[Template:Other uses](/wiki/Template:Other_uses" \o "Template:Other uses) [Template:Use British English](/wiki/Template:Use_British_English) [Template:Semiprotected](/wiki/Template:Semiprotected) [Template:Automatic taxobox](/wiki/Template:Automatic_taxobox)

**Crocodiles** (subfamily **Crocodylinae**) or **true crocodiles** are large aquatic [reptiles](/wiki/Reptile) that live throughout the tropics in Africa, Asia, the Americas and [Australia](/wiki/Australia_(continent)). Crocodylinae, all of whose members are considered true crocodiles, is classified as a biological [subfamily](/wiki/Subfamily). A broader sense of the term crocodile, [Crocodylidae](/wiki/Crocodylidae) that includes [*Tomistoma*](/wiki/Tomistoma), is not used in this article. The term crocodile here applies only to the species within the subfamily of Crocodylinae. The term is sometimes used even more loosely to include all [extant](/wiki/Extant_taxon) members of the [order](/wiki/Order_(biology)) [Crocodilia](/wiki/Crocodilia), which includes *Tomistoma*, the [alligators](/wiki/Alligator) and [caimans](/wiki/Caiman) (family [Alligatoridae](/wiki/Alligatoridae)), the [gharials](/wiki/Gharial) (family [Gavialidae](/wiki/Gavialidae)), and all other living and fossil [Crocodylomorpha](/wiki/Crocodylomorpha).

Although they appear to be similar to the untrained eye, crocodiles, alligators and the gharial belong to separate biological [families](/wiki/Family_(biology)). The gharial having a narrow [snout](/wiki/Snout) is easier to distinguish, while [morphological](/wiki/Morphology_(biology)) differences are more difficult to spot in crocodiles and alligators. The most obvious external differences are visible in the head with crocodiles having narrower and longer heads, with a more V-shaped than a U-shaped snout compared to alligators and caimans. Another obvious trait is that the upper and lower jaws of the crocodiles are the same width, and the [teeth](/wiki/Teeth) in the lower jaw fall along the edge or outside the upper jaw when the mouth is closed; therefore, all teeth are visible unlike an alligator; which possesses small depressions in the upper jaw, into which the lower teeth fit. Also, when the crocodile's mouth is closed, the large fourth tooth in the lower jaw fits into a constriction in the upper jaw. For hard-to-distinguish specimens, the protruding tooth is the most reliable feature to define the [family](/wiki/Family_(biology)) that the [species](/wiki/Species) belongs to.[[1]](#cite_note-1) Crocodiles have more [webbing](/wiki/Webbing) on the toes of the hind [feet](/wiki/Foot) and can better tolerate [saltwater](/wiki/Saline_water) due to specialized [salt glands](/wiki/Salt_gland) for filtering out salt, which are present but non-functioning in alligators. Another trait that separates crocodiles from other crocodilians is their much higher levels of [aggression](/wiki/Aggression).[[2]](#cite_note-2) Crocodile [size](/wiki/Measurement), [morphology](/wiki/Morphology_(biology)), [behaviour](/wiki/Behaviour) and [ecology](/wiki/Ecology) somewhat differs between [species](/wiki/Species). However, they have many similarities in these areas as well. All crocodiles are [semiaquatic](/wiki/Semiaquatic) and tend to congregate in [freshwater](/wiki/Freshwater) habitats such as [rivers](/wiki/River), [lakes](/wiki/Lake), [wetlands](/wiki/Wetland) and sometimes in [brackish](/wiki/Brackish) water and [saltwater](/wiki/Seawater). They are [carnivorous](/wiki/Carnivorous) animals, feeding mostly on [vertebrates](/wiki/Vertebrate) such as [fish](/wiki/Fish), [reptiles](/wiki/Reptile), [birds](/wiki/Bird) and [mammals](/wiki/Mammal), and sometimes on [invertebrates](/wiki/Invertebrate) such as [molluscs](/wiki/Mollusc) and [crustaceans](/wiki/Crustacean), depending on species and age. All crocodiles are [tropical](/wiki/Tropical) species that, unlike alligators, are very sensitive to [cold](/wiki/Cold). They separated from other [crocodilians](/wiki/Crocodilian) during the [Eocene](/wiki/Eocene) epoch, about 55 million years ago.<ref name=kambara>[Template:Cite journal](/wiki/Template:Cite_journal)</ref> Many species are at the risk of [extinction](/wiki/Extinction), some being classified as [critically endangered](/wiki/Critically_endangered).

