COMPARATIVE ACCOUNT FROM PORIFERA TO ASCHELMINTHES

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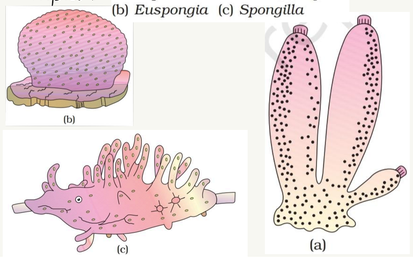
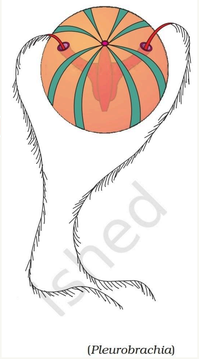
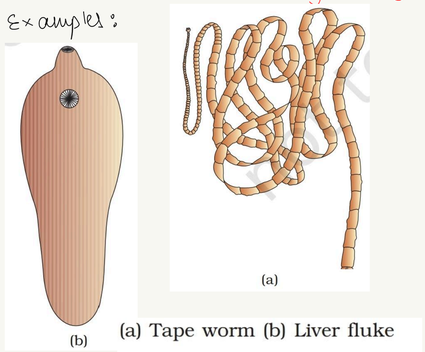
PARAMETERS	PORIFERA (SPONGES)	COELENTRATA (CNIDARIA)	CTENOPHORA (SEA WALNUTS)	PLATYHELMINTHES (FLATWORMS)	ASCHELMINTHES (ROUD WORMS)
HABITAT	Mostly Marine, some freshwater (Spongilla)	Mostly marine, some freshwater (Hydra) sessile, free-swimming.	Exclusively Marine	Free living or Parasitic	Aquatic, terrestrial, Parasitic in plants/Animals
EXOSKELETON	X	Coral forms have $CaCO_3$ exoskeleton	X	X	X
ENDOSKELETON	Spicules, spongin fibres	X	X	X	X
DIGESTION	• Digestive system Absent • Intra cellular digestion	• Digestive system Incomplete • Mouth on hypostome leading to body cavity → gastro-vascular cavity • Intra + Extra cellular digestion	• Intra + Extra cellular.	• Incomplete with single opening • Extra-cellular • some absorb food directly from body surface	• Complete alimentary canal with Muscular pharynx • Extra cellular digestion
RESPIRATION	Cell surface	Body wall	Body wall	Free living Body surface	Free living body surface.
CIRCULATION	circulating fluid = water	circulating fluid = water	circulating fluid = water	circulating fluid = water	circulating fluid = water
EXCRETION	Body surface	Body surface	Body surface	Flame cells (Protonephridia)	Excretory Pore
NERVOUS SYSTEM	X	Neurons Appear	✓	✓	✓
ASEXUAL REPRODUCTION	Fragmentation,	Budding	X	High regeneration capacity (Panaria)	X
SEXUAL REPRODUCTION	Present, Hermaphrodite	✓	Present, Hermaphrodite	Present, Hermaphrodite	Distinctly Dioecious
FERTILIZATION	Internal	External	External	External	Internal
DEVELOPMENT	Indirect, (larvae Morphologically distinct from Adult)	Indirect / direct	Indirect	Indirect through larval stages	Indirect / direct (young resembles adult)
UNIQUE FEATURES & EXAMPLES	• WATER CANAL SYSTEM Food gathering, Removal of wastes, Respiratory exchange Parameter: Number, location, size, waterflow Ostia: Many, Body surface, Minute, Entry Osculum: usually one, Body surface, large, Exit • Choanocytes / collar cells line the spongocoel. • Examples: Examples of Porifera : (a) *Sycon* (b) *Euspongia* (c) *Spongilla*	• Name derived from Cnidoblasts / Cnidocytes containing nematocytes Functions → Anchorage, Defense, Capture of prey. • Obelia Exhibits 2 forms Polyp (sessile, cylindrical) → Asexually (Alteration of generation) → Medusa (Free swimming, umbrella shaped) → Sexually • Examples: (a) *Aurelia* (Medusa) (b) *Adamsia* (Polyp)	• 8 External rows of Comb Plate for locomotion, hence called Comb Jellies. • Exhibit Biolumnescence. • Example: (Pleurobrachia)	• Dorsoventrally flattened Body • Hooks & suckers in parasitic form • 1st ones with bilateral symmetry. • Examples: (a) Tape worm (b) Liver fluke	• Circular in cross section. • 1st ones with complete Alimentary canal. • Females longer than males • Posterior end curved in males • Example: Male, Female (Roundworm)











