TAXONOMY OF PHYLUM ANNELIDA

Project work
by AGNUS
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Under the guidance of
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Submitted to
Gandhi University, Kottayam
in Partial fulfilment of requirement for the Degree of Bachelor of Science in Zoology

2022-23

CERTIFICATE

This is to certify that the project entitled “TAXONOMY OF FEW WORM BODIED ANIMALS” is an authentic record of dissertation work carried out by Ms. Mary Honey under my guidance and supervision in partial fulfilment of the requirements for Bachelor Degree in Zoology, St. Teresa’s college (Autonomous), affiliated to M. G University under the Faculty of Zoology. This is purely an independent work done by her under my guidance.

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Examiner :

1:

2 :

DECLARATION

I hereby declare that project work entitled “A taxonomic study on the Phylum Annelida using the Museum Specimens” submitted to St. Teresa’s College (Autonomous), Ernakulam affiliated to Mahatma Gandhi University, Kottayam in the partial fulfillment of the requirements of Bachelor of Science degree in Zoology, is a record of original project done by me under the guidance and supervision of Dr. Soja Louis, Associate Professor of Department of Zoology, St. Teresa’s College (Autonomous), Ernakulam.

Name : Agnus Metilda

Reg. No. :AB20ZOO025 Signature

ACKNOWLEDGEMENT

I, Agnus Metilda, is very much indebted to Dr. Soja Louis, my teacher guide for this work. I whole heartedly acknowledge my teacher guide for her keen interest, patience, guidance, unfailing encouragement and invaluable suggestions during the entire course of my work, which helped me accomplish this task.

I extend my gratitude to all the teaching and non teaching staff of the Department of Zoology for helping me in this project.

Above all, I thank Lord Almighty for his blessings and showing me the way throughout the journey.

Also, my sincere appreciation to my parents for always standing by me.

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SYNOPSIS

The project entitled, “ Taxonomy of worm bodied animals ” was done in order to classify all specimens kept in museum to species level. Taxonomy is the science of naming, describing classifying organisms including plants, animals and microorganism, using morphological, behavioural, genetical and biochemical observation. A vast majority of earth species are still unknown and a tremendous amount of biodiversity is yet to be discovered. Since most of the conserved areas prevent the entry of public people, the only way of studying the morphological features of a species is by examining the available specimens in the museum Taxonomy aims at classifying organisms into different taxa on the basis of similarities in their phenotypic characteristics that is, the characteristics which are expressed in an organism and that can be examined visually. Since, most of the conserved areas prevent the entry of public people, the only way of studying the characteristic features of species is by examining the available specimens in the museum. Hence, this project is relevant for this study.

In this project, worm like bodied specimens were examined from museum and identified to species level, based on their morphological features, segmentation, colouration, distribution, body measurements.20 species were grouped into the phylum Annelida

INTRODUCTION

Taxonomy is the science of naming, describing classifying organisms including plants, animals and microorganism, using morphological, behavioural, genetical and biochemical . Work carried out by taxonomist is crucial for understanding of biodiversity and its conservation. A vast majority of earth species are still unknown. A tremendous amount of biodiversity is yet to be discovered. Since most of the conserved areas prevent the entry of public people, the only way of studying the morphological features of a species is by examining the available specimens in the museum. Through taxonomy, the parasitic Platyhelminthes and nematode affecting humans, plants, and animals can be easily identified. Thus it would be useful for future studies regarding parasitic worms and their control measures. Therefore, taxonomical work is very important in the present scenario.

Taxonomical information is also essential for agencies and border authorities to identify, manage and control of invasive alien species their control and maintenance is possible only if they are identified correctly. Nowadays importance of taxonomy is growing in many fields such as medicine, food industry and agriculture. Taxonomy is useful for identification as well as knowing characteristics of a

particular species. Taxonomic work is essential for fundamental understanding of biodiversity and its conservation.

In the present scenario taxonomical identification is necessary to find out new specimen. The present study focuses on the study of taxonomy of phylum Annelida. Annelida is a class of animals also known as segmented worms or ringworms. The phylum is large, having over 17,000 different species. Throughout the 20th century Annelida was divided into the groups; Polychaeta, Oligochaeta (earthworms etc.) and Hirudinea (leeches). Generally, they thrive in marine and fresh waters; mostly in sediments and in damp terrestrial environments; mostly the soil. The familiar annelids are the earthworms and leeches. Annelids are vermiforms, bilateral symmetrical, tripoblastic and schizocoelomate whose body is metamerically segmented and covered with a layer of cuticle. Body length varies from less than 1mm to more than 3m.

However, the polychaetes are the most dominant of the phylum and are found in almost all marine environments. There are about 8,000 species of Polychaetes which include rag worms, lugworms, bloodworms, sea mice, and much more. Few organisms within this group also occur in fresh water and moist terrestrial surroundings. There are also pelagic polychaetes which swim and prey on plankton.

There are about 3,500 species of oligochaetes. They live in freshwater, salt water and in soil. Oligochaetes are known to be important recyclers in the environment. For example, the earthworm which makes soil. This class of Annelid range in length from a few millimetres to over 10 feet.