## Contents

* 1 Etymology[[edit](/index.php?title=(none)&action=edit&section=1)]
* 2 Species[[edit](/index.php?title=(none)&action=edit&section=2)]
* 3 Characteristics[[edit](/index.php?title=(none)&action=edit&section=3)]
  + 3.1 Size[[edit](/index.php?title=(none)&action=edit&section=4)]
  + 3.2 Teeth[[edit](/index.php?title=(none)&action=edit&section=5)]
* 4 Biology and behaviour[[edit](/index.php?title=(none)&action=edit&section=6)]
  + 4.1 Senses[[edit](/index.php?title=(none)&action=edit&section=7)]
    - 4.1.1 Vision[[edit](/index.php?title=(none)&action=edit&section=8)]
    - 4.1.2 Olfaction[[edit](/index.php?title=(none)&action=edit&section=9)]
    - 4.1.3 Hearing[[edit](/index.php?title=(none)&action=edit&section=10)]
    - 4.1.4 Touch[[edit](/index.php?title=(none)&action=edit&section=11)]
  + 4.2 Hunting and diet[[edit](/index.php?title=(none)&action=edit&section=12)]
    - 4.2.1 Bite[[edit](/index.php?title=(none)&action=edit&section=13)]
  + 4.3 Locomotion[[edit](/index.php?title=(none)&action=edit&section=14)]
  + 4.4 Longevity[[edit](/index.php?title=(none)&action=edit&section=15)]
  + 4.5 Social behaviour and vocalization[[edit](/index.php?title=(none)&action=edit&section=16)]
  + 4.6 Reproduction[[edit](/index.php?title=(none)&action=edit&section=17)]
  + 4.7 Intelligence[[edit](/index.php?title=(none)&action=edit&section=18)]
* 5 Taxonomy and phylogeny[[edit](/index.php?title=(none)&action=edit&section=19)]
  + 5.1 Phylogeny[[edit](/index.php?title=(none)&action=edit&section=20)]
* 6 Relationship with humans[[edit](/index.php?title=(none)&action=edit&section=21)]
  + 6.1 Danger to humans[[edit](/index.php?title=(none)&action=edit&section=22)]
  + 6.2 Crocodile products[[edit](/index.php?title=(none)&action=edit&section=23)]
  + 6.3 Crocodiles in religion[[edit](/index.php?title=(none)&action=edit&section=24)]
  + 6.4 Crocodile tears[[edit](/index.php?title=(none)&action=edit&section=25)]
* 7 See also[[edit](/index.php?title=(none)&action=edit&section=26)]
* 8 References[[edit](/index.php?title=(none)&action=edit&section=27)]
* 9 Further reading[[edit](/index.php?title=(none)&action=edit&section=28)]
* 10 External links[[edit](/index.php?title=(none)&action=edit&section=29)]

## Etymology[[edit](/index.php?title=(none)&action=edit&section=1)]

The word "crocodile" comes from the [Ancient Greek](/wiki/Ancient_Greek) κροκόδιλος (*crocodilos*), "lizard", used in the phrase *ho krokódilos tou potamoú*, "the lizard of the ([Nile](/wiki/Nile)) river". There are several variant Greek forms of the word attested, including the later form κροκόδειλος (*crocodeilos*)[[3]](#cite_note-3) It is ascribed to Herodotus, and supposedly describes the basking habits of the Egyptian crocodile.<ref name=etymonline>[Template:Cite web](/wiki/Template:Cite_web)</ref>

The form *crocodrillus* is attested in [Medieval Latin](/wiki/Medieval_Latin).[[4]](#cite_note-4) It is not clear whether this is a medieval corruption or derives from alternative Greco-Latin forms (late Greek *corcodrillos* and *corcodrillion* are attested). A (further) corrupted form *cocodrille* is found in [Old French](/wiki/Old_French) and was borrowed into [Middle English](/wiki/Middle_English) as *cocodril(le)*. The [Modern English](/wiki/Modern_English) form *crocodile* was adapted directly from the Classical Latin *crocodīlus* in the 16th century, replacing the earlier form. The use of -y- in the scientific name [*Crocodylus*](/wiki/Crocodylus) (and forms derived from it) is a corruption introduced by [Laurenti](/wiki/Josephus_Nicolaus_Laurenti) (1768).

