

Phylum Gastrotricha (Bristle Backs)

gastro=stomach; trich=hair; sometimes called "bristle backs"

790 species

mostly **meiofauna (interstitial fauna)**

small group of microscopic wormlike animals

same size as rotifers (usually <1mm, to 4mm)

widely distributed and abundant in freshwater and marine environments

benthic, part of **periphyton** =the layer of detritus and small organisms found on the seabed, submerged rocks, plants and algae

many cosmopolitan species

a few species are terrestrial and live in water films surrounding soil particles

resemble flatworms:

thin flattened wormlike body

acoelomate; no real body cavity

Animals: Phylum Gastrotricha; Ziser Lecture Notes; 2015.10

1

glide on cilia like planarians

cephalic ganglia with double nerve cord

protonephridia w flame cells

but have **complete digestive tract**

Body Form

head & trunk

head

with brain and sensory organs

trunk

usually the body is covered with spines, bristles, scales or plates

end of trunk usually forked

has two or more adhesive tubes or **cement glands** for attachment to substrates

a few also have an elongated tail

acoelomate

some consider them pseudocoelomates but no real body cavity

Body Wall

Animals: Phylum Gastrotricha; Ziser Lecture Notes; 2015.10

2

syncytial epidermis secretes outer **cuticle**

cuticle is hardened in some areas to produce scales, hooks and bristles

glide on ventral cilia

longitudinal and some circular muscles in body wall

there is no body cavity; the interior of body is filled with **mesenchyme**

entire ventral surface is ciliated, or sometimes the cilia are arranged in rows

Feeding & Digestion

feed in algae, protozoa, bacteria and detritus

mouth is at the anterior end

food is directed to mouth by cilia on head

mouth opens into an elongated muscular pharynx

has a triangular or Y-shaped lumen

the pharynx opens into a cylindrical intestine

lined with glandular and digestive cells

Animals: Phylum Gastrotricha; Ziser Lecture Notes; 2015.10

3

the anus is on the ventral surface close to the posterior of the body

no respiratory or circulatory systems

gas exchange by simple diffusion

a few species *may* be capable of anaerobic respiration

Excretory System

protonephridia serve in removing excess water

nitrogen wastes probably diffuse through the body wall

Nervous System

brain consists of pair of ganglia near pharynx

pair of lateral nerve cords extend the length of body

primary senses consist of bristles and cilia on the body that function as mechanoreceptors

a few chemoreceptors

but only a few species have **eyespots** (ocelli)

also, have sensory bristles on head for tactile clues

Animals: Phylum Gastrotricha; Ziser Lecture Notes; 2015.10

4

Excretion

protonephridia with **solenocytes** rather than flame cells

solenocyte has 1 flagellum enclosed in cylinder of cytoplasmic rods

(flame cells have a tuft of many flagella)

Reproduction and Development

all are **hermaphrodites**

mutual cross-fertilization

fertilized eggs are released by breaking through the body wall

can produce two kinds of eggs:

thin-walled egg for immediate reproduction

thick-walled egg for dormancy

resistant stage → can survive for years

direct development: no larval stage

juveniles mature in a few days after hatching

most freshwater species are parthenogenetic

some are protandric

a few bear live young.

gastrotrichs mature rapidly and have lifespans of only a few days

Classification

Two orders:

O. Macrodasyida

all marine
interstitial
hermaphroditic
no protonephridia

O. Chaetonida

mostly freshwater
only parthenogenetic females known
1 pr of protonephridia