The Leech, which is a subclass of Hirudinea, has about 650 species. They are known for having sucker. The length of their bodies ranges from a few millimeters to about 20 cm or even longer when the animal extends to stretch. These organisms thrive in fresh water and on land.

All annelids have a worm shaped segmented body. Annelid structure and function (2019) states that the number and organization of the bristles and appendages differ, they also protrude away from the body. These organisms thrive in fresh water and on land (Friedl, 2019). Species from this Phylum possess unique shapes and colours. In addition, annelids belong to the invertebrate group. These organisms are coelomate and triploblastic, with bilateral symmetry.

METHODOLOGY

Materials Required:

Formalin, bucket, water, scale, thread, bottle for dry and wet specimen.

Specimens kept in the musuem are classified under the Phylum Annelida were observed.

Methodology:

First of all on the basics of the morphological features, specimens are identified and classified into different phylum. All the specimens was taken out of the musuem and their external features where observed and scientific measurments where made. The dry specimen where dipped into bleach solution made with 3 spoons of bleach water. Four certain hours where rubbed with a brush for further cleaning and old formaline solution of wet specimen where removed and fresh formaline solution where added in the ratio 9:1 after cleaning the specimen bottle with detergents. The specimens where then put back into the bottle. Finally labels where tagged on each specimen bottle which contain information on their kingdom, phylum, class, order, family, genus and species.

REVIEW OF LITERATURE

Siddique et. al, 2022 studied on the distribution and diversity of polychaeta in the Northern coastal waters of Bay of Bengal. A compilation of polychaete species distributed along the East coast of India has been presented in the paper, which includes a total of 22 species belonging to 20 genera, 15 families, four orders and three subclasses; obtained during the summer monsoon survey of 2013. Subclass Errantia and Sedentaria comprised of 10 species each, while subclass polychaeta incerta disc consisted of only two species.

In 2021, Sebastian et. al studied the morphology of phylum annelida and reported that no clear morphological autapomorphies exist, but the following characters can help circumscribe the phylum: true metamerism, with body divided into “head” region (prostomium and peristomium), trunk, and pygidium. Chaetae that arise from the parapodia or body wall, generally paired on each segment (secondarily lost in Hirudinea). Nuchal organs; chemoreceptors located behind the prostomium (secondarily lost in Clitellata) and epidermis covered by cuticle with basal collagenous matrix

In 2021, Katrine et. al studied about the Interstitial annelida. This article provides a review of the evolution, systematics, and diversity of these families (Apharyngtidae n. fam., Dinophilidae, Diurodrilidae, Nerillidae, Lobatocerebridae, Parergodrilidae, Polygordiidae, Protodrilidae, Protodriloididae, Psammodrilidae and Saccocirridae), with the exception of Parergodrilidae, which was detailed in the review of Orbiniida by Meca, Zhadan, and Struck within this Special Issue. By compiling a comprehensive and updated review on these interstitial families, they hope to

promote new studies on their intriguing evolutionary histories, adapted life forms and high and hidden diversity.

Hee-JinKwak, et. al in 2021 they studied on the behavioural variation according to feeding organ diversification in glossiphoniid leech. In this study, they investigated the correlation between behavioral pattern and feeding organ structure of leech species. This study provides the characteristics of leeches with specific ingestion behaviors, and a comparison of structural differences that serves as the first evidence of the proboscis diversification.

In 2020, Zattara and Weisblat studied about the cellular and molecular mechanism of segmentation in Annelida. Annelida is one of the three phyla presenting a segmented body plan, composed of repeated morphological units, and the only lophotrochozoan group with this type of organization. This chapter introduces the annelid body plan, summarizes early embryonic development and segment formation in four species spanning the diversity of the phylum, and also discusses on what little is known about the molecular basis of annelid segmentation.

Marchese, et. al in 2020 studied and updated the taxonomic of freshwater Annelida found in the Neotropical and Antarctic Regions and presented it in as a chapter. This chapter provides dichotomous identification keys to Polychaeta, Clitellata, and Aphanoneura. Also included are current limits to identification of various annelids, a description of terms needed to identify taxa, and methods for preparing and identifying species.

In 2019, Drennan, et. al explained the taxonomy and phylogeny of mud owls (Annelida: Sternaspidae), including a new synonymy and new records from the

Southern Ocean, North East Atlantic Ocean and Pacific Ocean in their thesis "Marine Biodiversity 49". This study includes many new records and reports *Sternaspis affinis* Stimpson, 1864 from USA Pacific coastline and genetic connectivity between specimens identified as *Sternaspis* cf. This study performs the largest molecular taxonomy of Sternaspidae to date, using the nuclear gene 18S, and the mitochondrial genes 16S and cytochrome oxidase subunit I (COI) to assess phylogenetic relationships within the family, to reassess the placement of Sternaspidae within the wider polychaete tree and to investigate the effectiveness of the shield as a diagnostic morphological character.