## Species[[edit](/index.php?title=(none)&action=edit&section=2)]

[thumb|left|upright=3|Distribution of crocodiles](/wiki/File:Crocodylidae_Distribution.png)[Template:Clear](/wiki/Template:Clear) A total of 14 [extant](/wiki/Extant_taxon) species have been recognized. Further [genetic study](/wiki/Genetic_study) is needed for the confirmation of proposed species under the genus [Osteolaemus](/wiki/Osteolaemus), which is currently [monotypic](/wiki/Monotypic).

|  |  |  |  |
| --- | --- | --- | --- |
| **Species name** | **Image** | **Distribution** | **Description/Comments** |
| [American crocodile](/wiki/American_crocodile) ([Template:Nowrap](/wiki/Template:Nowrap)) | [140 px](/wiki/File:Crocodylus_acutus_mexico_02-edit1.jpg) | Throughout the [Caribbean Basin](/wiki/Caribbean_Basin), including many of the [Caribbean islands](/wiki/Caribbean_island) and [South Florida](/wiki/South_Florida). | A larger sized species, with a greyish colour and a prominent V-shaped snout. Prefers [brackish](/wiki/Brackish) water, but also inhabits lower stretches of [rivers](/wiki/River) and true [marine](/wiki/Marine_biology) environments. This is one of the rare species that exhibits regular sea-going behaviour, which explains the great distribution throughout the [Caribbean](/wiki/Caribbean). It is also found in [hypersaline lakes](/wiki/Hypersaline_lake) such as [Lago Enriquillo](/wiki/Lago_Enriquillo), in the [Dominican Republic](/wiki/Dominican_Republic), which has one of the largest populations of this species.[[5]](#cite_note-5) Diet consists mostly of aquatic and terrestrial vertebrates. Classified as [Vulnerable](/wiki/Vulnerable_species), but certain local populations under greater threat. |
| [Slender-snouted crocodile](/wiki/Slender-snouted_crocodile) ([Template:Nowrap](/wiki/Template:Nowrap)) | [140 px](/wiki/File:Crocodylus_cataphractus.jpg) | [Central](/wiki/Central_Africa) and [Western Africa](/wiki/Western_Africa) | A medium sized species with a narrow and elongated snout. Lives in [freshwater](/wiki/Freshwater) habitats within tropical forests of the continent. Feeds mostly on [fish](/wiki/Fish) but also other small to medium sized vertebrates. Possibly belongs to its own [monotypic](/wiki/Monotypic) [genus](/wiki/Genus), [*Mecistops*](/wiki/Mecistops).[[6]](#cite_note-6) Insufficient data on conservation. |
| [Orinoco crocodile](/wiki/Orinoco_crocodile) ([Template:Nowrap](/wiki/Template:Nowrap)) | [140 px](/wiki/File:Croc_inter.jpg) | [Colombia](/wiki/Colombia) and [Venezuela](/wiki/Venezuela) | This is a large species with a relatively elongated snout and a pale tan coloration with scattered dark brown markings. Lives primarily in the [Orinoco Basin](/wiki/Orinoco). Despite having a rather narrow snout, preys on a wide variety of vertebrates, including large mammals. It is a [Critically Endangered](/wiki/Critically_Endangered) species. |
| [Freshwater crocodile](/wiki/Freshwater_crocodile) ([Template:Nowrap](/wiki/Template:Nowrap)) | [140 px](/wiki/File:Australia_Cairns_18.jpg) | [Northern Australia](/wiki/Northern_Australia) | A smaller species with a narrow and elongated snout. It has light brown coloration with darker bands on body and tail. Lives in [rivers](/wiki/River) with considerable distance from the sea, to avoid confrontations with saltwater crocodiles. Feeds mostly on [fish](/wiki/Fish) and other small vertebrates. |
