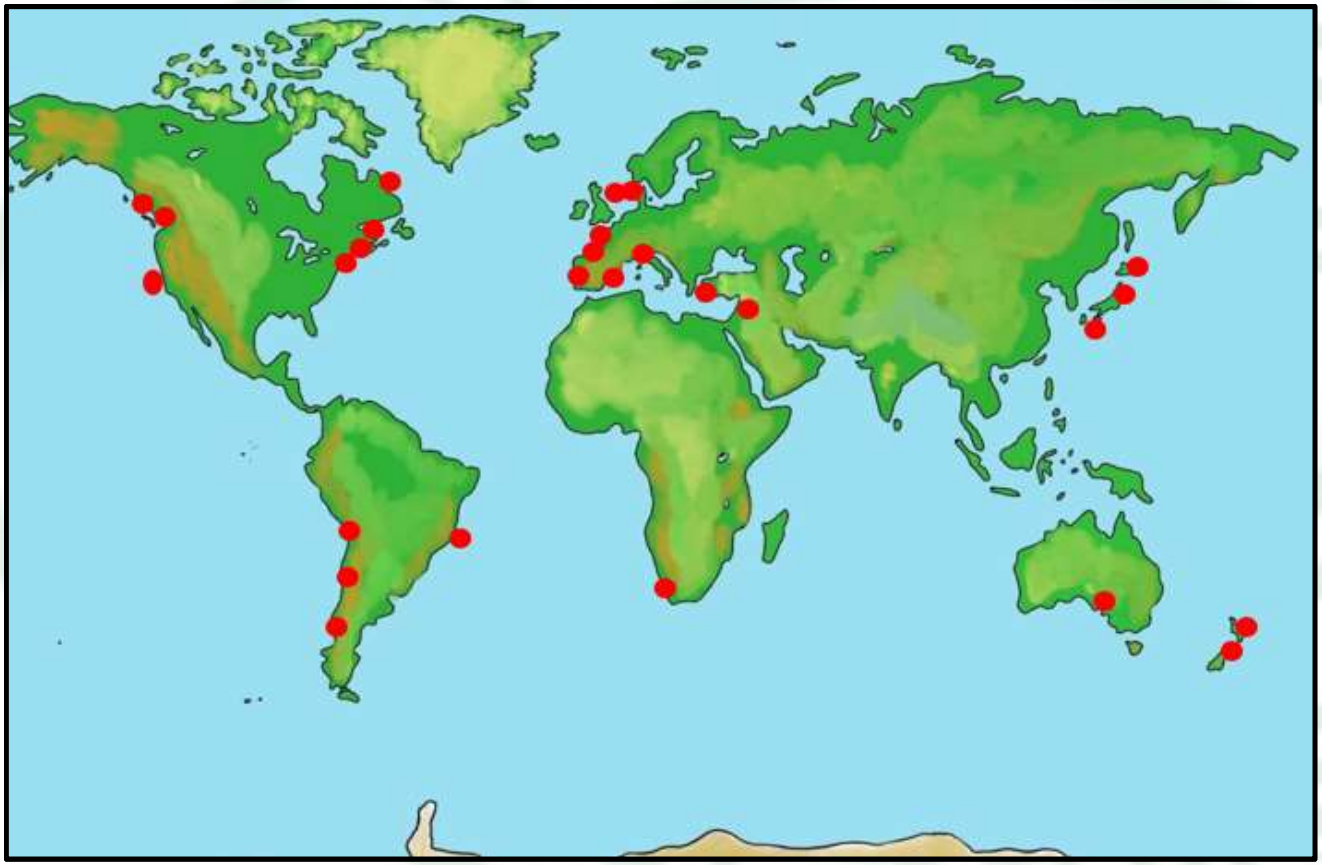
Genus - *Botryllus* (star tunicate)

IDENTIFYING FEATURES:

- Colony with star-shaped arrangement of zooids.
- Individual branchial aperture of zooids and a common cloacal aperture.

VIDEO LINK:

https://www.youtube.com/watch?v=FIQ6pxzuw2s



<u>Geographical Distribution</u>: Cosmopolitan mainly present in Atlantic, Mediterranean oceans.

<u>Habitat</u>: Colonies encrust over submerged rocks and sedentary animals near shallow sea water.

Branchiostoma

CLASSIFICATION:

Phylum- Chordata (Deuterostome, presence of notochord, nerve cord and pharyngeal gill slits)

Subphylum- Cephalochordata (Solitary, notochord and nerve cord extend through the entire length of the body)

Class- Leptocardii (Many paired pharyngeal gill slits)

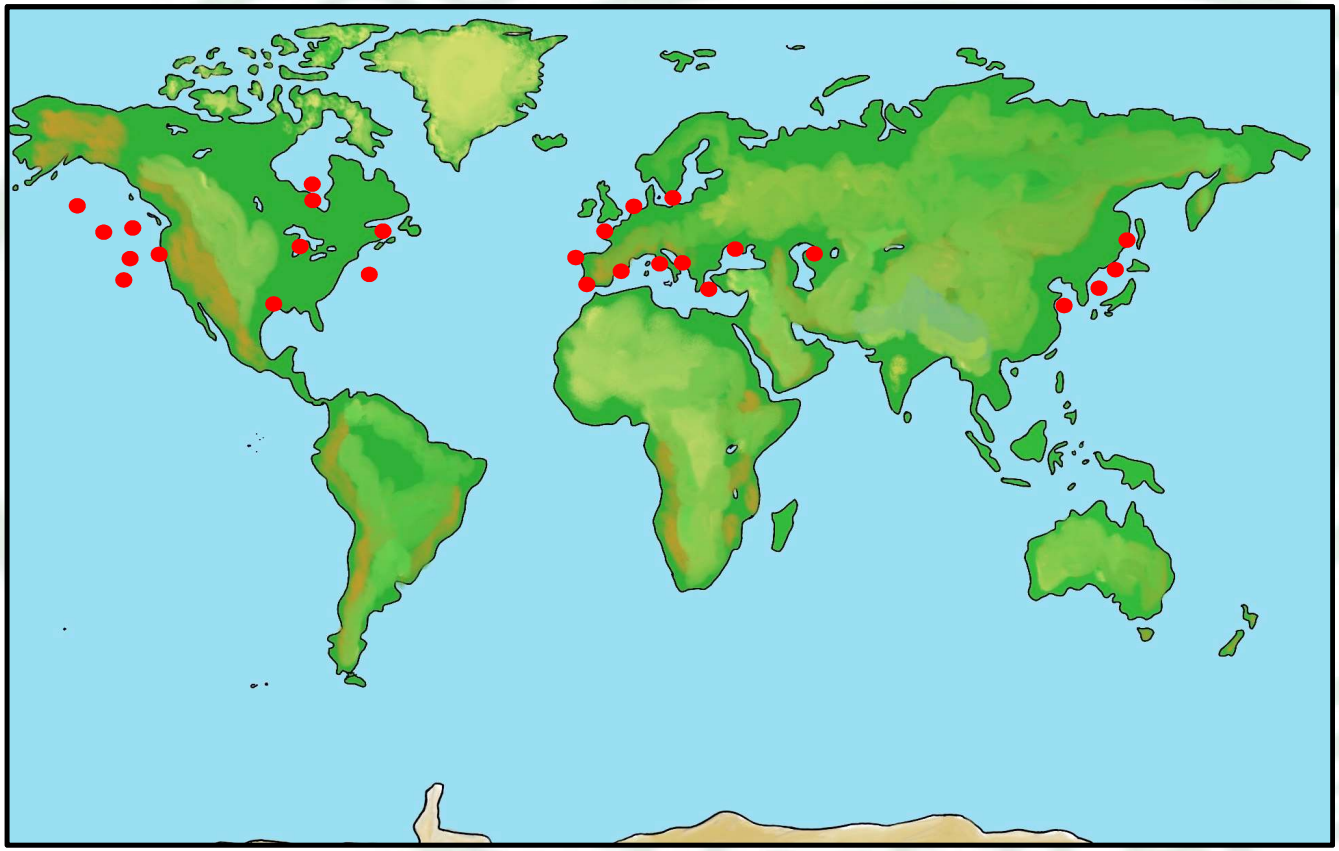
Genus- *Branchiostoma* (Lancelet or Lancet)

IDENTIFYING FEATURES:

- Fish like body with repeating myomeres.
- Laterally compressed body tapering at ends.
- Dorsal, ventral and caudal fins continuous.

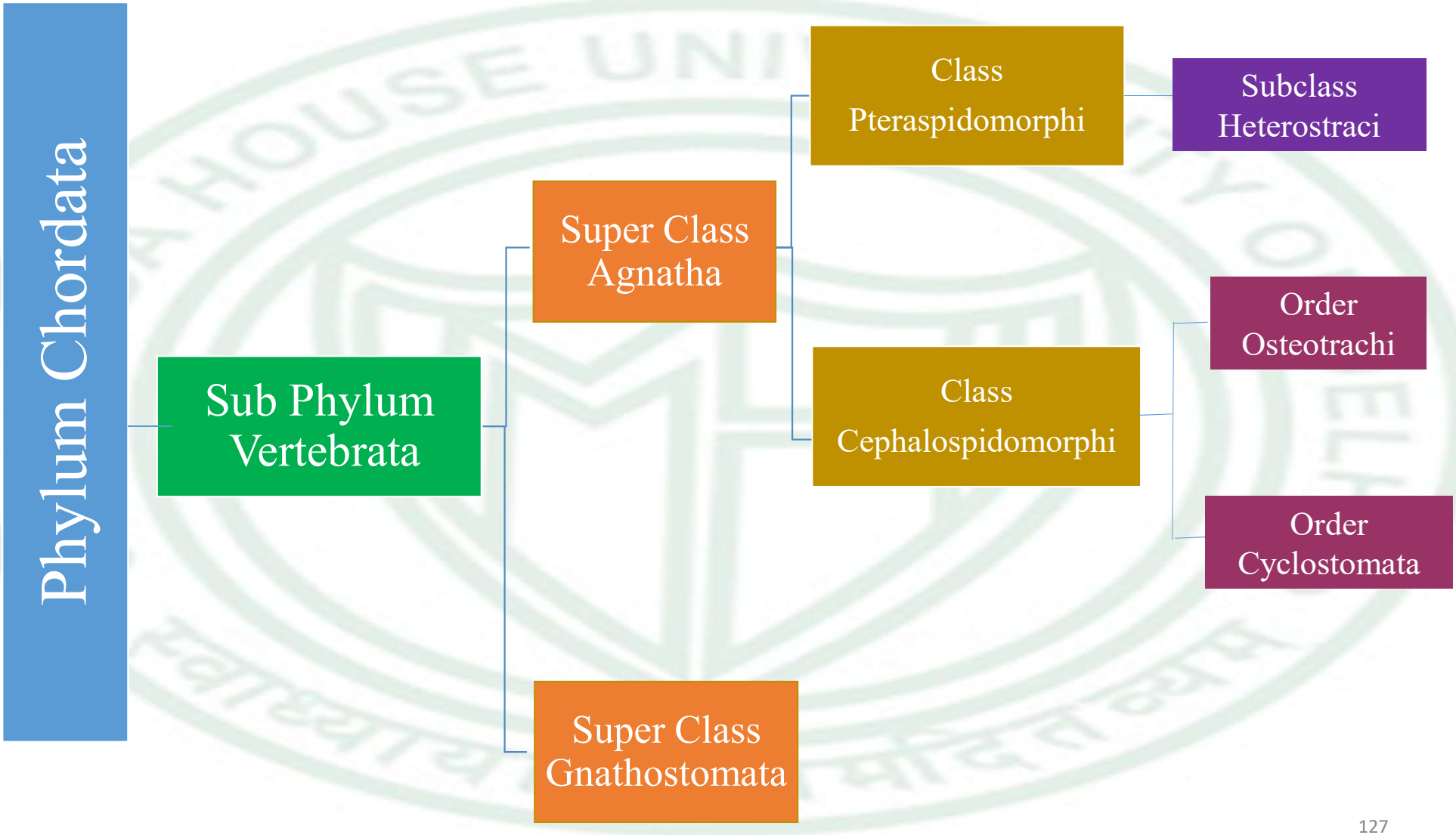
VIDEO LINK:

https://www.youtube.com/watch?v=c4r2yf9t6V0&t=254s



Geographical Distribution: Widely distributed in tropical and temperate coastal areas.

Habitat: Burrowing, shallow water animal, anterior end buried in the sand.


Phylum Chordata
Sub Phylum Vertebrata
Super Class Agnatha
Super Class Gnathostomata
Class Pteraspidomorphi
Class Cephalospidomorphi
Subclass Heterostraci
Order Osteotrachi
Order Cyclostomata

Petromyzon

CLASSIFICATION:

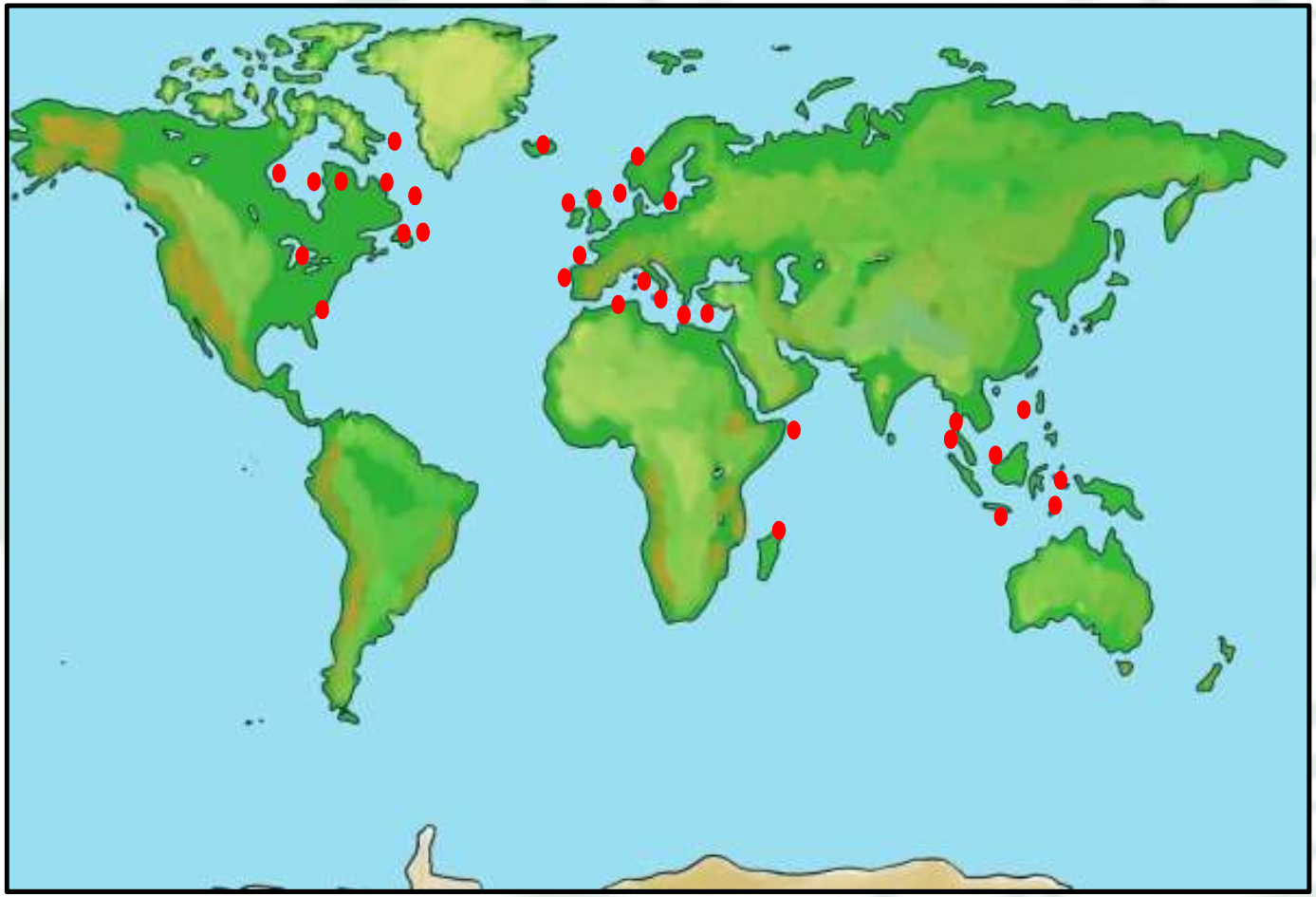
Phylum- Chordata (Deuterostome, Presence of notochord, nerve chord and pharyngeal gill slits)
Subphylum- Vertebrata (Presence of a vertebral column, notochord does not extend beyond brain, closed circulatory system)
Superclass- Agnatha (Jawless, heavy bodies, benthic)
Class- Cephalospidomorphi (head is shield shaped)
Order- Cyclostomata (Mouth replaced by oral disc with suckers)
Suborder- Petromyzontidae (dorsal fin is well developed, seven pairs of gill slits)
Genus- *Petromyzon (*Lamprey)

IDENTIFYING FEATURES:

- Body divisible into head, trunk and tail.
- Large oval mouth called sucker with horny teeth arranged in concentric rows.
- Seven pairs of external gill slits.
- Second dorsal fin is confluent with anal fin.

VIDEO LINK:

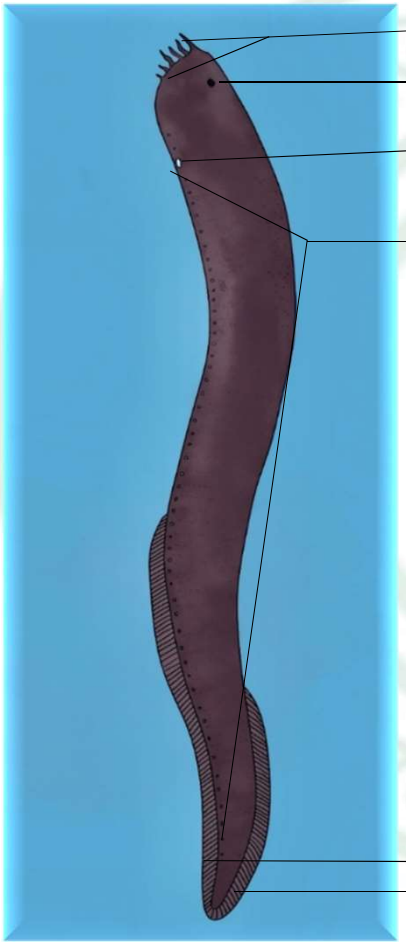
https://www.youtube.com/watch?v=LPO2VMerKuA



Geographical Distribution: Found in coastal regions, rivers and streams, lakes and ponds around Atlantic Ocean, Mediterranean and Indian Ocean

Habitat: Ectoparasite, Anadromous, attaches to the fish by its buccal funnel and secretes an anticoagulant for blood flow.

Myxine



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Phylum- Chordata (Deuterostome, Presence of notochord, nerve chord and pharyngeal gill slits)

Subphylum- Vertebrata (Presence of a vertebral column, notochord does not extend beyond brain, closed circulatory system)

Superclass- Agnatha (Jawless, heavy bodies, benthic)

Class- Cephalospidomorphi (head is shield shaped)

Order- Cyclostomata (Mouth replaced by oral disc with suckers)

Suborder- Myxinoidea (6-14 pairs external gill slits, absence of dorsal fins)

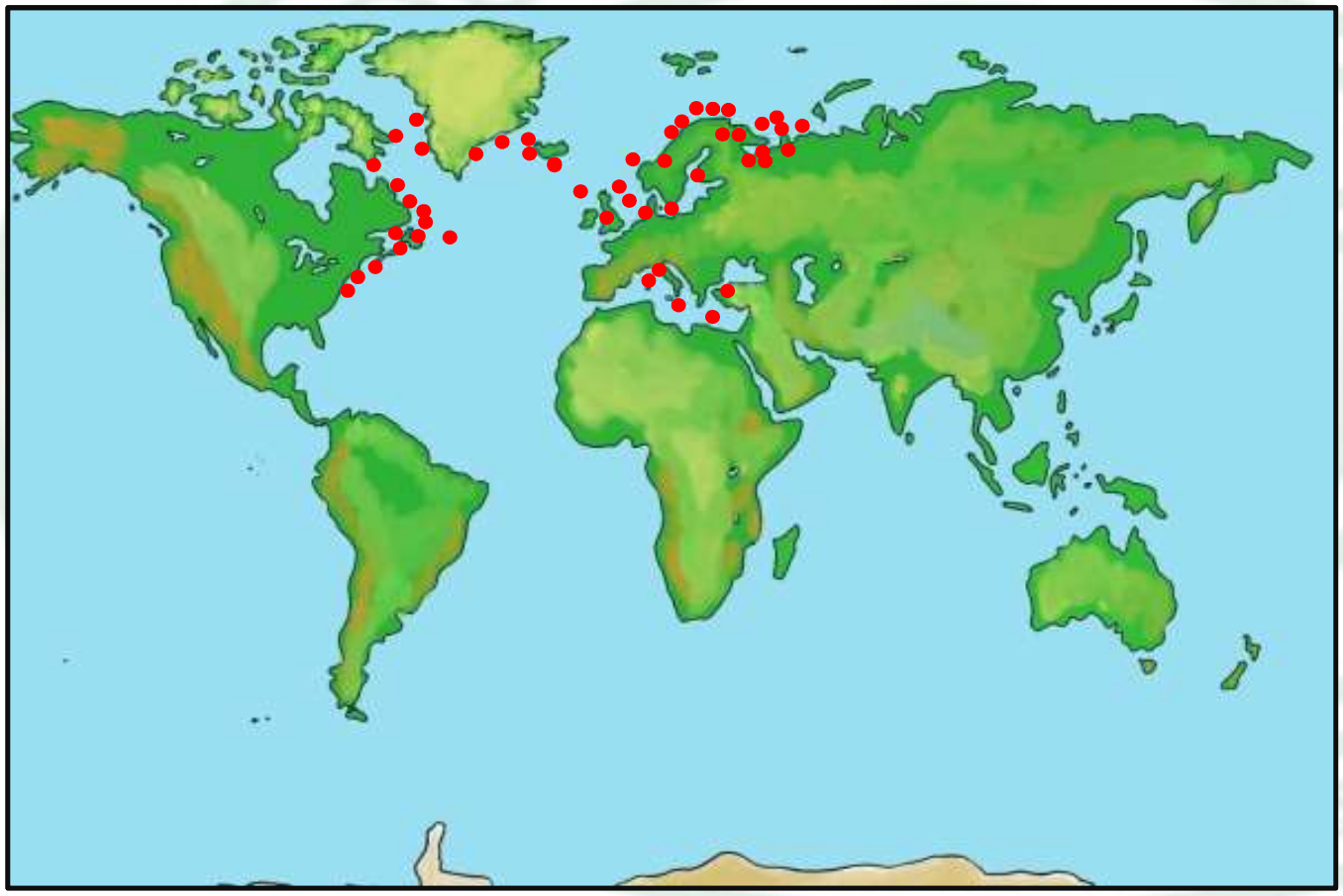
Genus- *Myxine (*Hagfish)

IDENTIFYING FEATURES:

- Eel like scaleless soft body divisible into head, trunk and tail.
- Anterior portion of head have four sensory tentacles surrounding the soft lips.
- Ventral fin and anal fin are confluent.
- Slime glands are present beneath skin releases mucus through pores.

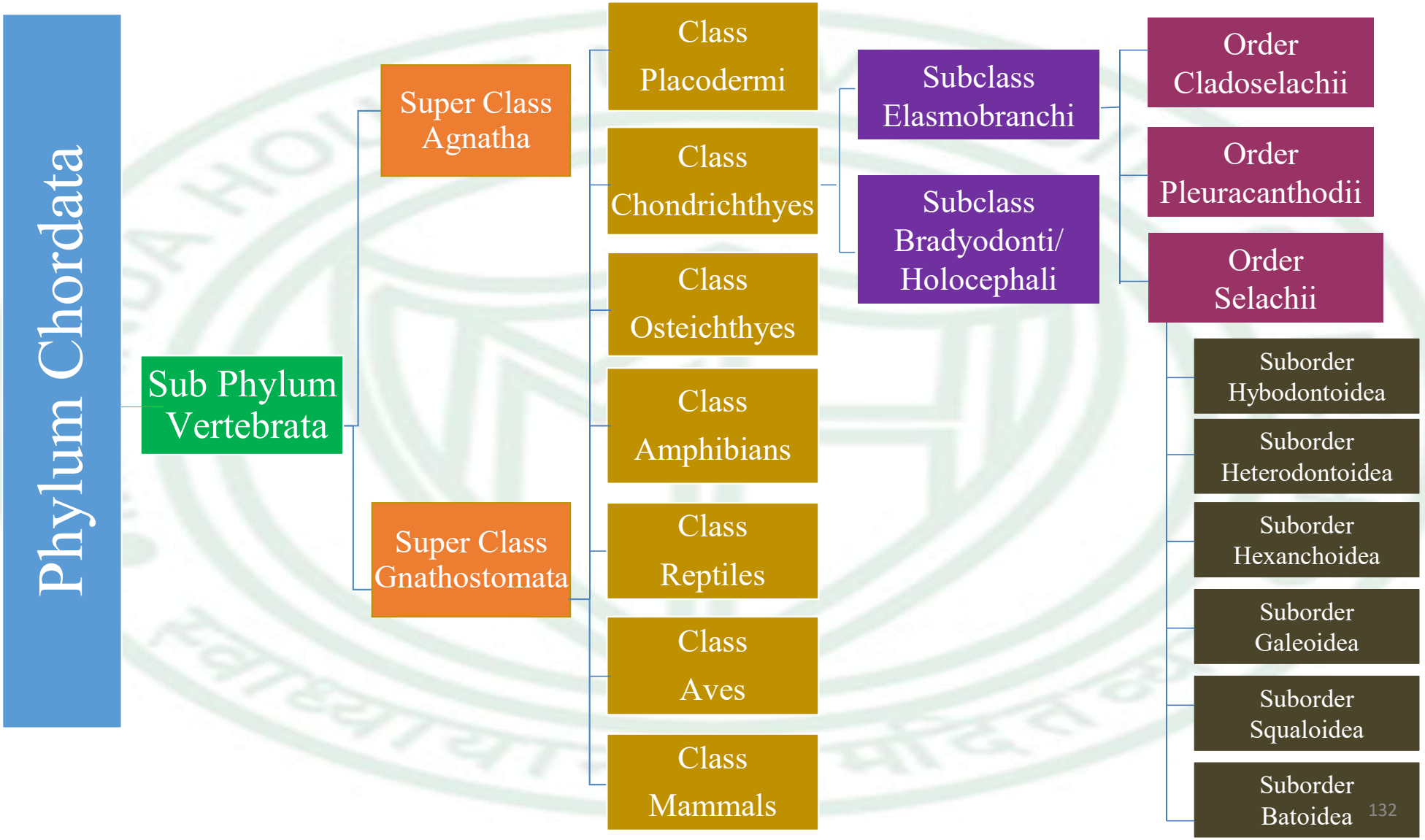
VIDEO LINK:

https://www.youtube.com/watch?v=_8FVpj0p-iU&t=40s

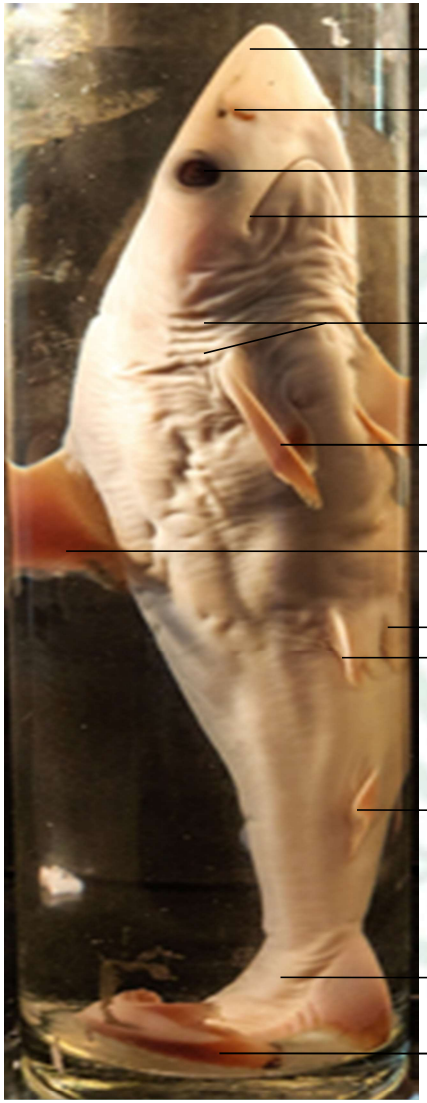


Geographical Distribution: Found in North Atlantic, Mediterranean Sea, Greenland to USA

Habitat: Nocturnal, buried in muddy bottom, parasitic generally remain attached to the gills of the fishes.


Phylum Chordata
Sub Phylum Vertebrata
Super Class Agnatha
Super Class Gnathostomata
Class Placodermi
Class Chondrichthyes
Class Osteichthyes
Class Amphibians
Class Reptiles
Class Aves
Class Mammals
Subclass Elasmobranchi
Subclass Bradyodonti/ Holocephali
Order Cladoselachii
Order Pleuracanthodii
Order Selachii
Suborder Hybodontoidea
Suborder Heterodontoidea
Suborder Hexanchoidea
Suborder Galeoidea
Suborder Squaloidea
Suborder Batoidea

Scoliodon



CLASSIFICATION:

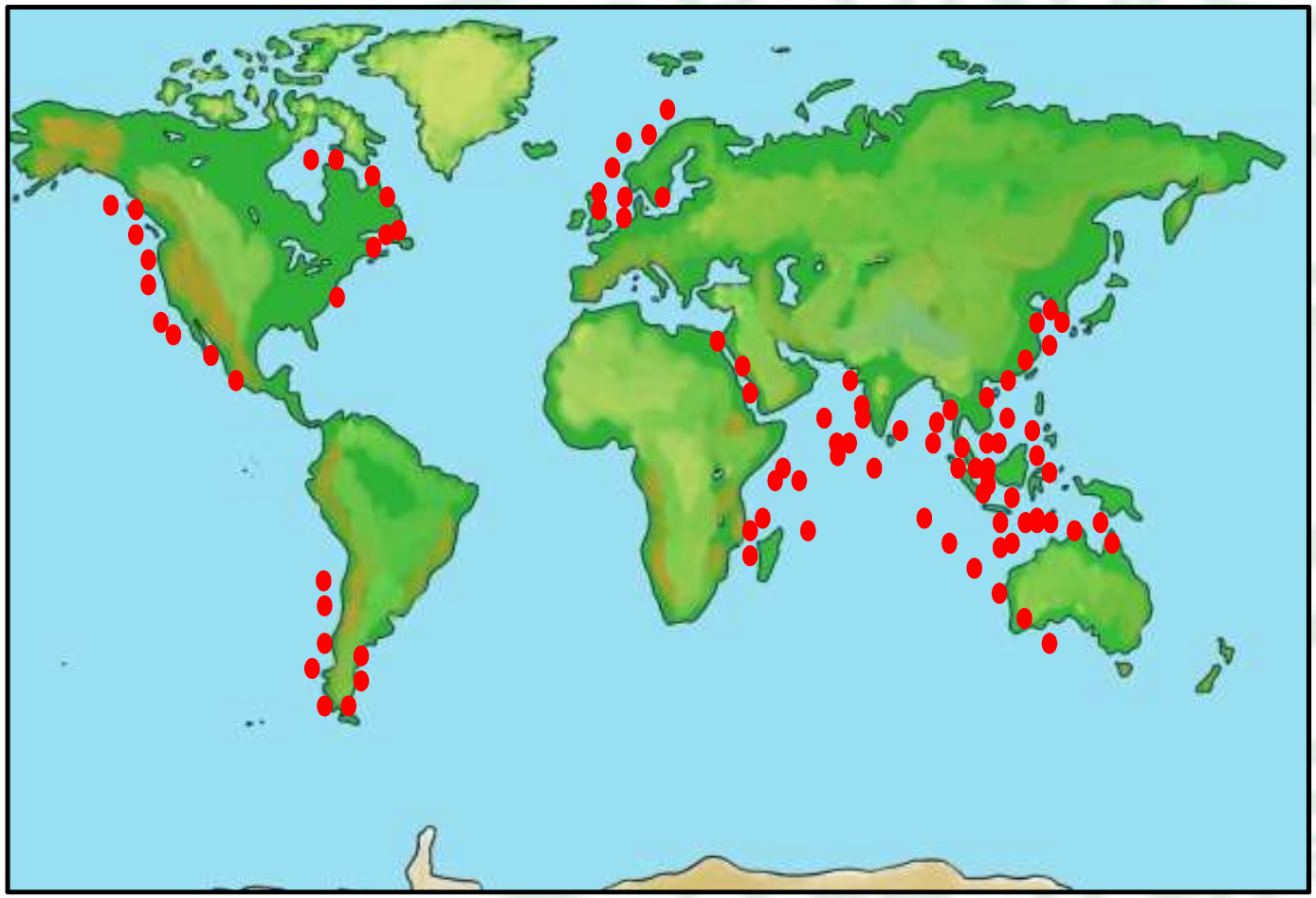
Phylum- Chordata (Deuterostome, Presence of notochord, nerve chord and pharyngeal gill slits)
Sub-phylum- Vertebrata (Notochord replaced by vertebral column)
Super class- Gnathostomata (Jaws are present)
Class- Chondrichthyes (Cartilaginous endoskeleton)
Sub class- Elasmobranchi (Gill slits 5-7 on each side)
Order- Selachi (Spiracles and cloaca present)
Sub order- Squaloidea (Lateral gill slits, small pectoral fins)
Genus- *Scoliodon* (Dog Fish)

IDENTIFYING FEATURES:

- Body is spindle shaped divisible into head, trunk and tail.
- Wedge shaped snout and dorso-ventrally flattened head with pair of eyes and nostrils.
- Mouth is ventrally placed.
- Trunk consists of 5 pairs of gill slits, pair of pectoral fin and pelvic fin, two dorsal fin and pair of clasper.
- Tail is heterocercal.

VIDEO LINK:

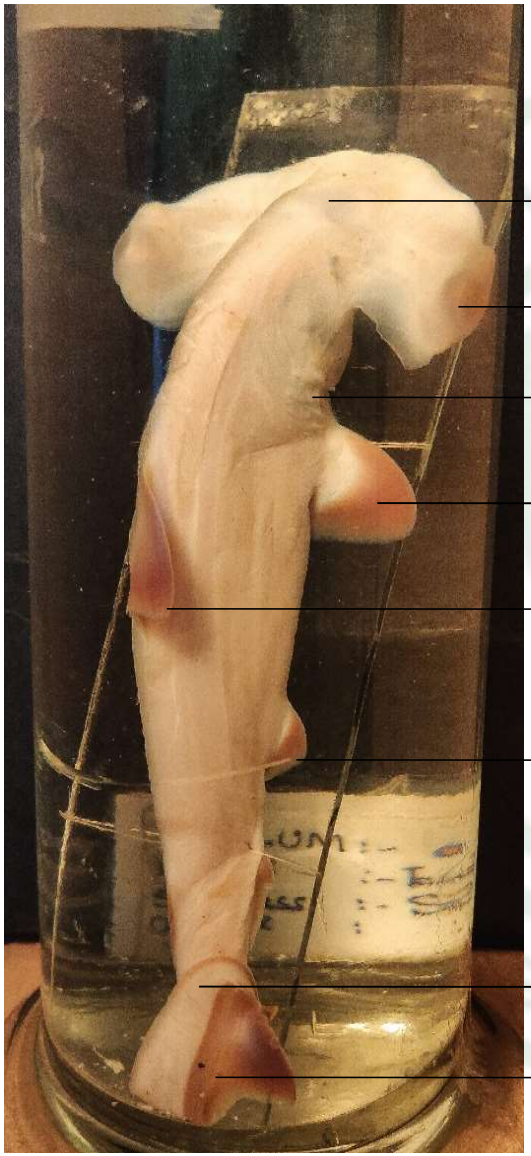
https://www.youtube.com/watch?v=8L84QB1K9aQ



Geographical Distribution: Oceans of East and North America, Africa, China, Japan and Australia.

Habitat: Marine, predacious and voracious feeders.

Sphyrna



CLASSIFICATION:

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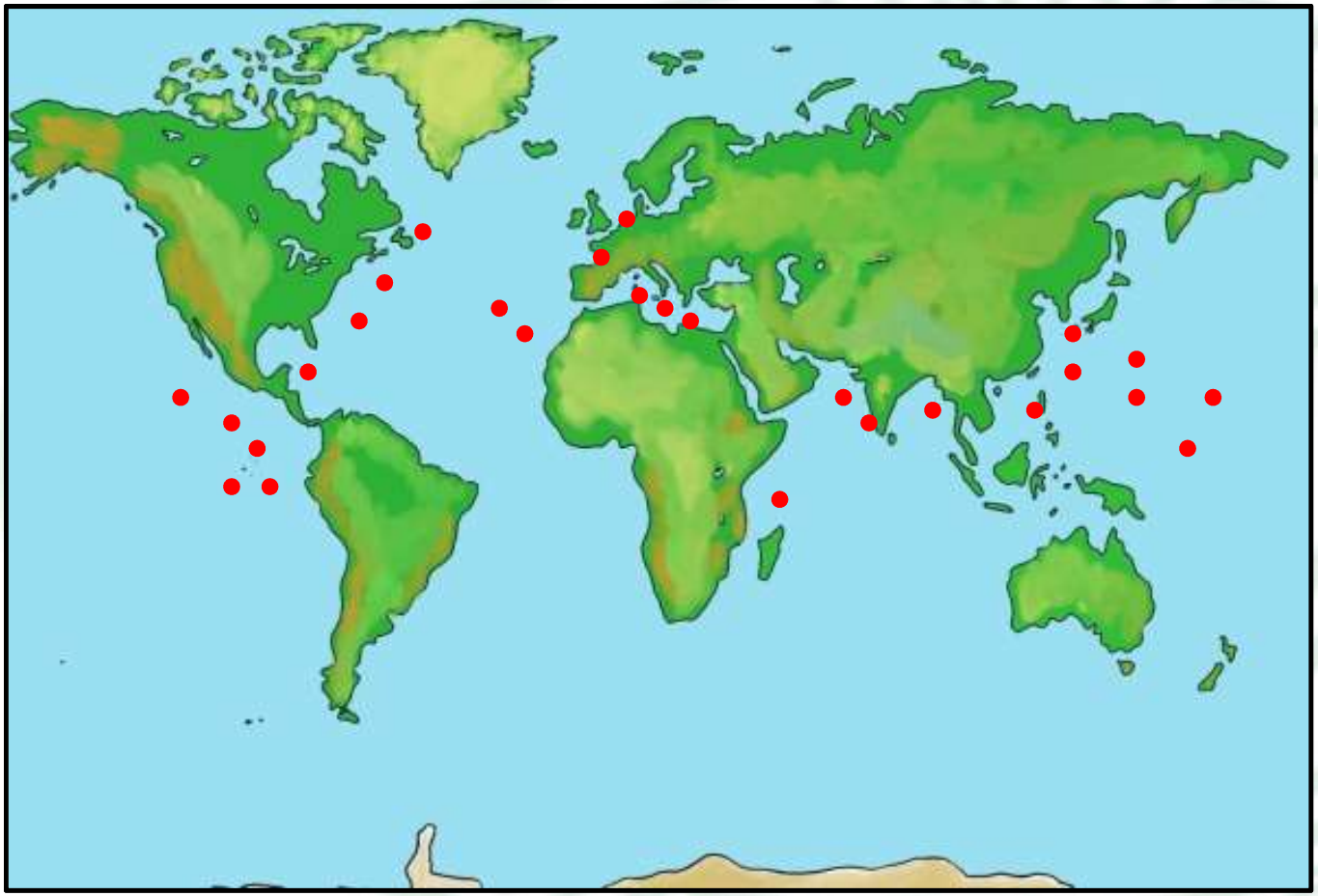
Sub-phylum- Vertebrata (Notochord replaced by vertebral column)
Super class- Gnathostomata (Jaws are present)
Class- Chondrichthyes (Cartilaginous endoskeleton)
Sub class-Elasmobranchi (Gill slits 5-7 on each side)
Order- Selachi (Spiracles and cloaca present)
Sub order- Squaloidea (Lateral gill slits, small pectoral fins)
Genus- *Sphyrna* (hammer-headed shark)

IDENTIFYING FEATURES:

- The head is extended forward into two lateral lobes, resembling a hammer.
- The eyes lie at the distal ends of these extended lobes.
- Hetero-cercal tail present.
- Pair of pectoral fin and pelvic fin and two dorsal fins present.

VIDEO LINK:

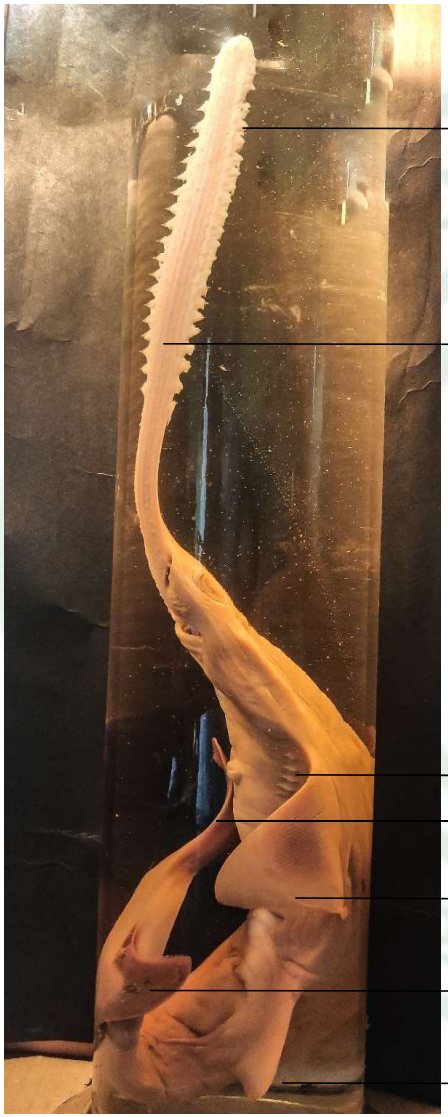
https://www.youtube.com/watch?v=IFq_AmvHRFE



Geographical Distribution: Tropical and sub tropical sea water and Pacific oceans.

Habitat: Marine life at deep sea level, Voracious feeder.