Verdes and Gruber (2017) found out the biological, chemical and functional diversity of bioluminescent annelids. Bioluminescence is widespread within the phylum annelida. The great taxonomic and ecological diversity is matched by a wide array of bioluminescent colours-including yellow light, which is rare among marine taxa. The diversity of bioluminescence colors and patterns suggest that light production in annelids might be involved in many functions like defence mechanism and intraspecific communications.

Chiffer, et. al, 2017 in their paper studied on the molecular data from orthonectid worms show they are highly Degenerate members of phylum Annelida not phylum Mesozoa. This result reveals one of the most extreme cases of body plan simplification in the animal kingdom; our finding makes sense of an annelid-like cuticle in orthonectids and suggests the circular muscle cells repeated along their body may be segmental in origin.

Weigert, et. al, in 2016 in their research paper on the evolution of mitochondrial gene order in Annelida. Annelida is a highly diverse animal group with over 21,000 described species. As part of Lophotrochozoa, the vast majority of annelids are currently classified into two groups: Errantia and Sedentaria, together forming Pleistoannelida. Comparisons of mitochondrial genomes have been used to investigate phylogenetic relationship within animal taxa. The mitochondrial genomes of Myzostomida show the conserved pattern of Pleistoannelida, thereby supporting their inclusion in this taxon

In 2013, Williams, et. al explained the Molecular phylogeny of North American Branchiobdellida (Annelida: Clitellata) in their article "Molecular phylogenetics and evolution". The main objectives of their study were to infer a molecular phylogeny for the North American Branchiobdellida, examine its congruence with morphology-based hypotheses of relationships at the subfamily and genus level, and use the dataset to assess consistency of GenBank-archived branchiobdellidan sequences. Results from their phylogenetic analyses indicate that current taxonomic groupings are largely unsupported by the molecular data. They found a high rate (49%) of inconsistency in GenBank-archived sequences, over 70% of which can be attributed to field or laboratory-based error.

In 2009 Hove and Kupriyanova studied about the taxonomy. The Serpulidae are a large group of sedentary polychaetes inhabiting calcareous tubes. The relationships within the group are poorly understood and taxonomy of the group is very confused which is a major obstacle to accessing their phylogeny. This review provides up-to-date information on the current state of taxonomy of *Serpulidae* sensu lato.

Many works have done on the Phylum Annelida recently: Harian K (2008), found out the use of polychaetes (annelida) as an indicator species of marine pollution. Polychaetes can provide useful information about the poor environmental conditions because they are used as sensitive monitors of water quality mainly on the effects of pollutant

Ereshefsky in 2007 from his paper philosophy of biology studied about the taxonomy and systematics. In it he discusses three conceptual issues in biological taxonomy and systematic. The first is the ontological status of species. Most philosophers believe that species are natural kinds, classes of organisms with theoretically significant similarities. Other philosophers, and many biologists, believe that species are individuals akin to particular entities. The second conceptual issue is taxonomic pluralism. This issue has implications outside of taxonomy. A third conceptual issue concerns the Linnaean hierarchy.

Halanych and Janosik (2006) did a review on molecular markers med for amelid phylogenetics. The anuseid phylogeny is based on the morphological cladistic analysis. The purpose of this is to elucidate and present tools that helps to understand the a volumary history of annelids.

Burresonbin in 2006 from his paper fish diseases and disorders studied about the hirudinea as vector and diseases agents. Leeches are the only important fish pathogens in the phylum Annelida. Both freshwater and marine leeches have worldwide distribution and they occur in a diversity of habitats. Leeches can potentially affect the health of fishes in a variety of ways. Their most important role is as vectors of potentially pathogenic organisms. Both freshwater and marine leeches are known to transmit haemoflagellates of the genera

In 2005, Świątek explain the Structure of the germinal vesicle during oogenesis in leech *Glossiphonia heteroclita*. Oogenesis in the glossiphoniid leech *Glossiphonia heteroclitis* nutrimental, i.e., the growing oocyte is supported by specialized germline cells, the nurse cells. As shown in the present study, during early previtellogenesis in the GV the meiotic chromosomes and prominent primary nucleoli occur. The amplification of rDNA genes, the occurrence of extrachromosomal DNA bodies, as well as the presence of multiple nucleoli and accessory nuclei are described for the first time in the phylum Annelida.

Belova and Krylov explain the distribution of blastocystis according to different systematic groups of hosts in their thesis Parazitologiia in 1998. After the carried out examination of different animals belonging to four phyla, Annelida, Mollusca, Arthropoda, and Chordata, the blastocysts were detected within three phyla, Annelida, Arthropoda, and Chordata. Within the phylum Annelida the blastocysts were found in Hirudinea, within the phylum Arthropoda—in Insecta, within the phylum Chordata—in Amphibia, Reptilia, Aves, and Mammalia.