| [Philippine crocodile](/wiki/Philippine_crocodile) ([Template:Nowrap](/wiki/Template:Nowrap)) | [140 px](/wiki/File:Crocodylus_mindorensis_basking_on_a_rock_in_the_Disulap_River,_Barangay_Disulap_-_ZooKeys-266-001-g102.jpg) | [Endemic](/wiki/Endemic) to the [Philippines](/wiki/Philippines) | This is a relatively small species with a rather broader snout. It has heavy dorsal armour and a golden-brown colour that darkens as the animal matures. Prefers [freshwater](/wiki/Freshwater) habitats and feeds on a variety of small to medium sized vertebrates. This species is [Critically Endangered](/wiki/Critically_Endangered) and the most severely threatened species of crocodile.[[7]](#cite_note-7) |
| [Morelet's crocodile](/wiki/Morelet's_crocodile) ([Template:Nowrap](/wiki/Template:Nowrap)) | [140 px](/wiki/File:Morelets.crocodile.arp.jpg) | Atlantic regions of [Mexico](/wiki/Mexico), [Belize](/wiki/Belize) and [Guatemala](/wiki/Guatemala) | A small to medium sized crocodile with a rather broad snout. It has a dark greyish-brown colour and is found in mostly various [freshwater](/wiki/Freshwater) habitats. Feeds on mammals, birds and reptiles. It is listed as [Least Concern](/wiki/Least_Concern). |
| [Nile crocodile](/wiki/Nile_crocodile) ([Template:Nowrap](/wiki/Template:Nowrap)) | [140 px](/wiki/File:Nile_croc_couple_690V1510_-_Flickr_-_Lip_Kee.jpg) | [Sub-saharan Africa](/wiki/Sub-saharan_Africa) | A large and aggressive species with a broad snout, especially in older animals. It has a dark bronze coloration and darkens as the animal matures. Lives in a variety of freshwater habitats but is also found in brackish water. It is an [apex predator](/wiki/Apex_predator) that is capable of taking a wide array of [African](/wiki/Africa) vertebrates, including large ungulates and other predators.[[8]](#cite_note-8) This species is listed as [Least Concern](/wiki/Least_Concern). |
|  |  |  |  |
| [New Guinea crocodile](/wiki/New_Guinea_crocodile) ([Template:Nowrap](/wiki/Template:Nowrap) | [140 px](/wiki/File:Neuguinea-krokodil-0272.jpg) | The island of [New Guinea](/wiki/New_Guinea) | A smaller species of crocodile with a grey-brown colour and dark brown to black markings on the tail. The young have a narrower V-shaped snout that becomes wider as the animal matures. Prefers [freshwater](/wiki/Freshwater) habitats, even though is tolerant to salt water, in order to avoid competition and predation by the saltwater crocodile. This species feeds on small to mid-sized vertebrates. |
| [Mugger crocodile](/wiki/Mugger_crocodile) ([Template:Nowrap](/wiki/Template:Nowrap)) | [140 px](/wiki/File:Mugger_crocodile_Crocodylus_palustris_(2155269175).jpg) | The [Indian subcontinent](/wiki/Indian_subcontinent) and surrounding countries | This a modest sized crocodile with a very broad snout and an alligator-like appearance. It has dark-grey to brown coloration with enlarged scutes around the neck, making it a considerably heavy armoured species. Prefers slow mowing [rivers](/wiki/River), [swamps](/wiki/Swamp) and [lakes](/wiki/Lake). It can also be found in [coastal](/wiki/Coastal) swamps but avoids areas populated by saltwater crocodiles.[[9]](#cite_note-9) Feeds on a wide array of vertebrates. |
| [Saltwater crocodile](/wiki/Saltwater_crocodile) ([Template:Nowrap](/wiki/Template:Nowrap)) | [140 px](/wiki/File:Crocodylus_porosus_4.jpg) | Throughout [Template:Nowrap](/wiki/Template:Nowrap), [Northern Australia](/wiki/Northern_Australia) and surrounding waters | The largest living reptile and most aggressive of all crocodiles. It is a big-headed species and has a relatively broad snout, especially when older. The coloration is pale yellow with black stripes when young but dark greenish-drab coloured as adults. Lives in [brackish](/wiki/Brackish) and [marine](/wiki/Marine_biology) environments as well as lower stretches of [rivers](/wiki/River). This species has the greatest distribution of all crocodiles. Tagged specimens showed long-distance marine travelling behaviour. It is the [apex predator](/wiki/Apex_predator) throughout its range and preys on virtually any animal within its reach. It is classified as [Least Concern](/wiki/Least_Concern) with several populations under greater risk.<ref name=IUCN>[Template:IUCN2011.1](/wiki/Template:IUCN2011.1)</ref> |