Pristis



CLASSIFICATION:

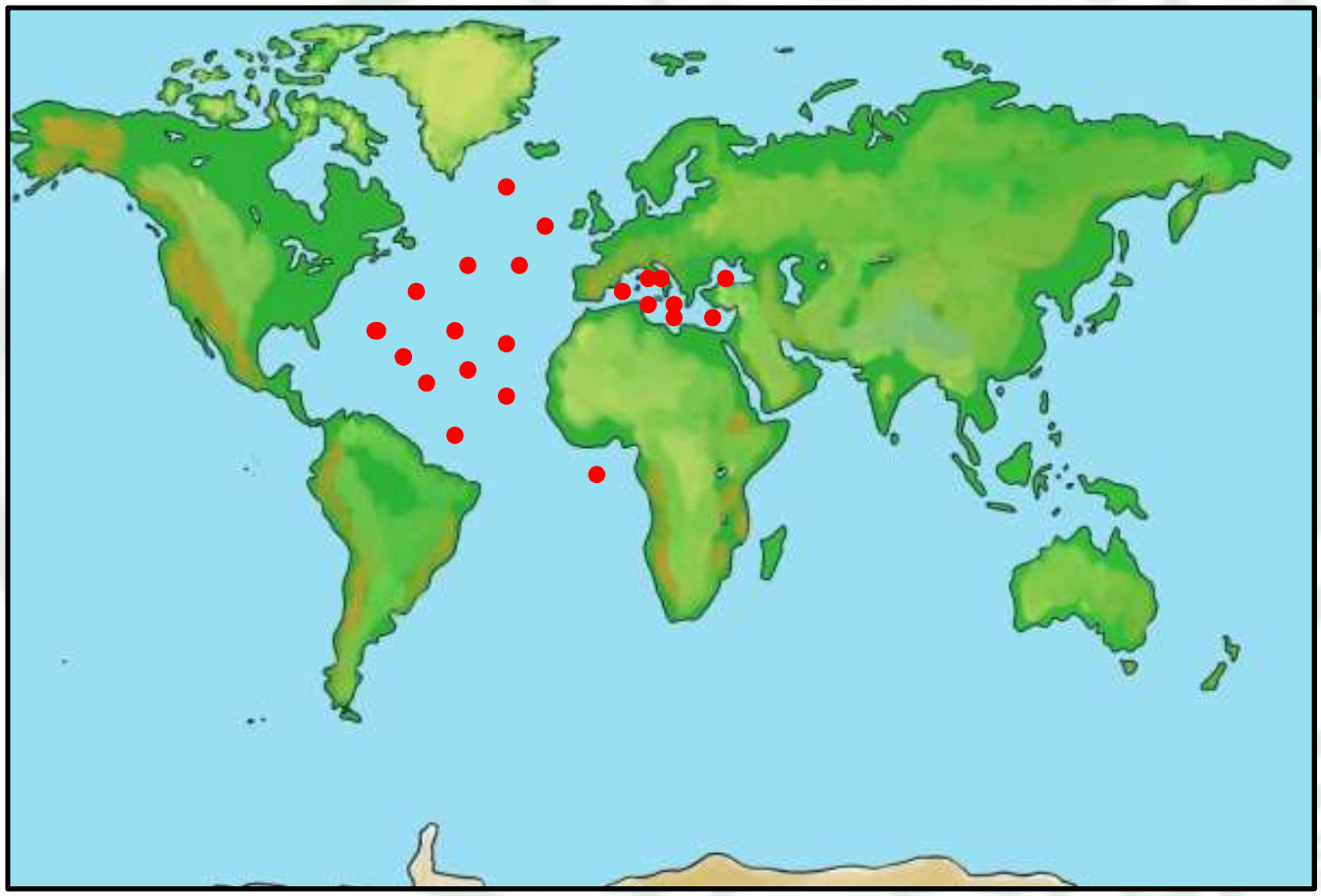
Phylum- Chordata (Deuterostome, Presence of notochord, nerve chord and pharyngeal gill slits)
Sub-phylum- Vertebrata (Notochord replaced by vertebral column)
Super class- Gnathostomata (Jaws are present)
Class- Chondrichthyes (Cartilaginous endoskeleton)
Sub class- Elasmobranchi (Gill slits 5-7 on each side)
Order- Selachi (Spiracles and cloaca present)
Sub-order- Batoidea (Enlarged pectoral fins fused to head)
Genus- *Pristis* (Saw-fish)

IDENTIFYING FEATURES:

- Head is extended into a long pointed rostrum.
- Lateral margins of rostrum have a series of strong tooth-like denticles which appear like a saw. Spiracles and eyes are present on the dorsal surface.
- Paired pectoral and pelvic fins are present.
- First dorsal fin opposite to pelvic fin and second dorsal fin is called adipose fin. Heterocercal tail is present.

VIDEO LINK:

https://www.youtube.com/watch?v=_-JWZTnnbqY
https://www.youtube.com/watch?v=2unMoI_y2ZY



<u>Geographical Distribution</u>: Mediterranean and Atlantic oceans.

<u>Habitat</u>: Warm marine water and predacious.

Torpedo

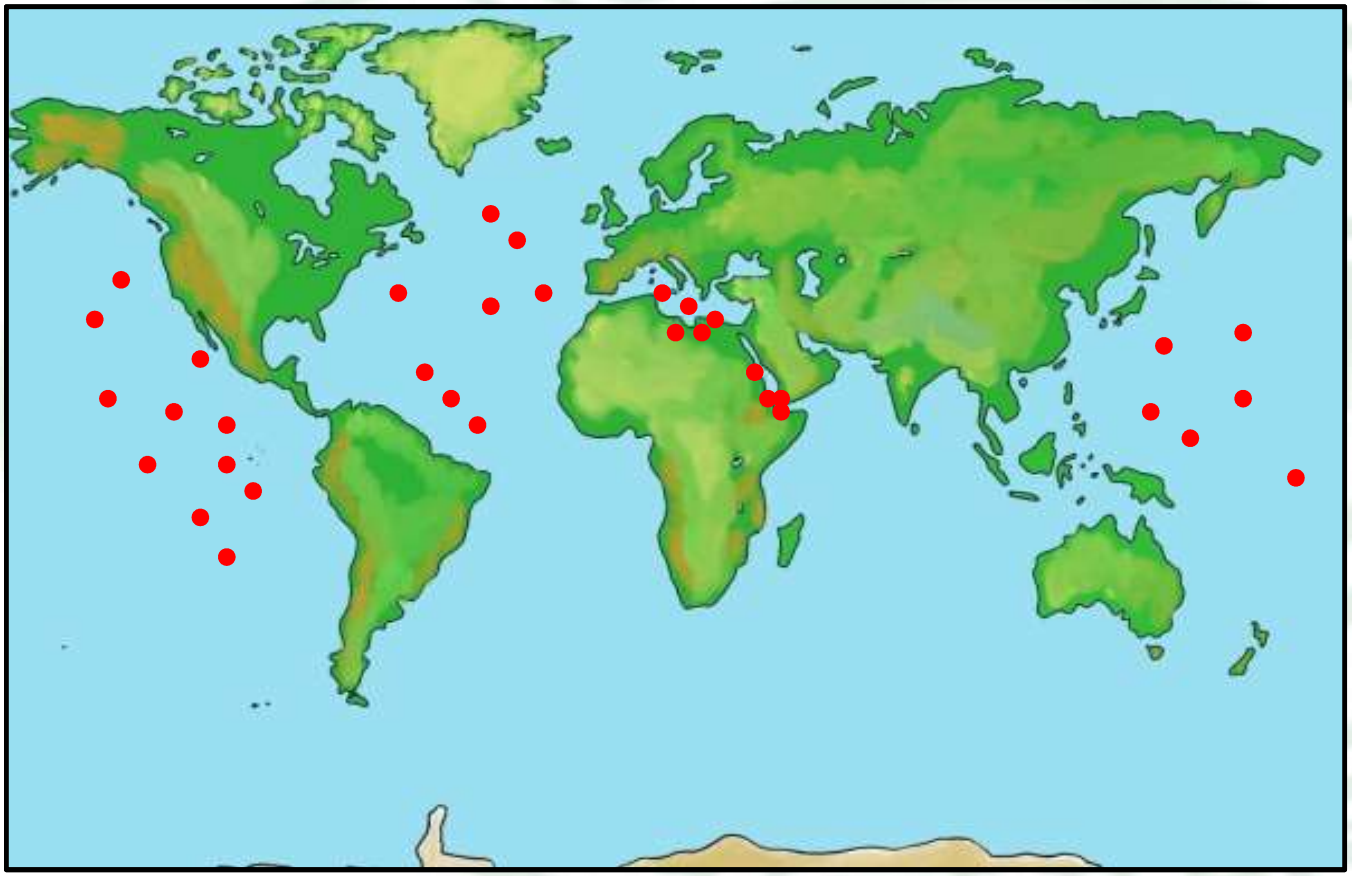
CLASSIFICATION:

Phylum- Chordata (Deuterostome, Presence of notochord, nerve chord and pharyngeal gill slits)
Sub-phylum- Vertebrata (Notochord replaced by vertebral column)
Super class- Gnathostomata (Jaws are present)
Class- Chondrichthyes (Cartilaginous endoskeleton)
Sub class- Elasmobranchi (Gill slits 5-7 on each side)
Order- Selachi (Spiracles and cloaca present)
Sub-order- Batoidea (Enlarged pectoral fins fused to head)
Genus- *Torpedo* (electric ray)

IDENTIFYING FEATURE:

- Dorso-ventrally flattened body, disc-shaped, head broad and rounded with eyes and spiracles on the dorsal side.
- A pair of large electric organs are present on either side in between the pectoral fins and the head.
- Pectoral fins are large and extend along the lateral margins of head and trunk.
- Tail is thick with pair of pelvic fins, two dorsal and caudal fin.

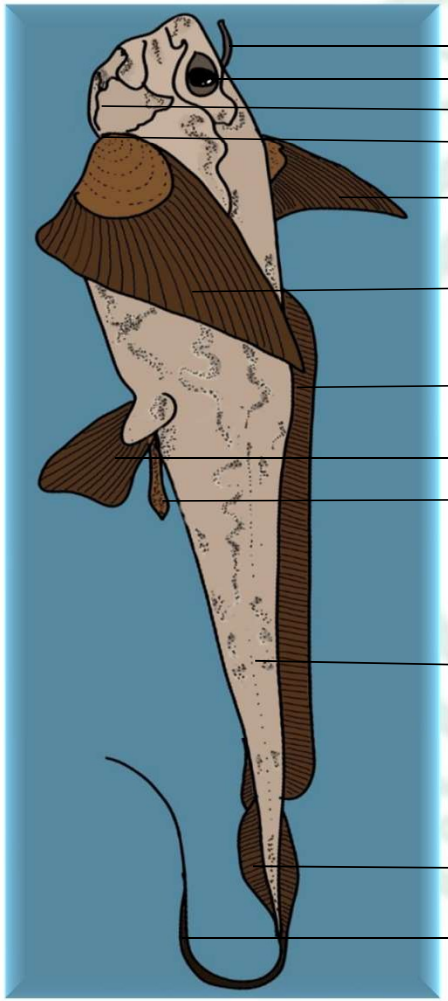
VIDEO LINK:
https://www.youtube.com/watch?v=4grNz5wLZg8



Geographical Distribution: Marine, Oceans of Pacific, Atlantic regions, also Mediterranean and Red sea

Habitat: Carnivorous, found on flat, sandy or muddy bottom.

Chimaera



CLASSIFICATION:

Phylum- Chordata (Deuterostome, Presence of notochord, nerve chord and pharyngeal gill slits)

Sub-phylum- Vertebrata (Notochord replaced by vertebral column)

Super class- Gnathostomata (Jaws are present)

Class- Chondrichthyes (Cartilaginous endoskeleton)

Subclass- Bradyodontii (Upper jaw fused with the brain case, a flap of skin covering the gill-slits)

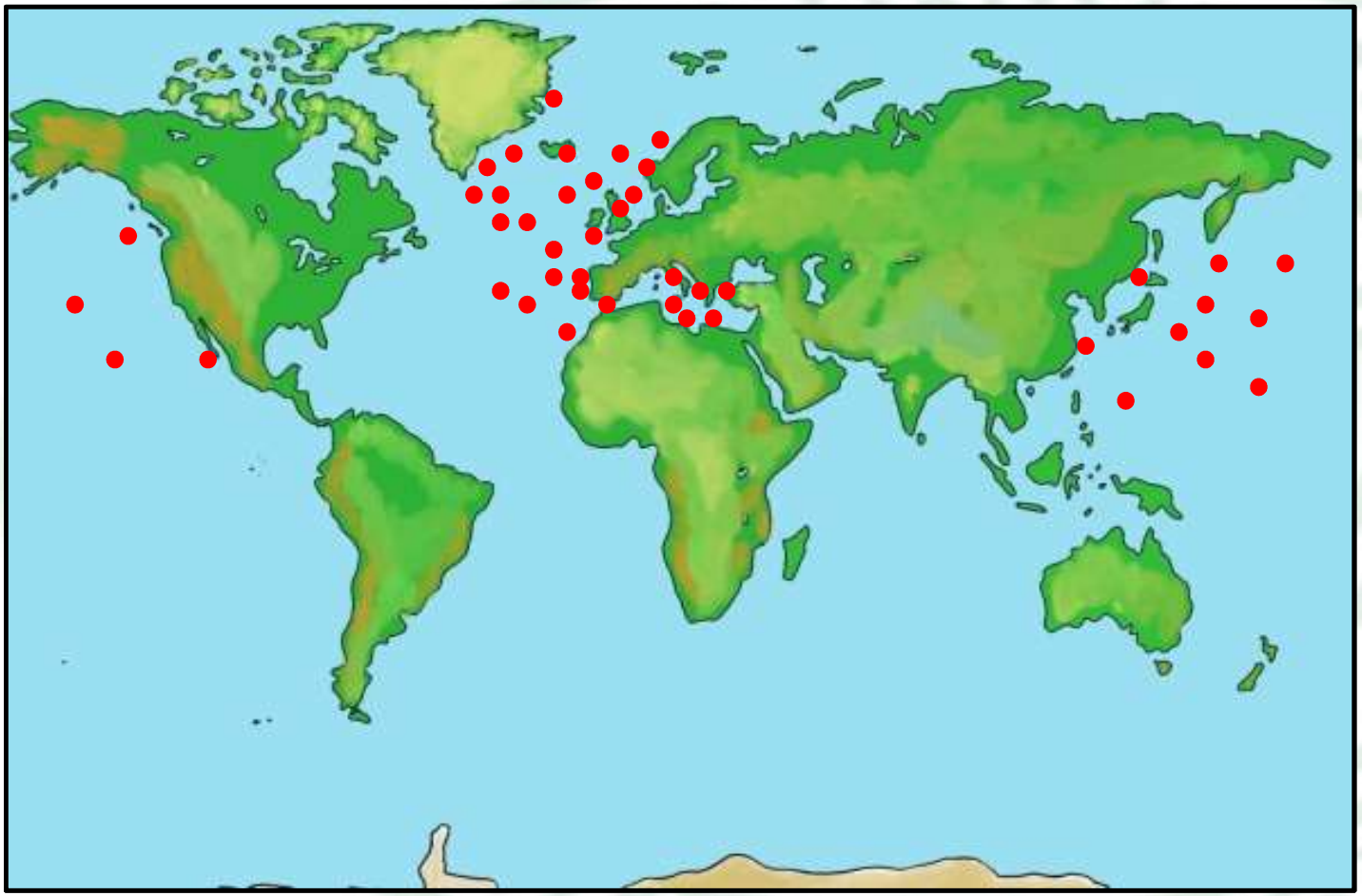
Genus- *Chimaera* (Rat fish, ghost fish)

IDENTIFYING FEATURES:

- Elongated body, appears shark like.
- Presence of flap covering gill-slits and a long tail.
- Pair of pectoral fin and pelvic fin, two dorsal fins and one small ventral fin is present.
- First dorsal fin is supported by a sharp spine making it always erectile and second dorsal fin is non erectile elongated one covering the most of the posterior side of the body.
- Males posses a pair anterior and posterior claspers adjacent to pelvic fins and single frontal clasper on the head.
- Tail fin is diphyceral, whip like.

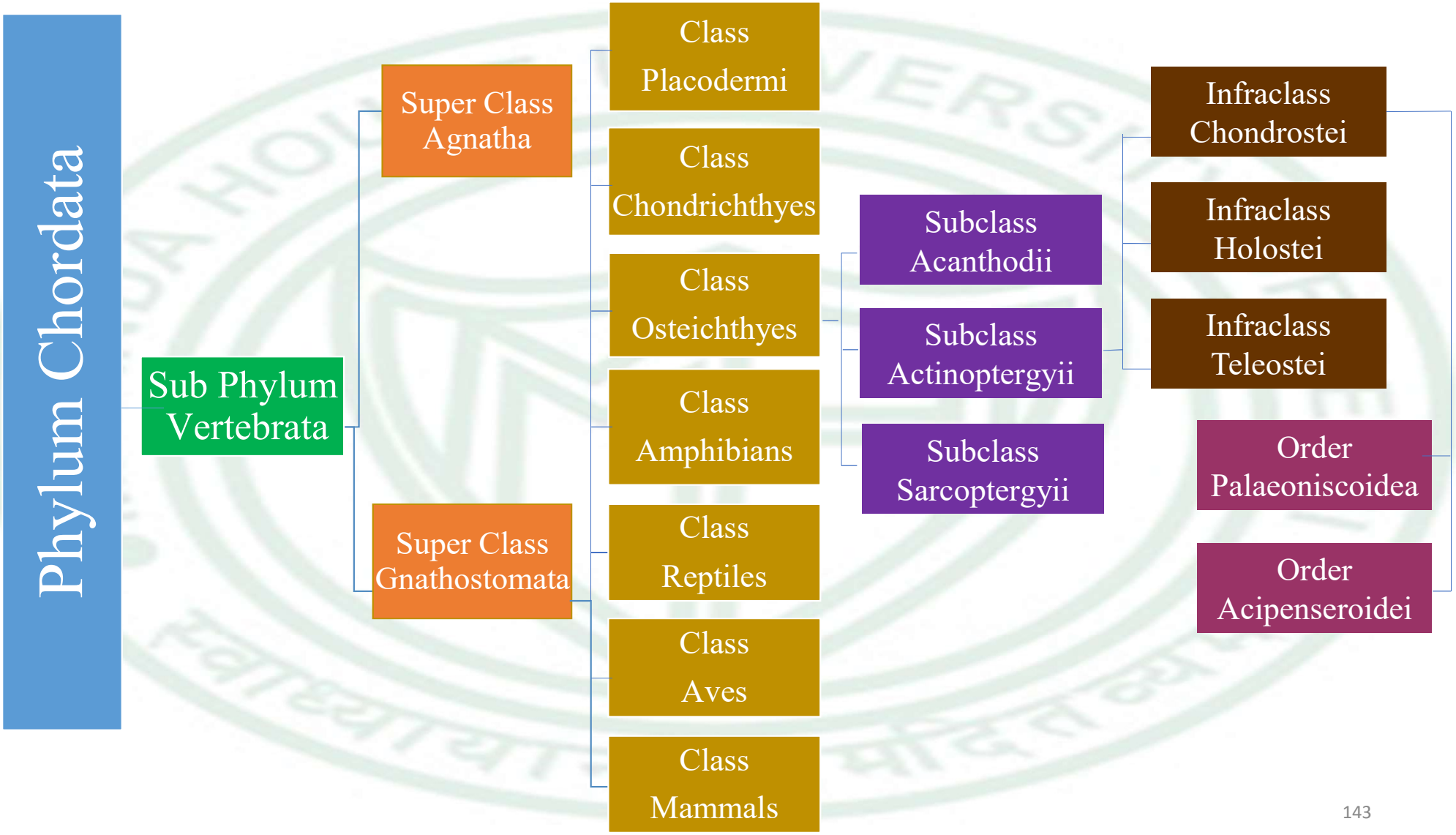
VIDEO LINK:

https://www.youtube.com/watch?v=asQhHT_09HM



Geographical Distribution: Cosmopolitan, rivers, estuaries and coastal waters to 2500 meters or more oceanic depth.

Habitat: Delicate and weak swimmer fish, feeds on small fishes and invertebrates.


Phylum Chordata
Sub Phylum Vertebrata
Super Class Agnatha
Super Class Gnathostomata
Class Placodermi
Class Chondrichthyes
Class Osteichthyes
Class Amphibians
Class Reptiles
Class Aves
Class Mammals
Subclass Acanthodii
Subclass Actinoptergyii
Subclass Sarcoptergyii
Infraclass Chondrostei
Infraclass Holostei
Infraclass Teleostei
Order Palaeoniscoidea
Order Acipenseroidei

Labeo

CLASSIFICATION:

Phylum –Chordata (Deuterostome, Presence of notochord, nerve chord and pharyngeal gill slits)

Sub-phylum- Vertebrata (Notochord replaced by vertebral column)

Super class- Gnathostomata (Jaws are present)

Class- Osteichthyes (Bony skeleton, operculum present , 4 pair gills)

Subclass- Actinopterygii (Rayed fins, large mouth opening, sub terminal mouth opening)

Infraclass-Teleostei (true bony fishes, homocercal caudal fin, swim bladder present, spiracle is lost)

Super order- Ostariophysi (Toothless mouth, head is scaleless, have a modified Weberian apparatus)

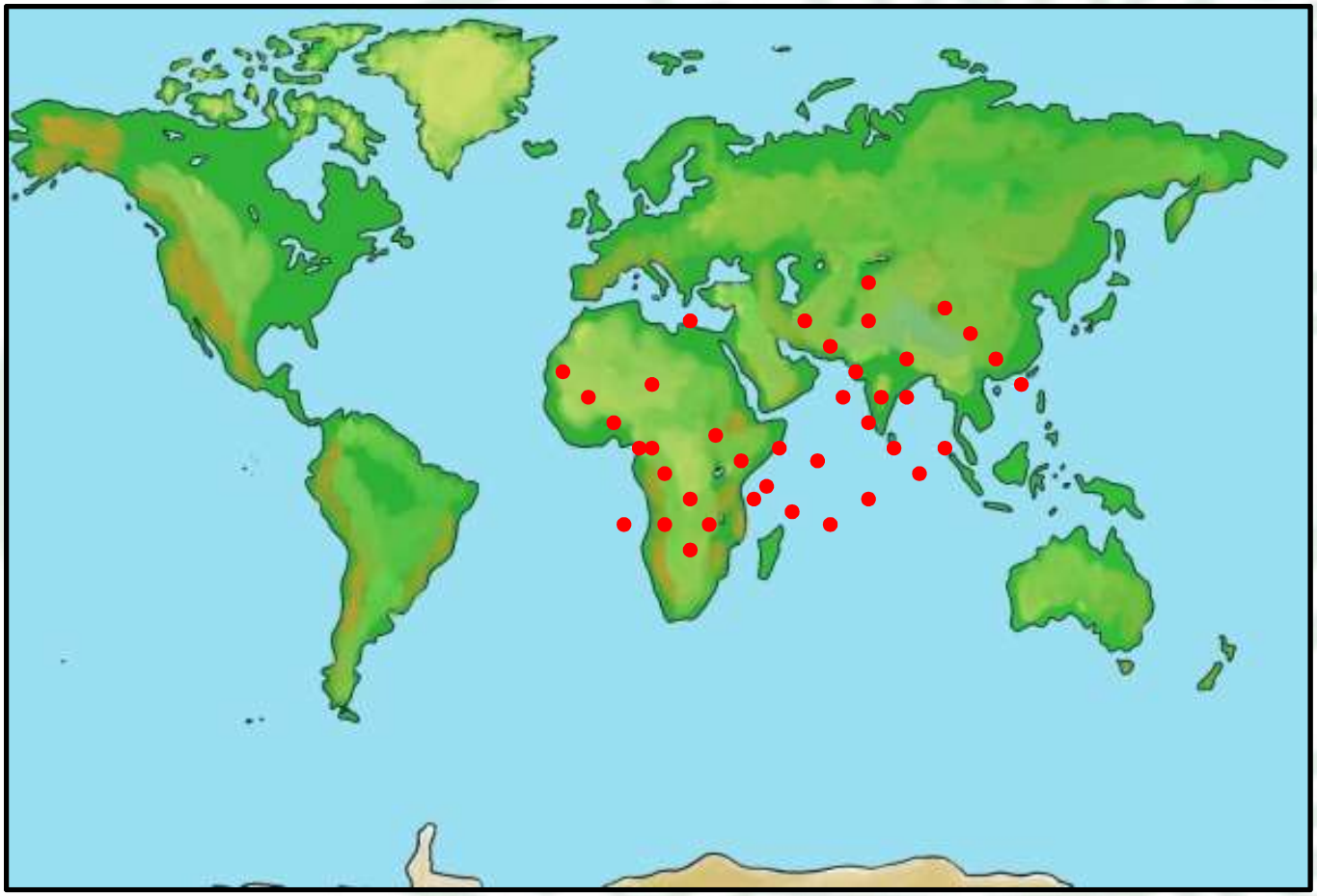
Genus- *Labeo* (Carp, Rohu)

IDENTIFYING FEATURES:

- Compressed, fusiform body covered with large overlapping cycloid scales and divisible into head, trunk and tail.
- Head bears sucking mouth with thick lips, pair eyes, nostrils and blunt snout.
- Two to four barbles are present on upper lip.
- There is large operculum covering the gill apertures.
- Pair of pectoral fin along with dorsal fin, ventral fin and anal fin present on trunk.
- Homocercal tail with forked caudal fin.

VIDEO LINK:

https://www.youtube.com/watch?v=y573RAnDaOI



Geographical Distribution: Found in freshwater in the tropics and subtropics of Asia and Africa.

Habitat: Bottom dwellers, feed on algae and small animals.

Heteropneustes

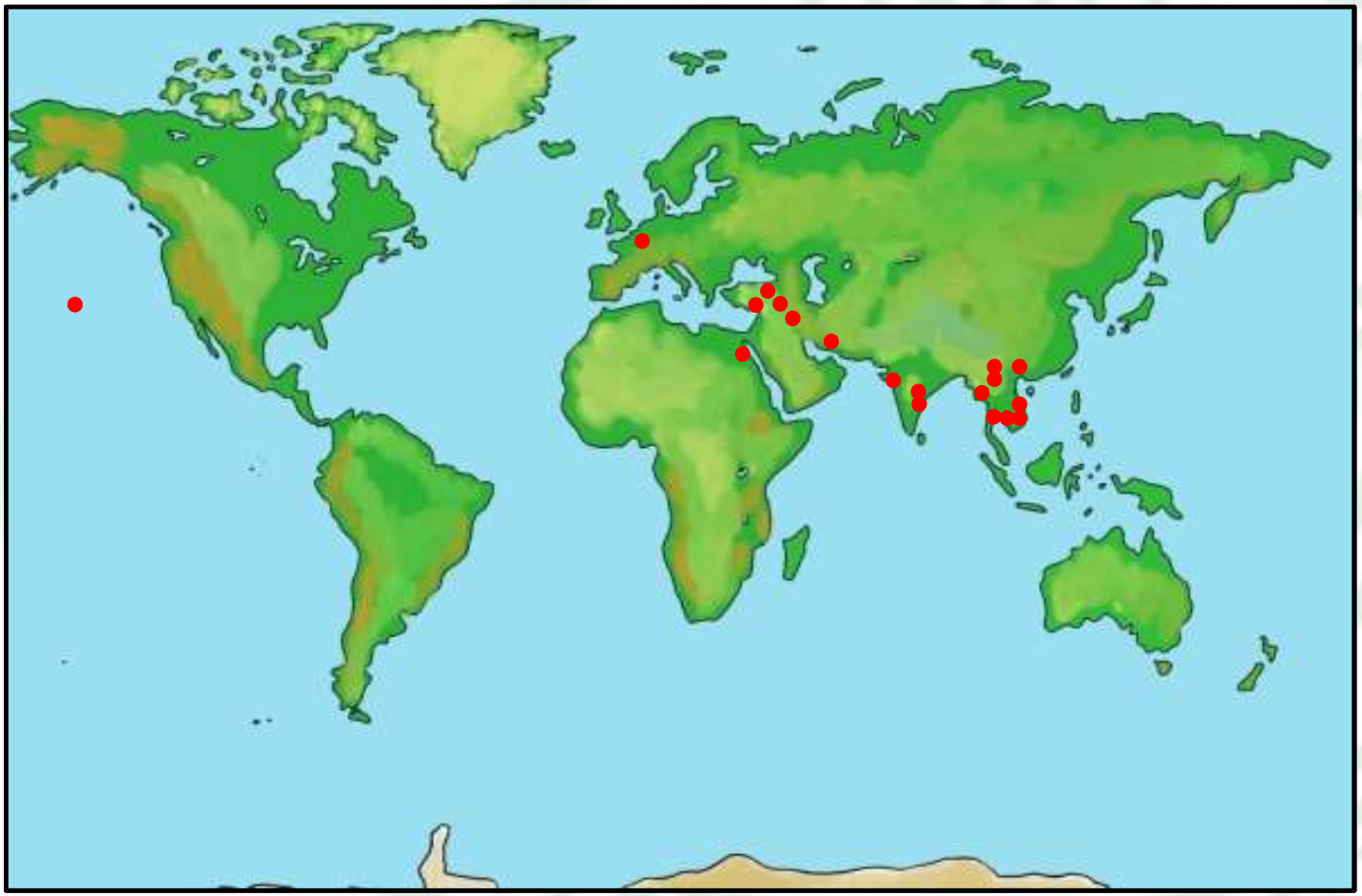
CLASSIFICATION:

Phylum –Chordata (Deuterostome, Presence of notochord, nerve chord and pharyngeal gill slits)
Sub-phylum- Vertebrata (Notochord replaced by vertebral column)
Super class- Gnathostomata (Jaws are present)
Class- Osteichthyes (Bony skeleton, operculum present , 4 pair gills)
Subclass- Actinopterygii (Rayed fins, large mouth opening, sub terminal mouth opening)
Infraclass-Teleostei (true bony fishes, homocercal caudal fin, swim bladder present, spiracle is lost)
Super order- Ostariophysi (Toothless mouth, head is scale-less, have a modified Weberian apparatus)
Genus –*Heteropneustes* (stinging catfish)

IDENTIFYING FEATURES:

- Elongated and compressed body, divisible into head, trunk and tail.
- Flattened head with eyes and long prominent four pairs of barbels on snout.
- Skin without scales, short dorsal fin without spines, pair of pectoral and pelvic fins are present.
- Anal fin is elongated, reaches up to the rounded caudal fin separated from it by a notch.

VIDEO LINK:
https://www.youtube.com/watch?v=rFQGqjHG78Q



Geographical Distribution: Found in rivers of Asian countries including India, Pakistan, Bangladesh, Nepal, Thailand and Myanmar.

Habitat: Omnivorous lives mainly in marshes, ponds, swamps and ditches, sometimes occur in muddy rivers.

Mystus

CLASSIFICATION:

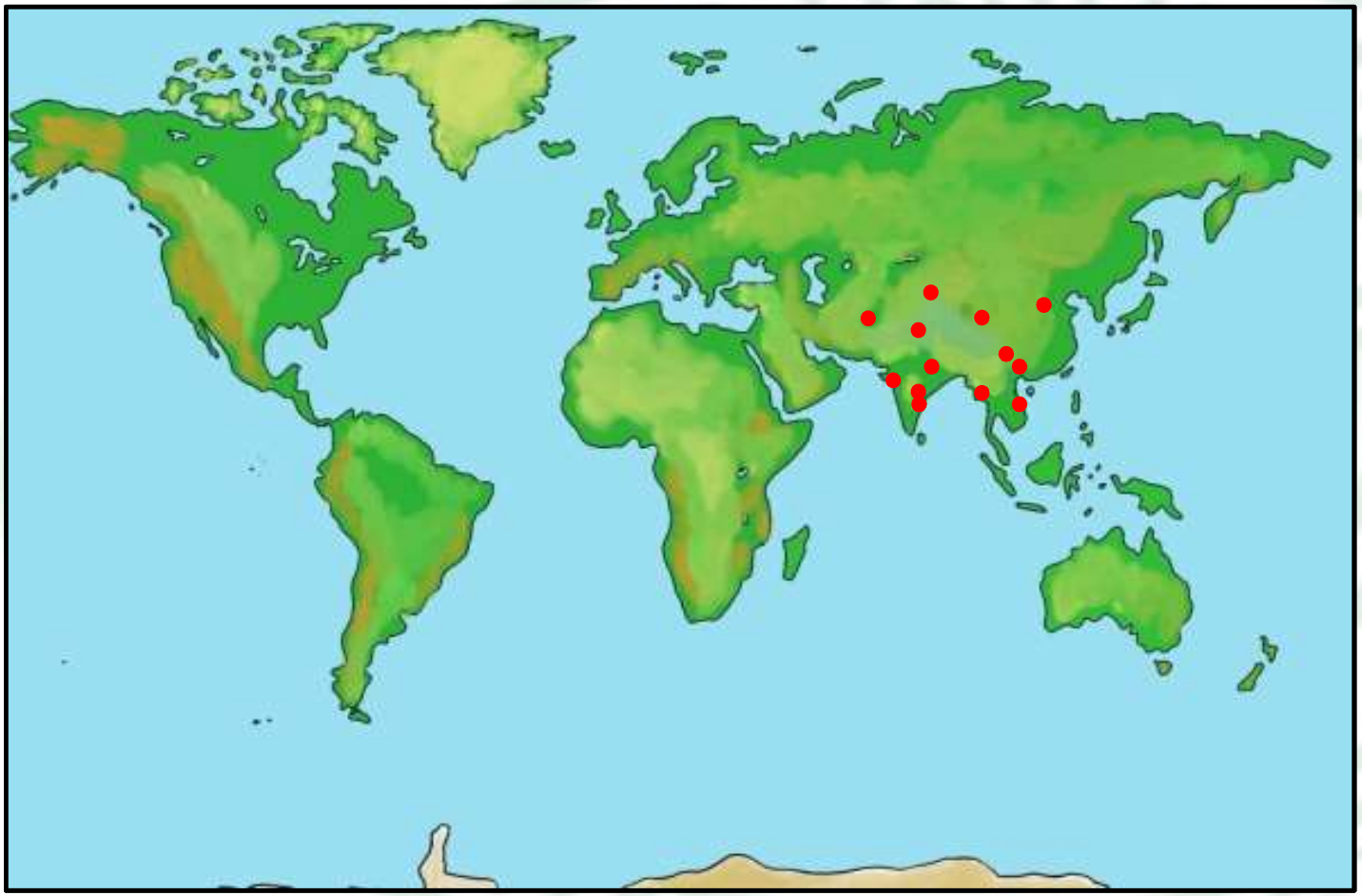
Phylum –Chordata (Deuterostome, Presence of notochord, nerve chord and pharyngeal gill slits)
Sub-phylum- Vertebrata (Notochord replaced by vertebral column)
Super class- Gnathostomata (Jaws are present)
Class- Osteichthyes (Bony skeleton, operculum present , 4 pair gills)
Subclass- Actinopterygii (Rayed fins, large mouth opening, sub terminal mouth opening)
Infraclass-Teleostei (true bony fishes, homocercal caudal fin, swim bladder present, spiracle is lost)
Super order- Ostariophysi (Toothless mouth, head is scale-less, have a modified Weberian apparatus)
Genus- *Mystus* (Tengra)

IDENTIFYING FEATURES:

- Body divisible into head, trunk and tail.
- Head constitutes terminal mouth, spatulate snout, pair of eyes and four pair of barbles.
- Prominent long snout with elongated body.

VIDEO LINK:

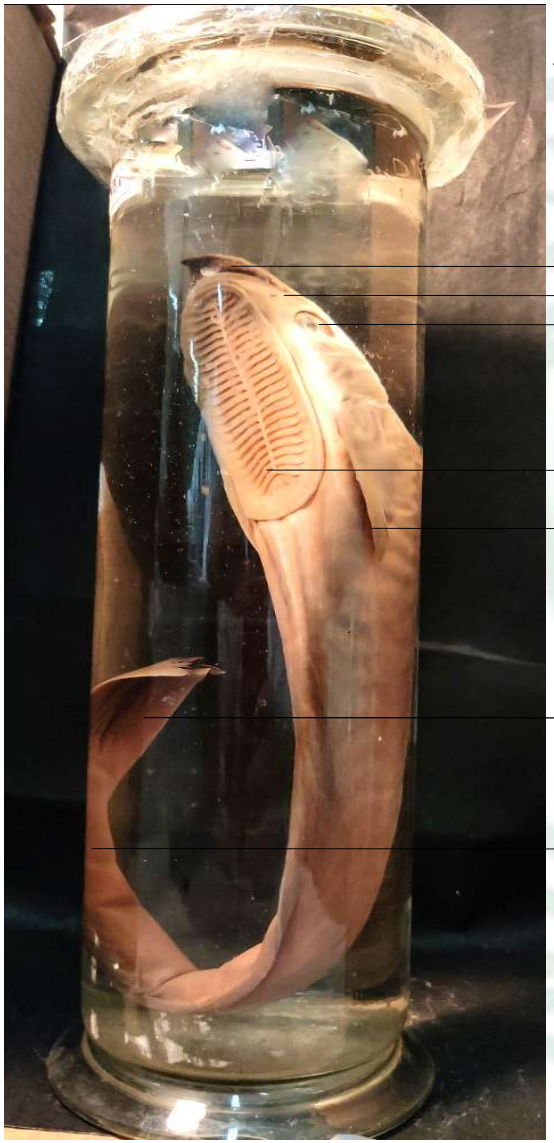
- https://www.youtube.com/watch?v=z8M5qccA7UM
- https://stock.adobe.com/in/search?k=mystus&asset_id=210214800



Geographical Distribution: Widely distributed in rivers of Asian countries

Habitat: Small indigenous freshwater fish, can survive in adverse environmental conditions.

Echeneis



CLASSIFICATION

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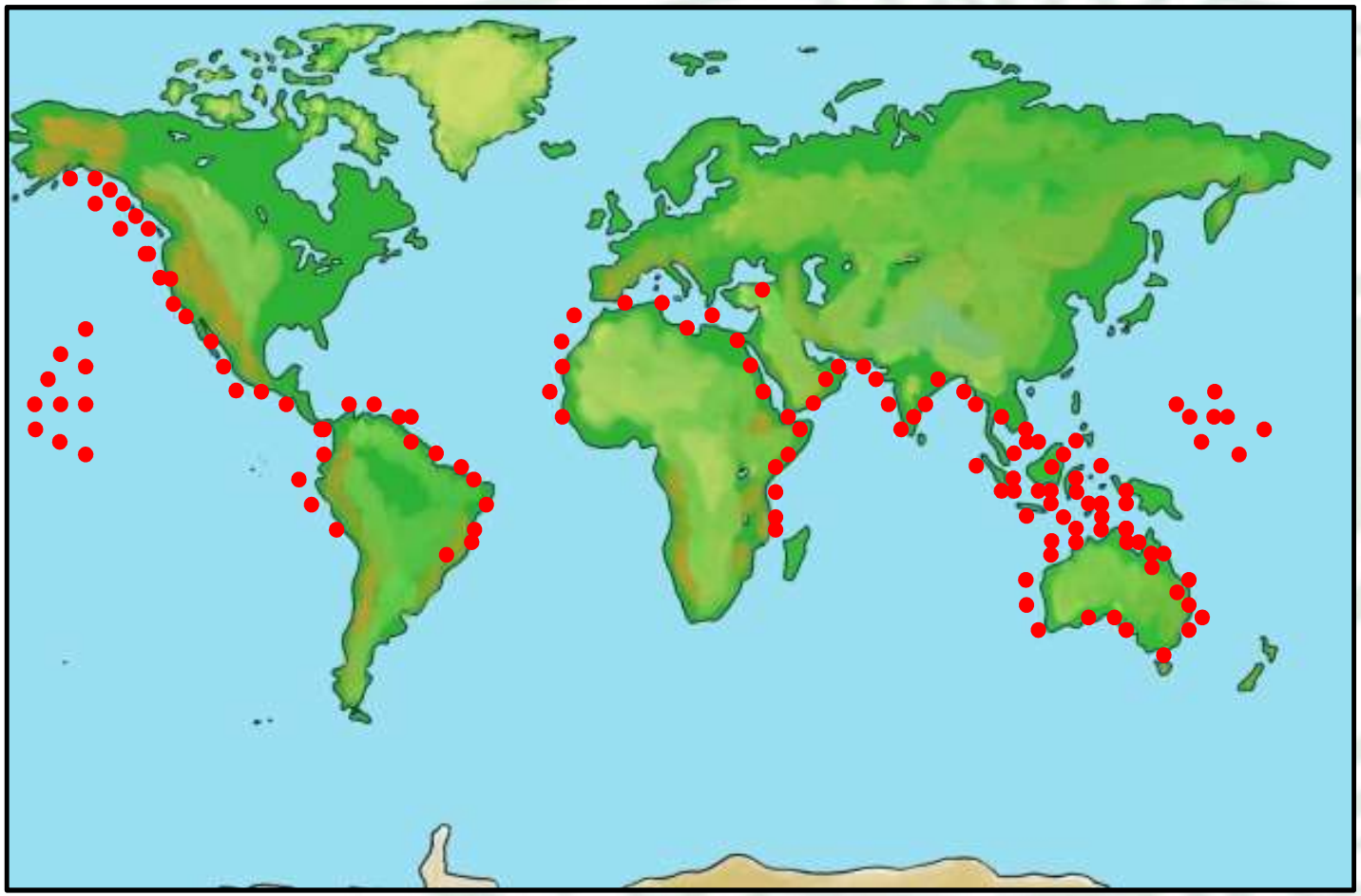
Sub-phylum- Vertebrata (Notochord replaced by vertebral column)
Super class- Gnathostomata (Jaws are present)
Class- Osteichthyes (Bony skeleton, operculum present , 4 pair gills)
Subclass- Actinopterygii (Rayed fins, large mouth opening, sub terminal mouth opening)
Infraclass-Teleostei (true bony fishes, homocercal caudal fin, swim bladder present, spiracle is lost)
Super order- Paracanthopterygii (nearly spiny fin fish)
Genus- *Echeneis* (Sucker fish)

IDENTIFIABLE FEATURES

- Depressed head with first dorsal fin modified into an adhesive disc
- Adhesive disc is flat, oval and transversely furrowed and is the organ for attachment.
- Ventral fin is with spines and rays, second dorsal fin and anal fins are elongated without spine.
- Bilobed caudal fin.

VIDEO LINK:
https://www.youtube.com/watch?v=Mxpa6gPIbLE



Geographical Distribution: Distributed widely all over tropical and warm seas

Habitat: Found free-swimming in shallow inshore areas and around coral reefs. Attaches to a variety of hosts including dolphins, sharks, rays, large bony, whales, fishes or sea turtles and even to ships temporarily.