In the thesis “Molecular Phylogenetics and Evolution” by Shigeaki Kojima in 1998 he explained the Paraphyletic status of Polychaeta suggested by phylogenetic analysis based on the amino acid sequences of elongation factor-1α.In order to judge whether or not Polychaeta is a paraphyletic group, I determined almost the entire amino acid sequence of elongation factor-1α from thirteen polychaetes, two oligochaetes, two hirudineans, two vestimentiferans, and two molluscs. Phylogenetic analysis by the neighbor-joining (NJ) method and the maximum likelihood (ML) method indicated the monophyly of Clitellata (the oligochaetes and hirudineans). In both the NJ and ML trees, vestimentiferans and clitellates were

derived from polychaetes independently. The present results strongly suggest that Polychaeta is a paraphyletic group.

In 1998 Gaudio, et. al, studied about the Organisation and Nucleotide Sequence of the Cluster of Five Histone Genes in the Polychaete Worm *Chaetopterus variopedatus*. In thier studies Histone genes were identified and their nucleotide sequences were determined in the polychaete marine worm *Chaetopterus variopedatus*. The genes are organized in about 390 clusters of 7.3 kbp. The H1 histone gene present in the clusters is the first ever isolated in the phylum Annelida. *Variopedatus* and *Platynereis dumerilii*, the other annelid in which histone genes has been studied.

Jha, et. al, in 1995 using the fluorescence in situ hybridization (FISH) technique. The presence of the vertebrate telomeric sequence (TTAGGG) was found in the chromosomes of two marine polychaetes belonging to two separate orders, they were errant *Platynereis dumerilii* (family Nereidae), and the other sessile, *Pomatoceros lamarckii* (family Serpulidae). This sequence was exclusively present at the ends of the chromosomes in both species.

In 1994, Rota explains the contribution to the taxonomy of the Hormogastridae (Annelida: Oligochaeta) with description of two new species from southern France. A new species of earthworm, *Vignysave dovinii* n. sp. (Hormogastridae), is described from Provence. On the basis of genetic and morphological evidence, the new species *Hormogaster gallica* n. sp. Is also proposed for two French populations of *H. pretiosa* Michaelsen.

In 1991, Jacobsen explains with few exceptions (principally within the genera Eteone, Hesionura and Paranaitis), the setae of the Phyllodocidae have been regarded as being so homogenous as to lack taxonomic value. The results indicate that subtle but important differences do exist, and may be very helpful in a more precise delimitation of genera within the Phyllodocidae. These conclusions are compared to remarks in the literature in an attempt to bring some order to setal observations. Potentially valuable characters seem to be present; along these lines, the need for further research is pointed out, above all a thorough revision of the genus Eulalia.

In 1984, Drewes explain the escape reflexes in earthworms and other annelids in his Neural mechanisms of startle behavior, Escape or startle reflexes are characteristically seen in many representatives of the Phylum Annelida (segmented worms), a group that comprises the earthworms, aquatic oligochaetes, leeches, and marine bristle or polychaete worms. From the standpoint of defense, the escape reflex represents one of the most important components of a worm's repertoire of locomotory behavior that, depending on the species, may also include undulating swimming or peristaltic creeping movements. The underlying control and coordination for all of these locomotory movements are carried out by the worm's central nervous system.

Reishon (1979) studied the bristle worms, and reported that these segmented worms generally bear many setae ("bristles") which usually arise from paired lateral extensions of the body. The color of living specimens is generally tan or brown, but some, especially the feather dusters (sabellids and serpulids), may be brightly

colored. Polychaetes are conveniently separated into the errantiates (free moving) and sedentarians.

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OBSERVATION AND RESULT

ANNELIDA

They are segmented worms. They range in size from less than 1 mm to more than 3 metre in length. Their bodies are long with segments that are divided extremely by shallow ring like constrictions they have the parapodia for locomotion. The 20 specimens belonging to Annelida studied are:

1.DASYCHONE

KINGDOM: Animalia

PHYLUM: Annelida

CLASS: Polychaetae

ORDER :Sabellida

FAMILY : Sabellidae

GENUS : *Dasychone*

DESCRIPTION:

Yellowish brown, segmented bristle worms, crown is feathers like, and presence of tentacles in set of two.

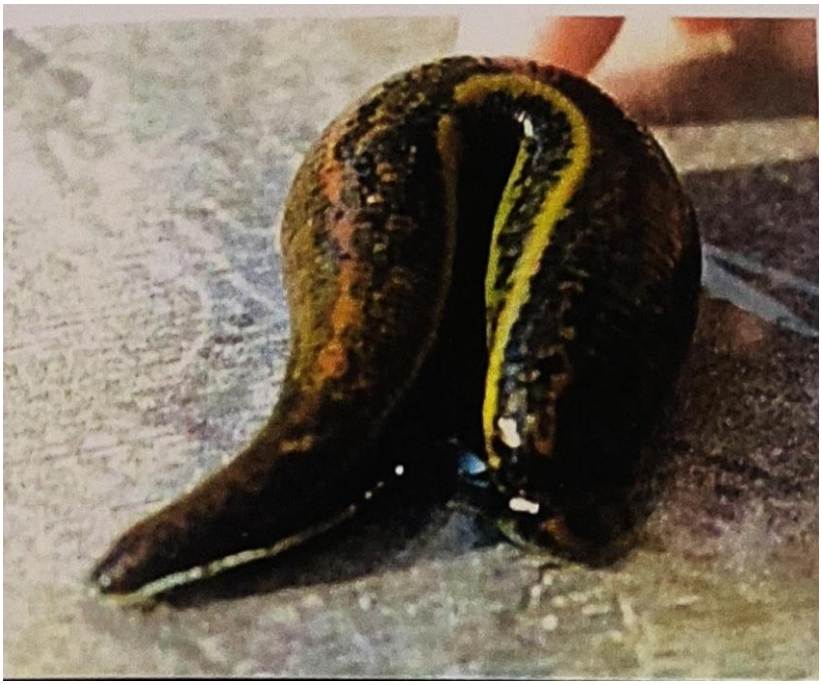
HABITAT:

Found amongst rock, crevice, stones shells

DISTRIBUTION:

Western Central Atlantic, Bermuda

2.HIRUDINARIA



KINGDOM: Animalia

PHYLUM: Annelida

CLASS: Hirudinea

ORDER: Gnathobdellida

FAMILY: Hirudinae

GENUS *Hirudinaria*

SPECIES: *Granulosa*

DESCRIPTION:

The central surface is more flat and the dorsal surface is somewhat complex. So they are a soft elongated dorso-ventrally flattened worm. Body is divided into many segments and they are brightly coloured. Dorsal surface is olive green and ventral surface is orange yellow in colour.

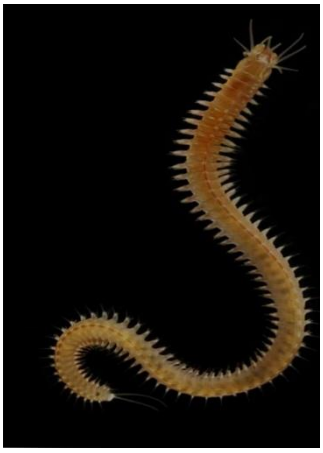
HABITAT:

They are found in lakes, ditches, ponds and slow moving streams and some of them have parasitic adaptation

ABUNDANCE AND DISTRIBUTION:

Occur in India, Burma, Sri lanka, Pakistan and Bangladesh in ponds, lakes,Tanks, swamps.

3.NERIES



Kingdom : Animalia

Phylum : Annelida

Class :Polychaeta

Order :Phyllodicida

Family : Neridídae

Genus : *Neries*

Species :*pelagica*

DESCRIPTION:

Nereis worms are commonly known as rag worms or clam worms. The body is long, slender, and dorso-ventrally flattened, reaching a length of 5-30 cm. The head consists of two parts: a roughly triangular anterior lobe-the prostomium-and a posterior ring-like portion-the peristomium.

HABITAT:

Nereis is a marine crawling type, living in temporary burrows in sand. They are free-living, predaceous, nocturnal, carnivorous.

ABUNDANCE AND DISTRIBUTION:

Distribution: It has cosmopolitan distribution found along the North Atlantic coast, Pacific coast, U.S.A. and Europe.

4.PONTOBDELLA

KINGDOM: Animalia

Phylum :Annelida

Class : Clittelata

Order :Rhynchobdellida

FAMILY: Piscicolidae

GENUS: *Pontobdella*

DESCRIPTION:

They are cylindrical, elongated worm. Consist of anterior and posterior sucker. Anterior sucker is saucer – shaped. The young are usually black or dark green spotted yellow or white or reddish with lighter cancellation. Adult are pale grey or yellow-green. Posterior sucker is cup shaped. Body is rough, leathery. Eyes are absent.

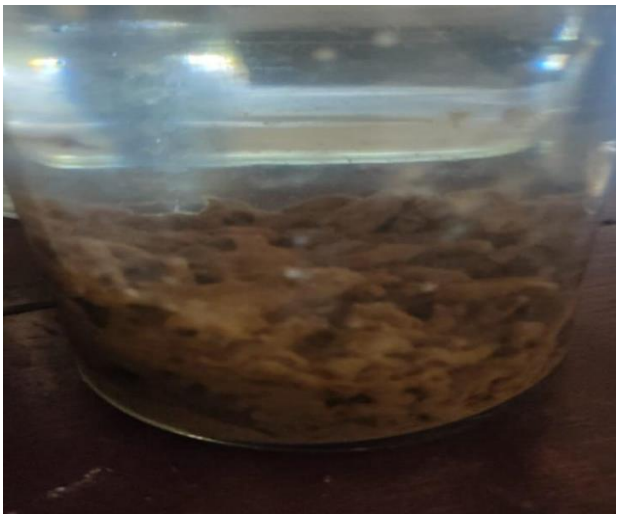
HABITAT:

It is marine, ecto-parasitic on sharks, skates and rays

DISTRIBUTION:

They are visible in north east, Atlantic, Baltic sea.

6.POLYCHAETA TUBES



Kingdom : Animalia

Phylum : Annelida

Class :Polychaeta

Order : Canalipalpata

Family : Serpulidae

DESCRIPTION:

They are long, cylindrical, segmented tube like. The body of tube worms is pale yellow to red and up to 200 segments. Tubicolous species can build tubes of unadorned mud, sand or parchment or of hardened calcium carbonate.

