

## Amphibian Diversity:

Although not following “strict” cladistic principles, we divide Amphibians up into three orders:

Anura - frogs (name refers to “without tail”)

Caudata (sometimes Urodela)- salamanders

Apoda - caecilians (name refers to “without legs”)

We'll spend some time with each of these groups.

## Caecilians - Apoda:

Found in the tropics. Distribution is almost worldwide, but are missing from some important areas.

Two distribution maps don't agree with each other in the details:

1) From text            2) From Wikipedia

Distribution of caecilians can be tracked back to several events:

Breakup of Pangea

Movement of Indian plate into Asia

Local events (such as drying up of central Africa causing species on the east and west to diverge).

Depending on your reference, there are between 6 and 10 families of caecilians, and somewhere between 170 and 200 species.

(It seems cladistic analyses generate more and more families... although families aren't really used in cladistics).

Since we don't really have any caecilians to look at (with one exception), we'll concentrate on two or three families and skip the rest.

The point is to learn what distinguishes different caecilians, not to learn about a bunch of animals most of us will never see except maybe in a jar (or picture).

## Caecilian characteristics:

Obviously, no legs (no trace of even a pectoral or pelvic girdle).

One lung is often reduced in size (two lungless species).

Short tails, blunt head, cloaca near end of body.

Generally no very colorful, but some exceptions do exist

Vision (if present) is limited to light perception.

Strong skull, with reduced bones, adapted for burrowing through the soil.

Smaller caecilians often resemble worms. Larger ones can resemble snakes (were classified as snakes a long, long time ago).

Ringed appearance is due to grooves termed “annuli”.

Each of these corresponds with a vertebrae.

Have a pair of tentacles between the nostrils and eye - serves to enhance smell (or so we think).

May be retractable.

All caecilians have internal fertilization.

Male uses a “phallosome” which is inserted into the female cloaca.

Copulation can last 2 - 3 hours.

Often the young are mostly terrestrial, and will spend much time on land near the water.

Some hatch in an already metamorphosed state.

Diet is not well known:

Mostly insects and invertebrates, but plant remains and other detritus has been found in their stomachs.

Earliest known real caecilian for which we have more than just a vertebra is *Eocaecilia* from the Jurassic.

Still had eyes and small limbs.

We'll look at three families:

#### I. Caeciliidae, or common caecilians.

Most diverse family of caecilians

Skull with fewer bones than most other groups, no tail, some without a larval stage.

Distributed world wide, including South and Central America, Africa, and India.

Size from 98mm (*Idiocranium russeli*) from Cameroon, up to 1.5m (*Caecilia thompsoni*) (weighs up to 1 kg, endemic to Columbia).

#### II. Ichthyophiidae (“fish caecilians”)

South East Asia.

Considered more primitive than other groups.

Tail, mouth that is not recessed, lots of scales.

All are oviparous, though the female often protects the eggs until hatching.

Gilled larva hatch on land and crawl to nearest water.

Presumably spread from India to elsewhere in South East Asia (“came in with India”)

### III. Typhlonectidae (aquatic caecilians)

Viviparous.

Some get fairly large (up to two feet).

No true tail.

Many adapted to live in water, and some are totally aquatic.

Body often compressed with dorsal fin (or fold).

South America, east of Andes (think “Amazon basin”)

The real problem with all caecilians is that we know very little about their natural history.

It would probably be difficult to do a real study on this!