Exocoetus

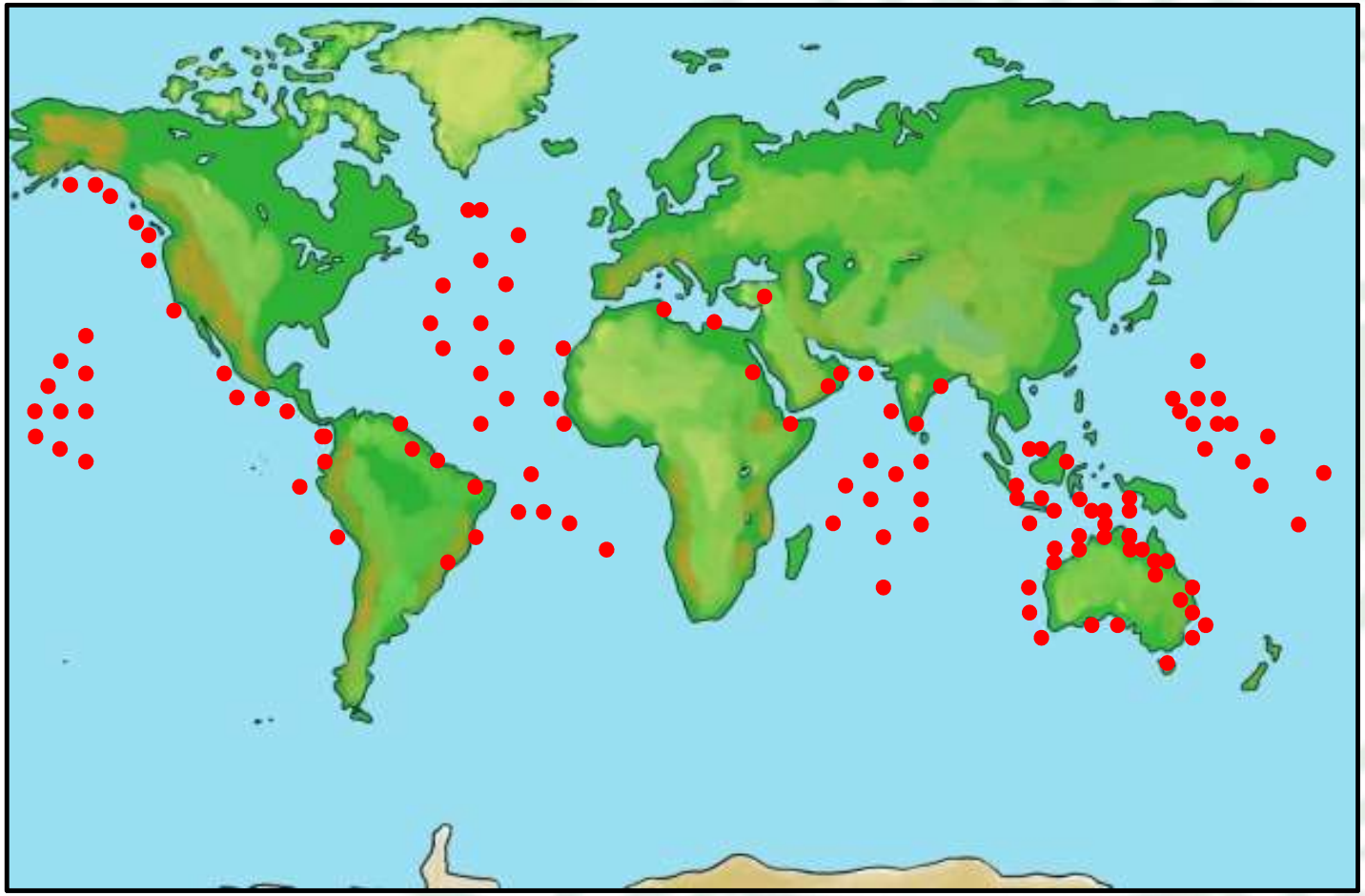
CLASSIFICATION

Phylum –Chordata (Deuterostome, Presence of notochord, nerve chord and pharyngeal gill slits)
Sub-phylum- Vertebrata (Notochord replaced by vertebral column)
Super class- Gnathostomata (Jaws are present)
Class- Osteichthyes (Bony skeleton, operculum present, 4 pair gills)
Subclass- Actinopterygii (Rayed fins, large mouth opening, sub terminal mouth opening)
Infraclass-Teleostei (true bony fishes, homocercal caudal fin, swim bladder present, spiracle is lost)
Super order- Acanthopterygii (Spiny finned fish, stiff spines at the front of the dorsal and anal fin, Premaxilla forms the tooth bearing margin of the jaw),,
Genus- *Exocoetus* (Flying fish)

IDENTIFIABLE FEATURES

- Body elongated and covered with overlapping cycloid scales
- Short dorsal and anal fins with 8-16 soft rays.
- Large, wing like pectoral fins which spreads and glides over water.
- Bilobed caudal fin with lower lobe larger than upper lobe.

VIDEO LINK:
https://www.youtube.com/watch?v=bk7McNUjWgw



Geographical Distribution: Oceanodromous, widespread in tropical and warmer Atlantic, Pacific and Indian oceans.

Habitat: Pelagic and feeding on mostly crustaceans and young fishes and their eggs. Form schools. Capable of leaping out of the water and gliding for long distances above the surface.

Hippocampus

CLASSIFICATION:

Phylum –Chordata (Deuterostome, Presence of notochord, nerve chord and pharyngeal gill slits)

Sub-phylum- Vertebrata (Notochord replaced by vertebral column)

Super class- Gnathostomata (Jaws are present)

Class- Osteichthyes (Bony skeleton, operculum present, 4 pair gills)

Subclass- Actinopterygii (Rayed fins, large mouth opening, sub terminal mouth opening)

Infraclass-Teleostei (true bony fishes, homocercal caudal fin, swim bladder present, spiracle is lost)

Super order- Acanthopterygii (Spiny finned fish, stiff spines at the front of the dorsal and anal fin, Premaxilla forms the tooth bearing margin of the jaw)

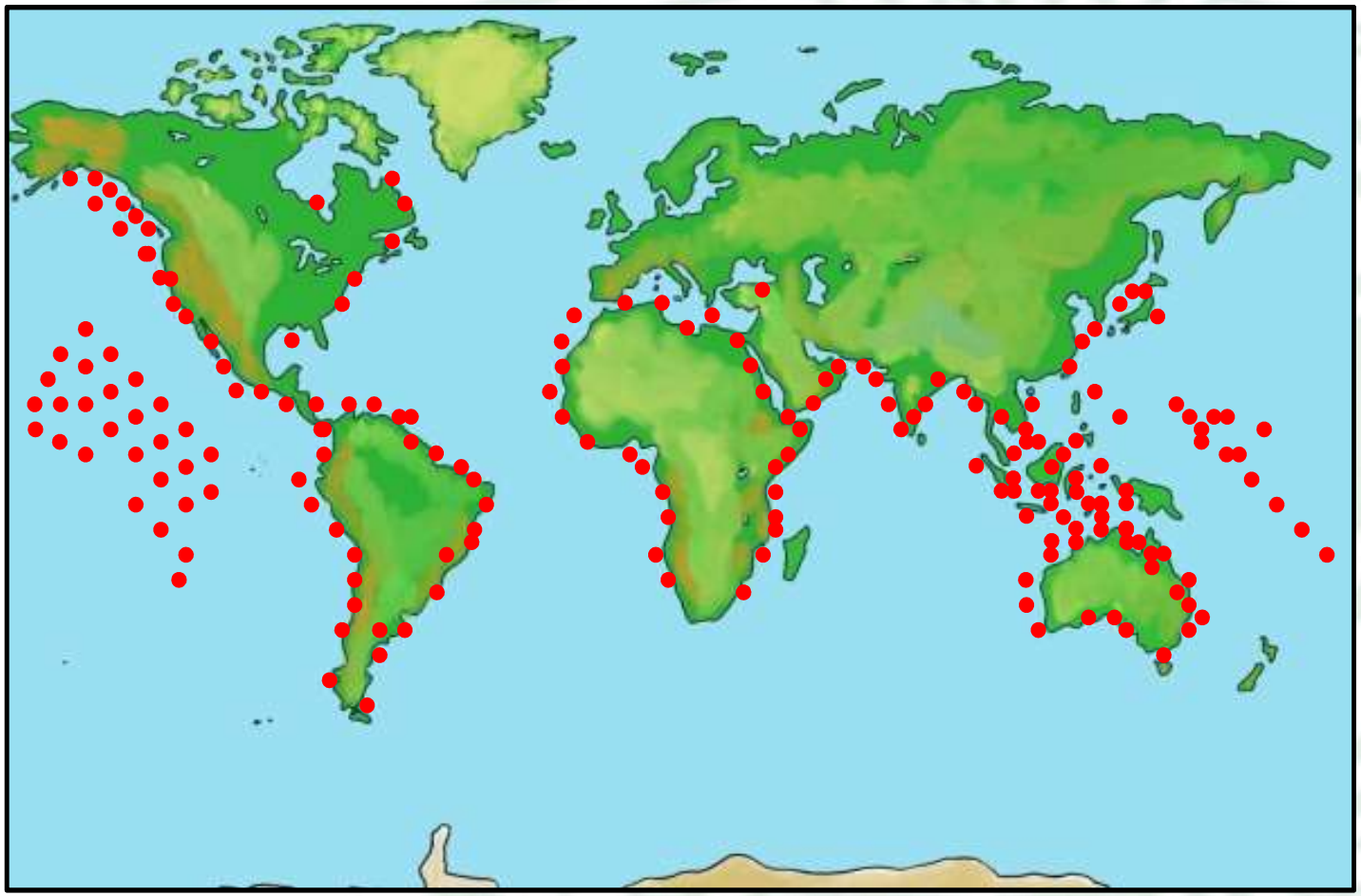
Genus- *Hippocampus* (Sea horse)

IDENTIFIABLE FEATURES:

- Body is divisible into head, trunk and tail.
- Body is covered by rigid elongated endoskeleton of bony ring like plates.
- Head is produced into a tubular snout bearing terminal mouth.
- Single dorsal fin is present, ventral and dorsal fins are absent.
- Small pectoral fins are present on either sides of head.
- Males contain Brood pouch and females have small anal fin.
- Presensile tail is present.

VIDEO LINK:

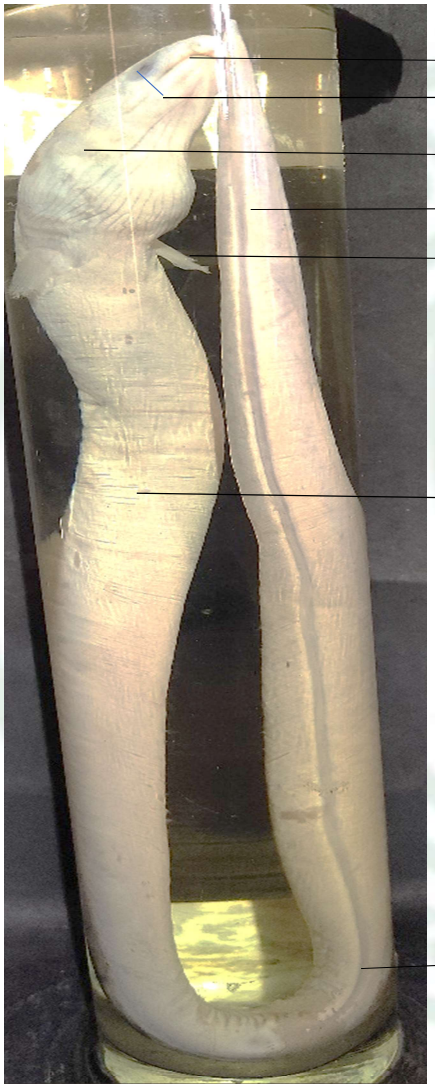
https://www.youtube.com/watch?v=i9Lg6PXyQHo



Geographical Distribution: Cosmopolitan found in all warm sea water.

Habitat: Swim upright gyrating their trunks and swaying their tails.

Anguilla



CLASSIFICATION:

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Sub-phylum- Vertebrata (Notochord replaced by vertebral column)

Super class- Gnathostomata (Jaws are present)

Class- Osteichthyes (Bony skeleton, operculum present, 4 pair gills)

Subclass- Actinopterygii (Rayed fins, large mouth opening, sub terminal mouth opening)

Infraclass-Teleostei (true bony fishes, homocercal caudal fin, swim bladder present, spiracle is lost)

Super order- Elopomorpha (Scales vestigial or absent, Dorsal and anal fins long and confluent)

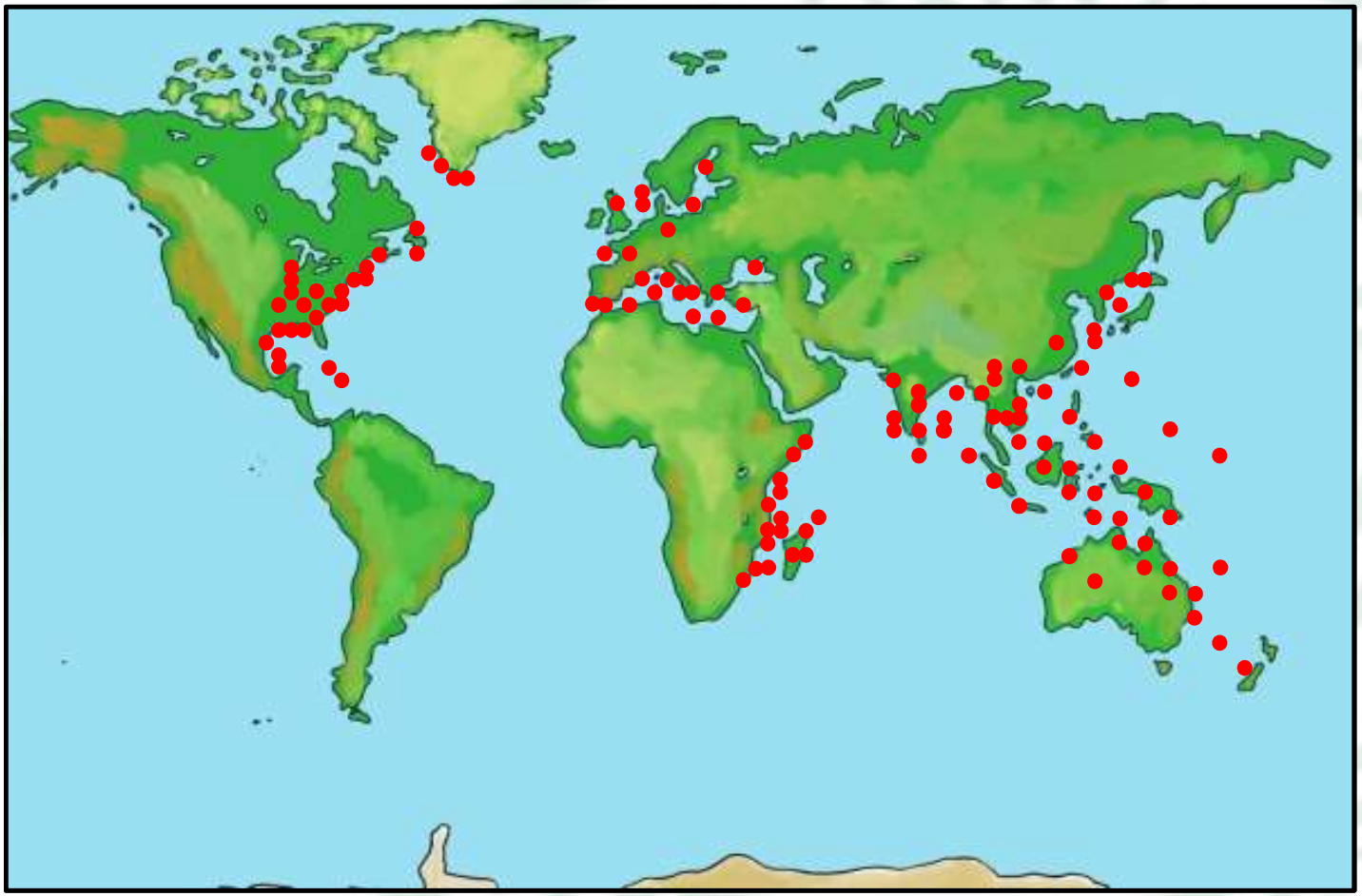
Genus- *Anguilla* (Eel)

IDENTIFIABLE FEATURES:

- Body is elongated and cylindrical in shape.
- Skin bears small rudimentary scales forming a pattern.
- Dorsal fin, anal fin and caudal fin are joined together forming a continuous fin. Fins are supported by fin rays.

VIDEO LINK:

https://www.youtube.com/watch?v=1XTEgdLr07c&t=5s



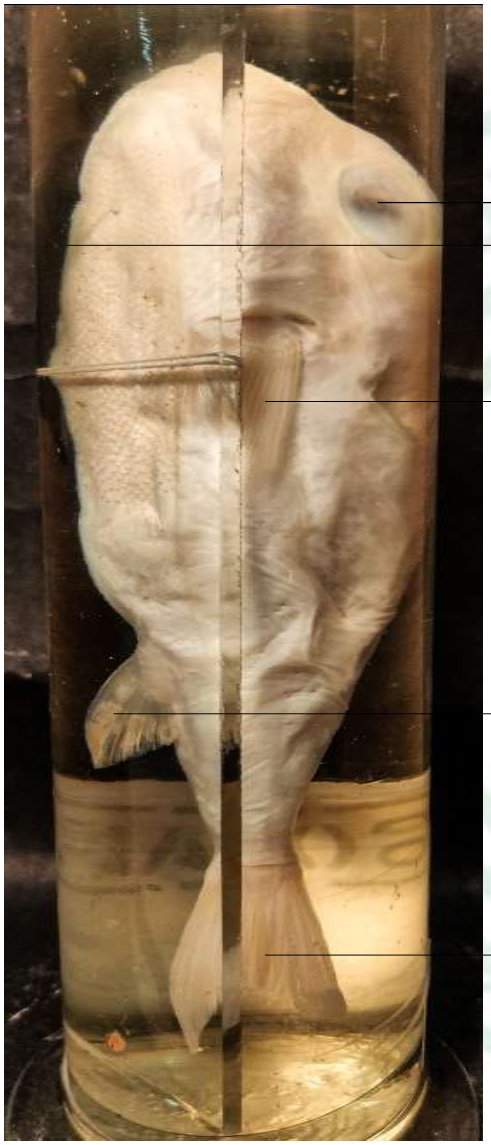
Geographical Distribution:

Widely distributed in Europe, North Africa, temperate Asia, North America, Mexico, West Indies, Australia and New Zealand.

Habitat:

Fresh-water, voracious feeder and catadromous fish and it can live for several hours out of water. Lives in ponds, estuaries, rivers and coastal areas of the sea and damp grass or moss outside water.

Tetrodon



CLASSIFICATION:

Phylum –Chordata (Deuterostome, Presence of notochord, nerve chord and pharyngeal gill slits)

Sub-phylum- Vertebrata (Notochord replaced by vertebral column)

Super class- Gnathostomata (Jaws are present)

Class- Osteichthyes (Bony skeleton, operculum present, 4 pair gills)

Subclass- Actinopterygii (Rayed fins, large mouth opening, sub terminal mouth opening)

Infraclass-Teleostei (true bony fishes, homocercal caudal fin, swim bladder present, spiracle is lost)

Super order- Elopomorpha (Scales vestigial or absent, Dorsal and anal fins long and confluent)

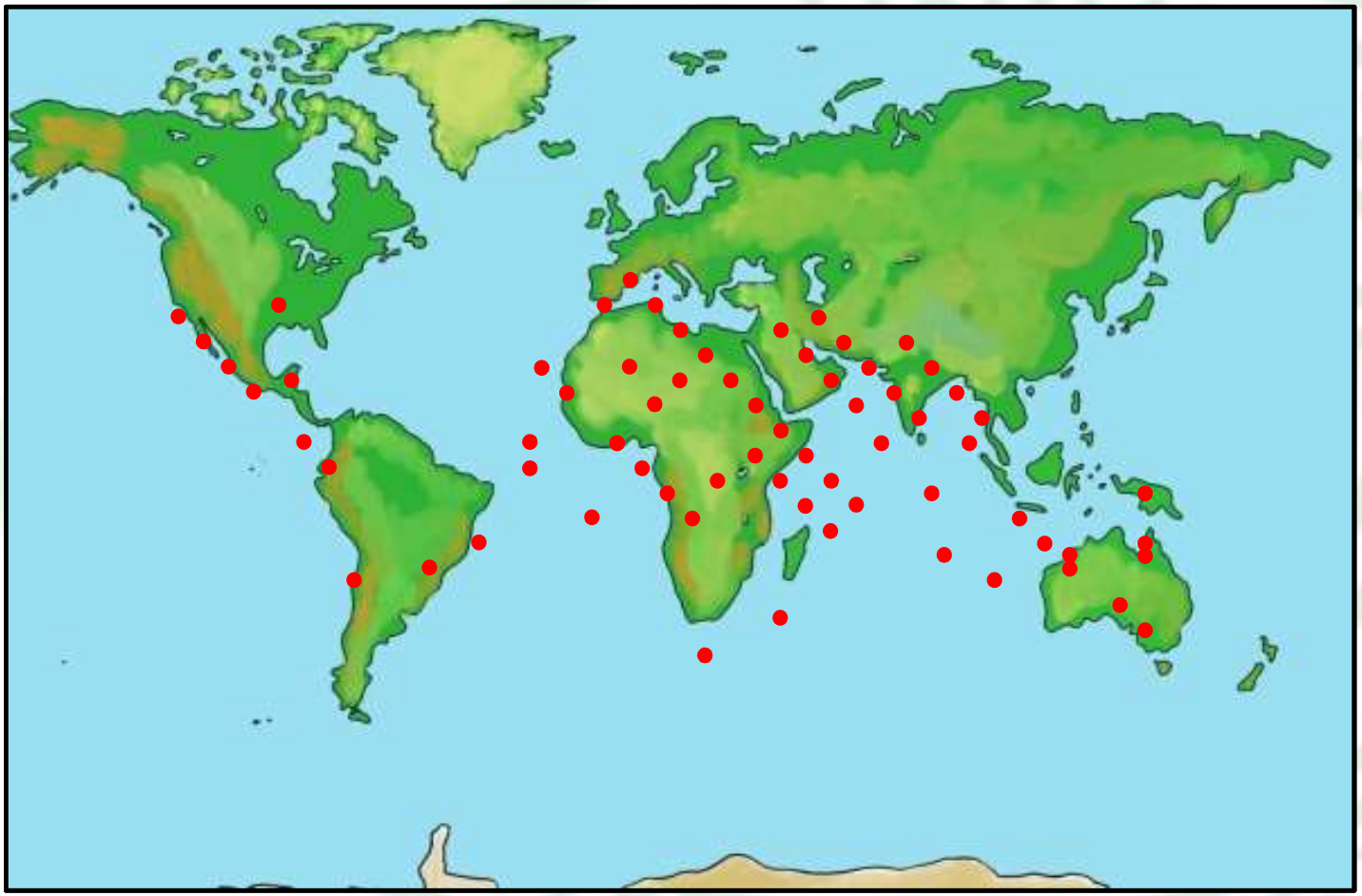
Genus- *Tetrodon* (puffer fish)

IDENTIFIABLE FEATURES:

- Body is elongated and cylindrical in shape.
- Skin bears small rudimentary scales forming a pattern.
- Dorsal fin, anal fin and caudal fin are joined together forming a continuous fin. Fins are supported by fin rays.

VIDEO LINK:

https://www.youtube.com/watch?v=1XTEgdLr07c&t=5s



Geographical Distribution: Indian Sea, Atlantic, Tropical and sub-tropical.

Habitat: Marine fish feeds on algae and invertebrates.

Anabas

CLASSIFICATION:

Phylum –Chordata (Deuterostome, Presence of notochord, nerve chord and pharyngeal gill slits)

Sub-phylum- Vertebrata (Notochord replaced by vertebral column)

Super class- Gnathostomata (Jaws are present)

Class- Osteichthyes (Bony skeleton, operculum present, 4 pair gills)

Subclass- Actinopterygii (Rayed fins, large mouth opening, sub terminal mouth opening)

Infraclass-Teleostei (true bony fishes, homocercal caudal fin, swim bladder present, spiracle is lost)

Super order- Acanthoptergii (the anterior rays of the dorsal and anal fins stiff and spiny)

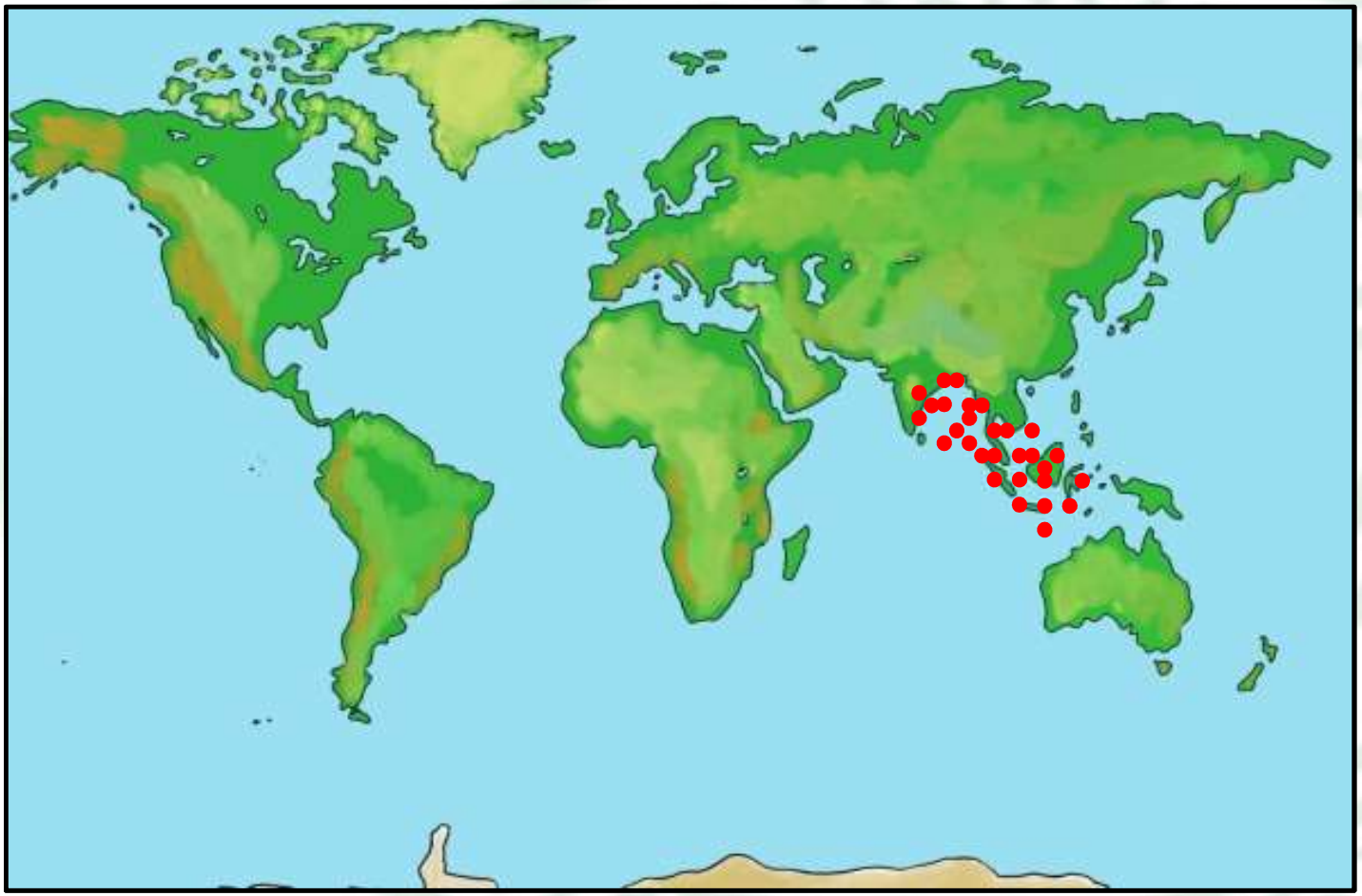
Genus- *Anabas* (climbing perch)

IDENTIFIABLE FEATURES:

1. Body divisible into head, trunk and tail and covered by cycloid scales.
2. Spiny Dorsal and Anal fins are present divided into anterior and posterior fins.
3. It can walk on land with help of spines.
4. Caudal fin is symmetrical

VIDEO LINK:

https://www.youtube.com/watch?v=qroO2GMNLVE



Geographical Distribution: distributed in India, Sri Lanka, Bangladesh, Burma, Indonesia, Malaysia, Thailand, Cambodia, and the Philippines.

Habitat: Fresh water fish, can live without water for long period.

Pleuronectus

CLASSIFICATION:

Phylum –Chordata (Deuterostome, Presence of notochord, nerve chord and pharyngeal gill slits)

Sub-phylum- Vertebrata (Notochord replaced by vertebral column)

Super class- Gnathostomata (Jaws are present)

Class- Osteichthyes (Bony skeleton, operculum present, 4 pair gills)

Subclass- Actinopterygii (Rayed fins, large mouth opening, sub terminal mouth opening)

Infraclass-Teleostei (true bony fishes, homocercal caudal fin, swim bladder present, spiracle is lost)

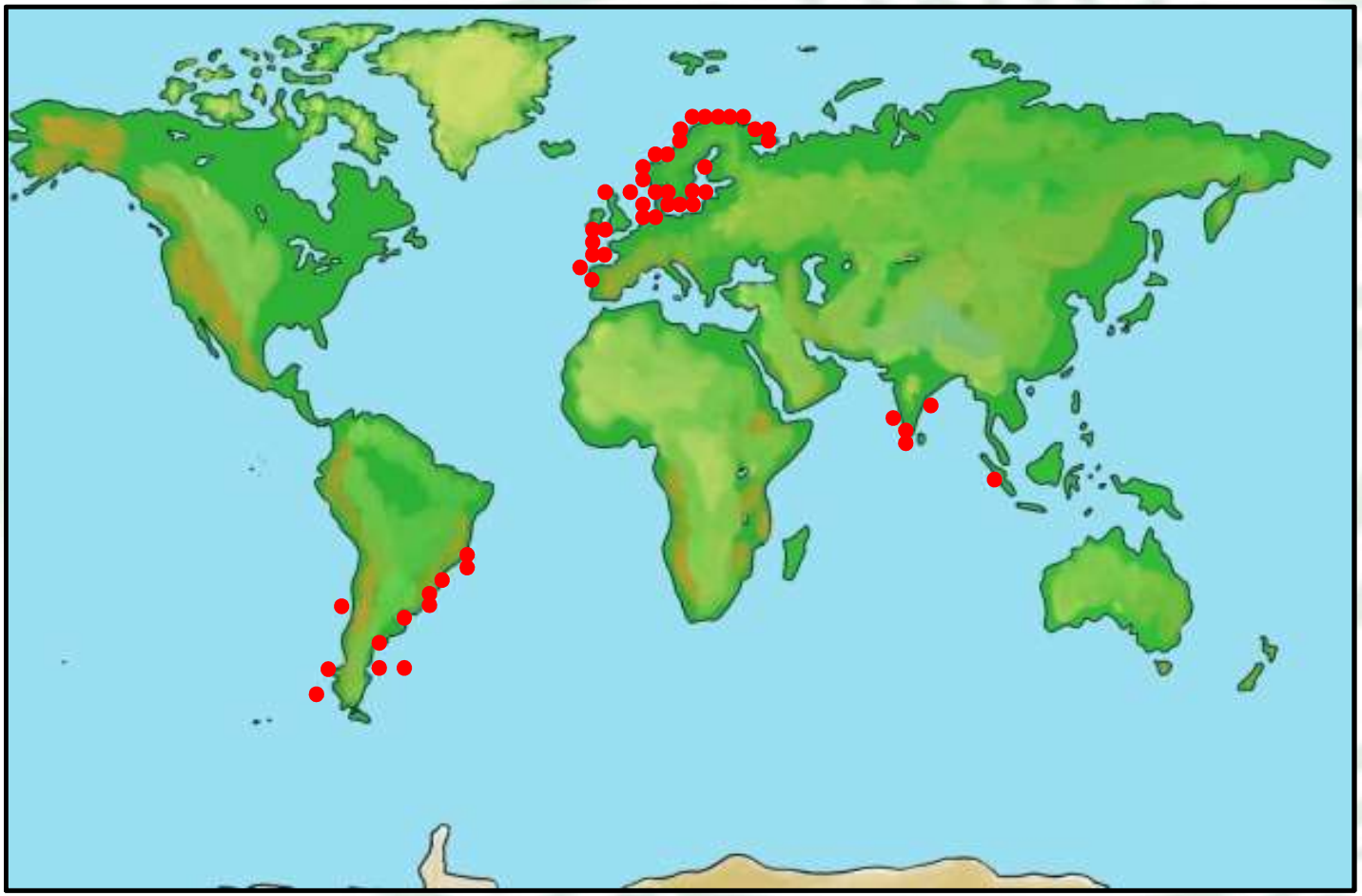
Super order- Acanthoptergii (the anterior rays of the dorsal and anal fins stiff and spiny)

Genus- *Pleuronectus* (flat fish)

IDENTIFIABLE FEATURES:

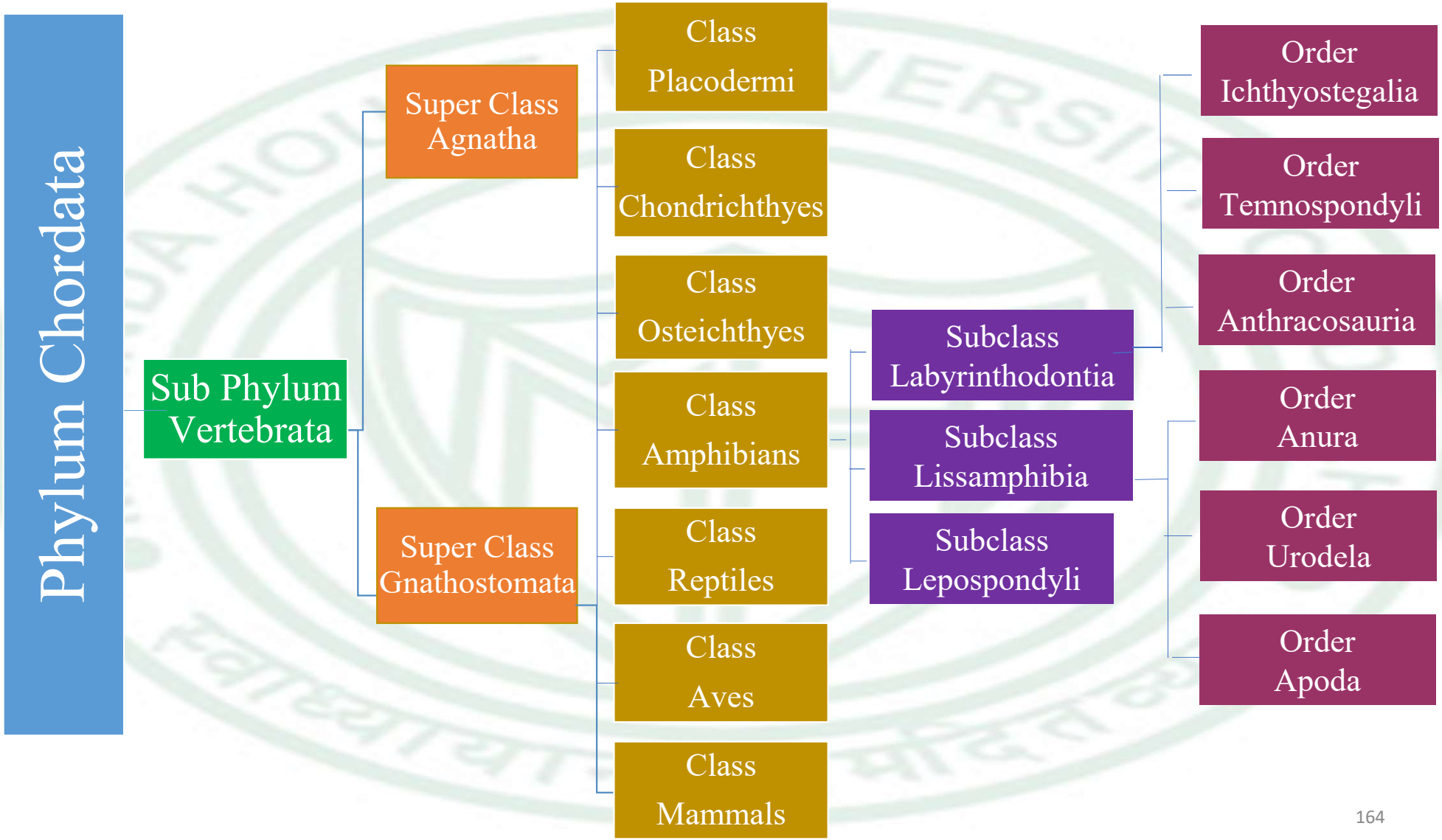
1. Body is compressed and asymmetrically flattened.
2. Eyes are found on let side.
3. Mouth is narrow and protrusible.
4. Cycloid scales are present.
5. Dorsal and anal fins are elongated, continued over the body.

VIDEO LINK:
https://www.youtube.com/watch?v=K2jzXMOL7MI

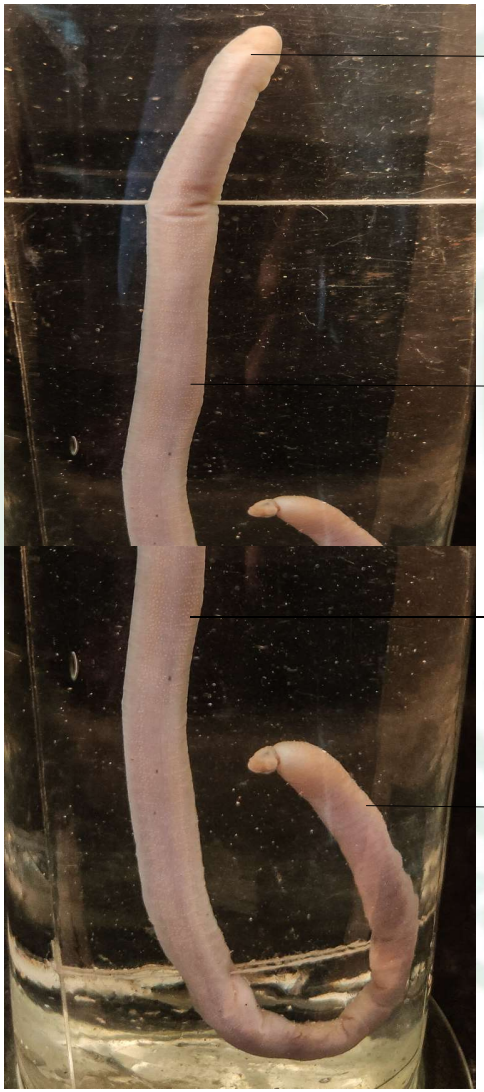


Geographical Distribution: North Sea, India, Malayasia and South America

Habitat: Bottom dweller of marine water


Phylum Chordata
Sub Phylum Vertebrata
Super Class Agnatha
Super Class Gnathostomata
Class Placodermi
Class Chondrichthyes
Class Osteichthyes
Class Amphibians
Class Reptiles
Class Aves
Class Mammals
Subclass Labyrinthodontia
Subclass Lissamphibia
Subclass Lepospondyli
Order Ichthyostegalia
Order Temnospondyli
Order Anthracosauria
Order Anura
Order Urodela
Order Apoda

Uraeotyphlus



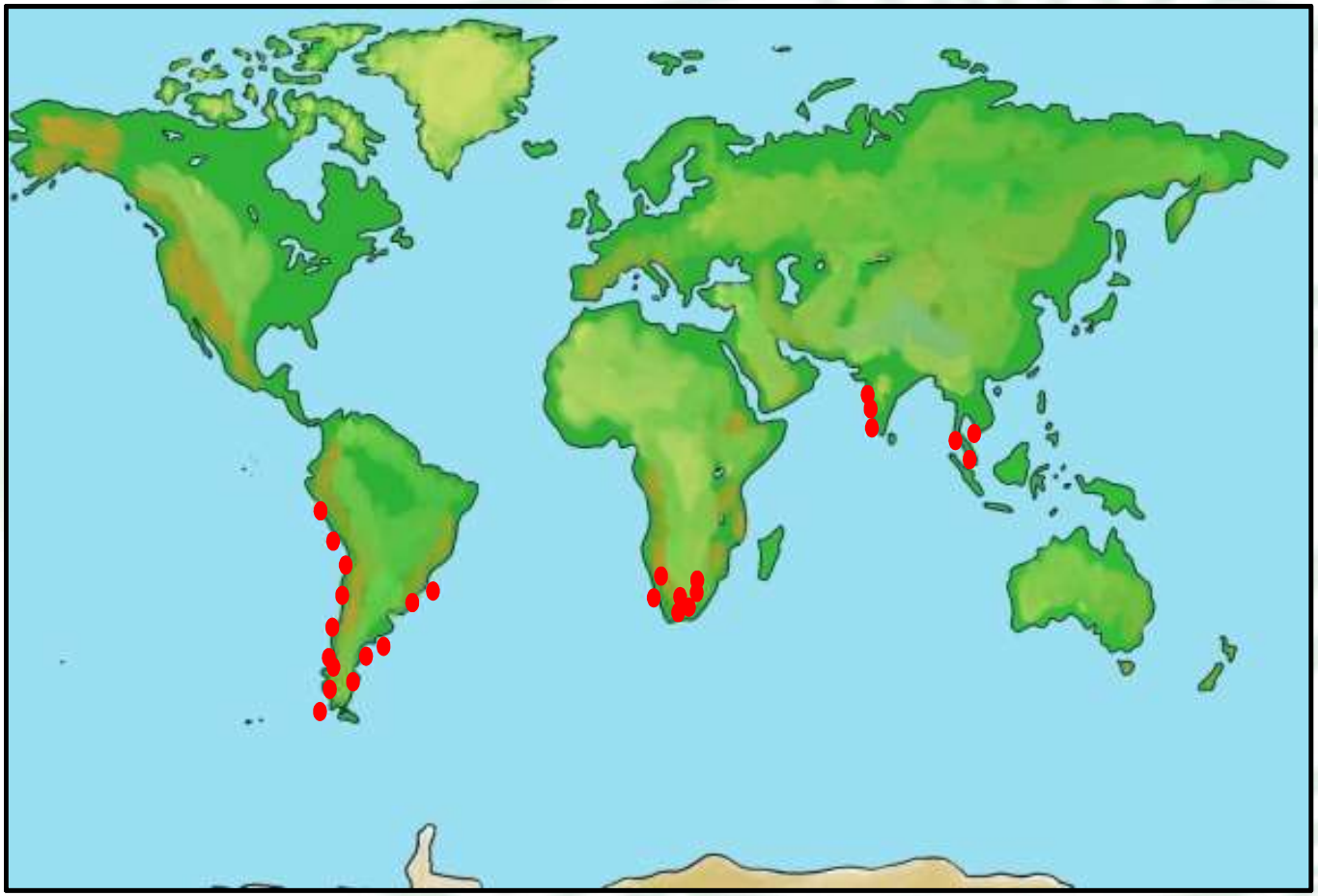
CLASSIFICATION:

Phylum- Chordata (Deuterostome, Presence of notochord, nerve chord and pharyngeal gill slits)
Sub-phylum- Vertebrata (Notochord replaced by vertebral column)
Super class- Gnathostomata (Jaws are present)
Class- Amphibia (cold-blooded, aquatic and terrestrial, moist soft glandular skin devoid of scales, two occipital condyles, three chambered heart)
Sub class- Lissamphibia (Modern day amphibians)
Order- Apoda (Burrowing, vermiform, skin has many grooves and wrinkles, limbs and girdles absent)
Genus- *Uraeotyphlus*

IDENTIFIABLE FEATURES:

- Elongated, cylindrical body divisible into head, trunk and tail.
- Transversely grooved skin with embedded scales.
- Head have non-functional eyes and nares.
- Sensory glandular apparatus present in the groove between eye and nostrils.

VIDEO LINK:
https://www.youtube.com/watch?v=bSlcaAsQYu8



Geographical Distribution: Malayasia, South Africa and South America and seven species are endemic to the Western Ghats of southwestern India.

Habitat: Borrows moist grount and feeds on small worms.