| [Cuban crocodile](/wiki/Cuban_crocodile) ([Template:Nowrap](/wiki/Template:Nowrap)) | [140 px](/wiki/File:Cuban_Crocodile.JPG) | Found only in the [Zapata Swamp](/wiki/Zapata_Swamp) of [Cuba](/wiki/Cuba) | It is a small but extremely aggressive species of crocodile that prefers [freshwater](/wiki/Freshwater) [swamps](/wiki/Swamps).[[10]](#cite_note-10) The coloration is vibrant even as adults and the scales have a "pebbled" appearance. It is a relatively terrestrial species with agile locomotion on land, sometimes displays terrestrial hunting. The snout is broad with a thick upper-jaw and large teeth. The unique characteristics and fossil record indicates a rather specialized [diet](/wiki/Diet_(nutrition)) in the past, preying on megafauna such as the giant sloth. This species sometimes displays pack-hunting behaviour, which might have been the key to hunting large species in the past, despite its small size.[[11]](#cite_note-11) Today most prey are small to medium sized vertebrates. It is [Critically Endangered](/wiki/Critically_Endangered), and the remaining wild population is under threat of hybridization.[[12]](#cite_note-12) |
| [Siamese crocodile](/wiki/Siamese_crocodile) ([Template:Nowrap](/wiki/Template:Nowrap)) | [140 px](/wiki/File:3.06b.jpg) | [Indonesia](/wiki/Indonesia), [Brunei](/wiki/Brunei), [East Malaysia](/wiki/East_Malaysia) and southern [Indochina](/wiki/Indochina) | A fairly small crocodile that prefers [freshwater](/wiki/Freshwater) habitats. It has a relatively broad snout and olive-green to dark green coloration. It feeds on a variety of small to mid-sized vertebrates. Listed as [Critically Endangered](/wiki/Critically_Endangered), but might be already extinct in the wild; status is unknown.<ref name=Bezuijen>[Template:Cite journal](/wiki/Template:Cite_journal)</ref> |
| [West African crocodile](/wiki/West_African_crocodile) ([Template:Nowrap](/wiki/Template:Nowrap)) | [140 px](/wiki/File:Crocodile_-_Copenhagen_Zoo.jpg) | [Western](/wiki/Western_Africa) and [Central Africa](/wiki/Central_Africa) | Recent studies revealed that this is distinct species from the larger Nile crocodile.[[13]](#cite_note-13)[[14]](#cite_note-14) It has a slightly narrower snout and is much smaller compared to its larger cousin. |
| [Dwarf crocodile](/wiki/Dwarf_crocodile) ([Template:Nowrap](/wiki/Template:Nowrap)) | [140 px](/wiki/File:Dwarf_crocodile_01.JPG) | [Western Africa](/wiki/Western_Africa) | It is the smallest of all living crocodiles. It belongs to its own [monotypic](/wiki/Monotypic) [genus](/wiki/Genus); however, new studies indicate there might be two or even three distinct species.[[15]](#cite_note-15) It is a heavily armoured species with uniform black coloration in adults, while juveniles have a lighter brown banding. Lives in the tropical forests of Western Africa. Feeds on small vertebrates and large aquatic invertebrates. It is a fairly terrestrial species and exhibits terrestrial hunting, especially at night. This species is classified as [Vulnerable](/wiki/Vulnerable_species). |