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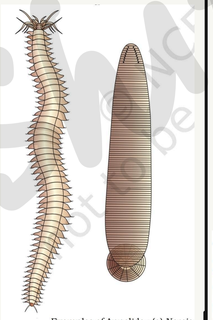
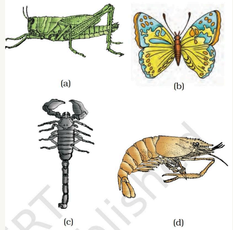
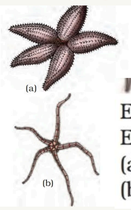
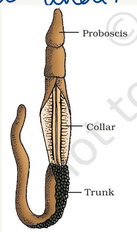
COMPARATIVE ACCOUNT FROM ANNELIDA TO HEMICHORDATA

Parameters	ANNELIDA (SEGMENTED WORMS)	ARTHROPODA (JOINT APPENDAGES)	MOLLUSCA / SOFT BODIED	ECHINODERMATA (SPINY SKINNED)	HEMICHORDATA (HALF CHORDATES)
HABITAT	Aquatic & Terristial			Exclusively Marine	
BODY DIVISIONS	Segments → Metamers / Annuli	Head, thorax, Abdomen	Head, Muscular pharynx, ~~visceral hump~~	star like	Proboscis, collar, trunk (worm like).
LOCOMOTORY STRUCTURE	Longitudinal & circular muscles Parapodia / lateral Appendages	Joined Appendages	Muscular foot	water vasular system	X
EXOSKELETON	X	Chitinous / Cuticle	Calcareous shells	spines	X
DIGESTION	✓	✓	Mouth with file like Rasping organ, Radula for feeding	Mouth → lower side / ventral Anus → upper side / dorsal	✓
RESPIRATION	Body surface	Gills, book gills, Tracheal system, book lungs	Feather like gills in mantle cavity	water vascular system	Gills
CIRCULATION	Closed	Open			
EXCRETION	Nephridia	Malphigian tubules	Gills	X	Proboscis gland
NERVOUS SYSTEM	Paired ganglia with double ventral nerve cord		✓	✓	✓
SENSE ORGANS	Eyes / Tentacles	Eyes (simple, compound) Antennae, statocyst (balancing)	Tentacles	✓	✓
MONO/ DIOECIOUS	Monoecious → Earthworm, Leech Dioecious → Neris (aquatic form)	Mostly dieocious	usually Dioecious	Dioecious	
FERTILIZATON	External / Internal	usually internal	External	usually external	External
DEVELOPMENT	Direct / Indirect		Indirect	Indirect with free swimming larvae	Indirect.
UNIQUE FEATURES & EXAMPLES	• 1st ones with Metamers & true coelom. • Examples:  Examples of Annelida : (a) *Nereis* (b) *Hirudinaria*	• Examples:  Figure 4.12 Examples of Arthropoda : (a) Locust (b) Butterfly Scorpion (d) Prawn *Apis* (Honey bee), *Bombyx* (Silkworm), *Laccifer* (Lac insect) Vectors – *Anopheles*, *Culex* and *Aedes* (Mosquitoes) Gregarious pest – *Locusta* (Locust) Living fossil – *Limulus* (King crab).	• Soft & spongy layer of skin forms mantle over visceral hump. • space btw hump & mantle → Mantle cavity • Example  Examples of Mollusca : (a) *Pila* (b) *Octopus* 	• water vascular system ↳ Loco motion ↳ capture & transport food ↳ Respiration • Presence of Calcareous ossicles • Example:  Examples of Echinodermata : (a) *Asterias* (b) *Ophiura*	• Rudimentary stomochord. Earlier considered as subphylum under chordata but now under non-chordata • Example:  Figure 4.15 *Balanoglossus*

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