Nectures

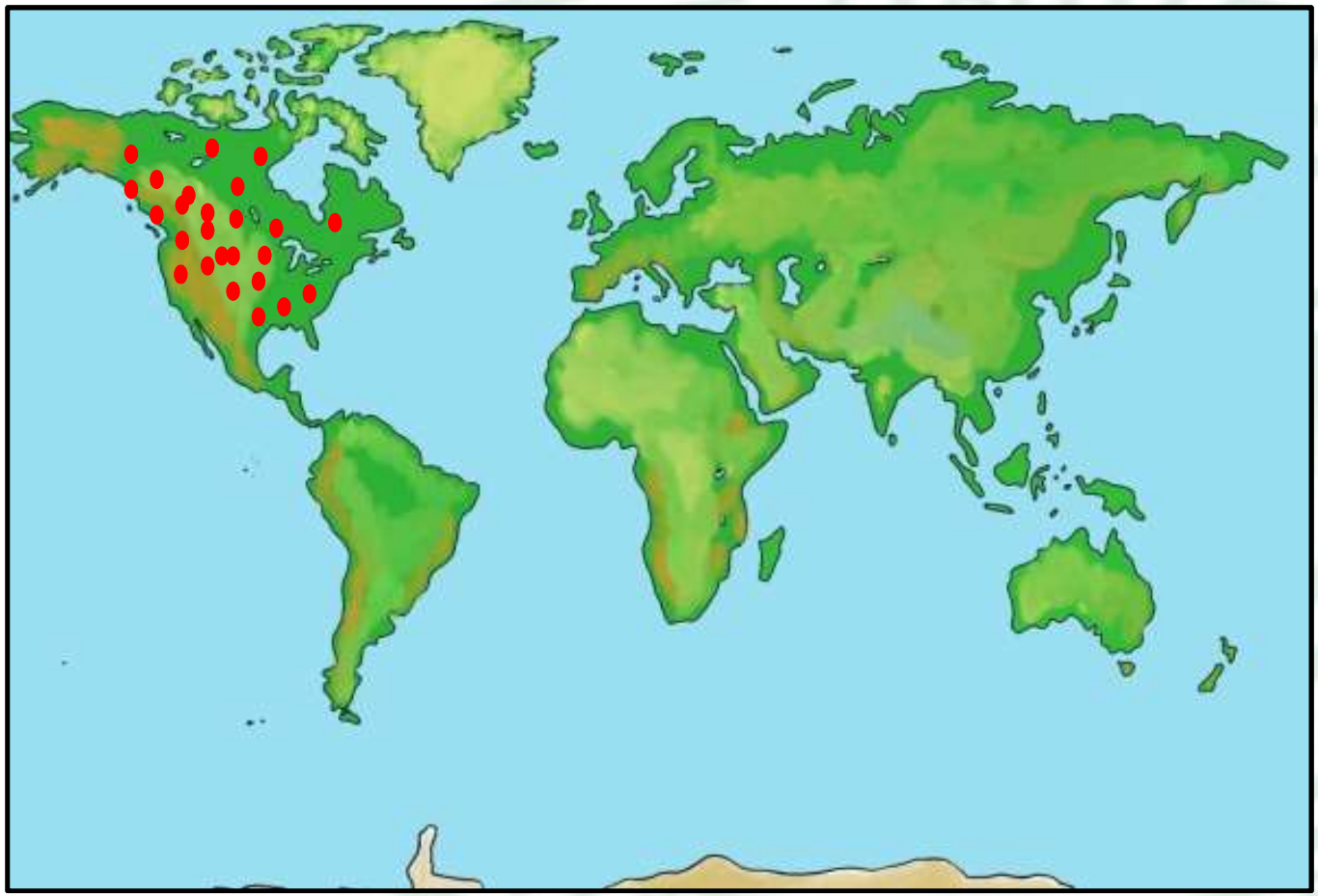
CLASSIFICATION:

Phylum- Chordata (Deuterostome, Presence of notochord, nerve chord and pharyngeal gill slits)
Sub-phylum- Vertebrata (Notochord replaced by vertebral column)
Super class- Gnathostomata (Jaws are present)
Class- Amphibia (cold-blooded, aquatic and terrestrial, moist soft glandular skin devoid of scales, two occipital condyles, three chambered heart)
Sub class- Lissamphibia (Modern day amphibians)
Order- Urodela (Body is scaleless, two pairs of equal sized limbs, with or without external gill in adults)
Genus- *Nectures* (Mud puppy)

IDENTIFIABLE FEATURES:

- Body is elongated divisible into head, trunk and tail.
- Head is compressed with eyes, nostrils and mouth.
- Three pairs of gill slits and two pairs of gill clefts are present in the adult.
- Fore limbs and hind limbs are short and weak
- Tail is long and laterally compressed.

VIDEO LINK:
https://www.youtube.com/watch?v=pt4Mz9JhSz0



<u>Geographical Distribution</u>:
Found in North America.

<u>Habitat</u>:
Lives in aquatic environment flowing water, sluggish streams, reservoirs, and clear, cool lakes. Found under large rocks, logs, and other cover objects during the day.

Salamandra

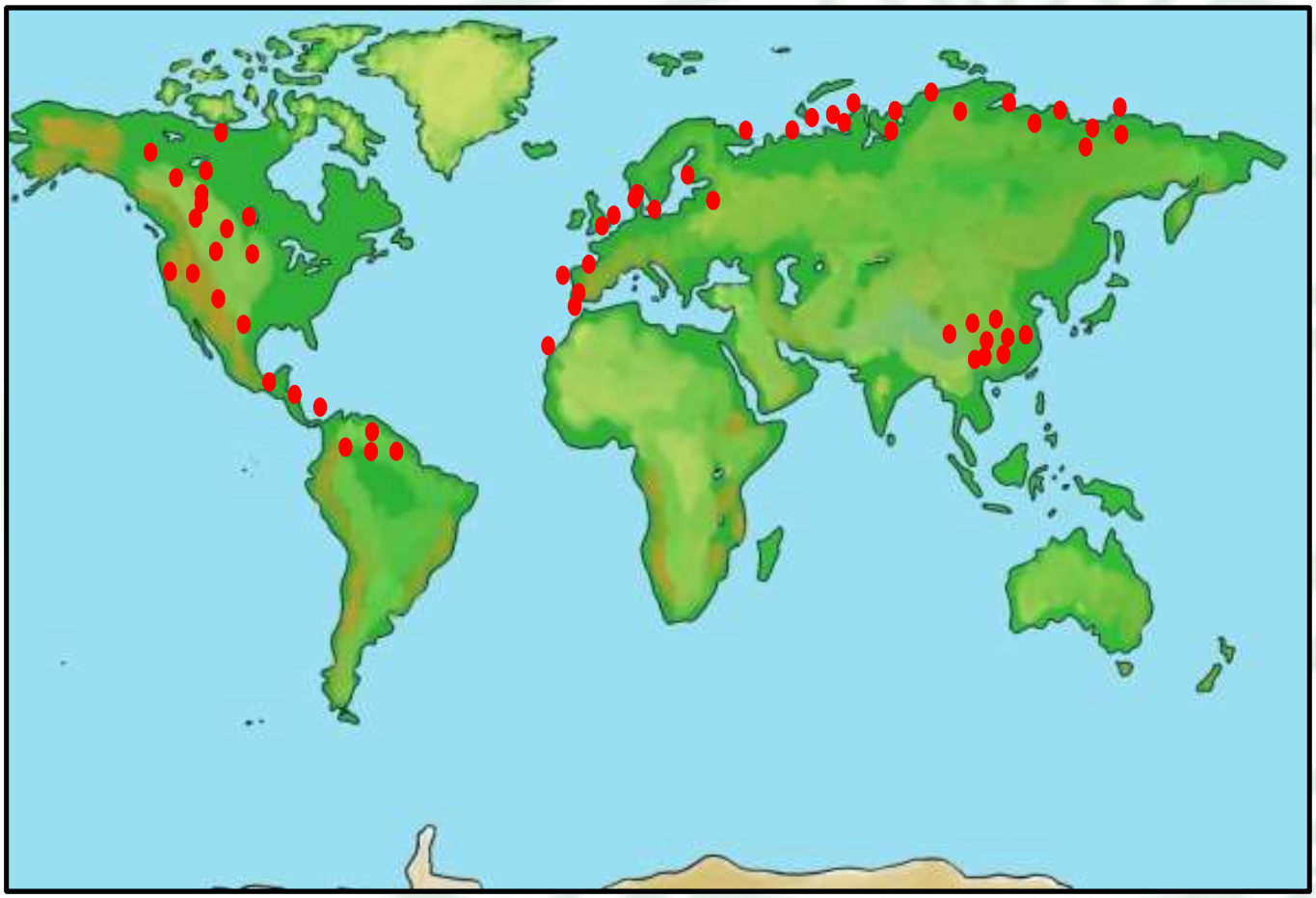
CLASSIFICATION:

Phylum- Chordata (Deuterostome, Presence of notochord, nerve chord and pharyngeal gill slits)
Sub-phylum- Vertebrata (Notochord replaced by vertebral column)
Super class- Gnathostomata (Jaws are present)
Class- Amphibia (cold-blooded, aquatic and terrestrial, moist soft glandular skin devoid of scales, two occipital condyles, three chambered heart)
Sub class- Lissamphibia (Modern day amphibians)
Order- Urodela (Body is scaleless and divisible into head, trunk and tail, two pairs of equal sized limbs, with or without external good and gill slits in adults)
Genus- *Salamandra* (European-fire salamander)

IDENTIFIABLE FEATURES:

- Body is lizard like and is divisible into head, trunk and tail.
- A pair of parotid glands are present behind the head.
- Prominent nostrils, mouth and eyes with movable eyelids on head.
- Trunk is uplifted by strong forelimbs and hindlimbs.
- Tail is without tail fin.

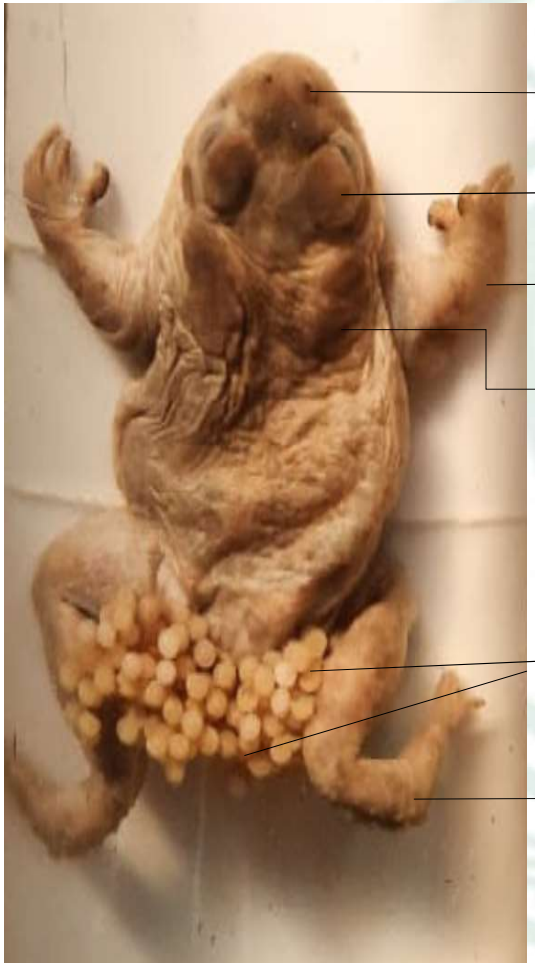
VIDEO LINK:
https://www.youtube.com/watch?v=TpLPkreZvFA



<u>Geographical Distribution</u>: Found in Europe, Eastern Asia and North America.

<u>Habitat</u>: found under stones, logs, crevices and cracks.

Alytes



CLASSIFICATION:

Phylum- Chordata (Deuterostome, Presence of notochord, nerve chord and pharyngeal gill slits)

Sub-phylum- Vertebrata (Notochord replaced by vertebral column)

Super class- Gnathostomata (Jaws are present)

Class- Amphibia (cold-blooded, aquatic and terrestrial, moist soft glandular skin devoid of scales, two occipital condyles, three chambered heart)

Sub class- Lissamphibia (Modern day amphibians)

Order- Anura (Broad and short body without neck and tail, hind limbs long, gills absent, lungs are the respiratory organ)

Genus- *Alytes* (Mid wife toad)

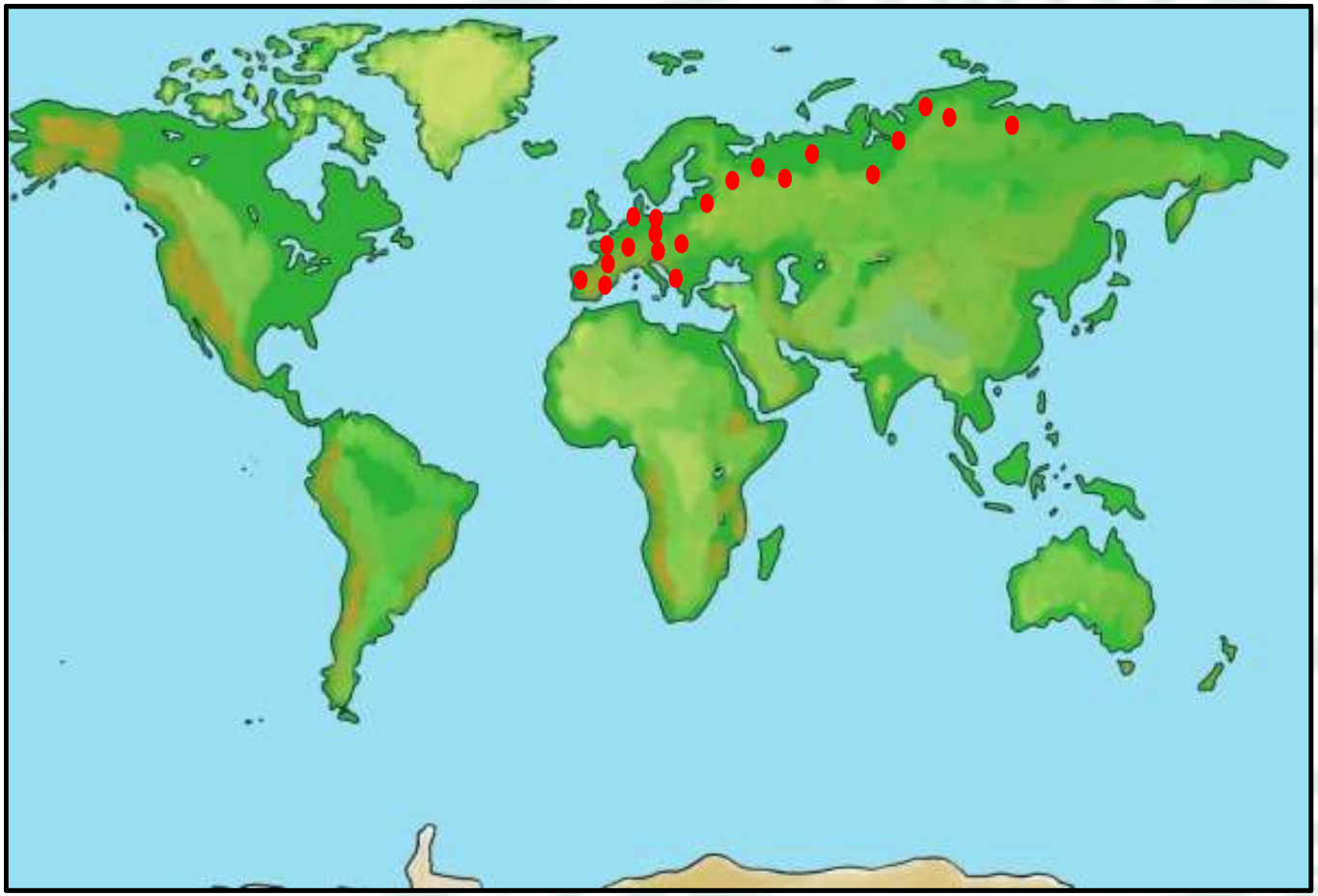
IDENTIFIABLE FEATURES:

- Body is short and strong with large head and short legs.
- Body is divisible into head and trunk.
- Large tympanum and protuberant eyes with vertical pupil are present over head.
- Tongue is round and sticky
- Poison stored warts are present over the body surface.
- Partially webbed toes are present.
- Males show parental care and carry their eggs between the hind limbs.

VIDEO LINK:

https://www.youtube.com/watch?v=Obura5AVScg&t=63s

https://www.youtube.com/watch?v=ufzY6L5PCWA



<u>Geographical Distribution</u>:
Found in European countries

<u>Habitat</u>:
Varies greatly

Hyla

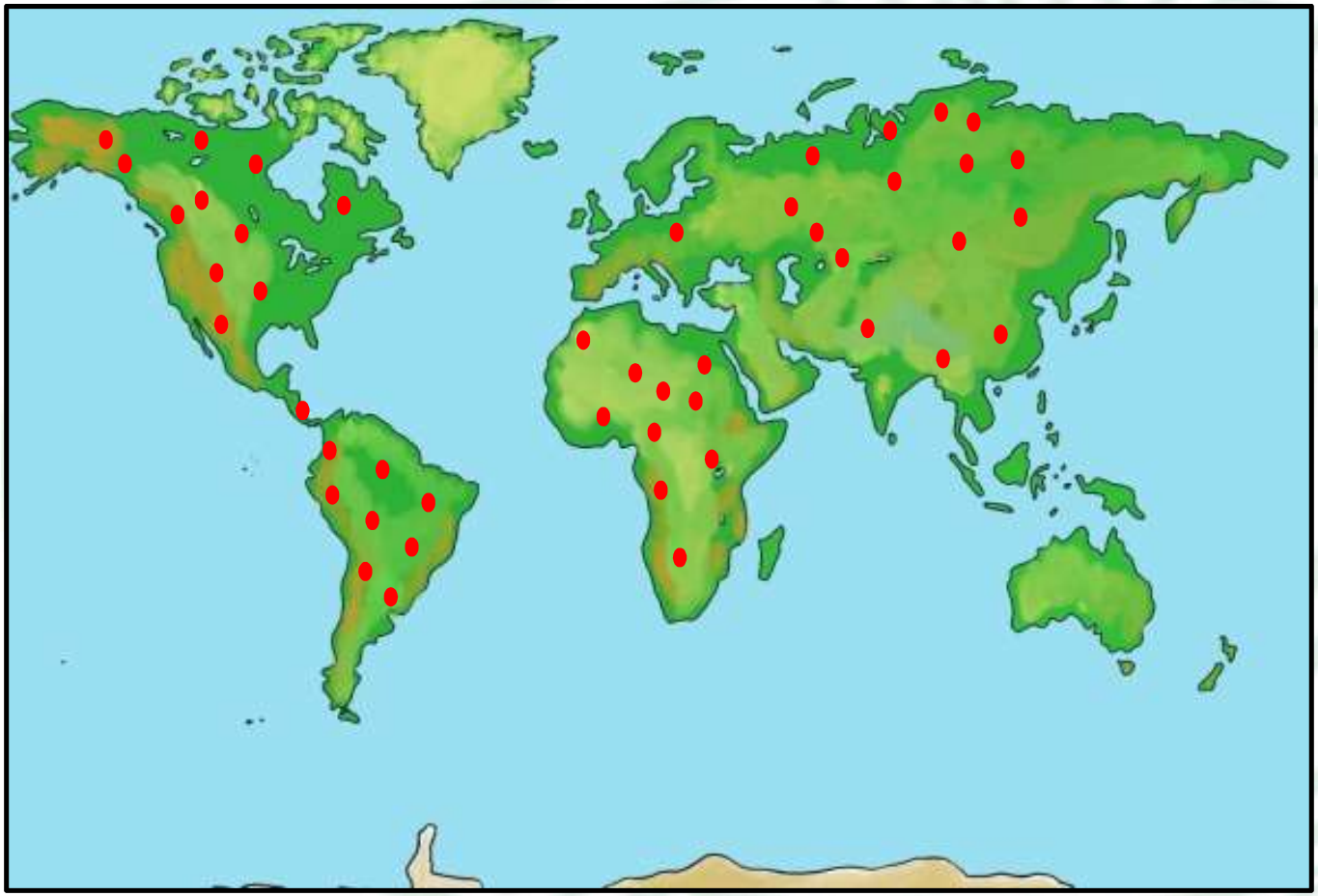
CLASSIFICATION:

Phylum- Chordata (Deuterostome, Presence of notochord, nerve chord and pharyngeal gill slits)
Sub-phylum- Vertebrata (Notochord replaced by vertebral column)
Super class- Gnathostomata (Jaws are present)
Class- Amphibia (cold-blooded, aquatic and terrestrial, moist soft glandular skin devoid of scales, two occipital condyles, three chambered heart)
Sub class- Lissamphibia (Modern day amphibians)
Order- Anura (Broad and short body without neck and tail, hind limbs long, gills absent, lungs are the respiratory organ)
Genus- *Hyla* (tree frog)

IDENTIFIABLE FEATURES:

- Body divisible into head and trunk.
- Eyes, distinct tympanum and nostrils present on head.
- Body surface is smooth, ventral side have hygroscopic glands.
- Limbs are elongated.
- Fingers and toes bear adhesive pads or disc for sticking on smooth surfaces.

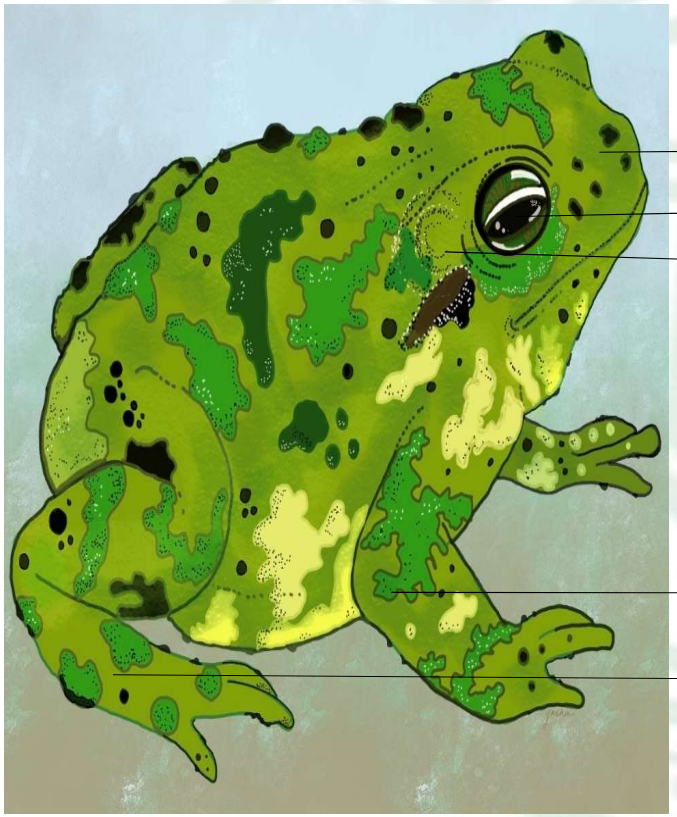
VIDEO LINK:
https://www.youtube.com/watch?v=PJzJBXBdGTM



Geographical Distribution:
Found primarily in Africa, Asia, Central-America, Europe, North and South America.

Habitat:
Frequently found in small ponds, large lakes, marshes, and streams.

Bufo



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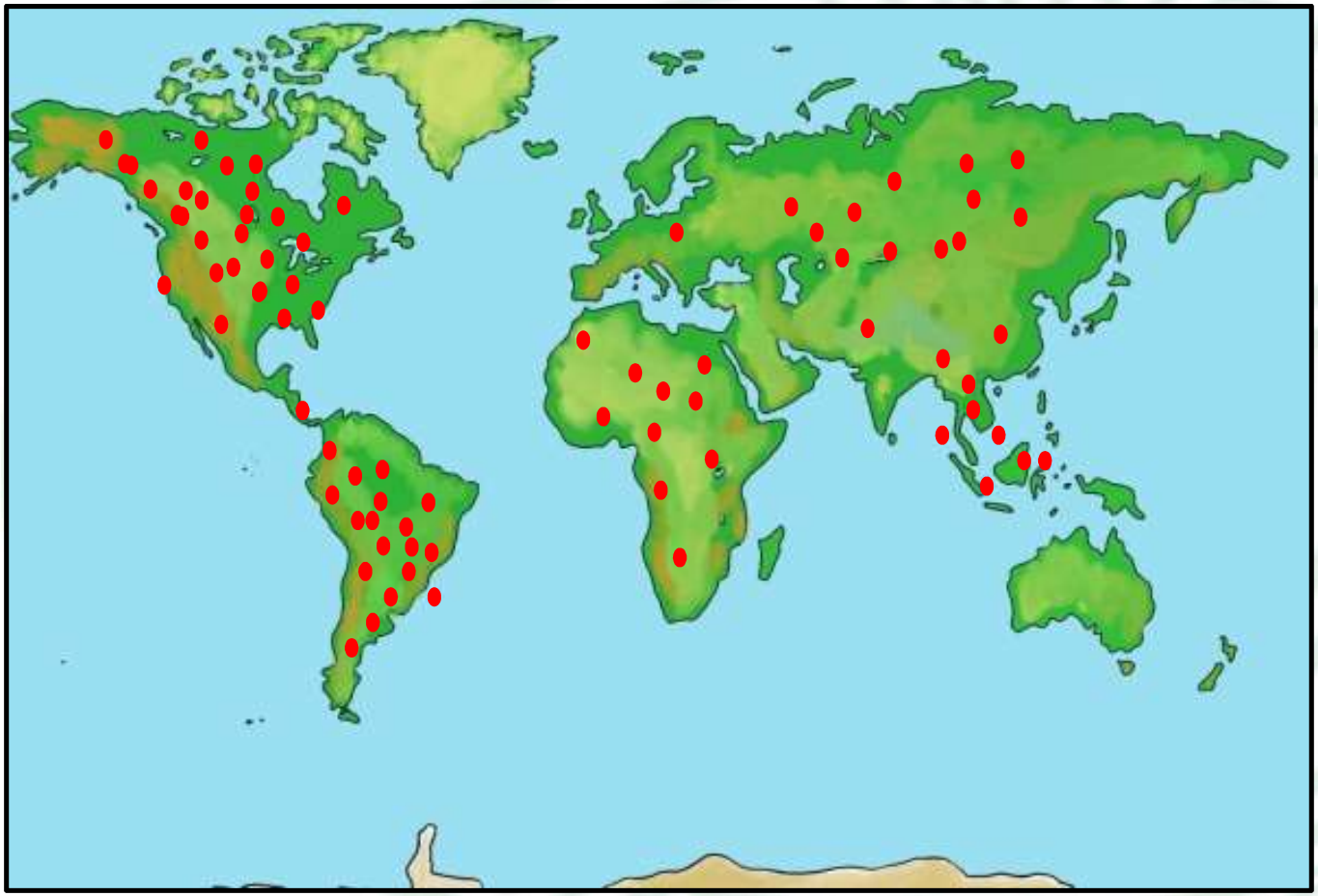
Class- Amphibia (cold-blooded, aquatic and terrestrial, moist soft glandular skin devoid of scales, two occipital condyles, three chambered heart)
Sub class- Lissamphibia (Modern day amphibians)
Order- Anura (Broad and short body without neck and tail, hind limbs long, gills absent, lungs are the respiratory organ)
Genus- *Bufo* (True toad)

IDENTIFIABLE FEATURES:

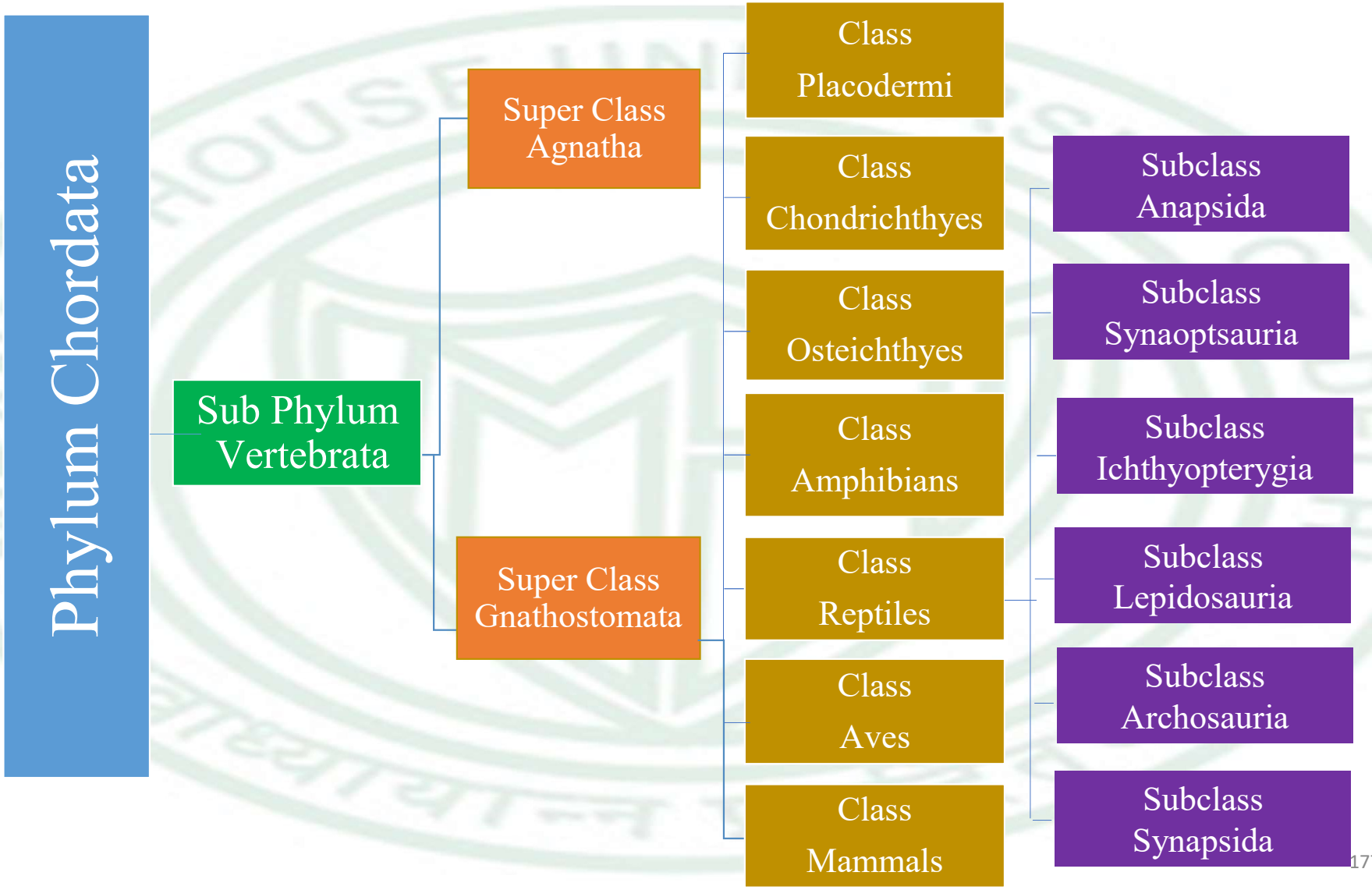
- The dorsal surface is rough, dry and warty and bears numerous poisonous glands.
- Body divided into head and trunk.
- Head contains mouth large eyes, nostrils and tympanum.
- Paired parotid glands are present behind the tympanum.
- Short hind limbs and fore limbs
- Hind limbs with 4 claw like digits and thumb pads or adhesive pads.

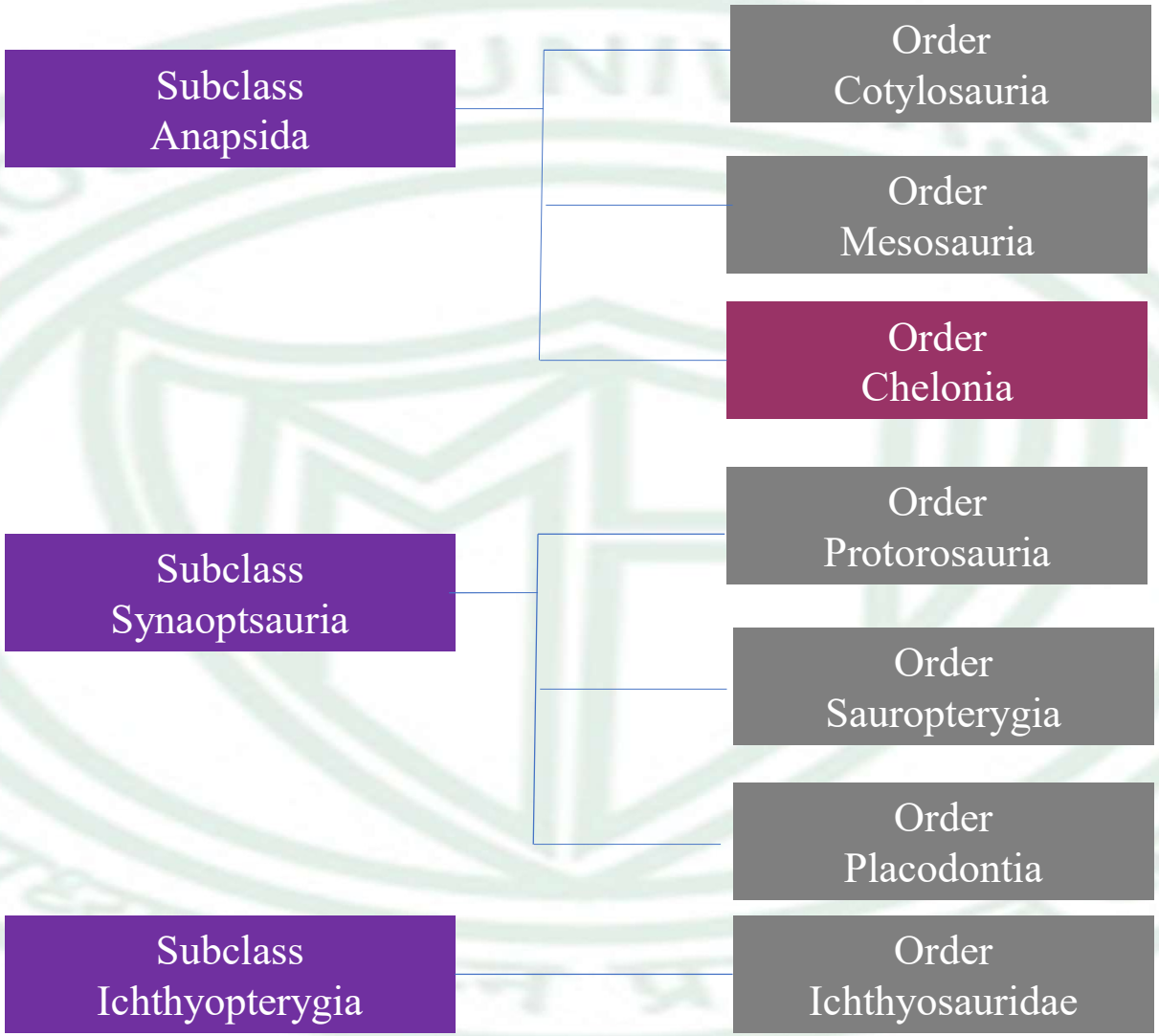
VIDEO LINK:
https://www.youtube.com/watch?v=RMzLes3BaCo

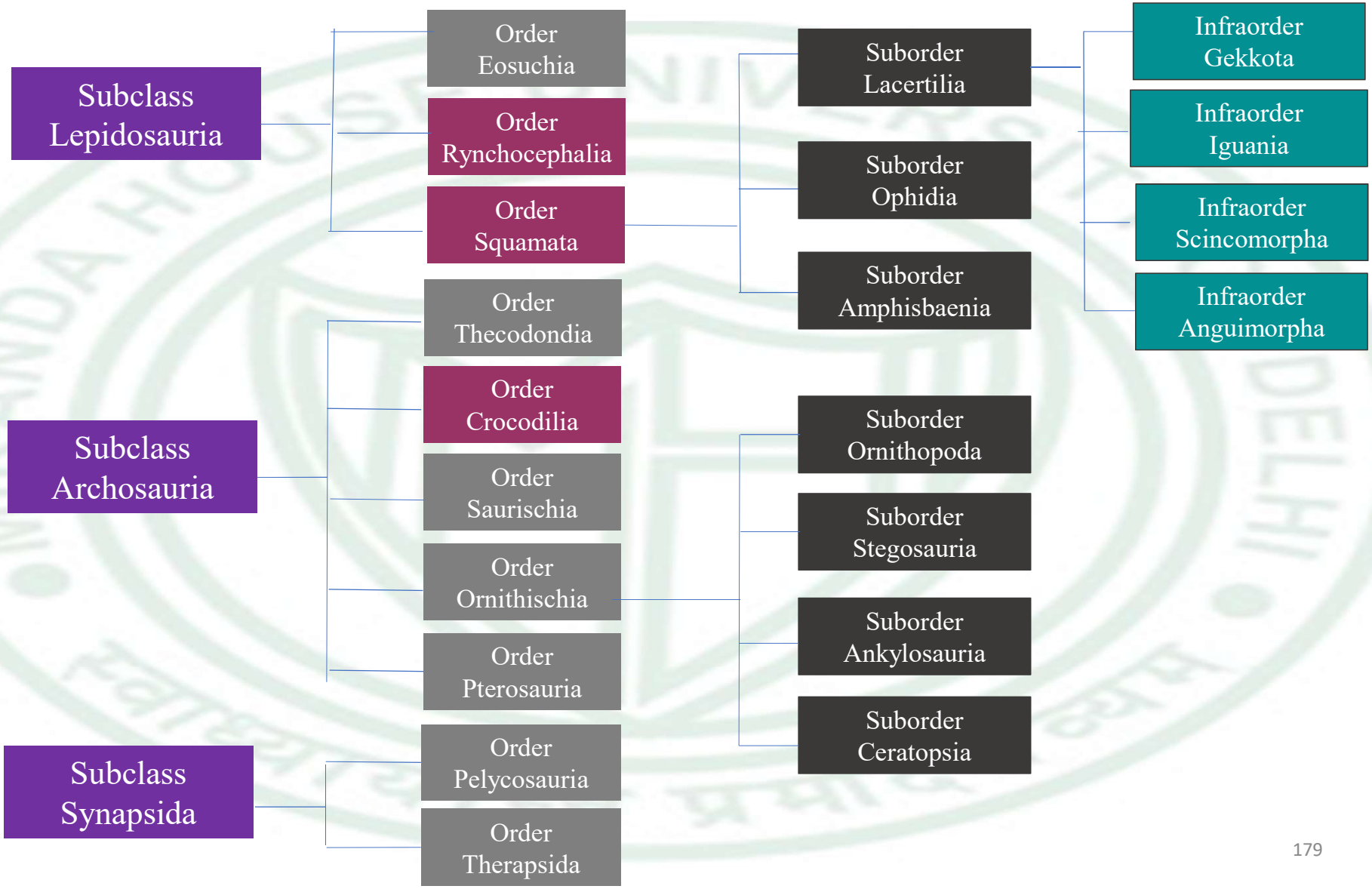


Geographical Distribution:
Distributed world-wide.

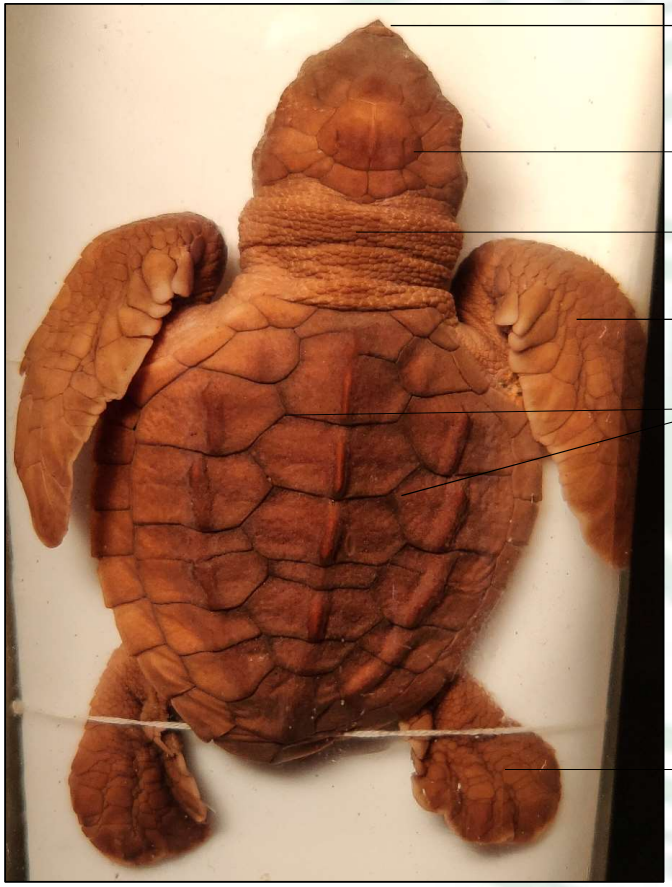
Habitat:
Nocturnal, terrestrial , hides under logs and stones, enters water only to breed and spawn.