[Template:For](/wiki/Template:For)

## Characteristics[[edit](/index.php?title=(none)&action=edit&section=3)]

*Crocodiles are similar to alligators and caimans; for their common characteristics and differences between them, see* [*Crocodilia*](/wiki/Crocodilia)*.*

[thumb|Crocodiles, like dinosaurs, have the abdominal ribs modified into](/wiki/File:Crocodilelyd5.png) [*gastralia*](/wiki/Gastralium). A crocodile’s physical traits allow it to be a successful [predator](/wiki/Predator). Its external [morphology](/wiki/Morphology_(biology)) is a sign of its [aquatic](/wiki/Aquatic_animal) and [predatory](/wiki/Predatory) lifestyle. Its [streamlined](/wiki/Drag_(physics)) body enables it to swim swiftly, it also tucks its feet to the side while swimming, which makes it faster by decreasing water resistance. They have [webbed feet](/wiki/Webbed_feet) which, though not used to propel the animal through the water, allow them to make fast turns and sudden moves in the water or initiate swimming. Webbed feet are an advantage in shallower water, where the animal sometimes moves around by walking. Crocodiles have a [palatal](/wiki/Palatal) flap, a rigid tissue at the back of the mouth that blocks the entry of water. The palate has a special path from the [nostril](/wiki/Nostril) to the [glottis](/wiki/Glottis) that bypasses the mouth. The nostrils are closed during submergence.

Like other [archosaurs](/wiki/Archosaur), crocodilians are [diapsid](/wiki/Diapsid), although their [post-temporal fenestrae](/wiki/Post-temporal_fenestra) are reduced. The walls of the braincase are bony, but lack supratemporal and postfrontal bones.<ref name=ausfauna>Grigg, Gordon and Gans, Carl (1993) [Morphology And Physiology Of The Crocodylia](http://eprint.uq.edu.au/archive/00002011/02/croc.pdf), in Fauna of Australia Vol 2A Amphibia and Reptilia, chapter 40, pp. 326–336. Australian Government Publishing Service, Canberra.</ref> Their [tongues](/wiki/Tongue) are not free, but held in place by a membrane that limits movement; as a result, crocodiles are unable to stick out their tongues.[[16]](#cite_note-16) Crocodiles have smooth skin on their bellies and sides, while their dorsal surfaces are armoured with large [osteoderms](/wiki/Osteoderms). The armoured skin has scales and is thick and rugged, providing some protection. They are still able to absorb heat through this armour, as a network of small [capillaries](/wiki/Capillaries) allows blood through the scales to absorb heat. Crocodilian scales have pores believed to be sensory in function, analogous to the [lateral line](/wiki/Lateral_line) in fishes. They are particularly seen on their upper and lower jaws. Another possibility is that they are secretory, as they produce an oily substance which appears to flush mud off.<ref name=ausfauna/>

### Size[[edit](/index.php?title=(none)&action=edit&section=4)]

[thumb|230px|A](/wiki/File:Large_Crocodylus_porosus.jpg) [saltwater crocodile](/wiki/Saltwater_crocodile) in captivity Size greatly varies between species, from the [dwarf crocodile](/wiki/Dwarf_crocodile) to the [saltwater crocodile](/wiki/Saltwater_crocodile). Species of *Osteolaemus* grow to an adult size of just [Template:Convert](/wiki/Template:Convert),[[17]](#cite_note-17) whereas the saltwater crocodile can grow to sizes over [Template:Convert](/wiki/Template:Convert) and weigh [Template:Convert](/wiki/Template:Convert).[[18]](#cite_note-18) Several other large species can reach over [Template:Convert](/wiki/Template:Convert) long and weigh over [Template:Convert](/wiki/Template:Convert). Crocodilians show pronounced [sexual dimorphism](/wiki/Sexual_dimorphism), with males growing much larger and more rapidly than females.<ref name=ausfauna/> Despite their large adult sizes, crocodiles start their lives at around [Template:Convert](/wiki/Template:Convert) long. The largest species of crocodile is the saltwater crocodile, found in eastern India, northern Australia, throughout [South-east Asia](/wiki/South-east_Asia), and in the surrounding waters.