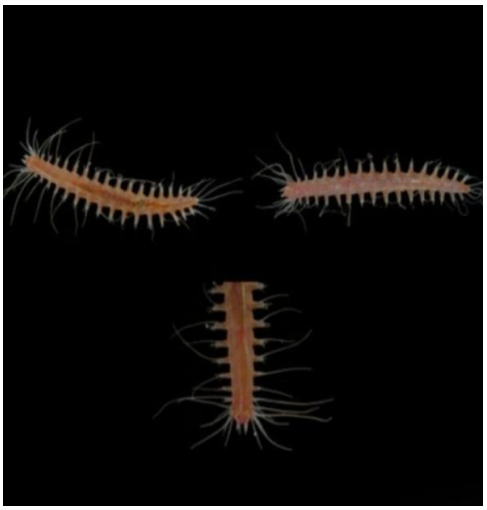
HABITAT:

They live in hard tubes attached to hard surface, such as rock, stones, bivalves. Only few are large, free living polychaete species have been identified.

DISTRIBUTION:

They are commonly found in North side of Alaska, Peninsula, and NortheastAtlantic Ocean.

6.LEOCRATES



Kingdom : Animalia
Phylum : Annelida
Class : Polychaeta
Order :Phyllodocida
Family :Hesioninae
Genus : *Leocrates*

DISCRIPTION:

They are fleshly coloured. Their tentacles are short, segmented worms. They contain many tentacles on each segment. They have parapodia which are used for locomotion.

HABITAT:

They are seen in marine and fresh water,

DISTRIBUTION:

The organisms are usually distributed in Japan, Indo- China, Persian Gulf, Red and Mediterranean Sea, tropical.

7.PHERITIMA

Kingdom : Animalia

Phylum : Annelida

Class :Oligochaeta

Genus : *Pheritima*

Species : *Posthuma*

Description:

Body is long, narrow and cyandrical. Length may reach upto 150 mm. Body colour is brown. The anterior most segment is called Prostomium. Mouth is a crescentic aperture, present at anterior end. The segment containing mouth is called

peristomium. Setse were present at all the segments moept-lat and last Fach set is embedded in a setel sac. A glandular band called Clitellum is situated in 14^{th} to 16^{th} segments. It forms cocoon during the reproduction.

HABITAT:

These are nocturnal in habit and live in damp, most, humus-rich soil of lawns, gardens etc in dry weather they burrow deeper into the soil to avoid dryness. Their are herbivore and are macro-decomposers, they form an important source of food for birds it also helps in soil restoration and increasing soil fertility

Distribution:

Found in moist soil all over the world

8.HEAMADIPSA

Kingdom : Animalia

Phylum : Annelida

Class : Clitellata

Order : Arynchobdellida

Family : Haemadipsidae

Genus :*Haemadipsa*

Species : *zelanica*

DESCRIPTION:

Have 5 pairs of eyes. Most of them have 2 jaws. They are broad, bluish grey, black/brown, yellowish-greenish or multicolured, 3 to 4 rows of broken stripes. They have blood feeding habitat.

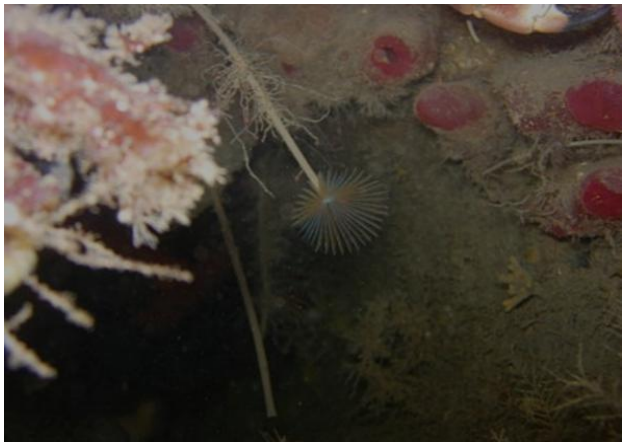
HABITAT:

Occur on bushes and grasses. They attach themselves to hand, arm, shoulders of passers-by.

DISTRIBUTION:

They are distributed in Subtropical and tropical regions around Indian and Pacific Ocean.

9.SABELLA



Kingdom : Animalia

Phylum : Annelida

Class :Polychaeta

Order : canalipalpata

Family :sabellidae

Genus : *Sabella*

Species : *pavonina*

DESCRIPTION:

It is 10-25 centimetres in length. Its body is elongated and divided into 100-600 small segments. The head has two fans of feathery tentacles arising from fleshy, semi-circular lobes. The body is mostly grey-green while the tentacles are brown, red or purple with darker bands.

HABITAT:

It is found in shallow, tidal waters with a bed of mud, sand or gravel. It is sometimes found on rocks or shipwrecks. The worm lives inside a smooth tube of fine mud or sand particles held together with mucus.