Phylum Chordata
Sub Phylum Vertebrata
Super Class Agnatha
Super Class Gnathostomata
Class Placodermi
Class Chondrichthyes
Class Osteichthyes
Class Amphibians
Class Reptiles
Class Aves
Class Mammals
Subclass Anapsida
Subclass Synaoptsauria
Subclass Ichthyopterygia
Subclass Lepidosauria
Subclass Archosauria
Subclass Synapsida


Subclass
Anapsida
Order
Cotylosauria
Order
Mesosauria
Order
Chelonia
Subclass
Synaoptsauria
Order
Protorosauria
Order
Sauropterygia
Order
Placodontia
Subclass
Ichthyopterygia
Order
Ichthyosauridae


Subclass Lepidosauria
Order Eosuchia
Order Rynchocephalia
Order Squamata
Suborder Lacertilia
Suborder Ophidia
Suborder Amphisbaenia
Infraorder Gekkota
Infraorder Iguania
Infraorder Scincomorpha
Infraorder Anguimorpha
Subclass Archosauria
Order Thecodondia
Order Crocodilia
Order Saurischia
Order Ornithischia
Order Pterosauria
Suborder Ornithopoda
Suborder Stegosauria
Suborder Ankylosauria
Suborder Ceratopsia
Subclass Synapsida
Order Pelycosauria
Order Therapsida

Chelone



CLASSIFICATION:

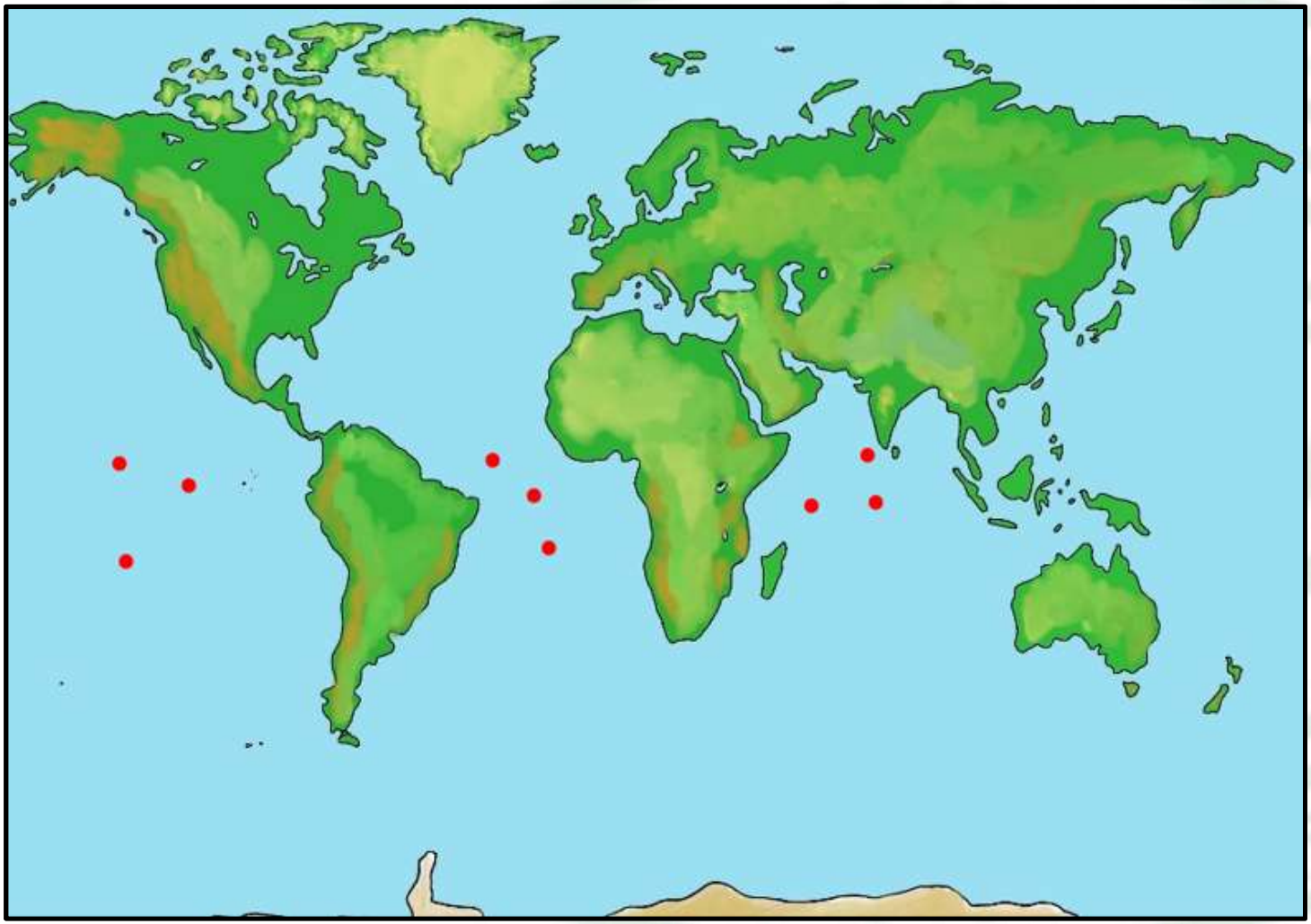
Phylum- Chordata (Deuterostome, Presence of notochord, nerve chord and pharyngeal gill slits)
Sub-phylum- Vertebrata (Notochord replaced by vertebral column)
Superclass - Gnathostomata (Jaw present, paired appendages)
Class - Reptilia (cold blooded, terrestrial or aquatic amphibious, monocondylic skull, respiration through lungs)
Subclass – Anapsida (Primitive reptiles, skull with solid roof, temporal fossae absent)
Order - Chelonia (Toothless jaws with horny sheath)
Genus – *Chelone* (Green turtle)

IDENTIFYING FEATURES:

- The head has a small snout and covered with one pair of prefrontal shields.
- The dorsal part is called carapace and ventral is called plastron
- Eyes have eyelids and nictitating membrane
- They have the ability to retractile their head, limbs and tail inside the carapace

VIDEO LINK:

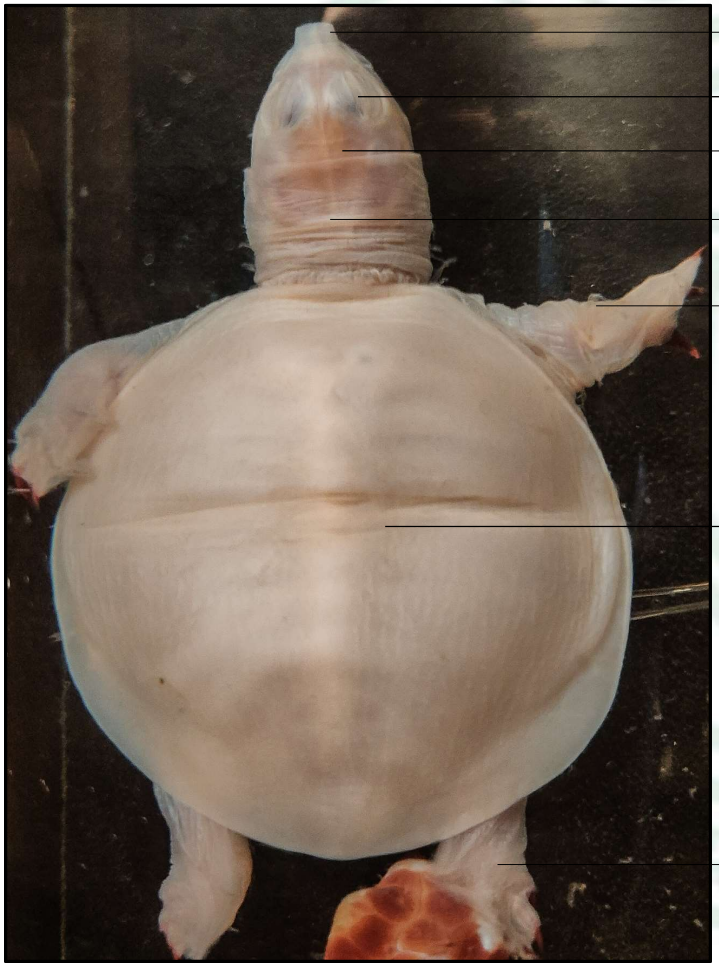
https://www.youtube.com/watch?v=rmyhkTHDejM&ab_channel=DeepMarineScenes



Geographical Distribution: Indian, Pacific and Atlantic Oceans

Habitat: Marine reptile, feeds on sea grasses and algae

Trionyx



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Class - Reptilia (cold blooded, terrestrial or aquatic amphibious, monocondylic skull, respiration through lungs)

Subclass – Anapsida (Primitive reptiles, skull with solid roof, temporal fossae absent)

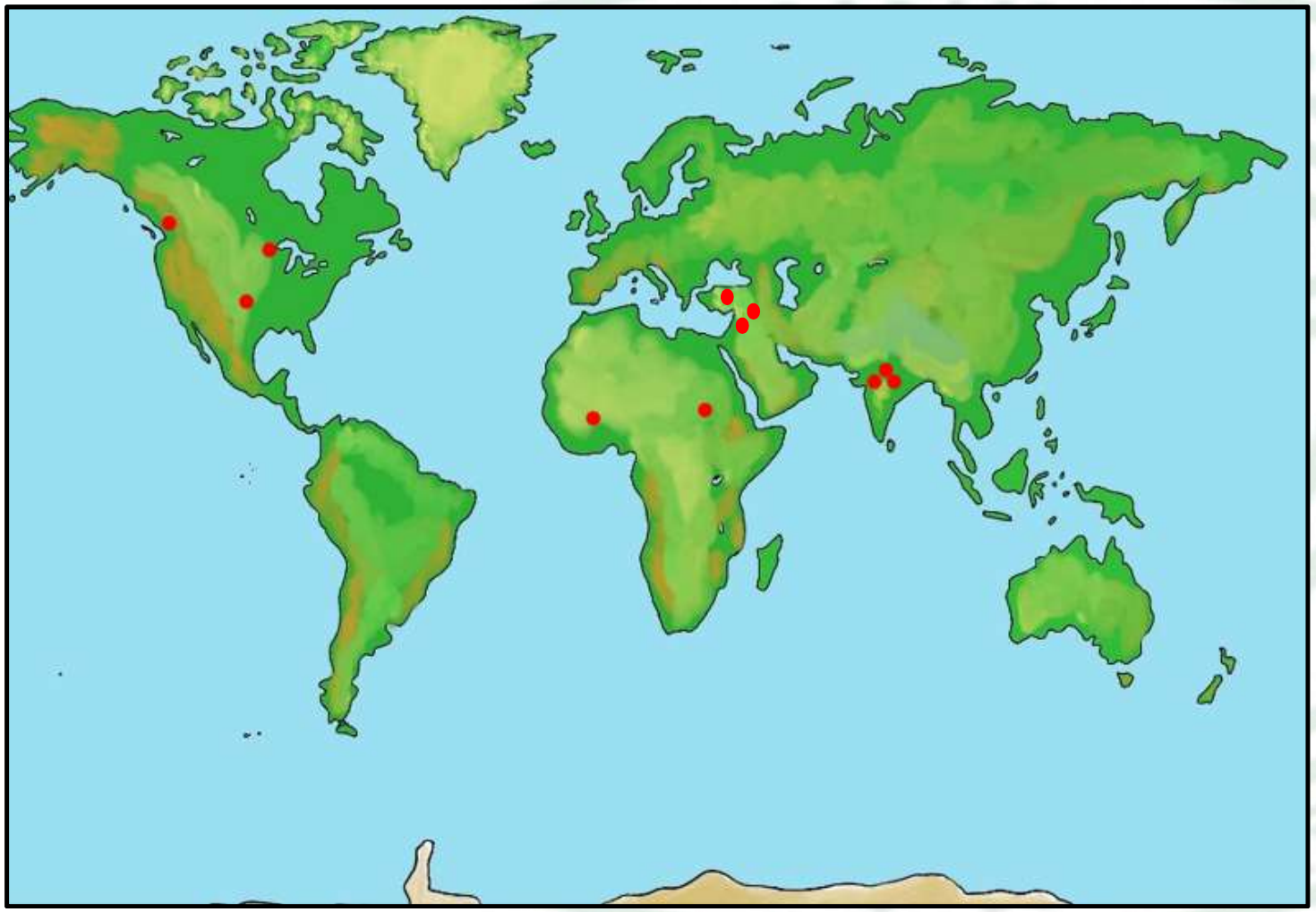
Order - Chelonia (Toothless jaws with horny sheath)

Genus - *Trionyx* (Soft river terrapine)

IDENTIFYING FEATURES:

- The body is covered by carapace dorsally and plastron ventrally, the shell is covered with soft skin.
- The head is triangular and extends proboscis formed by the nose.
- The jaw is covered with horny sheath and toothless.
- The limbs possess clawed digits, five in each limb

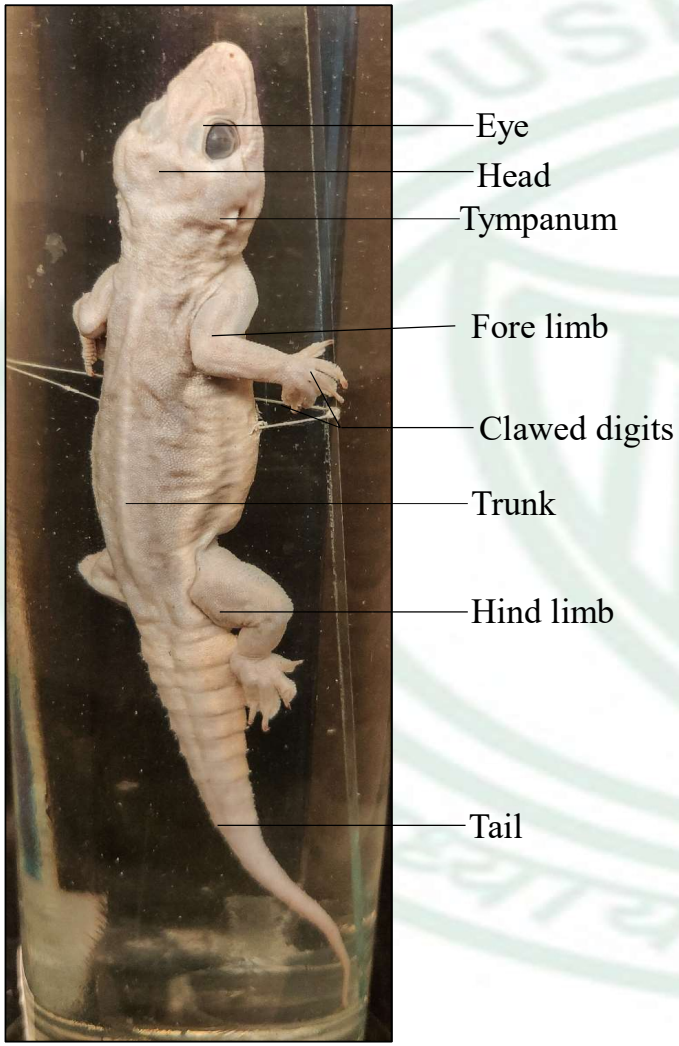
VIDEO LINK: https://www.youtube.com/watch?v=b7_3SRO-GzU&ab_channel=jimboLovitsz



Geographical Distribution: Africa, middle East (Israel, Lebanon, Syria and Turkey), India, USA

Habitat: Found in freshwater rivers, streams and estuaries. It is omnivorous and feeds on molluscs, worms, algae and aquatic weeds.

Hemidactylus



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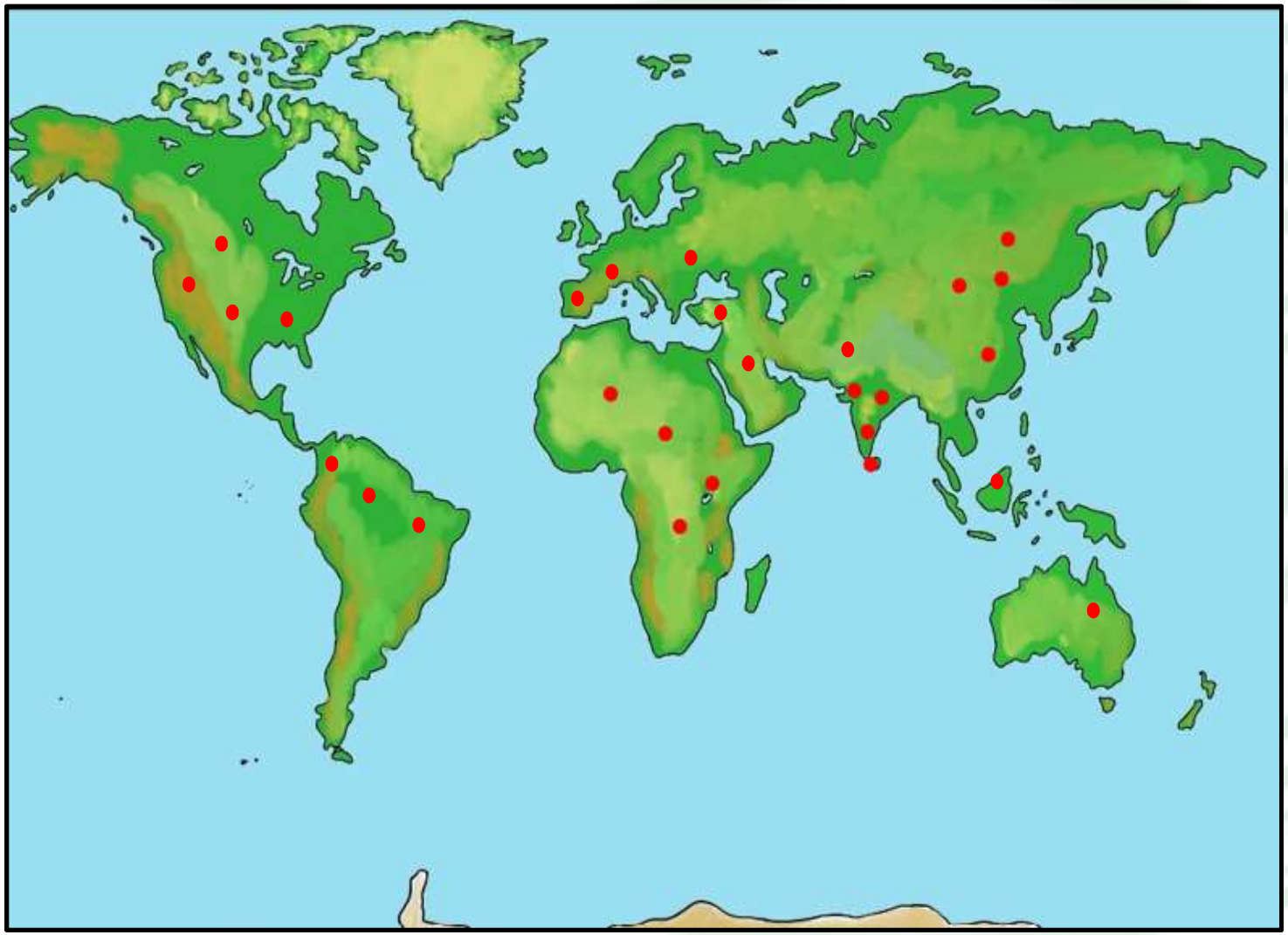
Class - Reptilia (cold blooded, terrestrial or aquatic amphibious, monocondylic skull, respiration through lungs)
Sub-class – Lepidosauria (Two temporal vacuities are present, Diapsid skull)
Order - Squamata (Body is covered with horny scales, pleurodont teeth, males have copulatory organs)
Suborder - Lacertilia (Arboreal, pentadactyle limbs, sternum present)
Genus - *Hemidactylus* (house lizard)

IDENTIFYING FEATURES:

- The body is distinguishable into head, trunk and tail.
- Scaly integuments cover the whole body, which is a characteristic feature.
- The broad and flat head bears a pair of eyes, vertical ear opening: tympanum, nostrils and a mouth.
- Its tongue is notched and protrusible, the stickiness enables it to catch its prey.
- The fore limbs and hind limbs contain clawed digits

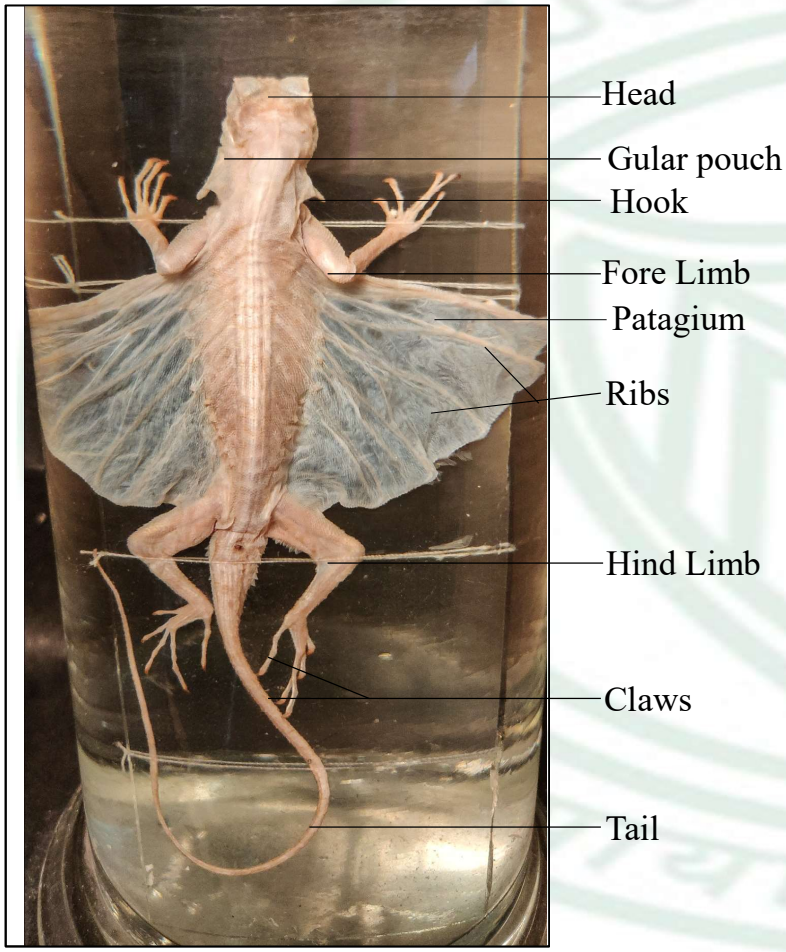
VIDEO LINK:
https://www.youtube.com/watch?v=X5If9oUvExk&ab_channel=GeorgekonstantinouCyprusWildlifetours



Geographical Distribution: Found in tropical regions of the world, in all continents except Antarctica

Habitat: Nocturnal terrestrial reptile found in proximity to urban environments, also found in open fields, rain forest, deserts, etc and eats insects.

Draco



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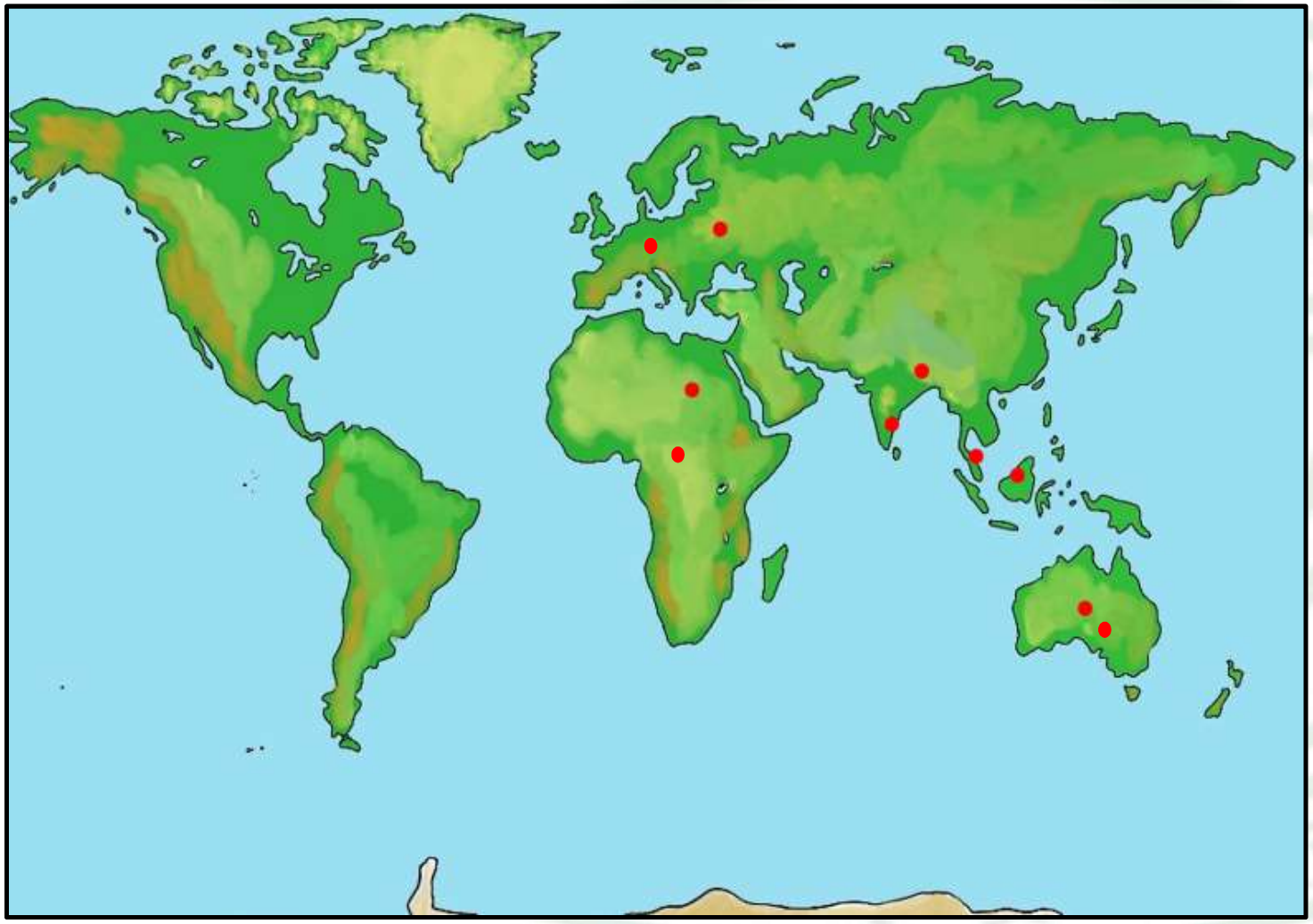
Order - Squamata (Body is covered with horny scales, pleurodont teeth, males have copulatory organs)
Suborder - Lacertilia (Arboreal, pentadactyle limbs, sternum present)
Genus – *Draco* (flying dragon or flying lizard)

IDENTIFYING FEATURES:

- The triangular shaped head has nostrils, eyes and tympanum (ear opening).
- The lower part of neck has gular pouch
- On both sides of the body the skin extends to form patagium. The patagium is supported by ribs. Since it is an arboreal creature the patagium helps in gliding from the trees.

VIDEO LINK:

https://www.youtube.com/watch?v=a94DNeLh6r0&ab_channel=BBC



Geographical Distribution: Asia (Myanmar, India, Malayasia) Europe, Africa, and Australia

Habitat: Arboreal reptiles found in Tropical rainforests feeds on ants and termites.

Chamaeleon

CLASSIFICATION

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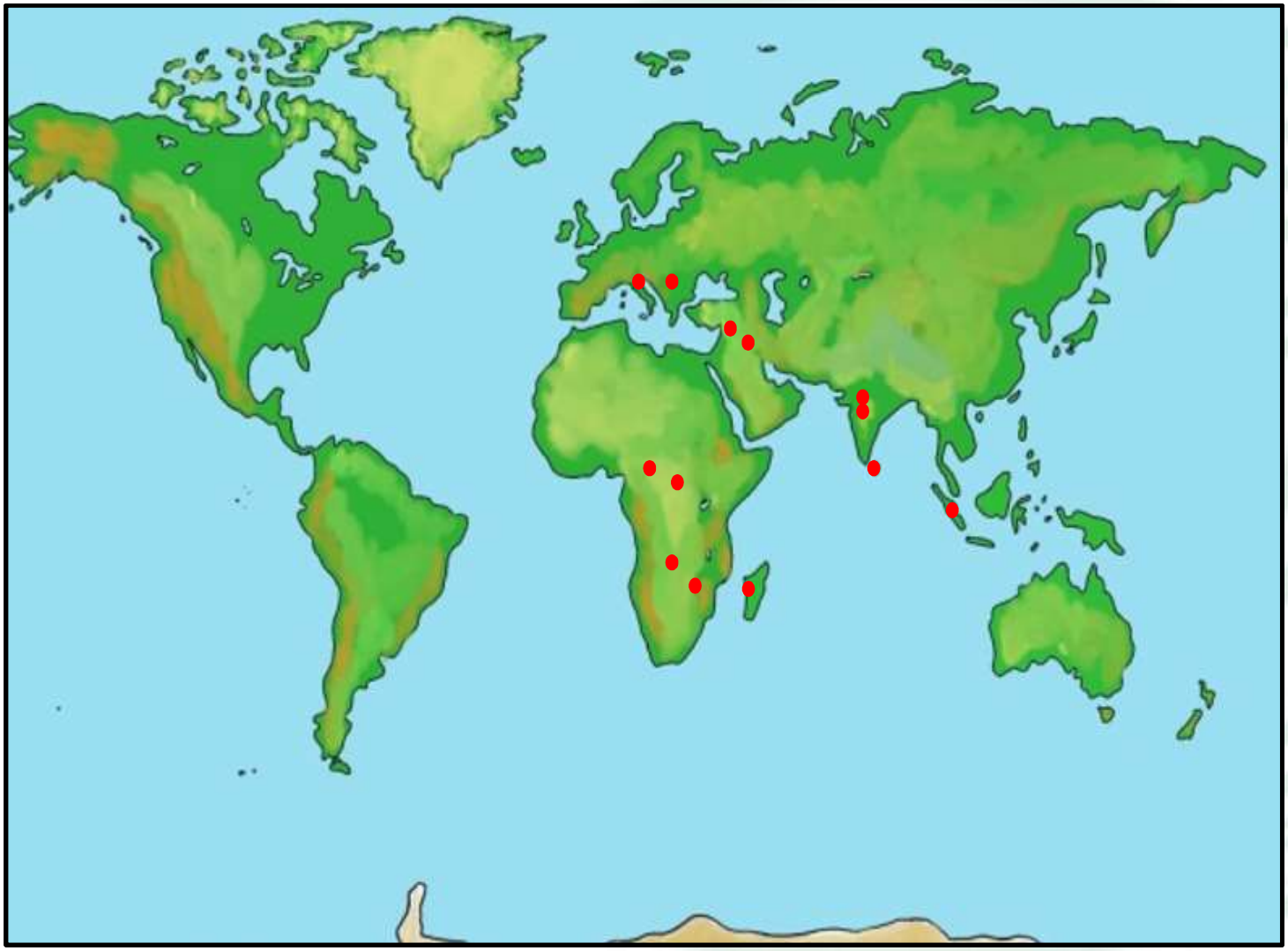
Sub-phylum- Vertebrata (Notochord replaced by vertebral column)
Superclass - Gnathostomata (Jaw present, paired appendages)
Class - Reptilia (cold blooded, terrestrial or aquatic amphibious, monocondylic skull, respiration through lungs)
Sub-class – Lepidosauria (Two temporal vacuities are present, Diapsid skull)
Order - Squamata (Body is covered with horny scales, pleurodont teeth, males have copulatory organs)
Suborder - Lacertilia (Arboreal, pentadactyle limbs, sternum present)
Genus – *Chamaeleon*

IDENTIFYING FEATURES

- Tongue is extremely protrusible and helps in catching prey.
- Tail is also long and prehensile and allows the *Chamaeleon* to sit on trees.
- Long and slender limbs are present. The digits show syndactyly, i.e. they form groups of three and two.
- Long and prehensile tail.

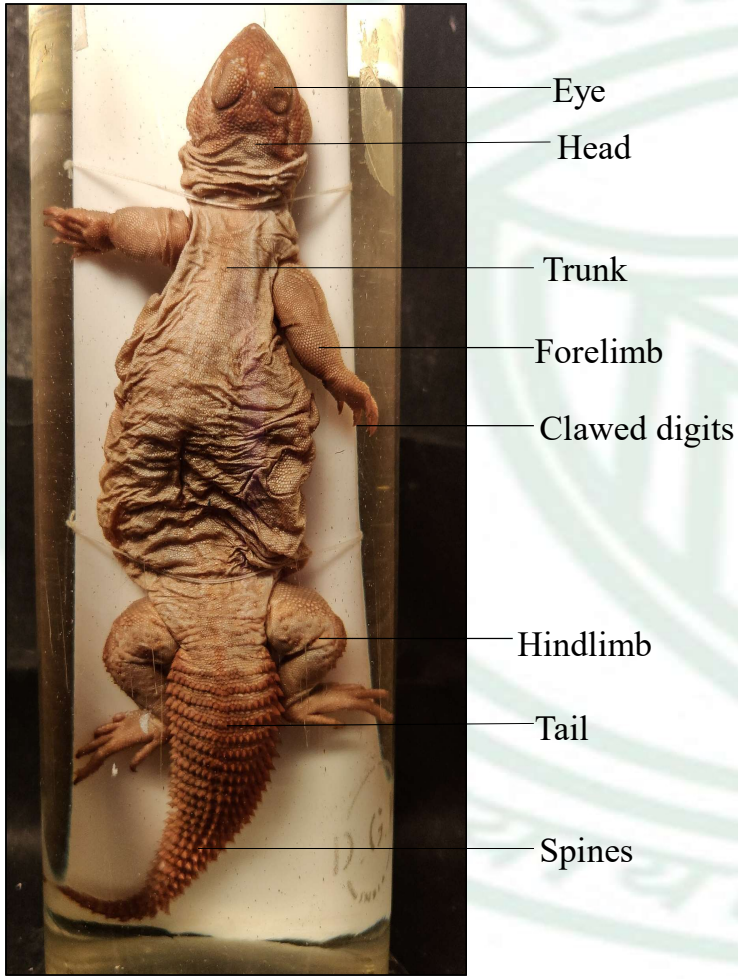
VIDEO LINK-
https://www.youtube.com/watch?v=yMYV7heOkUA&ab_channel=FreeDocumentary-Nature



Geographical Distribution: Sub Saharan Africa, Madagascar, Southern Europe, Middle East, India, Sri Lanka.

Habitat: Found in rainforests and Deserts, diet includes variety of Insects.

Uromastix



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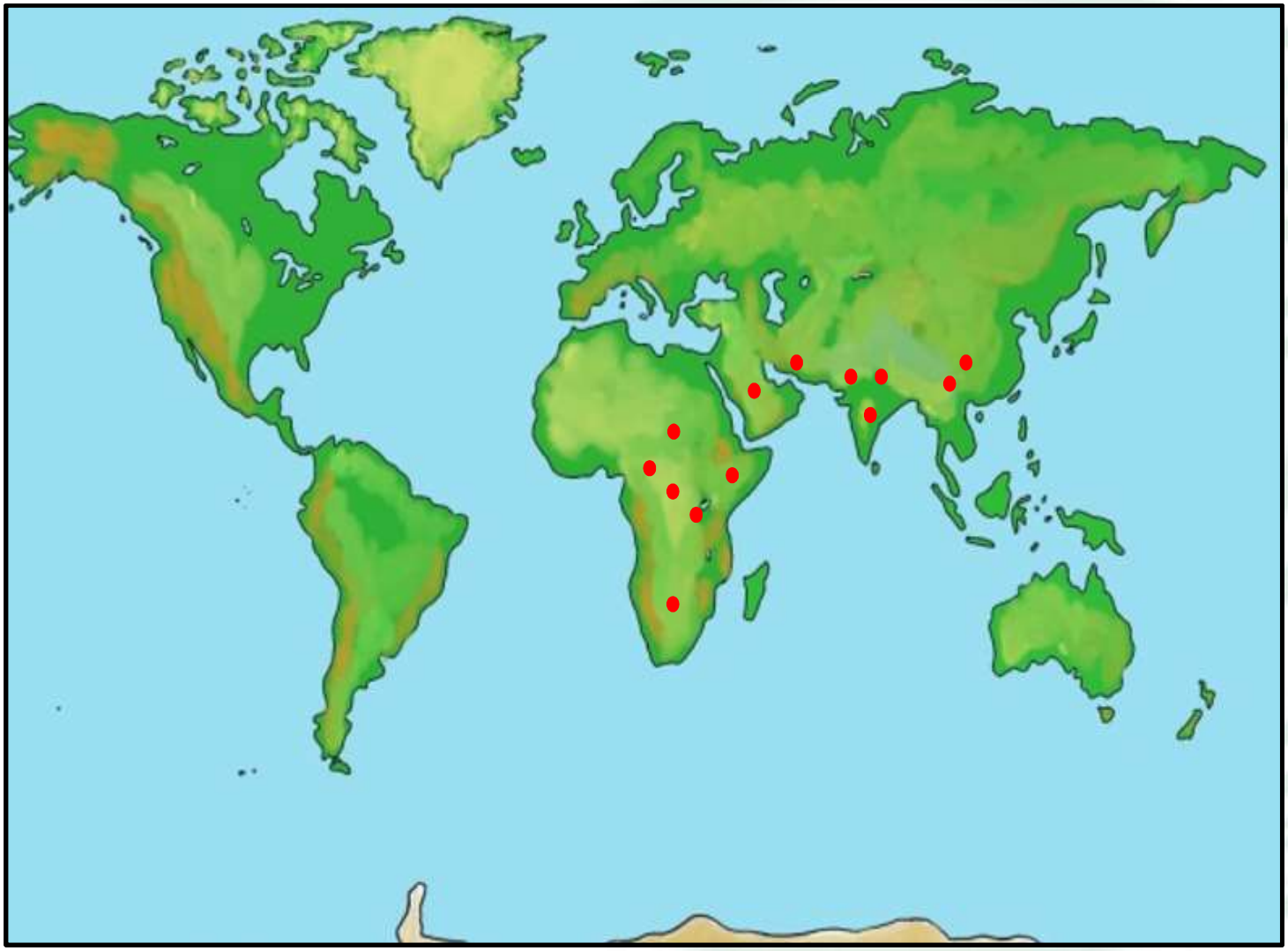
Order - Squamata (Body is covered with horny scales, pleurodont teeth, males have copulatory organs)
Suborder - Lacertilia (Arboreal, pentadactyle limbs, sternum present)
Genus – *Uromastix* (Spiny tailed lizard)

IDENTIFYING FEATURES

- Body is bulky and with a triangular head and a tail
- Head produced into a short and curved snout in front
- Tail has large spikes from base to the tip.
- Horny overlapping epidermal scales cover the entire body surface

VIDEO LINK-

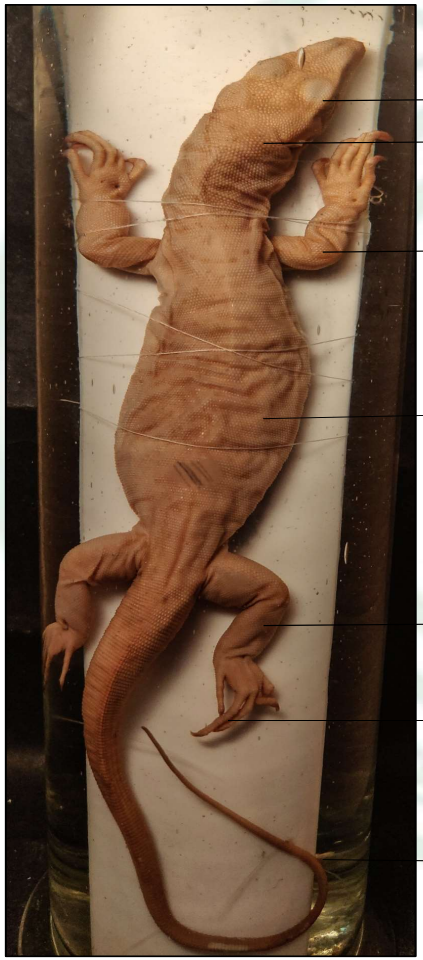
https://www.youtube.com/watch?v=ewi1pfpPw9g&ab_channel=AnimalPlanet



Geographical Distribution: Found in Asia and Africa

Habitat: Found in rocky crevices, burrows and sandy deserts. Feeds on plants and seeds and occasionally insects.

Varanus



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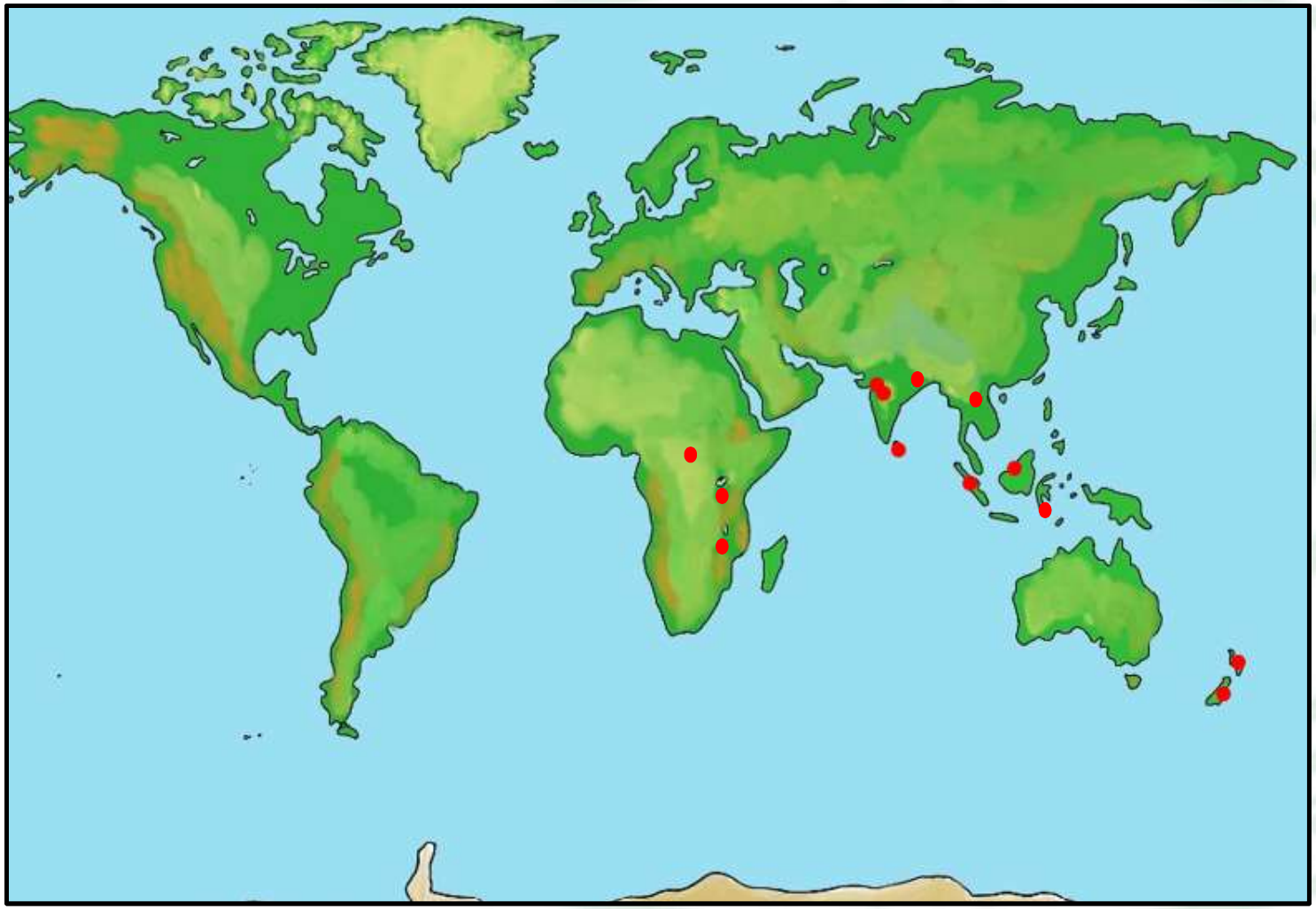
Order - Squamata (Body is covered with horny scales, pleurodont teeth, males have copulatory organs)
Suborder - Lacertilia (Arboreal, pentadactyle limbs, sternum present)
Genus – *Varanus* (Monitor lizard)

IDENTIFYING FEATURES:

- Elongated trunk and stout long tail
- Scales cover the entire body
- The forelimbs and hindlimbs are stout with clawed digits, they are unable to lift up the body from the ground.
- The tail is elongated and thick due to storage of fat.