The largest crocodile ever held in captivity is an estuarine–Siamese hybrid named Yai ([Template:Lang-th](/wiki/Template:Lang-th), meaning big) (born 10 June 1972) at the [Samutprakarn Crocodile Farm and Zoo](/wiki/Samutprakarn_Crocodile_Farm_and_Zoo), [Thailand](/wiki/Thailand). This animal measures [Template:Convert](/wiki/Template:Convert) in length and weighs [Template:Convert](/wiki/Template:Convert).[[19]](#cite_note-19) The longest crocodile captured alive is [Lolong](/wiki/Lolong), which was measured at [Template:Convert](/wiki/Template:Convert) and weighed at [Template:Convert](/wiki/Template:Convert) by a National Geographic team in Agusan del Sur Province, Philippines.[[20]](#cite_note-20)[[21]](#cite_note-21)[[22]](#cite_note-22)

### Teeth[[edit](/index.php?title=(none)&action=edit&section=5)]

Crocodiles are [polyphyodonts](/wiki/Polyphyodont); they are able to replace each of their 80 teeth up to 50 times in their 35 to 75-year lifespan.[[23]](#cite_note-23)[[24]](#cite_note-24) Next to each full grown tooth, there is a small replacement tooth and a [odontogenic](/wiki/Tooth_development) [stem cell](/wiki/Stem_cell) in the [dental lamina](/wiki/Dental_lamina) in standby that can be activated if required.[[25]](#cite_note-25)

## Biology and behaviour[[edit](/index.php?title=(none)&action=edit&section=6)]

*Crocodiles are similar to alligators and caimans; for their common biology and differences between them, see* [*Crocodilia*](/wiki/Crocodilia)*.*

Crocodilians are more closely related to birds and dinosaurs than to most animals classified as reptiles, the three families being included in the group [Archosauria](/wiki/Archosauria) ('ruling reptiles'). Despite their prehistoric look, crocodiles are among the more biologically complex reptiles. Unlike other reptiles, a crocodile has a [cerebral cortex](/wiki/Cerebral_cortex) and a four-chambered [heart](/wiki/Heart). Crocodilians also have the functional equivalent of a diaphragm by incorporating muscles used for aquatic locomotion into respiration.[[26]](#cite_note-26) [Salt glands](/wiki/Salt_gland) are present in the tongues of crocodiles and they have a pore opening on the surface of the tongue, which is a trait that separates them from alligators. Salt glands are dysfunctional in Alligatoridae.<ref name=ausfauna/> Their function appears to be similar to that of salt glands in [marine turtles](/wiki/Marine_turtle). Crocodiles do not have sweat glands and release heat through their mouths. They often sleep with their mouths open and may pant like a dog.[[27]](#cite_note-27) Four species of freshwater crocodile climb trees to bask in areas lacking a shoreline.[[28]](#cite_note-28)

### Senses[[edit](/index.php?title=(none)&action=edit&section=7)]

[thumb|Crocodile eye](/wiki/File:A_crocodiles_eye_(7825799462).jpg) Crocodiles have acute senses, an evolutionary advantage that makes them successful predators. The eyes, ears and nostrils are located on top of the head, allowing the crocodile to lie low in the water, almost totally submerged and hidden from prey.

#### Vision[[edit](/index.php?title=(none)&action=edit&section=8)]

Crocodiles have very good night vision, and are mostly [nocturnal](/wiki/Nocturnality) hunters. They use the disadvantage of most prey animals' poor nocturnal vision to their advantage. The light receptors in crocodilians’ eyes include [cones](/wiki/Cone_cell) and numerous [rods](/wiki/Rod_cells), so it is assumed all crocodilians can see colours.[[29]](#cite_note-29) Crocodiles have vertical-slit shaped pupils, similar to domestic cats. One explanation for the evolution of slit pupils is that they exclude light more effectively than a circular pupil, helping to protect the eyes during daylight.[[30]](#cite_note-30) On the rear wall of the eye is a [tapetum lucidum](/wiki/Tapetum_lucidum), which reflects incoming light back onto the retina, thus utilizing the small amount of light available at night to best advantage. In addition to the protection of the upper and lower eyelids, crocodiles have a [nictitating membrane](/wiki/Nictitating_membrane) that can be drawn over the eye from the inner corner while the lids are open. The eyeball surface is thus protected under the water while a certain degree of vision is still possible.[[31]](#cite_note-31)