DISTRIBUTION:

They can be found along the coasts of Western Europe and the Mediterranean.

10.TEREBELLA

Kingdom : Animalia

Phylum : Annelida

Class : Polychaeta

Order :Terebellida

Family : Terebellidae

Genus : *Terebella*

DESCRIPTION:

They are red coloured, marine and tubicolous worms found along European and American coasts buried in mud between sea rocks. Body elongated and measures about 15 to 20 cm. in length and is broad in front and narrow behind. Head is distinct and comprises a horse-shoe shaped prostomium and a peristomium. Posterior region is without parapodia.

HABITAT:

Terebella is a marine, burrowing, sedentary annelid. The animal burrows in tubes in sand. Some species live 10 to 230 fathoms deep.

DISTRIBUTION:

Probably seen in the sub Antartica, Indian ocean and near Marion Island

11.*Megascolex*

Kingdom : Animalia

Phylum : Annelida

Class :Clittileta

Order : Haplotaxida

Family : Megascolex

Genus : *Megascolex*

Species : *mauriti*

DESCRIPTION:

Worms are slender. It is greyish colour/ purplish rather paler on ventral surface. They are segmented worms; setae are arranged in each segment.

HABITAT:

Rivers where it contains extensive mud and sand flats and embankments.

DISTRIBUTION: They are abundantly available in Mud/sand of banks of Mekong rivers.

12.EURYTHOE

Kingdom : Animalia

Phylum : Annelida

Class :polychaeta

Order : Aciculata

Family : Amphinomidae

Genus : *Eurythoe*

DESCRIPTION:

The animal is generally observed on the reef or near it. The species can be found between 2 and 15 meters. Uncommon species and the species are generally isolated. These worms can have orange, salmon pink, green or even black body can often have dark mid ventral line.

HABITAT:

Found in all ecosystems, intertidal zones on sandy beaches. This species thrives in warm shallow water, individual can found under rock

DISTRIBUTION:

They are tropical species found in Atlantic, Pacific, Indian Ocean Meditterian and Red Sea

13.ARENICOLA

Kingdom : Animalia

Phylum : Annelida

Class : Polychaeta

Order : Capittalidae

Family : Arenicolidae

Genus : *Arenicola*

DESCRIPTION:

Arenicola marina is the familiar lugworm, much prized as bait by anglers. This sedentary polychaete has a firm, cylindrical body divided into a thoracic and an

abdominal region. The head is small, with no appendages or eyes although a rough proboscis may be visible. Anterior region thick posterior region long and narrow

HABITAT:

Found from high water neap in sand and muddy sand, living in a characteristic U or J-shaped burrow.

DISTRIBUTION:

Found on all coast around Britain, Ireland and North West Europe

14.AMPHRITE

Kingdom : Animalia

Phylum : Annelida

Class : Polychaeta

Order : Terebellida

Family : Terebellidae

Genus : *Amphrite*

DESCRIPTION:

Amphitrite ornata or ornate worm, is a species of marine polychaete worm in the family Terebellidae. Polychaetes, or marine bristle worms, have elongated bodies divided into many segments. Each segment may bear setae (bristles) and parapodia. Body is long, laterally and ventrally flattened, numerous long tentacles are present, yellowish in colour,

HABITAT:

They are seen in soft mud and under stone. Sometimes found living as commensal inside tube behind the worms.

DISTRIBUTION:

They are abundantly available in North side of Cape cod to new found land.

15.EUNICE

Kingdom : Animalia

Phylum : Annelida

Class :Polychaeta

Order : Eunicudae

Family : Eunicidae

Genus : *Eunice*

DESCRIPTION :

Individuals grow to a length of between 0.5 and 300 cm (0.20 and 118.11 in). Their bodies have multiple segments. They have two eyes and five tentacles. They have well-developed sense organs and relatively large brains. They are white in colour

HABITAT:

Found in ocean and seas and in soft sediments such as sand, muddy sand, mud, gravel, broken shell or fragments of coral.

DISTRIBUTION: Species is found in northern Atlantic Ocean, Mediterranean Sea, North Sea, Indian and Pacific Ocean.

16.POLYONE

Kingdom : Animalia

Phylum : Annelida

Class : Polychaeta

Order : Phyllodocidae

Family : Polynoidae

Genus : *Polyone*

DESCRIPTION:

Their body may be elliptical or line. Dorsal and ventral surface is smooth. They have distinct head,2 pairs of eyes, three antennae and palps. It is whitish, creamy in colour.

HABITAT:

They are dwell in protected environment susch as under stone

DISTRIBUTION:

They are not that much abundant.

*17.*SABILLERIA

Kingdom : Animalia

Phylum : Annelida

Class : Polychaeta

Order :Cannalipalpata

Family : Sabillaridae

Genus : *Sabelleria*

DESCRIPTION:

Their colour is wine red, thoracic with dark brown spots. They live in the tube made up of shell fragment and sand cement together with mucus. Their body is thin cylindrical and smooth. About 40 segments can be seen.