VIDEO LINK- https://www.youtube.com/watch?v=2dm-SsZAxBY&ab_channel=WildlifeInstituteofIndia%2CDehradun



Geographical Distribution: Found in Asia, Africa and some islands in Pacific ocean

Habitat: Semi aquatic, found near river banks and swamps. Diet includes small mammals, birds, reptiles, fishes, arthropods, eggs, crustaceans, and mollusks

Ophisaurus

CLASSIFICATION

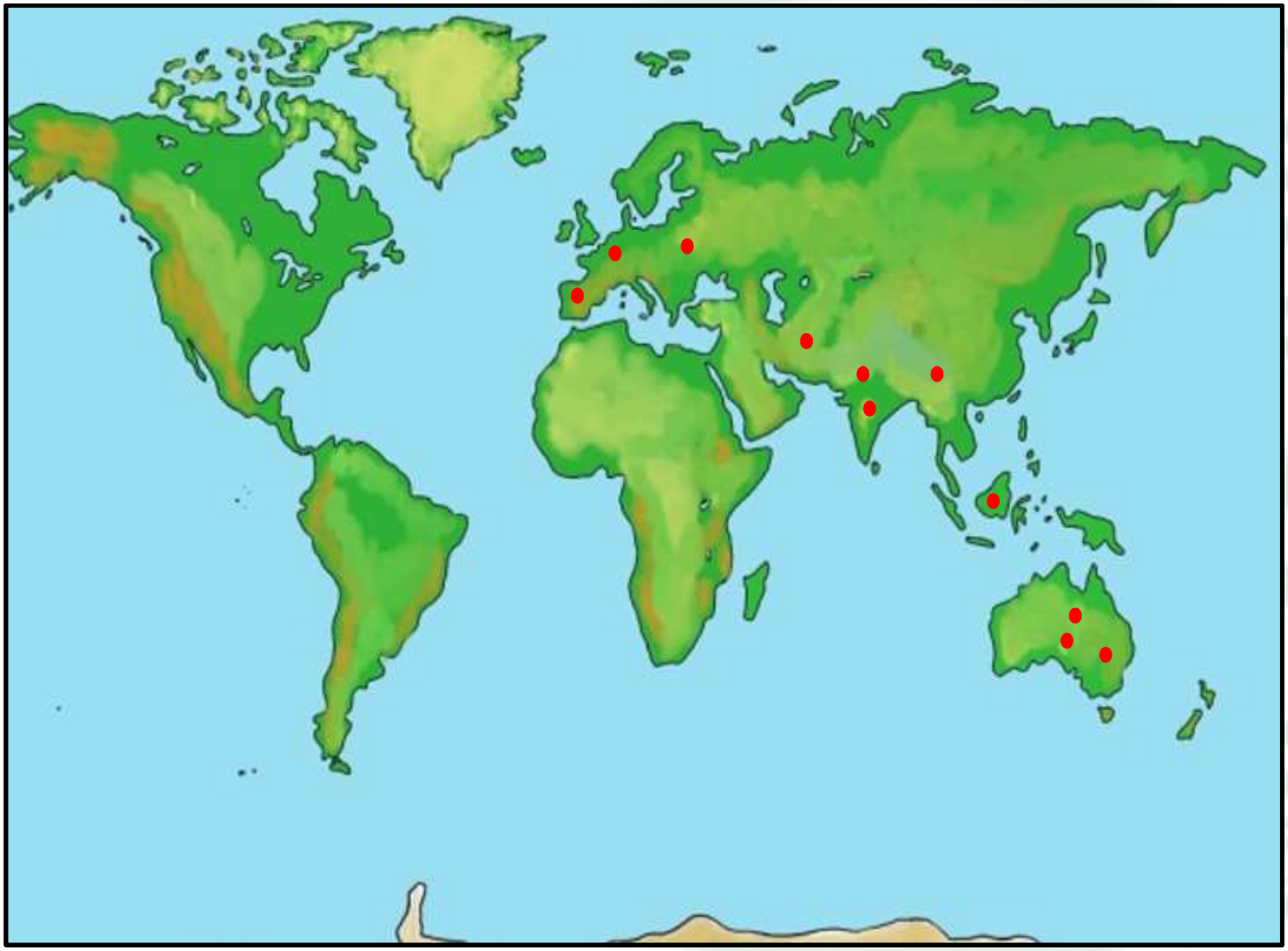
Phylum- Chordata (Deuterostome, Presence of notochord, nerve chord and pharyngeal gill slits)
Sub-phylum- Vertebrata (Notochord replaced by vertebral column)
Superclass - Gnathostomata (Jaw present, paired appendages)
Class - Reptilia (cold blooded, terrestrial or aquatic amphibious, monocondylic skull, respiration through lungs)
Sub-class – Lepidosauria (Two temporal vacuities are present, Diapsid skull)
Order - Squamata (Body is covered with horny scales, pleurodont teeth, males have copulatory organs)
Suborder - Lacertilia (Arboreal, pentadactyle limbs, sternum present)
Genus – *Ophisaurus* (Glass snake)

IDENTIFYING FEATURES

- Long tail and body but the head is of a typical lizard.
- Limbs are highly reduced and defunct (limbless lizard). They are present as cloacal spikes at the sides of the cloacal opening.
- Longitudinal folds of skin are present on the lateral sides of the body
- Tongue has two distinct portions. The anterior portion is thin, emarginated, extensile and retractile into the posterior wider portion

VIDEO LINK-

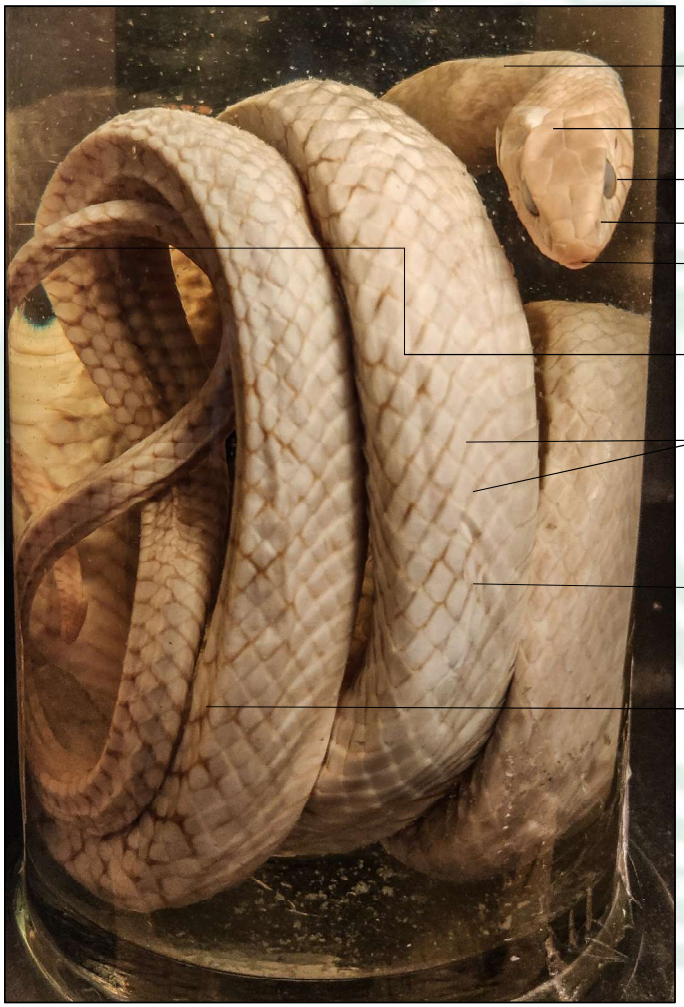
https://www.youtube.com/watch?v=Mhflbu15BII&ab_channel=NatGeoWILD



Geographical Distribution: Europe, Asia and Australia

Habitat: Found in dry habitats such as rocky hillsides, lowland grasslands, woodland. Diet includes primarily of arthropods, with larger animals eating snails and small mammals.

Zamenis



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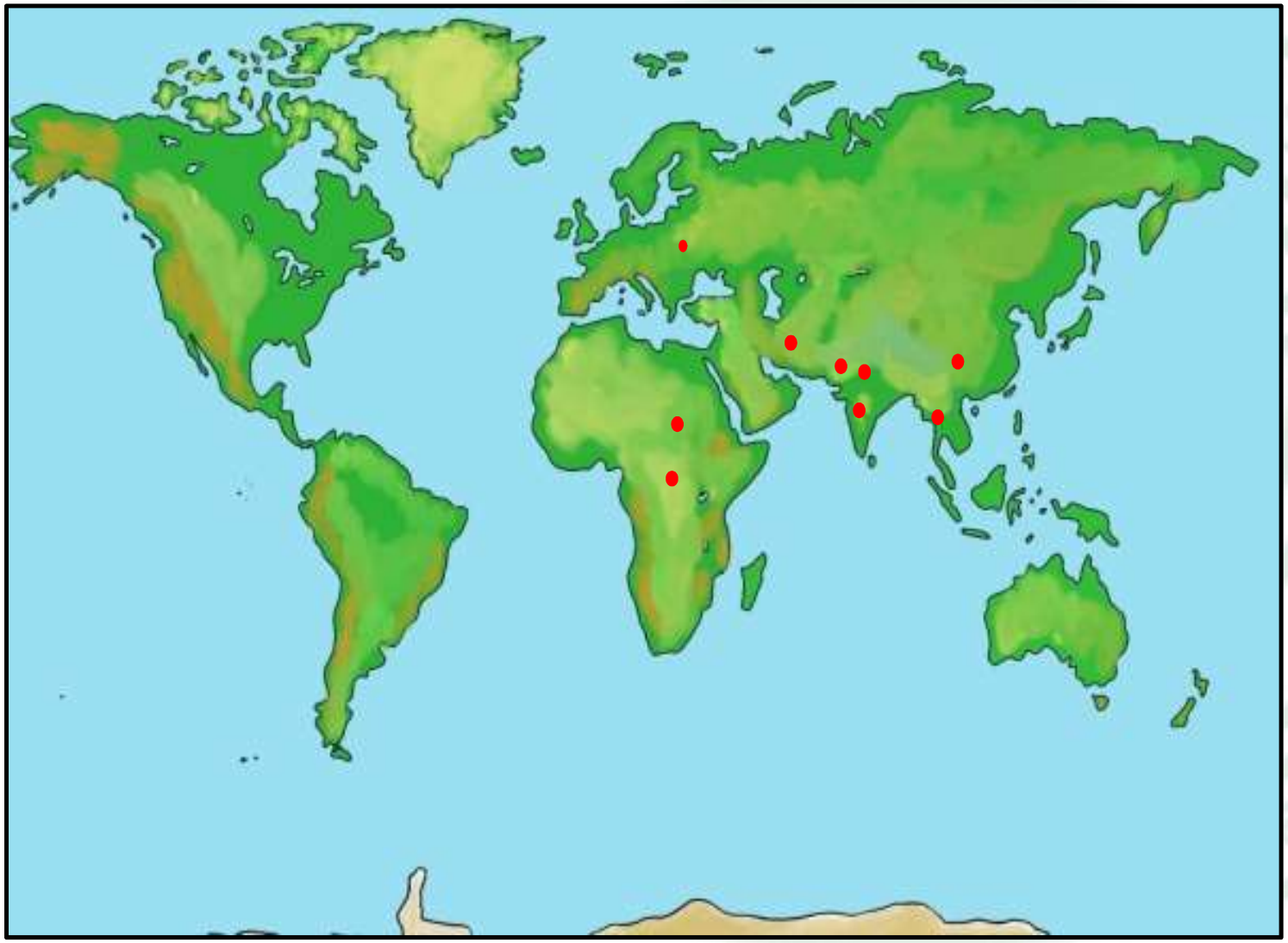
Class - Reptilia (cold blooded, terrestrial or aquatic amphibious, monocondylic skull, respiration through lungs)
Sub-class – Lepidosauria (Two temporal vacuities are present, Diapsid skull)
Order - Squamata (Body is covered with horny scales, pleurodont teeth, males have copulatory organs)
Sub Order – Ophidia (snakes)
Genus – *Zamenis* (Rat snake)

IDENTIFYING FEATURES

- Body has keeled scales that form 16-17 rows
- A protuberant dorsal-ridge formed by the back bone is present along the mid-dorsal line.
- Distinct head and neck, the head bears round pupils, nostrils and mouth.
- Fourth and fifth supra-labials touch the eye.
- Tail is very long and prehensile.

- VIDEO LINK - https://www.youtube.com/watch?v=RC2xHZVuuo0&ab_channel=LivingZoology



Geographical Distribution: Found in Asia and Africa

Habitat: Arid land, open fields, farmland, coastal regions, freshwater or brackish water wetlands. Diet includes rodents, shrews and moles.

Naja

CLASSIFICATION:

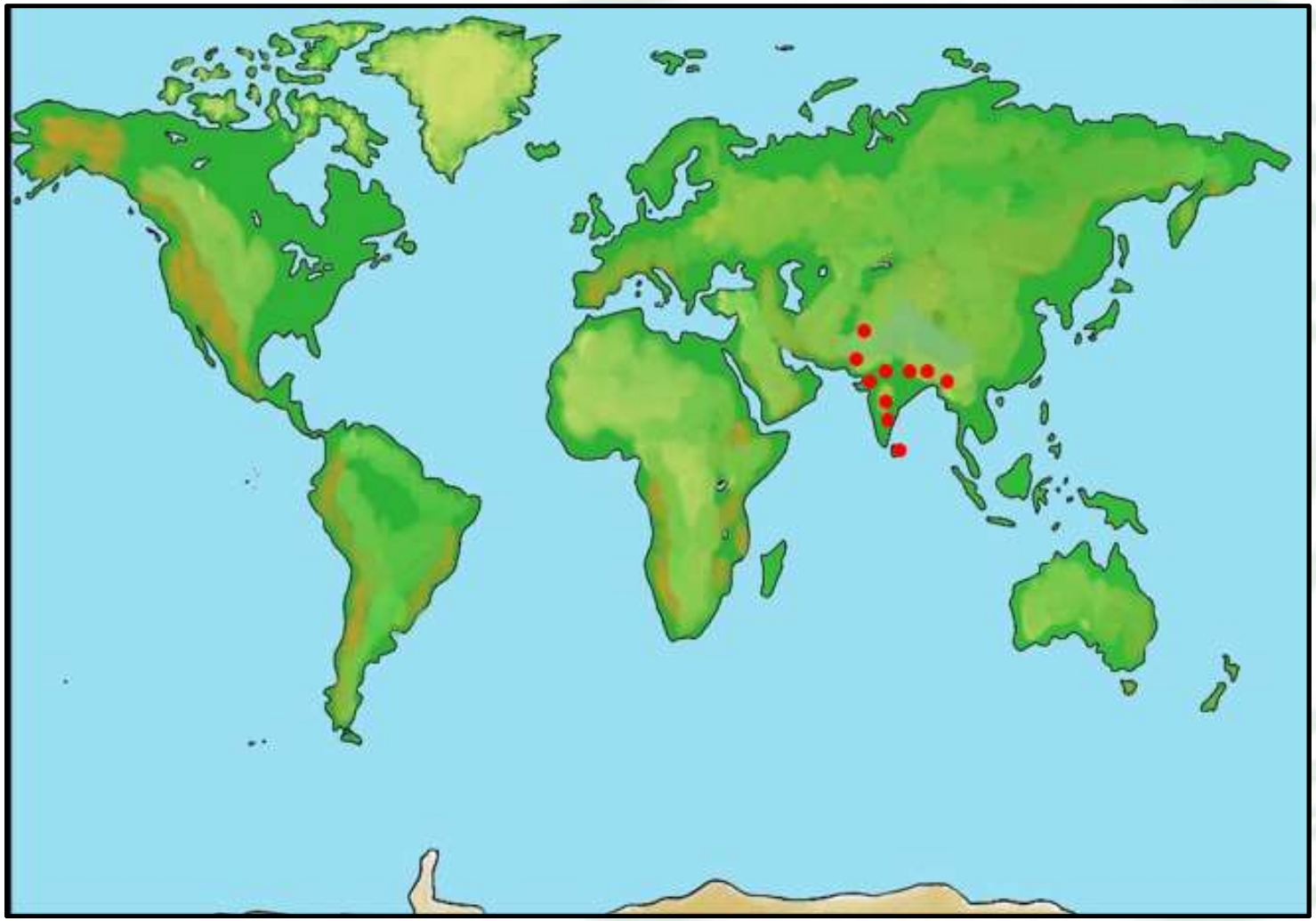
Phylum- Chordata (Deuterostome, Presence of notochord, nerve chord and pharyngeal gill slits)
Sub-phylum- Vertebrata (Notochord replaced by vertebral column)
Superclass - Gnathostomata (Jaw present, paired appendages)
Class - Reptilia (cold blooded, terrestrial or aquatic amphibious, monocondylic skull, respiration through lungs)
Sub-class – Lepidosauria (Two temporal vacuities are present, Diapsid skull)
Order - Squamata (Body is covered with horny scales, pleurodont teeth, males have copulatory organs)
Sub Order – Ophidia (snakes)
Genus: *Naja* (Indian Cobra)

IDENTIFYING FEATURES:

- It has a characteristic hood with a binocellate mark.
- It is a venomous snake.
- The scales covering the undersurface of body are broad ventral scales and rest is covered with oblique dorsal scales.
- The third supralabial shield touches the eye and nostril.

VIDEO LINK

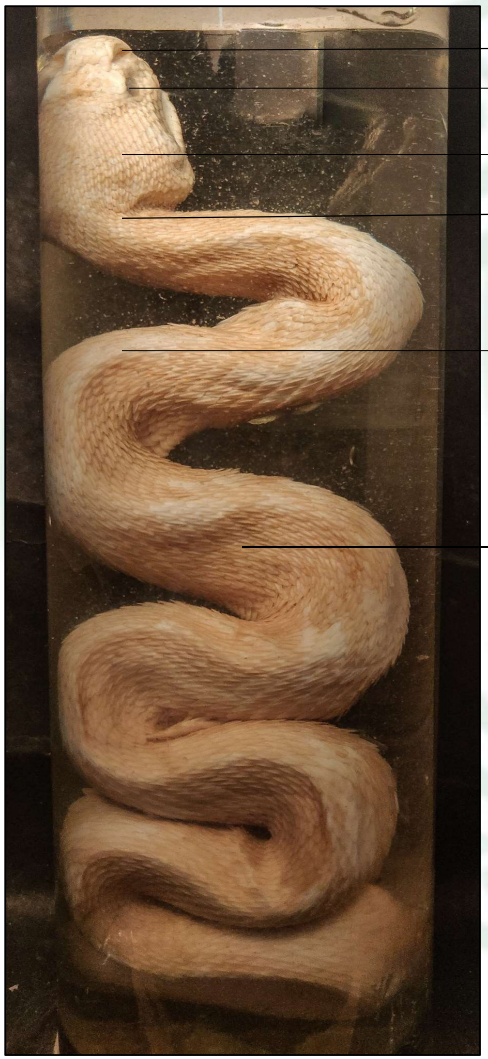
https://www.youtube.com/watch?v=ofrQskZk_qM&ab_channel=AnimalGlobe



Geographical Distribution: India, Pakistan, Bangladesh, Nepal and Bhutan

Habitat: Diet includes frogs, birds and other snakes.

Viper



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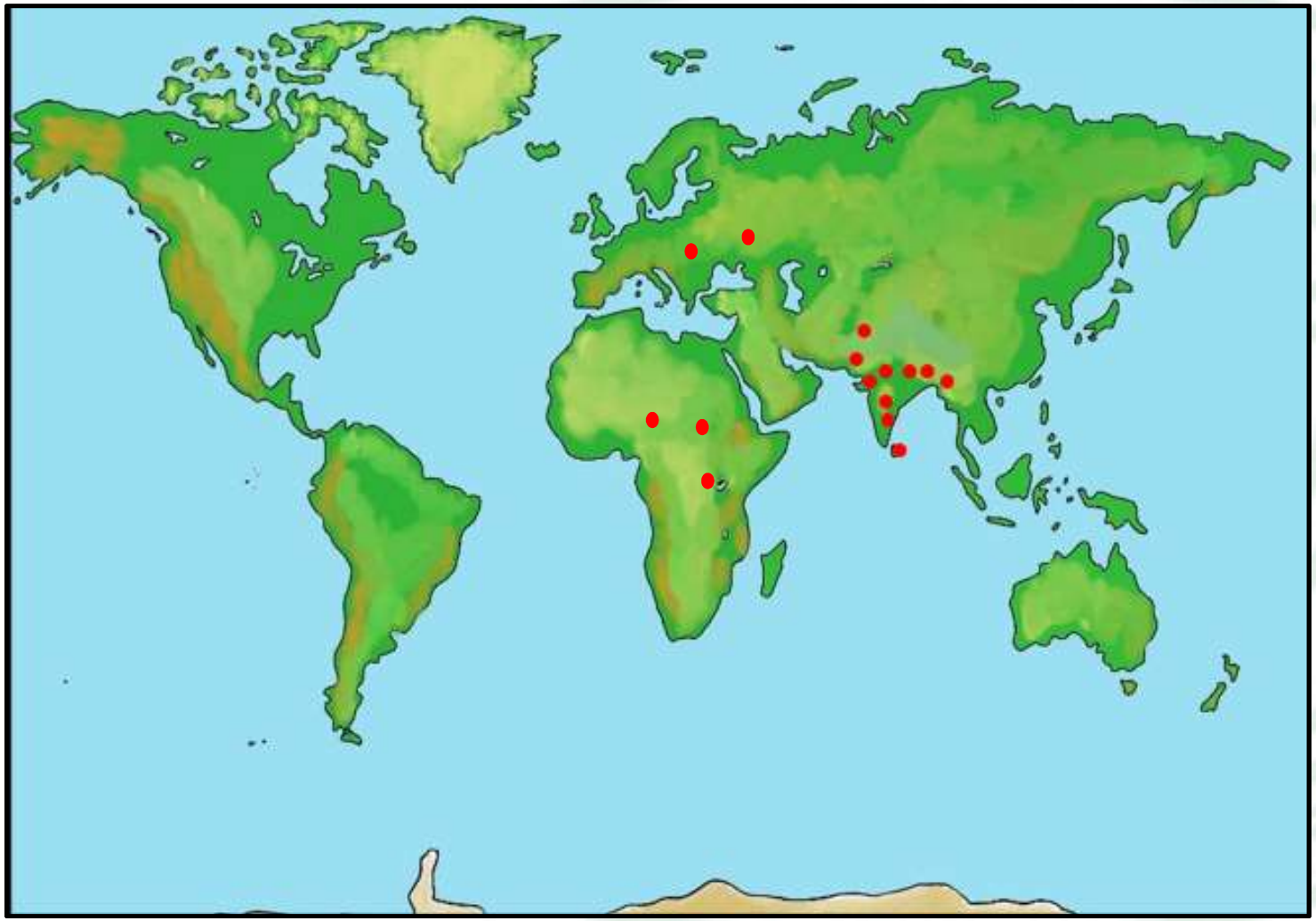
Order - Squamata (Body is covered with horny scales, pleurodont teeth, males have copulatory organs)
Sub Order – Ophidia (snakes)
Genus – *Viper*

IDENTIFYING FEATURES

- Elongated body with upper pale brown surface bearing three longitudinal series of black spots and underparts are yellowish white.
- Triangular head with angulate snout.

VIDEO LINK

Not available



Geographical Distribution: Europe, Asia, Sri Lanka, Myanmar and India

Habitat: Live in **desert to forest habitats of Europe, Asia, and Africa**

Hydrophis

CLASSIFICATION:

Phylum- Chordata (Deuterostome, Presence of notochord, nerve chord and pharyngeal gill slits)

Sub-phylum- Vertebrata (Notochord replaced by vertebral column)

Superclass - Gnathostomata (Jaw present, paired appendages)

Class - Reptilia (cold blooded, terrestrial or aquatic amphibious, monocondylic skull, respiration through lungs)

Sub-class – Lepidosauria (Two temporal vacuities are present, Diapsid skull)

Order - Squamata (Body is covered with horny scales, pleurodont teeth, males have copulatory organs)

Sub Order – Ophidia (snakes)

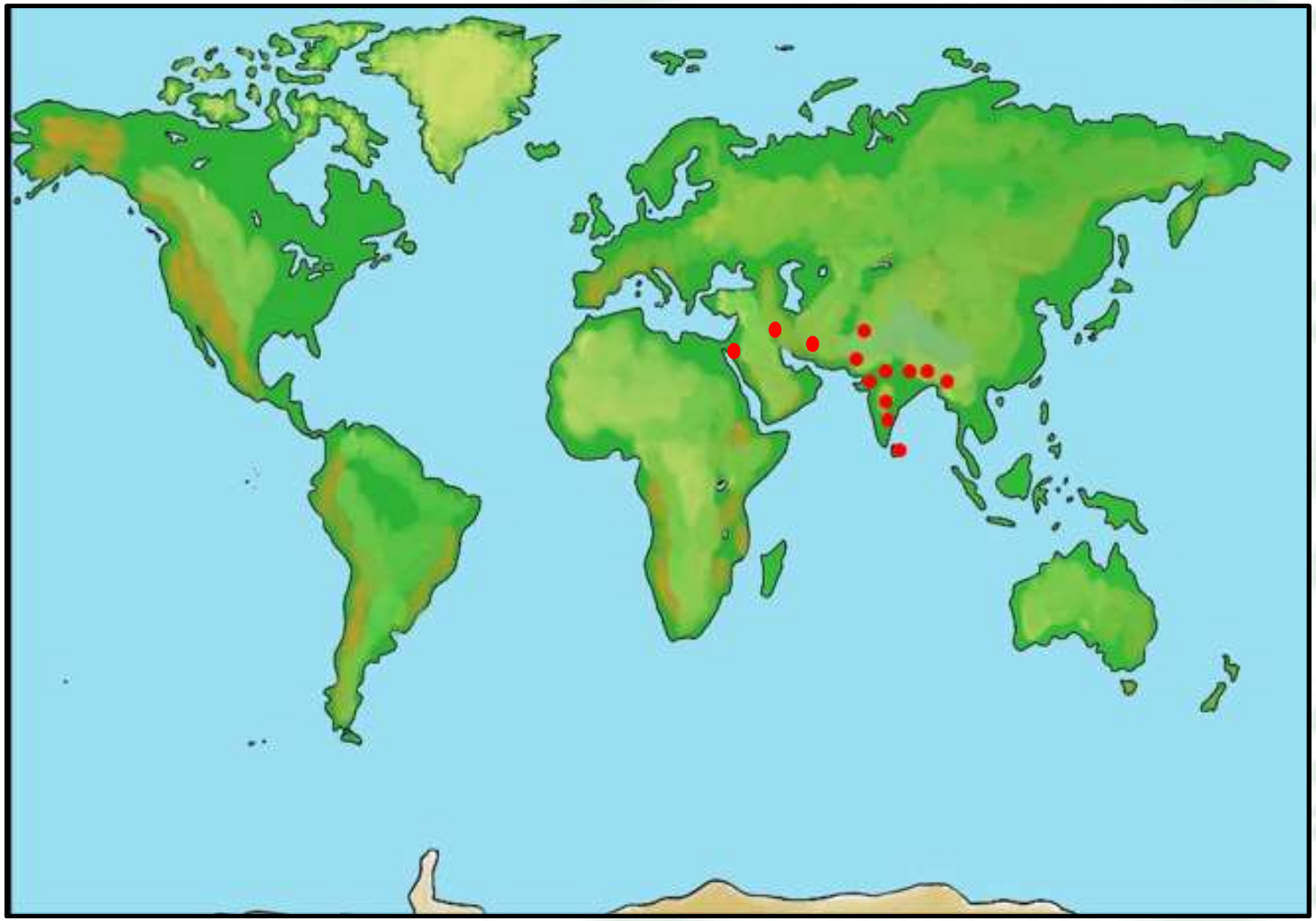
Genus - *Hydrophis*(Sea snake)

IDENTIFYING FEATURE:

➢It has a flattened oar like tail and laterally compressed body

VIDEO LINK

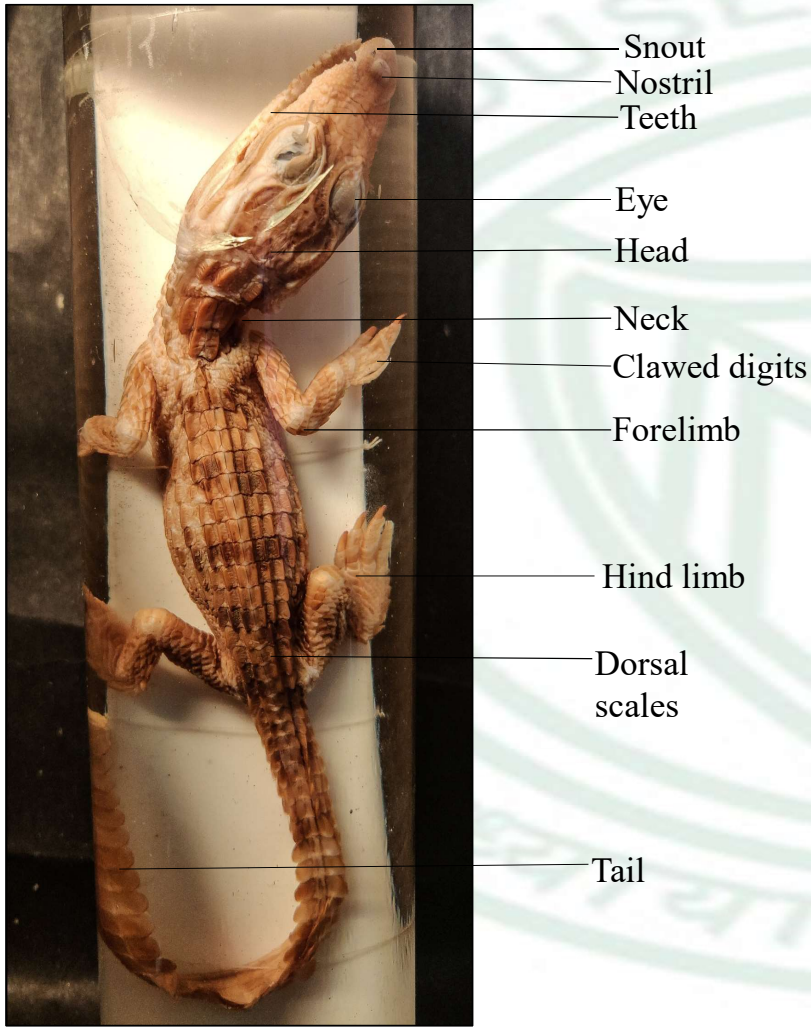
https://www.youtube.com/watch?v=AVxMbNs9OO0



Geographical Distribution: Indian Ocean (Persian Gulf, off the coasts of Oman, United Arab Emirates, Iran, Iraq, Saudi Arabia, Bahrain and Kuwait

Habitat: found in muddy, sandy ocean bottoms.

Crocodylus



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Class - Reptilia (cold blooded, terrestrial or aquatic amphibious, monocondylic skull, respiration through lungs)

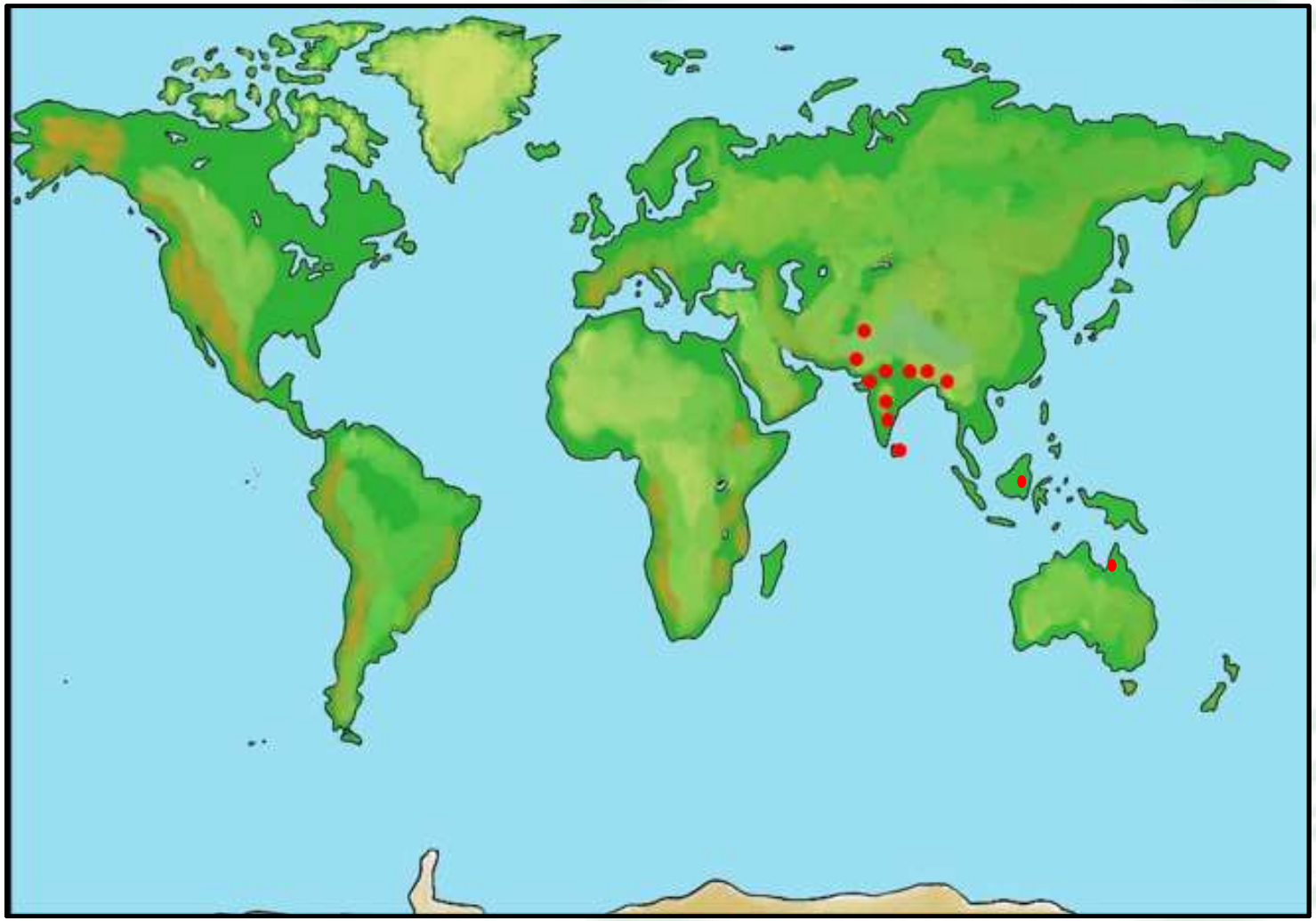
Sub class – Archosauria (Closed upper temporal vacuity in skull and possesses both the temporal arches, thecodont teeth, amphicoelus or procoelous)

Order – Crodilia (Exoskeleton of thick horny epidermal scales, laterally compressed tail, proceolous, immovable quadrate, uncinate processes in thoracic ribs)

Genus – *Crocodylus* (Marsh-crocodile)

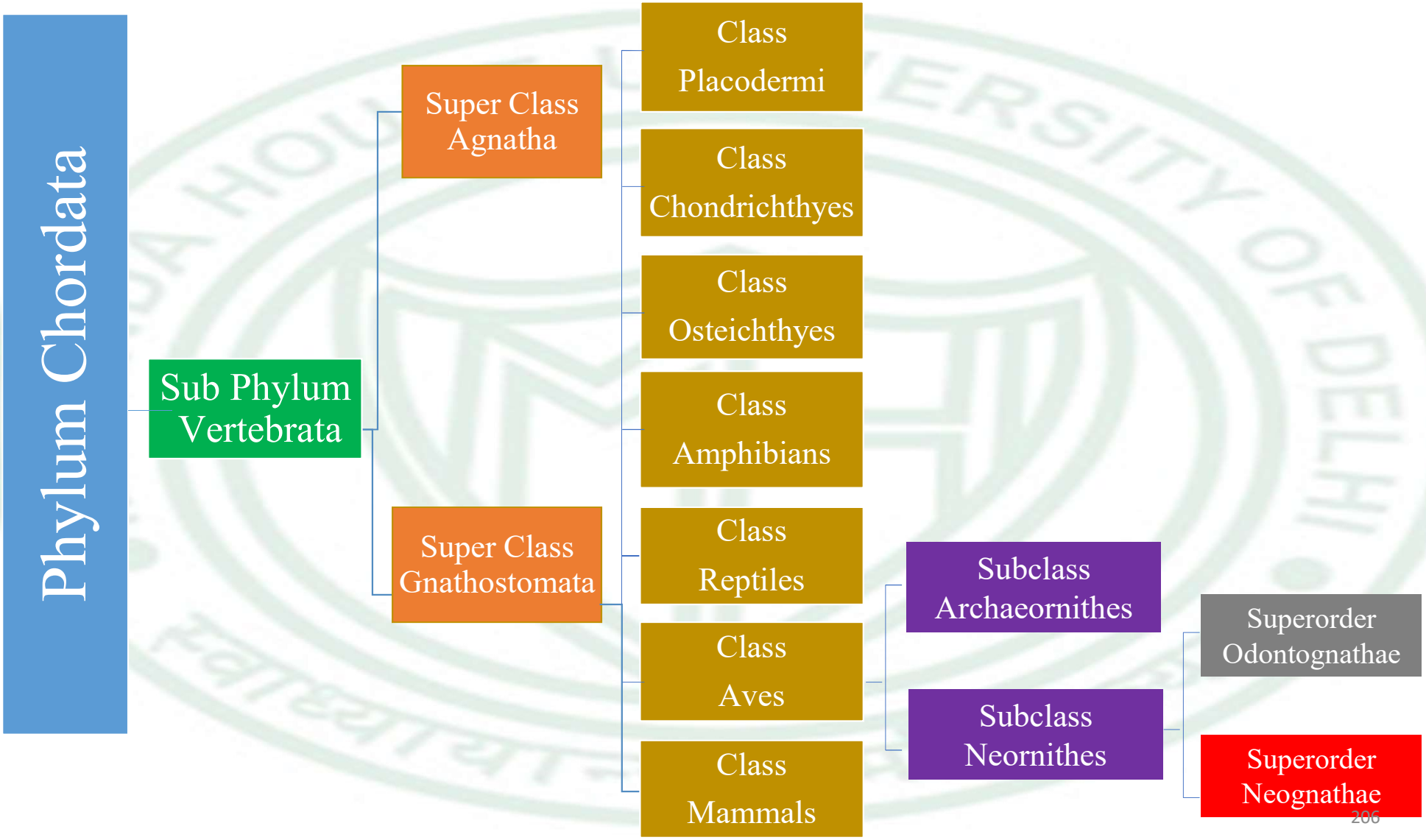
IDENTIFYING FEATURES

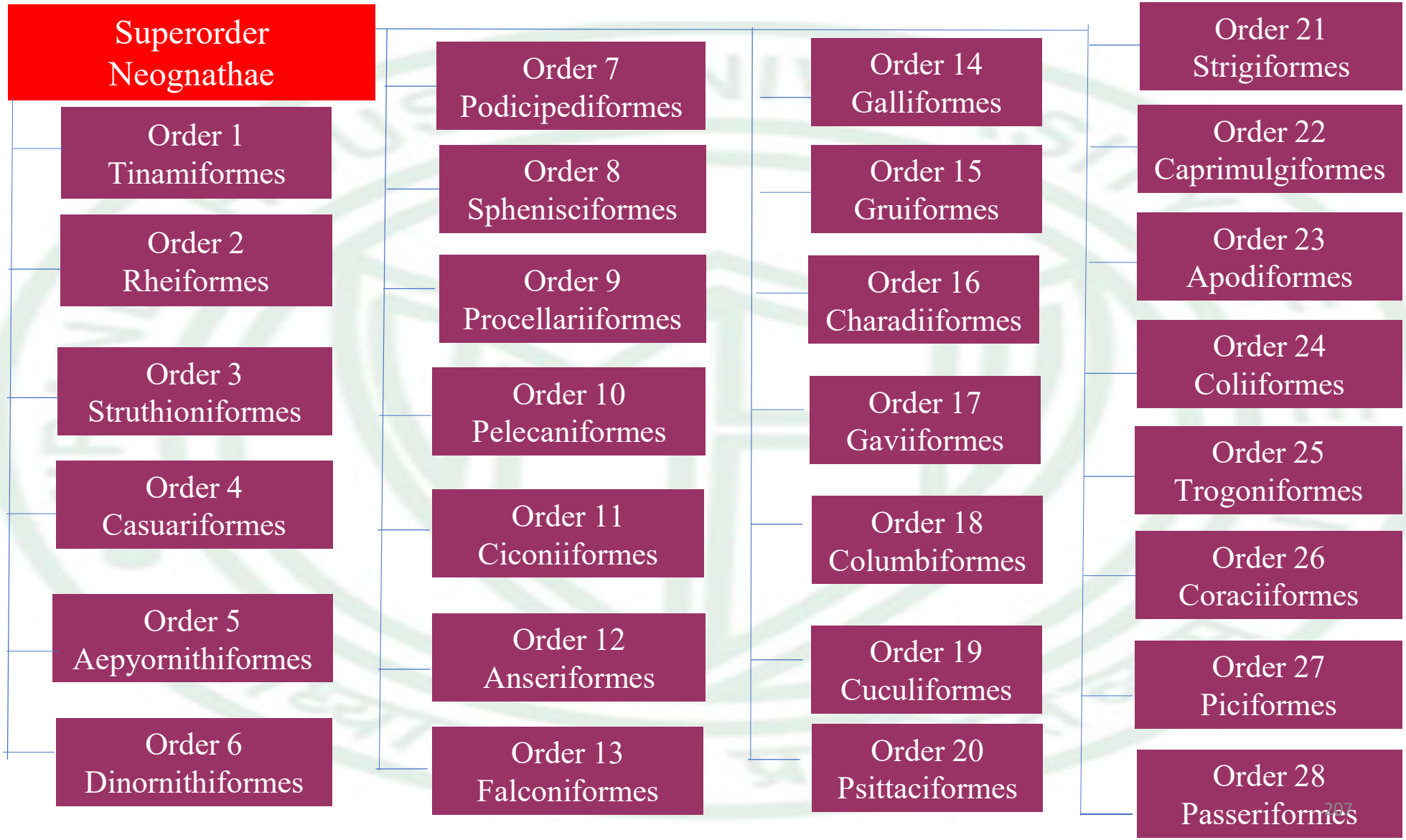
- Triangular head, with broad snout.
- Body exoskeleton is composed of thick horny epidermal scales provided with dermal bony plates.



