

## Ecology part I

We will try to concentrate on that part that is sort or unique to amphibians and reptiles.

We won't learn how to do life tables, calculate diversity and such, as that's really part of an ecology class proper.

### I. Relationships (other than predator-prey).

Mutualism - both organisms benefit. Some examples:

Eggs of *Ambystoma maculatum*:

Eggs turn green as they incorporate algae:

Algae benefit from waste products, larva benefit from oxygen.

Some reports that for *A. opacum*, algae may actually be toxic.

Algae on turtle shells:

Algae provide camouflage, get a place to live.

(used to be given as an example of commensalism).

Birds picking parasites off crocodiles (not from the mouth).

Commensalism - only one species benefits (the other is "unaffected")

There are very few good examples of commensalism, but some possible examples:

Gopher tortoises - burrows are used by many different species (this doesn't really affect the tortoises).

Tuatara - shearwater? Just how well they get along is a bit of a question.

Usually, they get along fine and just share their burrow.

Tuataras benefit from guano which attracts many invertebrates.

Occasionally will go after young seabirds.

Parasitism - lots of examples of parasitism in reptiles and amphibians.

Parasites are probably much more important in driving evolution than previously thought.

Almost any multicelled (and some single celled) organism is infested with parasites.

The effect of parasites can be anything from almost undetectable to causing mass die-offs.

Protozoans - found in intestines and blood

(Malaria is known to have infected dinosaurs, and can be found in many reptiles including in the U.S.)

Trematodes (flukes) - in digestive tract, blood, urogenital system, lungs.

Tapeworms - in digestive system; eggs in muscles.

Nematodes - can be host specific and can even help in taxonomy (identifying the host!).

(this is actually true of several groups of parasites).

in dig. system, lungs, oviducts, urinary system.

Acanthocephalans - intestines

common in turtles.

Leeches - usually on surface but also in mouth and anal cavity.

Pentastomids - tongue worms

crustaceans; found in mouth and upper respiratory cavities of snakes (pit vipers, boas & pythons in particular)

Ticks & mites - on surface, sometimes congregate in specific areas (e.g., near ears of lizards)

Some lizards seem to have special “mite pockets” that allow mites to congregate.

It's unclear as to why - are lizards really getting any kind of benefit?

Insects - mosquitoes, flesh flies, etc.

Diseases - of course, amphibians and reptiles are subject to many diseases.

Some (like Chytridiomycosis) have (and are) causing huge problems.

We already mentioned malaria.

But a few are also important from the human health standpoint:

### 1) Salmonella

Wide spread in reptiles (and some amphibians).

Usually asymptomatic in reptiles (spreads through fecal-oral route).

But wide spread, and transferable to humans.

### 2) Encephalitis (equine) can be harbored by several snakes.

Equine encephalitis can be (rarely) transmitted to humans.

### 3) Poultice made from frog leg muscles

Used in Southeast Asia as a treatment for open wounds

Frog muscle will harbor parasites that are then transferred to humans.

### 4) Tapeworms:

Rarely can get transmitted to humans who eat infected reptiles.

Example: sparganosis is transmitted to humans; amphibians and reptiles are an intermediate host.

Some comments on parasites and diseases:

Many amphibians and reptiles will choose higher than usual body temperatures if they are infected.

(Everything's infected, it's just a matter of how serious it is).

See also table 11.2 in your text for more examples.

## II. Territoriality

Territory - area that is defended from intruders.

smaller than home range; includes feeding sites, breeding sites, "home" (e.g., burrow).

Functions in several ways:

ensures adequate food supply

regulates species density

reduced predation

slows spread of disease

reduces interference with breeding

(of course, all of these vary considerably throughout the year).

How this works in amphibians and reptiles varies. Some have strong territoriality, others have no territoriality, or only show territoriality during certain times of year.

Some examples:

Frogs:

All species studied show some territoriality

females/juveniles defend feeding territory

males defend breeding territory

Salamanders:

Also show territoriality, though it's not well studied.

(e.g., nudging/biting seen in some Plethodontids).

Turtles:

Frequently there are large basking aggregations (ie., not really territorial), but there is usually a dominance hierarchy set up for the best basking sites

Tortoises are territorial.

Some wood and spotted turtles become aggressive during the breeding season.

Crocodiles:

1 male per breeding hole; may defend multiple females

Females obviously defend nests.

Lizards:

Females often defend nesting sites

Males will often defend display sites (where they “display”)

Snakes:

Not many that aggressive in defending territories.

Tuataras

Will defend nest site and burrows (sometime shearwaters will benefit from this).

Some comments:

Home ranges and territories will shift due to:

seasons, succession, habitat changes, destruction, etc.

Home ranges for carnivores usually larger than for herbivores.

Some may have different home ranges in summer and winter.

Depending on the animal, these may be connected with a migration corridor.

We don't think of too many amphibians and reptiles "migrating", but seasonal movements between ponds and woods are exactly that on a small scale.