HABITAT:

It lives in the price of shell , sand and gravel

DISTRIBUTION:

Found mostly in coastal of British Isles, in the sublittoral zone and occasionally in the intertidal zone. It is also found in other regions of north east Atlantic Ocean, south to Portugal and Mediterranean Sea.

18.AMPHRODITE

Kingdom : Animalia

Phylum : Annelida

Class :polychaeta

Order : Phyllodocida

Family :Amphroditidae

Genus : *Amphrodite*

DESCRIPTION:

An oval bodied worm of around 10-20 cm long with a width of up to 6 cm. They are flush green and blue /brown in colour. They are dorso-ventrally flattened, contain 30-35 segments. Many long bristles on lateral side are present.

HABITAT:

Found in muddy bottoms of all seas. Sluggish worms, it creeps on the sea floor.

DISTRIBUTION:

Found around the coasts of Britain and Ireland.

19.SERPULA

Kingdom : Animalia

Phylum : Annelida

Class : Polychaeta

Order : Canalipalpata

Family : Serpula

Genus : *Serpula*

DESCRIPTION:

The members of this family differ from other sabellid tube worms in that they have a specialized operculum that blocks the entrance of their tubes when they withdraw into the tubes. In addition, serpulids secrete tubes of calcium carbonate. Most distinctive features are their colourful fan shaped crown. Single, funnel like operculum is present. They are sessile, marine, tube worms.

HABITAT:

They are usually benthic, sedentary suspension feeders. They secrete and inhabit a permanent calcareous tube attached to hard substrata.

DISTRIBUTION:

Their distribution is worldwide. Pacific, Atlantic, Indian Ocean, Mediterranean Sea, North Sea, red sea. Species of Serpula are common on the west coast of North America from Alaska to California. It is found attached to submerged rocks, shells.

20. CHLOEIA

Kingdom : Animalia

Phylum : Annelida

Class : Erantia

Order :Amphinomida.

Family :Amphinomidae

Genus : *Chloeia*

Species : *bimaculata*

DESCRIPTION:

It is characterized by having two distinct mid-dorsal dark spots one behind the other on each segment. It can be distinguished from its sympatric species *C. parva,* which is characterized by having a mid-dorsal "Y"-shaped dark pigment on each segment. They are flat and broad having many hair bristles along it's sides and a pattern of triangular spot on upper part of the body.

HABITAT:

It is found in sandy to silty ditreial areas close by the reef

DISTRIBUTION:

Chloeia's distribution is tropical. Most of them are found in India , Pacific Ocean and few species in Atlantic Ocean.

CONCLUSION

Taxonomic keys are used for the taxonomic identification where they provide the unique characteristics of species with written descriptions and pictures. They are also capable of conveying natural variation in the morphology of speciesnor the small yet characteristic morphological features of a species. Taxonomic identification is less time consuming and as they help students by providing necessary information on the specimens with referring any internet or book sources. Eventhough many species of annelida observed in the museum were originally distributed in water bodies other those around India like Pacific Ocean, so these may have become invasive (A species I regarded a as invasive if it has become introduced to a location, area, or region where is did previously occur naturally and becomes capable of establishing a breeding population the new location).

DISCUSSION

Annelida a class of animals also known as segmented worms or ringworms consist of 17,000 different species. Annelida was divided into the groups; Polychaeta, Oligochaeta (earthworms etc.) and Hirudinea (leeches). Generally they thrive in marine and fresh waters, mostly in sediments and in damp terrestrial environments, mostly the soil. The familiar annelids are the earthworms and leeches. They are tripoblastic and schizocoelomate whose body is metamerically segmented and covered with a layer of cuticle

A total of 20 genera including 22 species entitled in the article “Distribution and diversity of polychaeta in the northern coastal water bay of bengal” and also mentioned the polychaeta species distributed on the east coast. They where obtained in the summer monsoon season.From this the main character Siddique pointed out is that peristomium is longer than the prostomium and posterior end has maximum filament. The species provided in the museum contain 14 of polychaetas where identified and pointed out the features such as fleshyfleshy Prostrusian called parapodia which bears many bristles called chaetae.

The research paper “Cellular and molecular mechanism of segmentaion in annelida an open question discuss mainly about the segmentation in annelids.Zattara and weisblast point out that arthropods and vertebrates also show segmental organization, annelids are the only phylian where segment formation continues well beyond embryonic development and into adult stages, either in normal posterior growth, asial regeneration oraseul reproduction. Annelids are also unique in that they can form segments through two quite different mechanisms boundary driven and lineage-driven segmentation. Because of the vast distribution of segmented worm most of the species distributed in the museum was also the segmented worms which is composed of the repeated morphological unit. Both of the ideas conclude that most species of the annelida consist of the segmented worms.

The character showing the biluminescent where distributed In eight polychaeta families namely Accrocinidae, Flabelli geridae, Polynoidae, Terebellidae, Chaelopteridae, Cirattelidae and painted out by verdes in the article Biological chemical and functional diversity of biluminescent in annelid. With the same identification 1 polynoidae and 2 terebellidae where identified in museum.

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