Geographical Distribution: India's east coast across Southeast Asia and the Sundaic region to northern Australia and Micronesia

Habitat: native to **saltwater habitats and brackish wetlands**


Phylum Chordata
Sub Phylum Vertebrata
Super Class Agnatha
Super Class Gnathostomata
Class Placodermi
Class Chondrichthyes
Class Osteichthyes
Class Amphibians
Class Reptiles
Class Aves
Class Mammals
Subclass Archaeornithes
Subclass Neornithes
Superorder Odontognathae
Superorder Neognathae


Superorder Neognathae
Order 1 Tinamiformes
Order 2 Rheiformes
Order 3 Struthioniformes
Order 4 Casuariformes
Order 5 Aepyornithiformes
Order 6 Dinornithiformes
Order 7 Podicipediformes
Order 8 Sphenisciformes
Order 9 Procellariiformes
Order 10 Pelecaniformes
Order 11 Ciconiiformes
Order 12 Anseriformes
Order 13 Falconiformes
Order 14 Galliformes
Order 15 Gruiformes
Order 16 Charadiiformes
Order 17 Gaviiformes
Order 18 Columbiformes
Order 19 Cuculiformes
Order 20 Psittaciformes
Order 21 Strigiformes
Order 22 Caprimulgiformes
Order 23 Apodiformes
Order 24 Coliiformes
Order 25 Trogoniformes
Order 26 Coraciiformes
Order 27 Piciformes
Order 28 Passeriformes

Columba

CLASSIFICATION:

Phylum- Chordata (Deuterostome, Presence of notochord, nerve chord and pharyngeal gill slits)

Sub-phylum- Vertebrata (Notochord replaced by vertebral column)

Super class- Gnathostomata (Jaws are present)

Class- Aves (warm blooded, body covered in features, monocondylic skull, pneumatic bones, forelimbs modified into wings, respiration through lungs)

Subclass- Neornithes (True birds, fused metacarpals, keeled sternum)

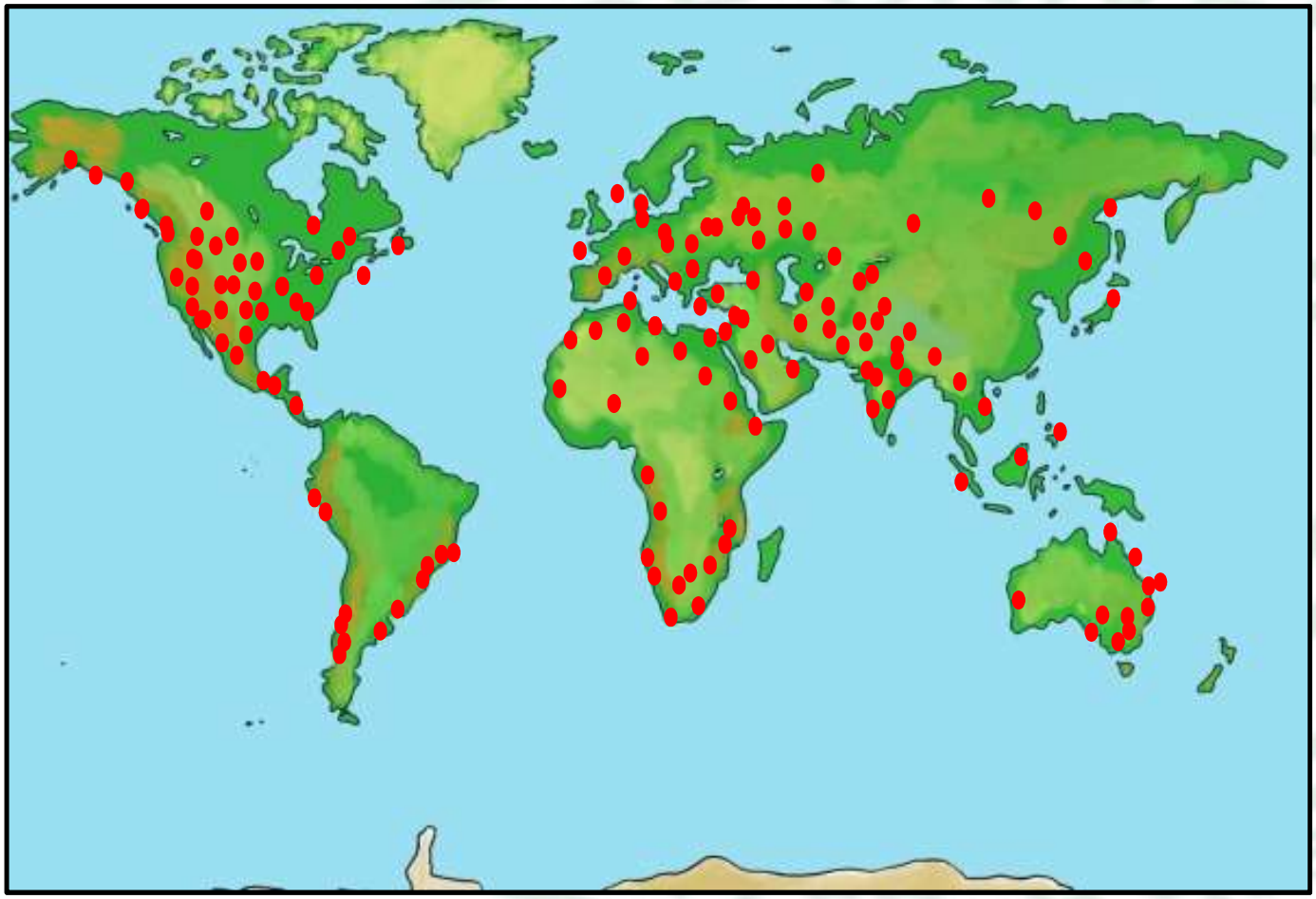
Order- Columbiformes (short and slender beak, toes are longer than tarsus)

Genus- *Columba* (Pigeon)

IDENTIFIABLE FEATURES:

- It has a short and slender seed eating beak.
- It is covered by greyish feathers.
- Anisodactyl toes, three toes pointing forward and one long toe pointing back (perching type).

VIDEO LINK:



<u>Geographical Distribution</u>: India, forested zone of the Pacific coast and United States.

<u>Habitat</u>: Nesting in buildings, sheds old houses, railway stations and warehouses.

Psittacula

CLASSIFICATION:

Phylum- Chordata (Deuterostome, Presence of notochord, nerve chord and pharyngeal gill slits)

Sub-phylum- Vertebrata (Notochord replaced by vertebral column)

Super class- Gnathostomata (Jaws are present)

Class- Aves (warm blooded, body covered in features, monocondylic skull, pneumatic bones, forelimbs modified into wings, respiration through lungs)

Subclass- Neornithes (True birds, fused metacarpals, keeled sternum)

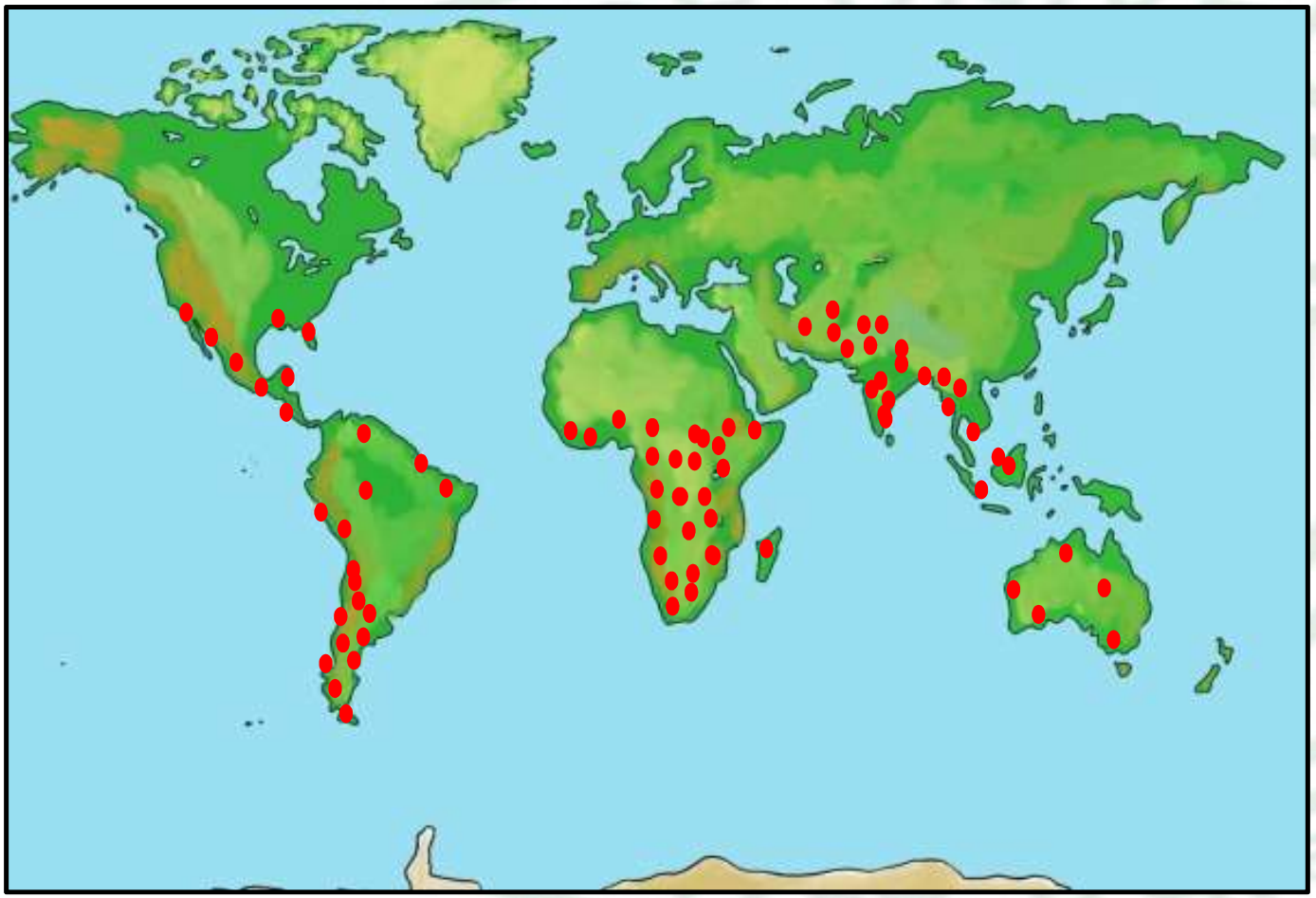
Order - Psittaciformes (sharp hooked beak, brilliantly coloured feathers)

Genus - *Psittacula* (Parrot)

IDENTIFIABLE FEATURES:

- It is covered in bright green feathers
- Fruit eating beak is hooked and red in color.
- Climbing and clinging feet with second and third toes points in front and first and fourth toes points backward.

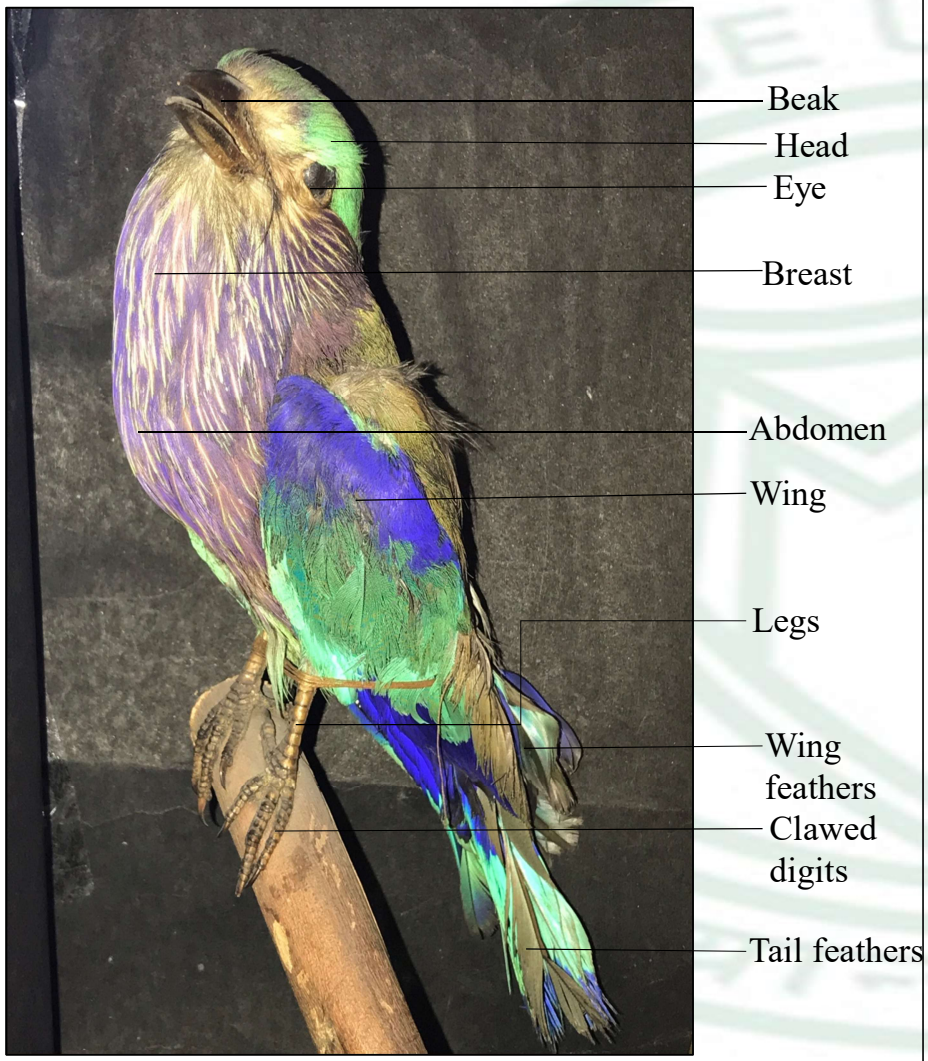
VIDEO LINK:



<u>Geographical Distribution</u>: The United States, India, Sri Lanka, Myanmar, and Pakistan

<u>Habitat</u>: Feeds on fruits and crops. Commonly found on fruit tress, ripe crops and Jungles.

Coracias



CLASSIFICATION:

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Sub-phylum- Vertebrata (Notochord replaced by vertebral column)

Super class- Gnathostomata (Jaws are present)

Class- Aves (warm blooded, body covered in features, monocondylic skull, pneumatic bones, forelimbs modified into wings, respiration through lungs)

Subclass- Neornithes (True birds, fused metacarpals, keeled sternum)

Order - Coraciformes (Beak strong, third and fourth toes fused at the base)

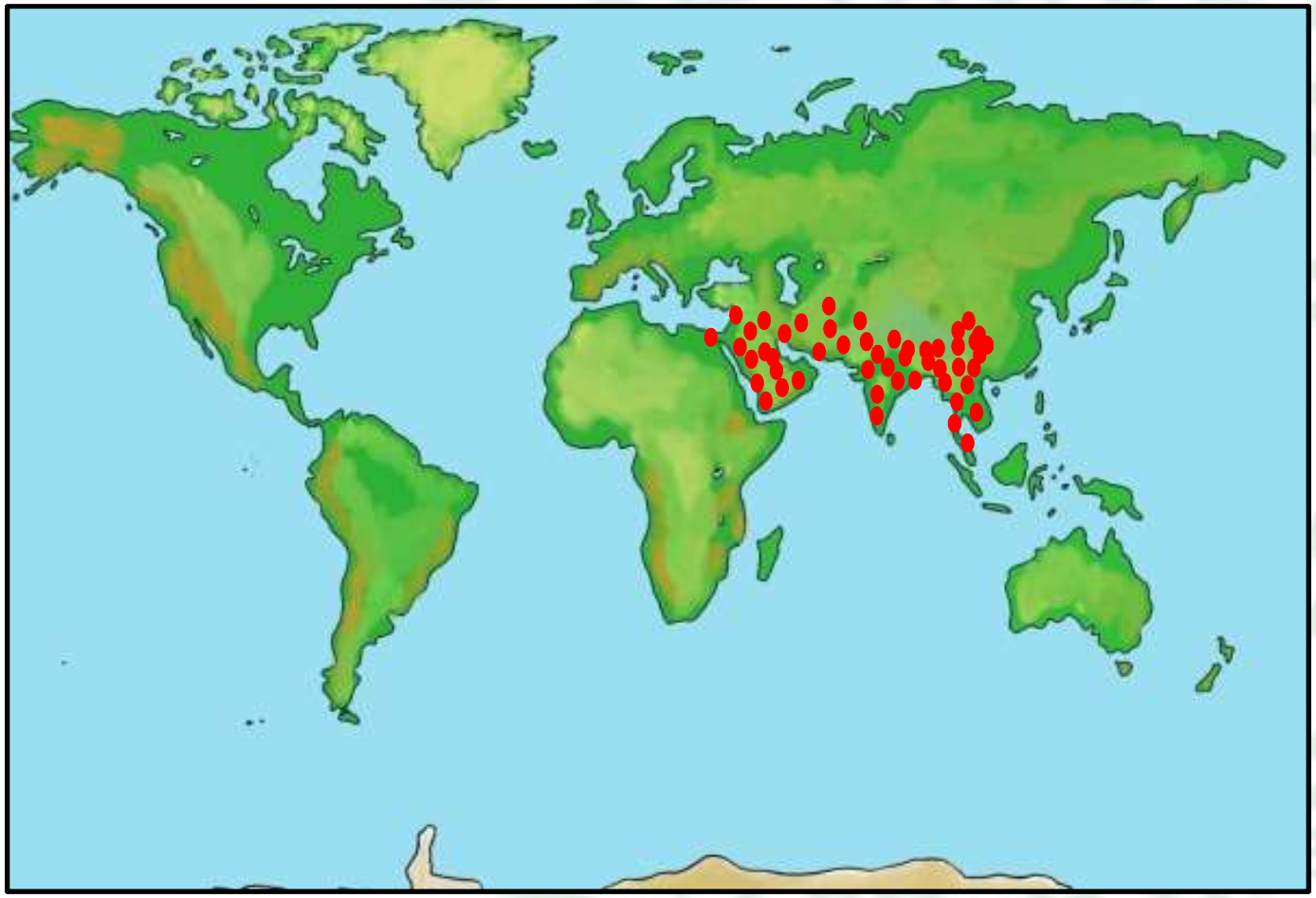
Genus – *Coracias* (Indian roller)

IDENTIFIABLE FEATURES:

- It has an insect eating beak.
- The feet are of perching type.

VIDEO LINK:

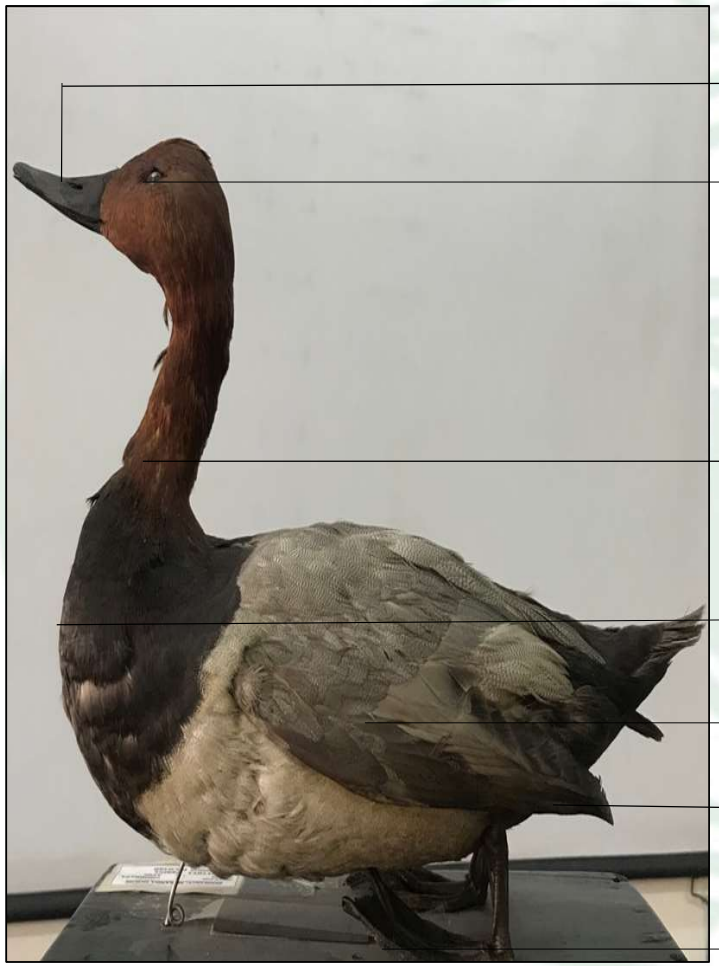
Not available



Geographical Distribution: Afghanistan Iraq, Indian subcontinent, Oman, United Arab Emirates , Iran, Saudi Arabia and Kuwait.

Habitat: Feeds on beetles, grasshoppers, crickets and other insects also sometimes on frogs, lizards and mice. March to July is nesting period.

Anas



CLASSIFICATION:

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Sub-phylum- Vertebrata (Notochord replaced by vertebral column)

Super class- Gnathostomata (Jaws are present)

Class- Aves (warm blooded, body covered in features, monocondylic skull, pneumatic bones, forelimbs modified into wings, respiration through lungs)

Subclass- Neornithes (True birds, fused metacarpals, keeled sternum)

Order- Anseriformes (short and slender beak, toes are longer than tarsus)

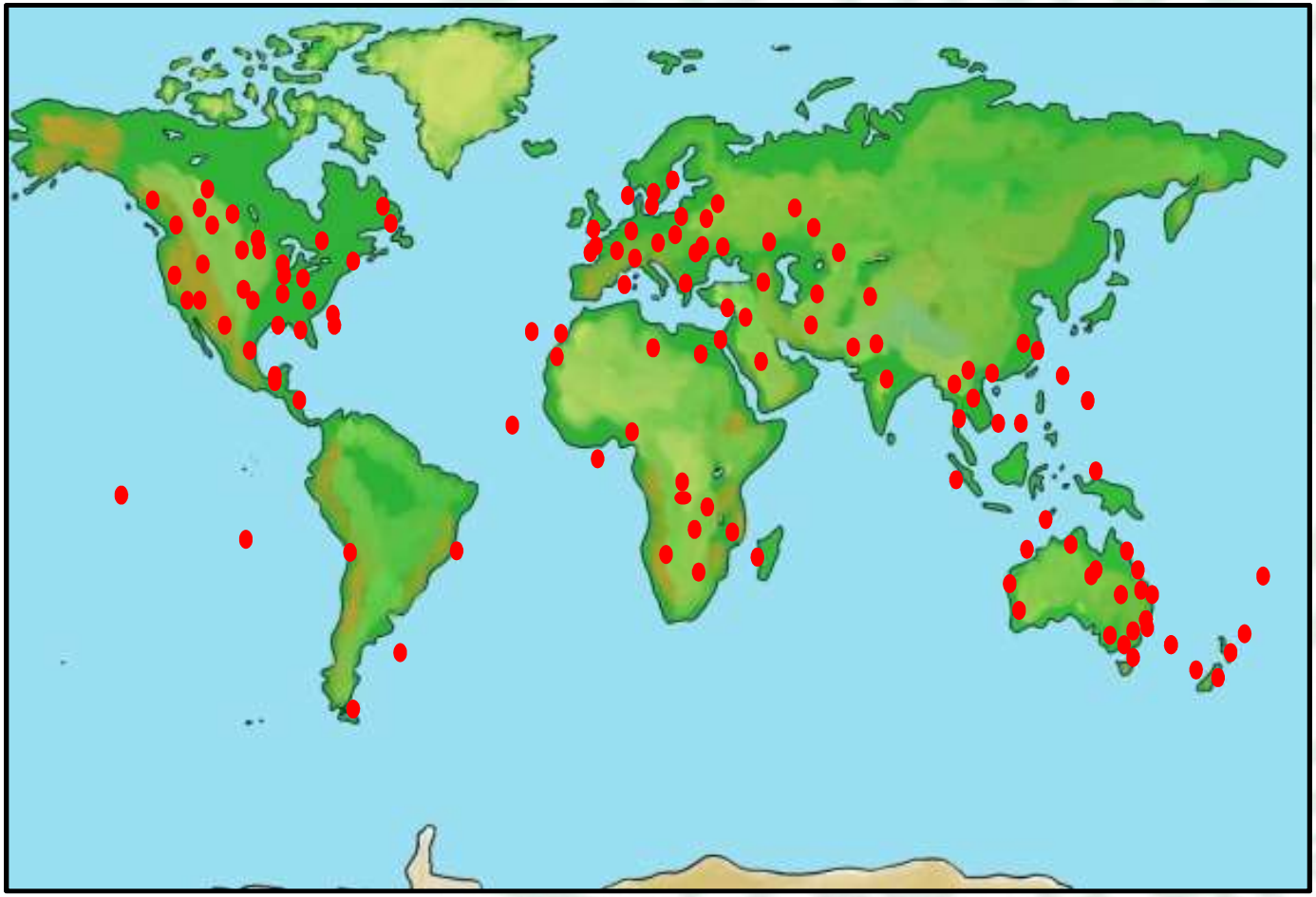
Genus- *Anas* (Duck)

IDENTIFIABLE FEATURES:

- Beak is water and mud straining type.
- Swimming feet are present.

VIDEO LINK:

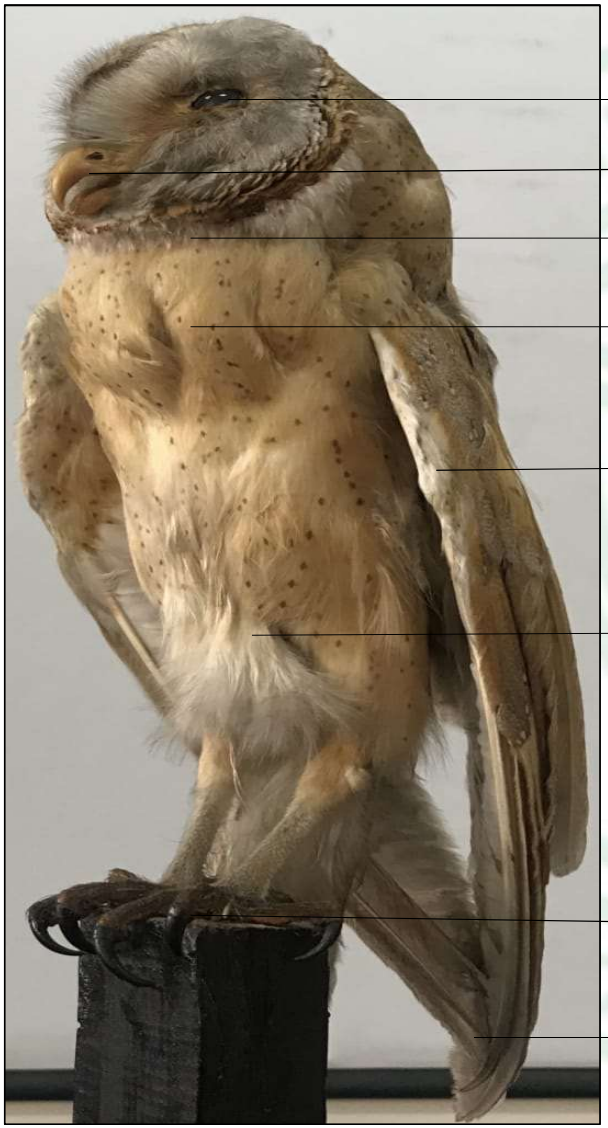
https://www.youtube.com/watch?v=zlIpkR589Q4



Geographical Distribution: China, Egypt, Nigeria, Europe and Southeast Asia

Habitat: Oceans, lakes, ponds, marshes and rivers.

Tyto



CLASSIFICATION:

Phylum- Chordata (Deuterostome, Presence of notochord, nerve chord and pharyngeal gill slits)

Sub-phylum- Vertebrata (Notochord replaced by vertebral column)

Super class- Gnathostomata (Jaws are present)

Class- Aves (warm blooded, body covered in features, monocondylic skull, pneumatic bones, forelimbs modified into wings, respiration through lungs)

Subclass- Neornithes (True birds, fused metacarpals, keeled sternum)

Order- Strigiformes(large head, forward directed large eyes, nocturnal birds)

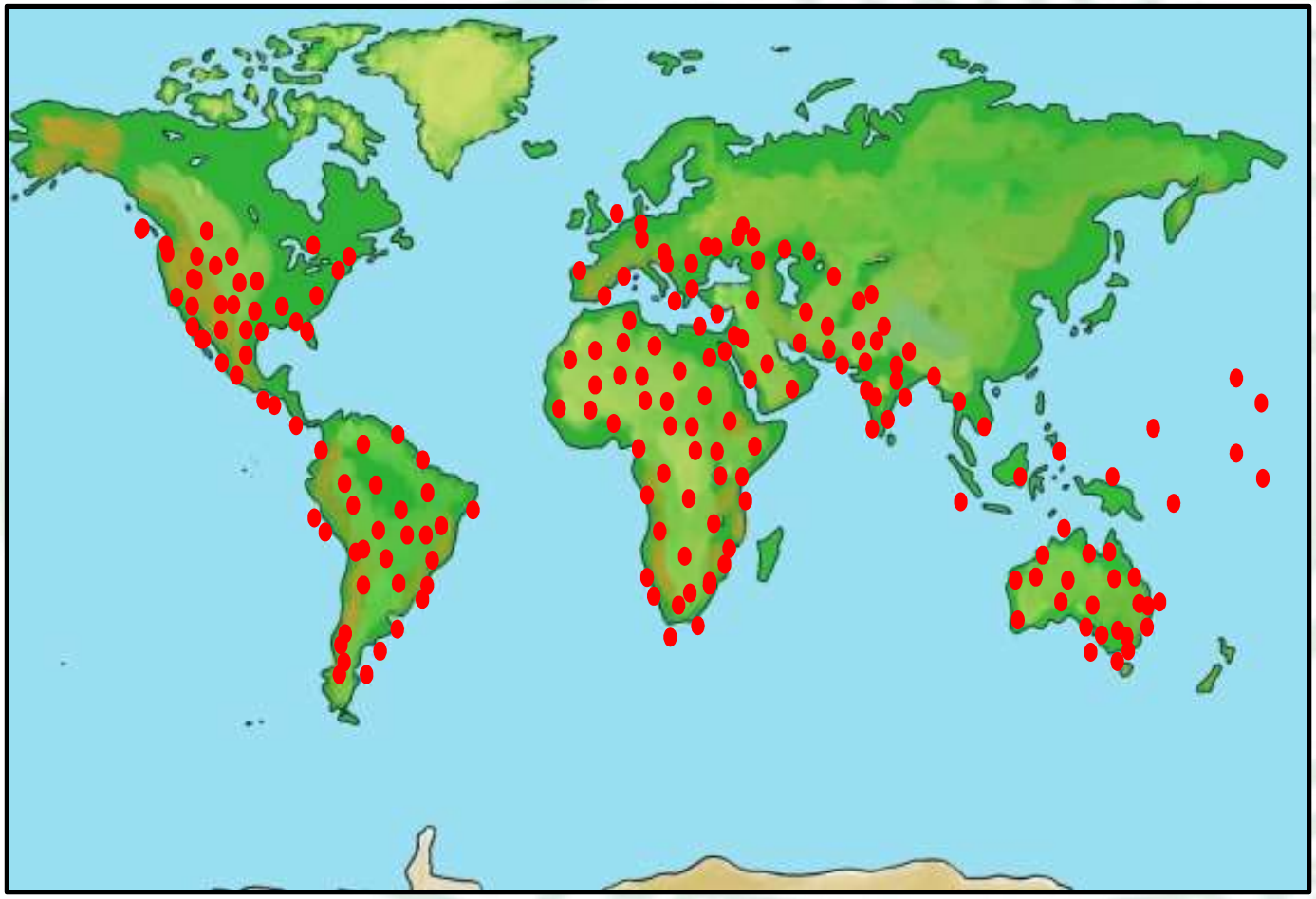
Genus- *Tyto* (Barn owl)

IDENTIFIABLE FEATURES:

- Beak is Tearing and piercing type.
- It have raptorial feet.

VIDEO LINK:

https://www.youtube.com/watch?v=UOFUW8nvxkQ



Geographical Distribution: Wildly spread all over.

Habitat: Rural to urban. Mostly on marshes, grasslands, deserts, agricultural fields and cavities for nesting.

Spilornis

CLASSIFICATION:

Phylum- Chordata (Deuterostome, Presence of notochord, nerve chord and pharyngeal gill slits)

Sub-phylum- Vertebrata (Notochord replaced by vertebral column)

Super class- Gnathostomata (Jaws are present)

Class- Aves (warm blooded, body covered in features, monocondylic skull, pneumatic bones, forelimbs modified into wings, respiration through lungs)

Subclass- Neornithes (True birds, fused metacarpals, keeled sternum)

Order-Falconiformes (sharp hooked beak, sharp claws curved, mostly predatory birds)

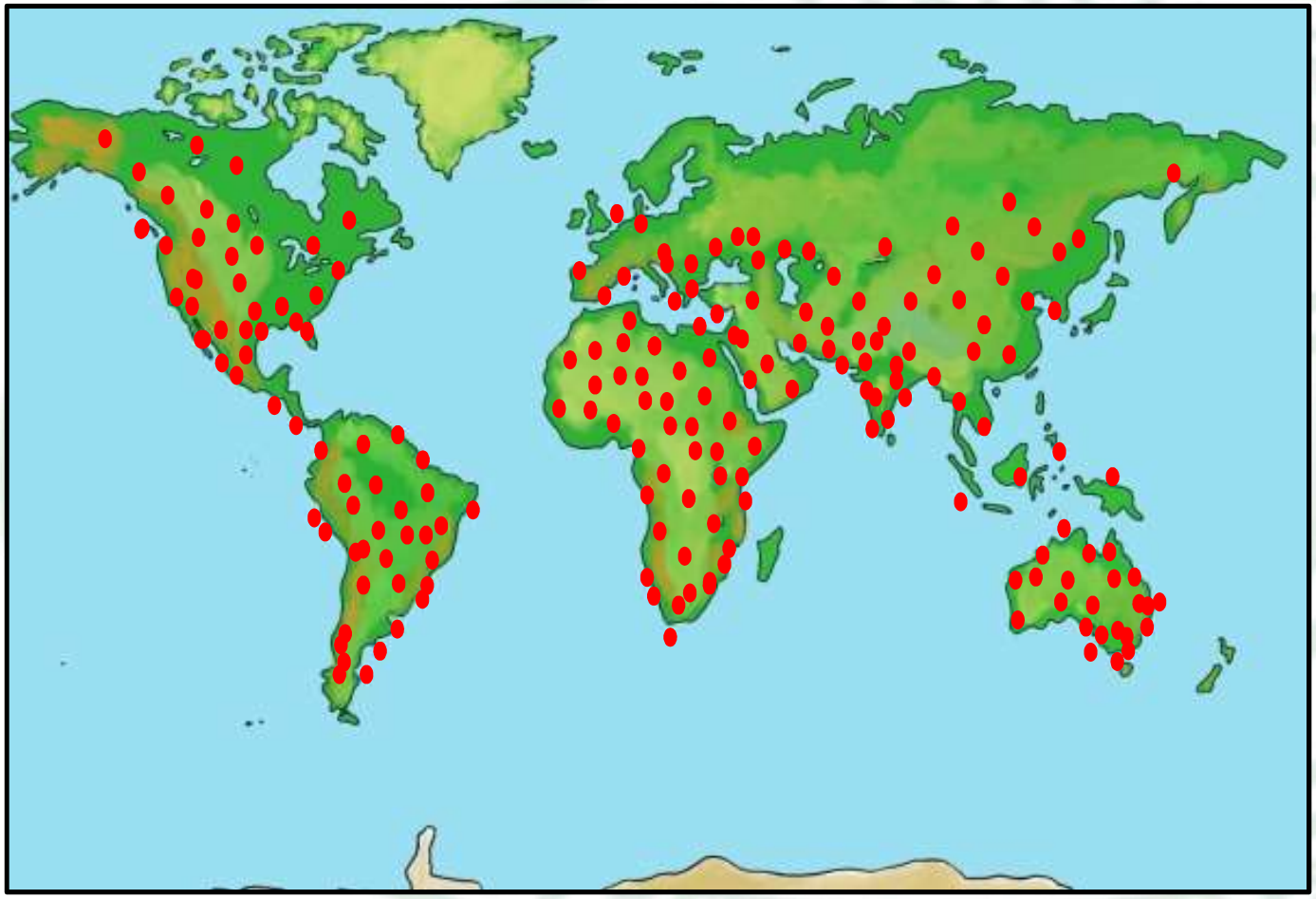
Genus- *Spilornis* (Eagle)

IDENTIFIABLE FEATURES:

- Beak is Tearing and piercing type.
- It have raptorial feet.

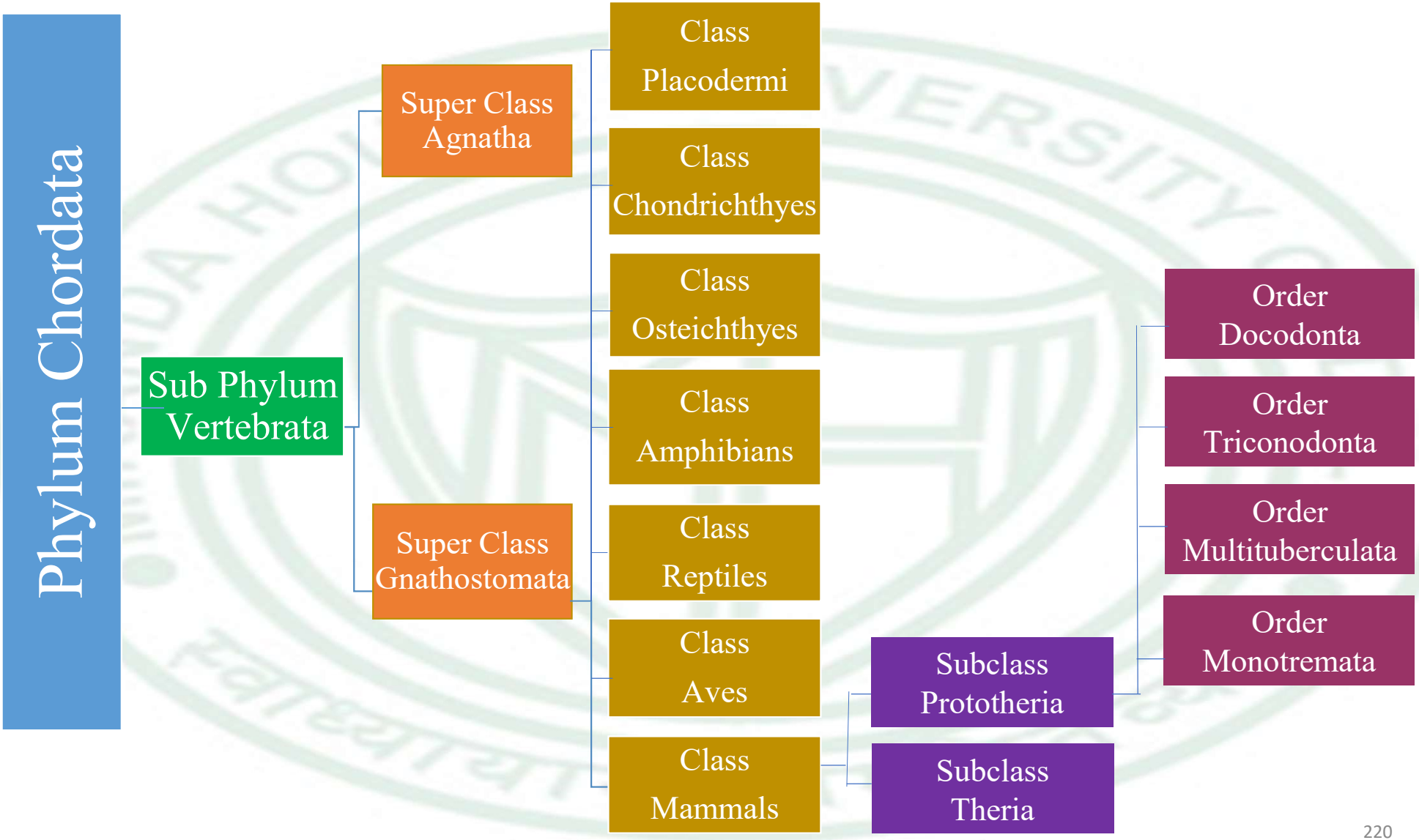
VIDEO LINK:

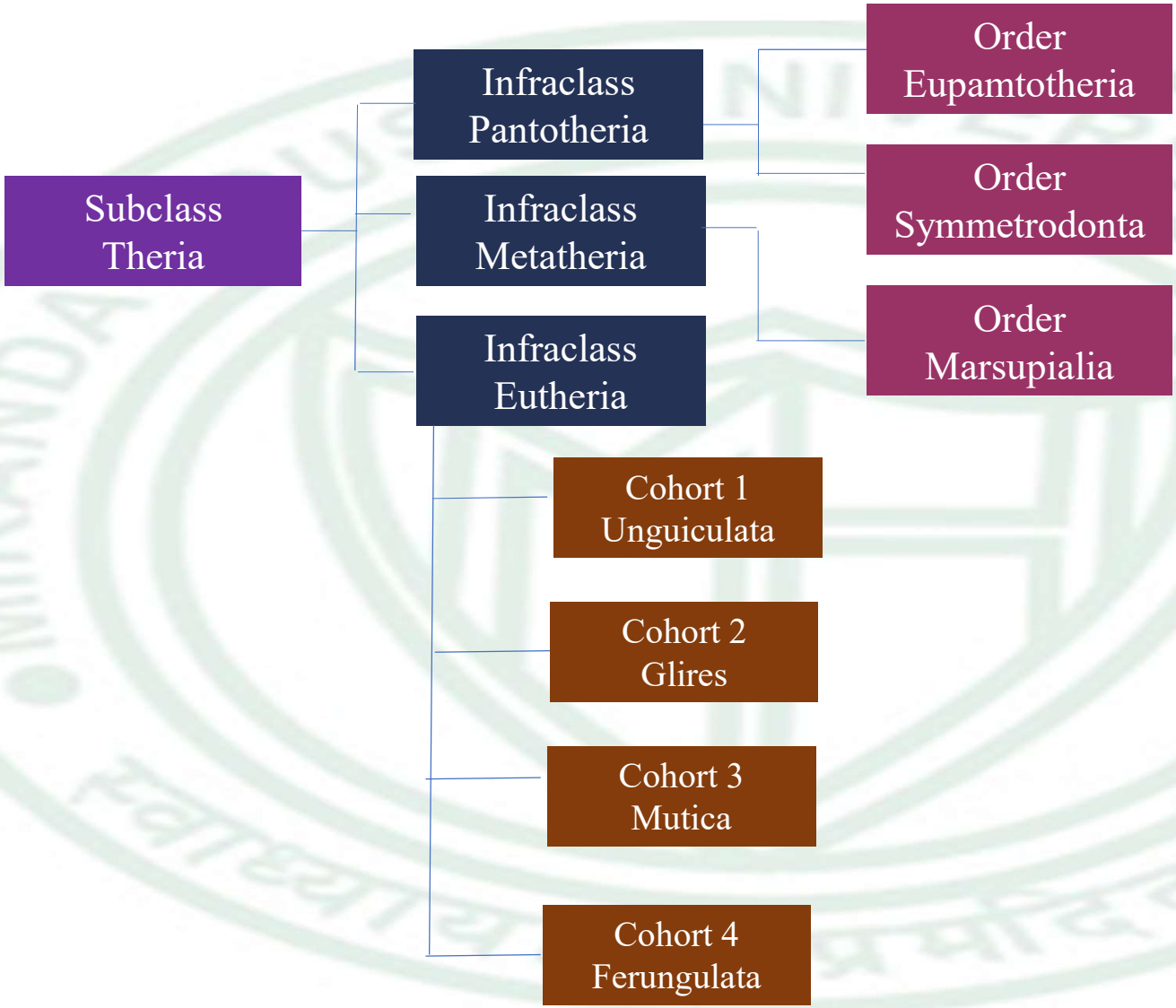
https://www.youtube.com/watch?v=MOe1Vrg4YaY

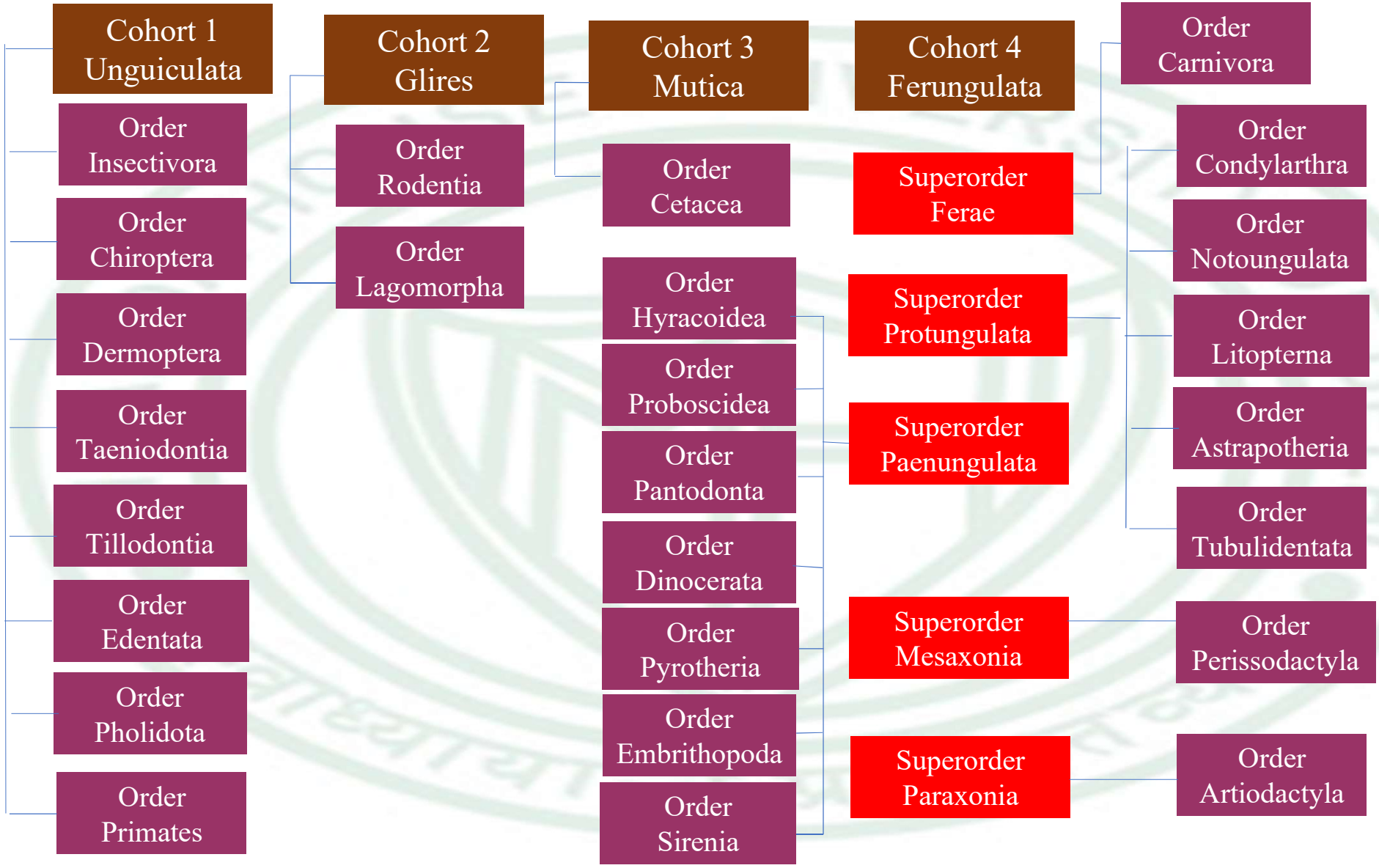


Geographical Distribution: Distributed worldwide (except Antarctica)

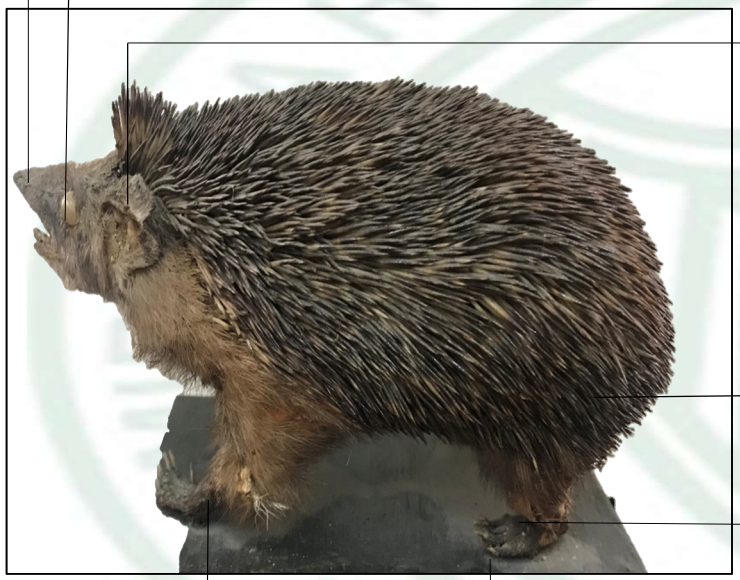
Habitat: Prefer different habitat.


Phylum Chordata
Sub Phylum Vertebrata
Super Class Agnatha
Super Class Gnathostomata
Class Placodermi
Class Chondrichthyes
Class Osteichthyes
Class Amphibians
Class Reptiles
Class Aves
Class Mammals
Subclass Prototheria
Subclass Theria
Order Docodonta
Order Triconodonta
Order Multituberculata
Order Monotremata


Subclass Theria
Infraclass Pantotheria
Infraclass Metatheria
Infraclass Eutheria
Order Eupamtotheria
Order Symmetrodonta
Order Marsupialia
Cohort 1 Unguiculata
Cohort 2 Glires
Cohort 3 Mutica
Cohort 4 Ferungulata


Cohort 1 Unguiculata
Order Insectivora
Order Chiroptera
Order Dermoptera
Order Taeniodontia
Order Tillodontia
Order Edentata
Order Pholidota
Order Primates
Cohort 2 Glires
Order Rodentia
Order Lagomorpha
Cohort 3 Mutica
Order Cetacea
Order Hyracoidea
Order Proboscidea
Order Pantodonta
Order Dinocerata
Order Pyrotheria
Order Embrithopoda
Order Sirenia
Cohort 4 Ferungulata
Superorder Ferae
Superorder Protungulata
Superorder Paenungulata
Superorder Mesaxonia
Superorder Paraxonia
Order Carnivora
Order Condylarthra
Order Notoungulata
Order Litopterna
Order Astrapotheria
Order Tubulidentata
Order Perissodactyla
Order Artiodactyla

Erinaceus



CLASSIFICATION:

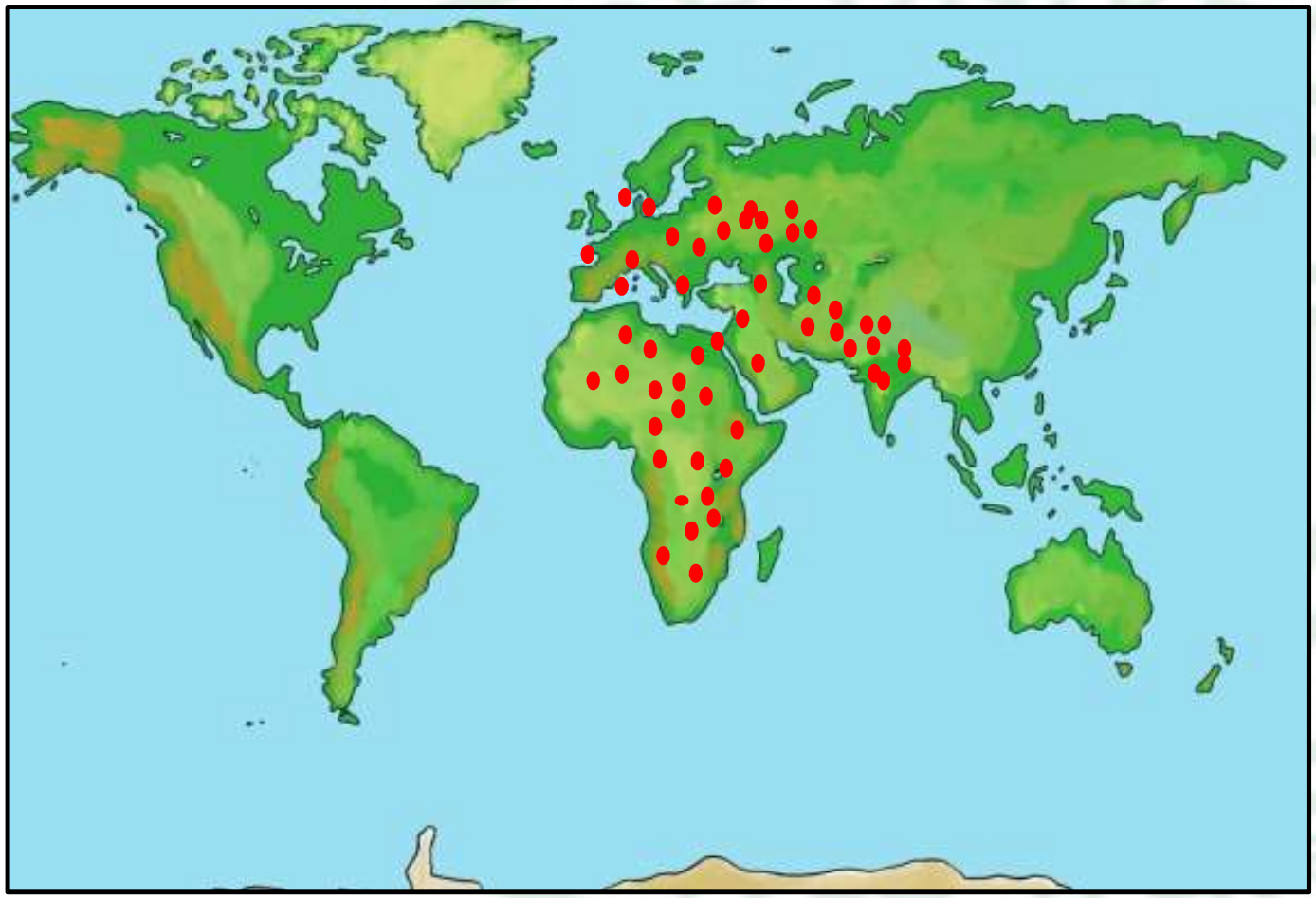
Phylum- Chordata (Deuterostome, Presence of notochord, nerve chord and pharyngeal gill slits)
Sub-phylum- Vertebrata (Notochord replaced by vertebral column)
Super class- Gnathostomata (Jaws are present)
Class- Mammalia (Body is covered in hair, presence of mammary glands in females)
Sub class- Theria (placental mammals)
Infra class- Eutheria (marsupial pouch absent, young ones nourished inside the uterus for some time by females)
Order- Insectivora (small furry animals, pointed and small snout)
Genus- *Erinaceus* (Hedgehog)

IDENTIFIABLE FEATURES:

- Body is covered with sharp and backwardly directed spines on dorsal side.
- Ventral side have soft spines
- Head is protruded into a small snout with nostrils, eyes and ear pinna.
- Fore limbs and Hind limbs are short.

VIDEO LINK:

https://www.youtube.com/watch?v=BDV5de82Pao
https://www.youtube.com/watch?v=j7UVKJfXSuk



Geographical Distribution: Europe, Africa, Northern hemisphere and India

Habitat: Nocturnal, omnivorous, rolled up its body when get alarmed.

Sorex

CLASSIFICATION:

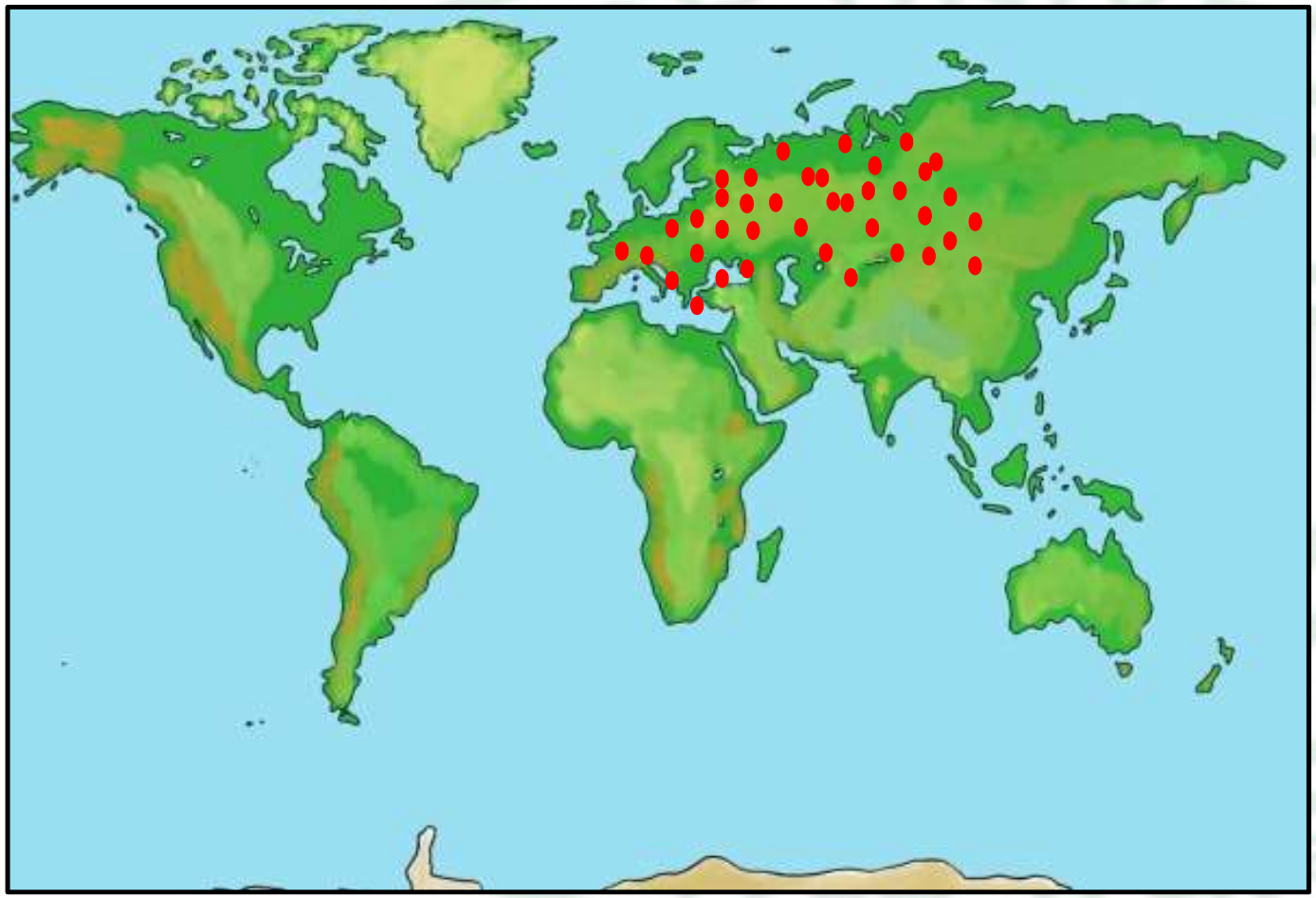
Phylum- Chordata (Deuterostome, Presence of notochord, nerve chord and pharyngeal gill slits)
Sub-phylum- Vertebrata (Notochord replaced by vertebral column)
Super class- Gnathostomata (Jaws are present)
Class- Mammalia (Body is covered in hair, presence of mammary glands in females)
Sub class- Theria (placental mammals)
Infra class- Eutheria (marsupial pouch absent, young ones nourished inside the uterus for some time by females)
Order- Insectivora (small furry animals, pointed and small snout)
Genus- *Sorex* (Shrew)

IDENTIFIABLE FEATURES:

- Body is covered with tricoloured fur coat.
- Head contains elongated snout with several vibrissae.
- Eyes are rudimentary and ear pinnae hidden in fur.
- Well developed forelimbs and hind limbs, a long tail also present.

VIDEO LINK:

https://www.youtube.com/watch?v=NNowlueg4H4&t=181s
https://www.youtube.com/watch?v=aFBp-iNTwBc



Geographical Distribution: Distributed through out the world.

Habitat: Lives underground or underdense vegetation, Insectivorous and carnivorous.

Pteropus

CLASSIFICATION:

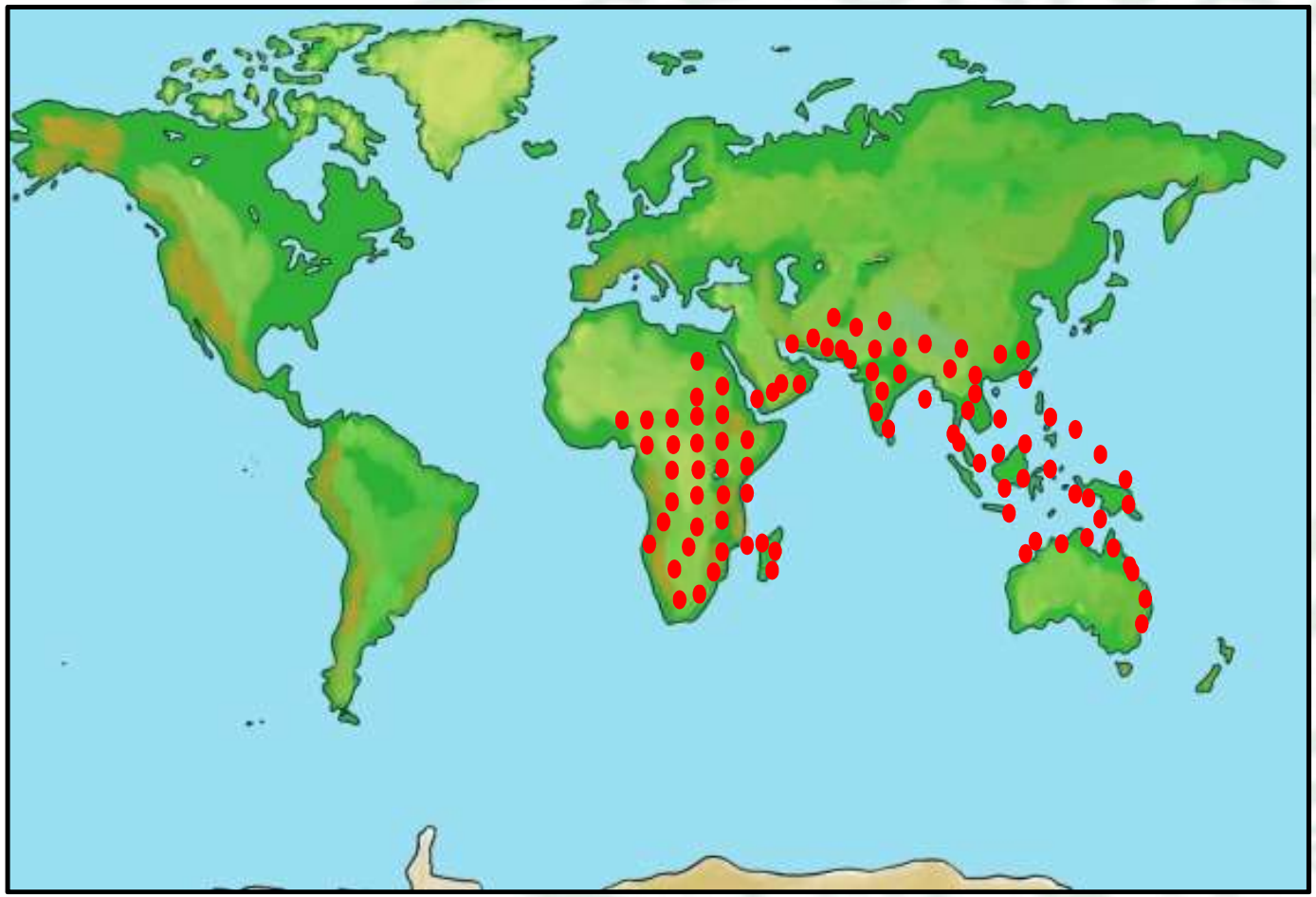
Phylum- Chordata (Deuterostome, Presence of notochord, nerve chord and pharyngeal gill slits)
Sub-phylum- Vertebrata (Notochord replaced by vertebral column)
Super class- Gnathostomata (Jaws are present)
Class- Mammalia (Body is covered in hair, presence of mammary glands in females)
Sub class- Theria (placental mammals)
Infra class- Eutheria (marsupial pouch absent, young ones nourished inside the uterus for some time by females)
Order- Chiroptera (Fore limbs modified for flight, five clawed digits-2nd and 5th are elongated supporting the flight membrane, small eyes, large pinnae, sharp teeth)
Sub order- Megachiroptera (Large fruit eating bats, elongated snout, short/no tail)
Genus- *Pteropus* (Flying fox)

IDENTIFIABLE FEATURES:

- Body is divisible into head, neck, trunk and tail
- Forelimbs are modified into wing made up of patagium supported with 2nd and 5th fingers.
- Wings are large with a wide wing- spread area.
- Its first and second fingers bear claws.
- Face appears fox like with an elongated snout having big eyes, ear pinna and teeth.
- Tail is short.
- Hind feet small with claws.

VIDEO LINK:

https://www.youtube.com/watch?v=MbhFKcqNFUU&t=206s



Geographical Distribution: Southern Asia, Australia, Eastern Africa, and some islands in the Indian ocean and Pacific Oceans.

Habitat: Found in tropical forest, swamps and Frugivorous.

Myotis

CLASSIFICATION:

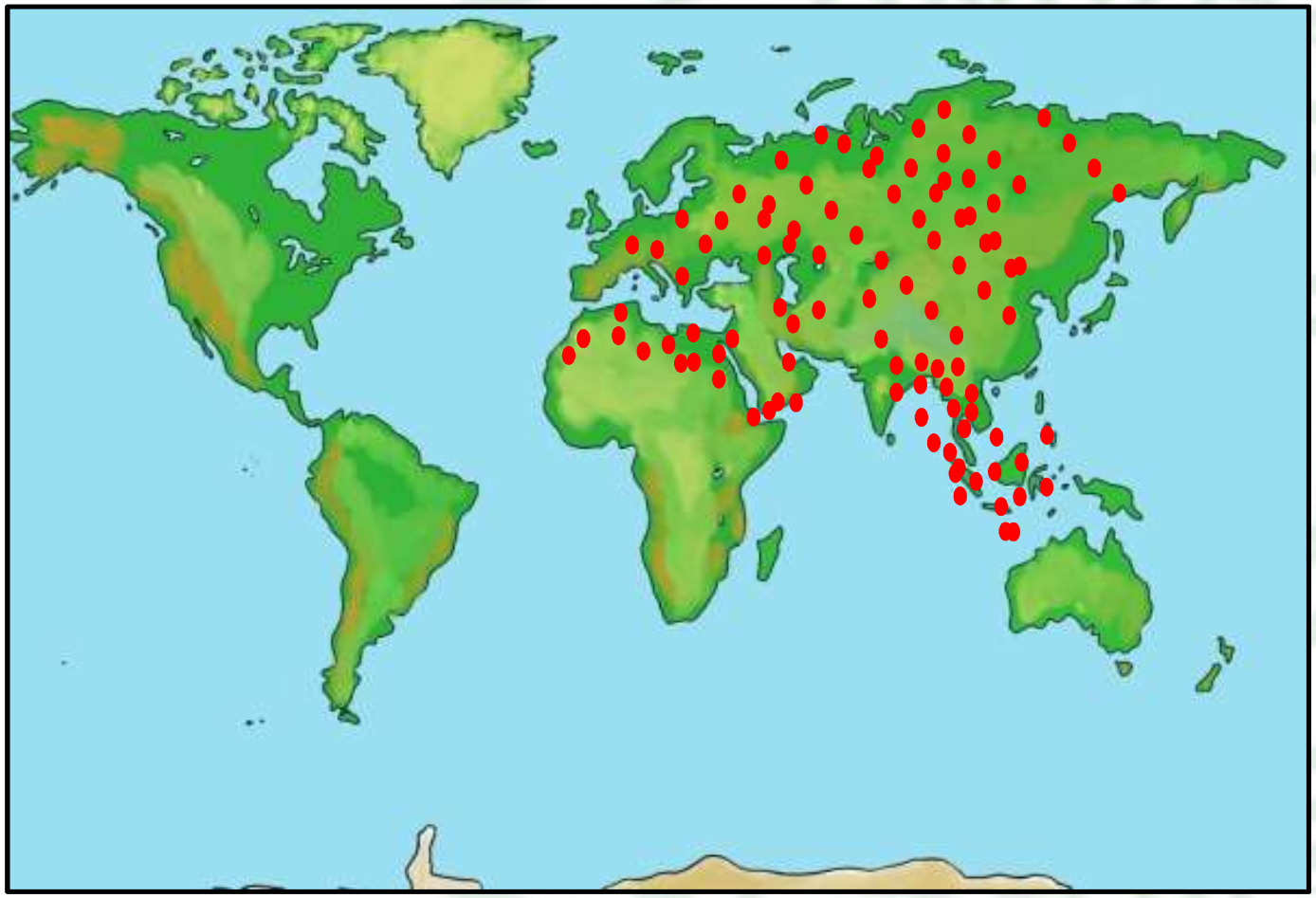
Phylum- Chordata (Deuterostome, Presence of notochord, nerve chord and pharyngeal gill slits)
Sub-phylum- Vertebrata (Notochord replaced by vertebral column)
Super class- Gnathostomata (Jaws are present)
Class- Mammalia (Body is covered in hair, presence of mammary glands in females)
Sub class- Theria (placental mammals, nipples are present on mammary glands)
Infra class- Eutheria (marsupial pouch absent, young ones nourished inside the uterus for some time by females)
Order- Chiroptera (Fore limbs modified for flight, five clawed digits-2nd and 5th are elongated supporting the flight membrane, small eyes, large pinnae, sharp teeth)
Sub order- Microchiroptera (Insectivorous, short snouts, molars with transverse grooves with cusped crowns)
Genus- *Myotis* (Bat)

IDENTIFIABLE FEATURES:

- Body is small in size and covered with soft fur.
- Snout and ears are large.
- Forelimbs modified for flying with patagium, its first digit is clawed.
- Hindlimbs are short and weak with clawed fifth digit.
- Large tail enclosed in interfemoral membrane.

VIDEO LINK:

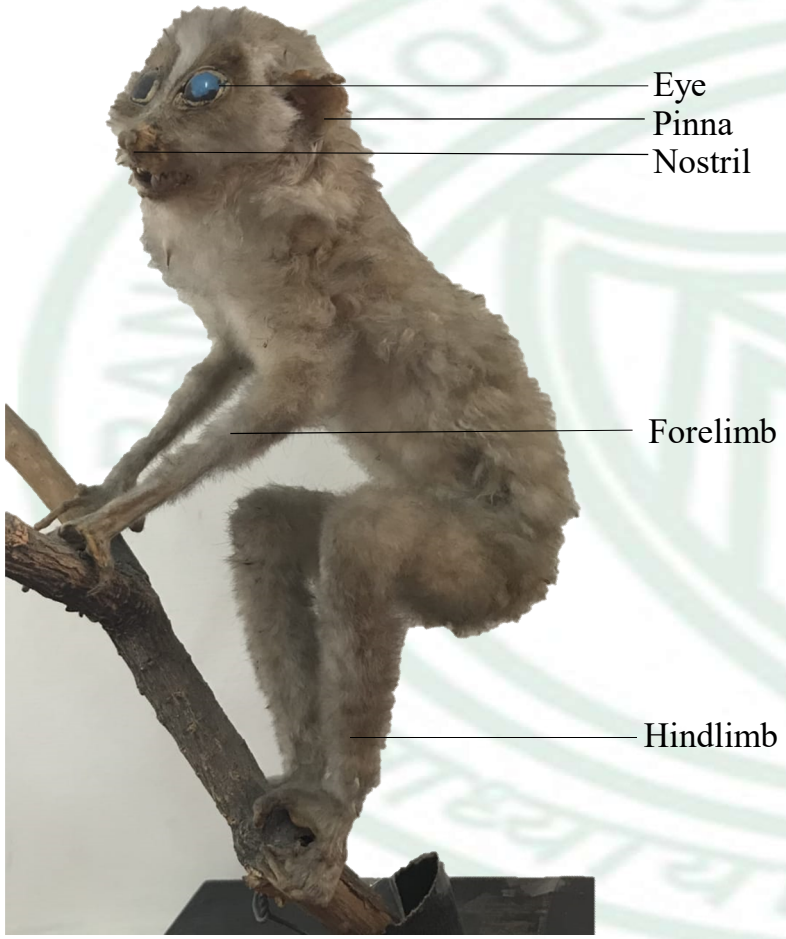
https://www.youtube.com/watch?v=bbTWWWtFFUs&t=19s



Geographical Distribution: Asia, North Africa

Habitat: Caves and buildings, insectivorous.

Loris



CLASSIFICATION:

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Sub-phylum- Vertebrata (Notochord replaced by vertebral column)

Super class- Gnathostomata (Jaws are present)

Class- Mammalia (Body is covered in hair, presence of mammary glands in females)

Sub class- Theria (placental mammals, nipples are present on mammary glands)

Infra class- Eutheria (marsupial pouch absent, young ones nourished inside the uterus for some time by females)

Order- Primates (Hairy mammals, arboreal, hands with 5 digits each, foot with flat nails, plantigrades, femur without 3rd trochanter, testes enclosed in scrotum, penis is pendent)

Sub order- Lemuroidea (Second toe with claw, nocturnal, orbit opens into temporal fossa)

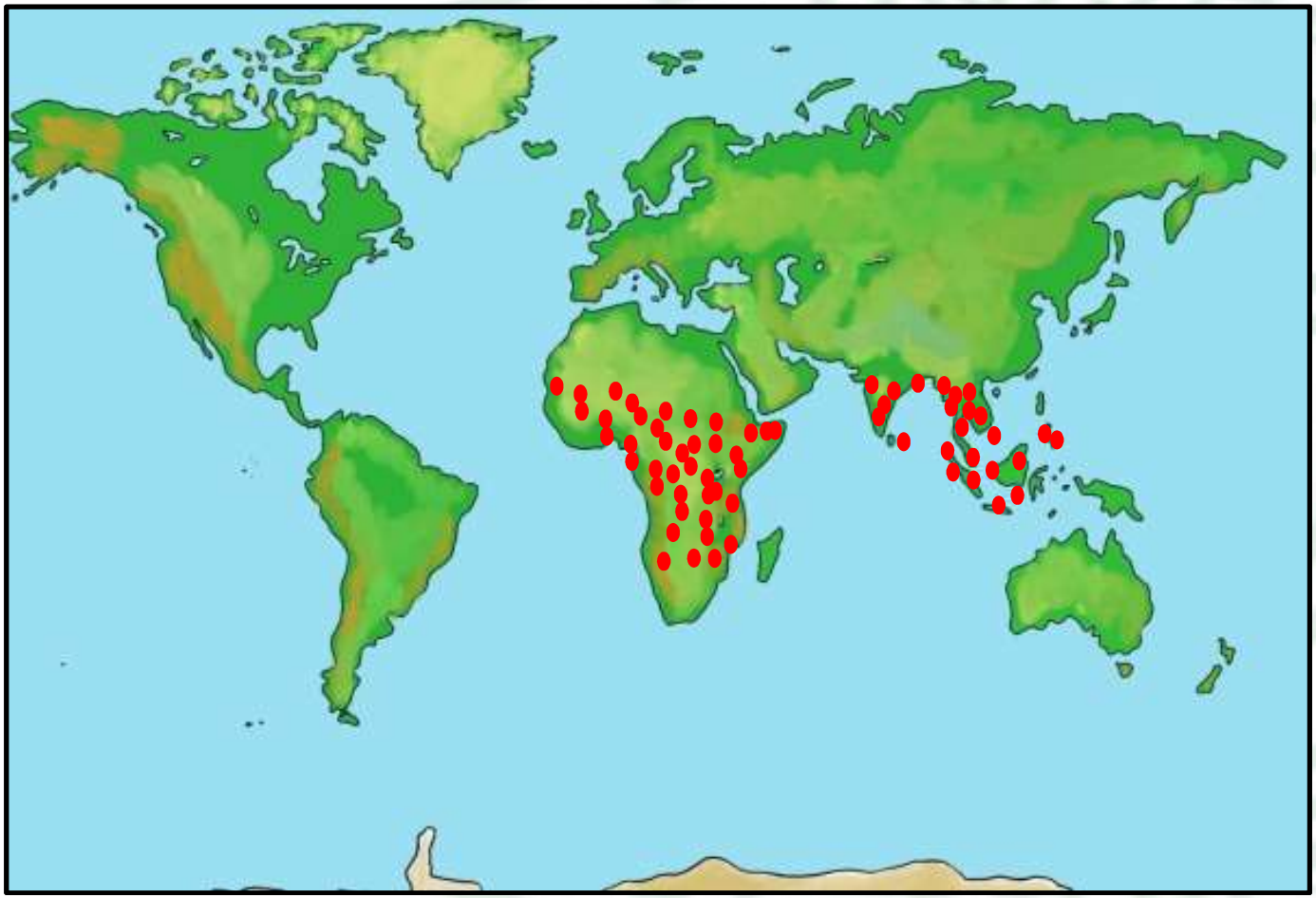
Genus- *Loris* (Spectacled monkey)

IDENTIFIABLE FEATURES:

- Body covered by thick woolly fur.
- Head is produced into a pointed muzzle and appears fox like.
- Prominent ears, Large eyes with brown irises.
- Hindlimbs are longer than forelimbs.

VIDEO LINK:

https://www.youtube.com/watch?v=OuuTFvNtA80



Geographical Distribution: Africa, Southern India, Srilanka and Southeast Asia.

Habitat: Aboreal, Nocturnal and Omnivorous.

Funambulus

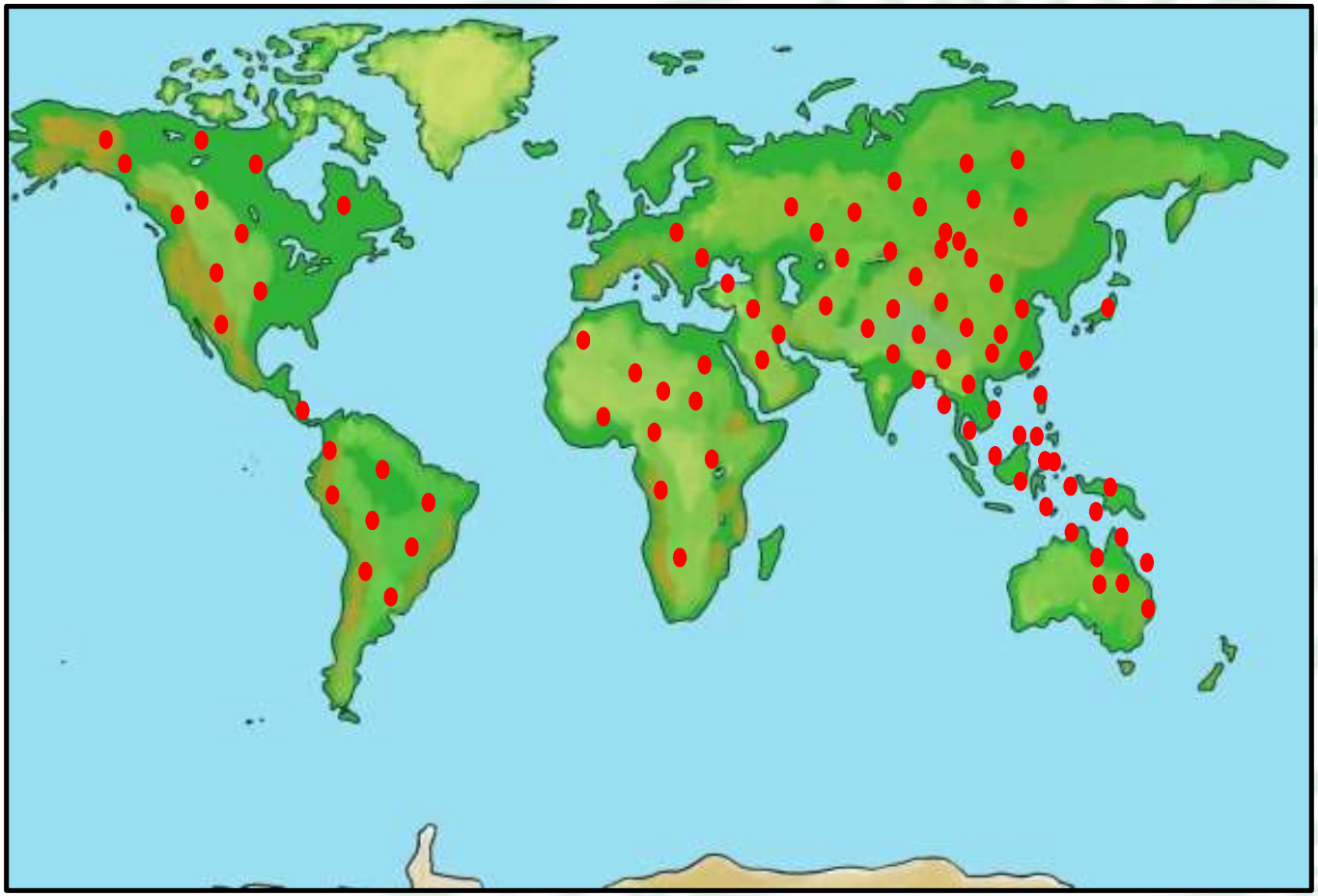
CLASSIFICATION:

Phylum- Chordata (Deuterostome, Presence of notochord, nerve chord and pharyngeal gill slits)
Sub-phylum- Vertebrata (Notochord replaced by vertebral column)
Super class- Gnathostomata (Jaws are present)
Class- Mammalia (Body is covered in hair, presence of mammary glands in females)
Sub class- Theria (placental mammals, nipples are present on mammary glands)
Infra class- Eutheria (marsupial pouch absent, young ones nourished inside the uterus for some time by females)
Order- Rodentia (Incisors are single pair, chisel shaped and rootless, canines are entirely absent, space is present between incisors and molars called diastemma)
Genus- *Funambulus* (Squirrel)

IDENTIFIABLE FEATURES:

- Elongated body covered with fur.
- Large eyes, ear pinna, nostrils with vibrissae are present.
- Five dark coloured stripes are present on the back.
- Well developed forelimbs and hindlimbs with clawed toes
- Long and bushy tail.

VIDEO LINK:
https://www.youtube.com/watch?v=XbY0n6bmm_0



Geographical Distribution: All continents and Islands

Habitat: Diurnal, feeds on fruits and seeds.

Herpestes

CLASSIFICATION:

Phylum- Chordata (Deuterostome, Presence of notochord, nerve chord and pharyngeal gill slits)

Sub-phylum- Vertebrata (Notochord replaced by vertebral column)

Super class- Gnathostomata (Jaws are present)

Class- Mammalia (Body is covered in hair, presence of mammary glands in females)

Sub class- Theria (placental mammals, nipples are present on mammary glands)

Infra class- Eutheria (marsupial pouch absent, young ones nourished inside the uterus for some time by females)

Order- Carnivora (Well developed canines, small incisors three on each side of each jaw, toes or digits not less than four with strong and sharp claws, large and round tympanic bulla, scaphoid and lunar bones of hand are always fused)

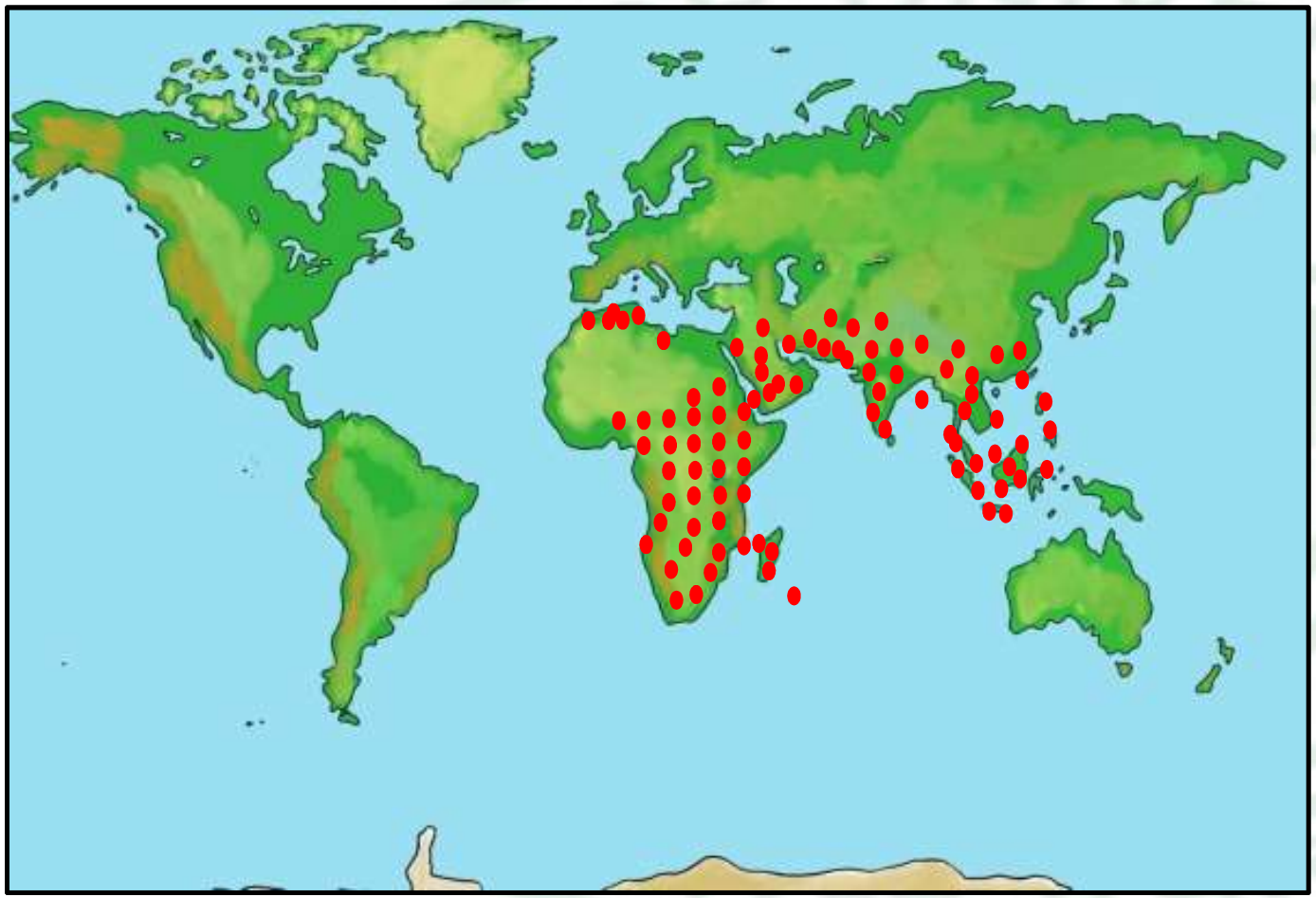
Genus- *Herpestes* (Mongoose)

IDENTIFIABLE FEATURES:

- Elongated body with yellowish grey fur.
- Head is elongated and has a pointed snout.
- Strong forelimbs and hindlimbs with fossorial claws.
- Tail is long and bushy.

VIDEO LINK:

https://www.youtube.com/watch?v=9T1u4ej_XqU



<u>Geographical Distribution</u>: Majorly in African and Asian countries.

<u>Habitat</u>: Nocturnal borrowing mammal.