#### Olfaction[[edit](/index.php?title=(none)&action=edit&section=9)]

Crocodilian [sense of smell](/wiki/Olfaction) is also very well developed, aiding them to detect prey or animal carcasses that are either on land or in water, from far away. It is possible that crocodiles use olfaction in the egg prior to hatching.[[31]](#cite_note-31) [Chemoreception](/wiki/Chemoreception) in crocodiles is especially interesting because they hunt in both terrestrial and aquatic surroundings. Crocodiles have only one olfactory chamber and the [vomeronasal organ](/wiki/Vomeronasal_organ) is absent in the adults[[32]](#cite_note-32) indicating all olfactory perception is limited to the olfactory system. Behavioural and olfactometer experiments indicate that crocodiles detect both air-borne and water-soluble chemicals and use their olfactory system for hunting. When above water, crocodiles enhance their ability to detect volatile odorants by gular pumping, a rhythmic movement of the floor of the pharynx.[[33]](#cite_note-33)[[34]](#cite_note-34) Unlike [turtles](/wiki/Turtle), crocodiles close their nostrils when submerged, so olfaction underwater is unlikely. Underwater food detection is presumably gustatory and tactile.[[35]](#cite_note-35)

#### Hearing[[edit](/index.php?title=(none)&action=edit&section=10)]

Crocodiles can hear well; their [tympanic membranes](/wiki/Eardrum) are concealed by flat flaps that may be raised or lowered by muscles.<ref name=ausfauna/>

#### Touch[[edit](/index.php?title=(none)&action=edit&section=11)]

**Caudal**: The upper and lower jaws are covered with sensory pits, visible as small, black speckles on the skin, the crocodilian version of the [lateral line](/wiki/Lateral_line) organs seen in fish and many amphibians, though arising from a completely different origin. These pigmented nodules encase bundles of [nerve fibers](/wiki/Axon) innervated beneath by branches of the trigeminal nerve. They respond to the slightest disturbance in surface water, detecting vibrations and small pressure changes as small as a single drop.[[36]](#cite_note-36) This makes it possible for crocodiles to detect prey, danger and intruders, even in total darkness. These sense organs are known as *Domed Pressure Receptors* (DPRs).[[37]](#cite_note-37) **Post-Caudal**: While alligators and caimans have DPRs only on their jaws, crocodiles have similar organs on almost every scale on their bodies. The function of the DPRs on the jaws is clear; to catch prey, but it is still not clear what is the function of the organs on the rest of the body. The receptors flatten when exposed to increased osmotic pressure, such as that experienced when swimming in sea water [hyper-osmotic](/wiki/Hyper-osmotic) to the body fluids. When contact between the integument and the surrounding sea water solution is blocked, crocodiles are found to lose their ability to discriminate salinities. It has been proposed that the flattening of the sensory organ in hyper-osmotic sea water is sensed by the animal as “touch”, but interpreted as chemical information about its surroundings.[[37]](#cite_note-37) This might be why in alligators they are absent on the rest of the body.[[38]](#cite_note-38)

### Hunting and diet[[edit](/index.php?title=(none)&action=edit&section=12)]

[225px|thumb|Nile crocodile attacking wildebeest](/wiki/File:Crocodile_attack_during_Mara_River_crossing_-_frame_1_-_Flickr_-_Lip_Kee.jpg) Crocodiles are [ambush predators](/wiki/Ambush_predator), waiting for fish or land animals to come close, then rushing out to attack. Crocodiles mostly eat [fish](/wiki/Fish), [amphibians](/wiki/Amphibian), [crustaceans](/wiki/Crustacean), [molluscs](/wiki/Mollusc), [birds](/wiki/Bird), [reptiles](/wiki/Reptile), and [mammals](/wiki/Mammal), and they occasionally [cannibalize](/wiki/Cannibalize) smaller crocodiles. What a crocodile eats varies greatly with species, size and age. From the mostly fish-eating species, like the [slender-snouted](/wiki/Slender-snouted_crocodile) and [freshwater crocodiles](/wiki/Freshwater_crocodile), to the larger species like the [Nile crocodile](/wiki/Nile_crocodile) and the [saltwater crocodile](/wiki/Saltwater_crocodile) that prey on large mammals, such as [buffalo](/wiki/Bovinae), [deer](/wiki/Deer) and [wild boar](/wiki/Wild_boar), diet shows great diversity. Diet is also greatly affected by the size and age of the individual within the same species. All young crocodiles hunt mostly [invertebrates](/wiki/Invertebrates) and small [fish](/wiki/Fish), gradually moving on to larger prey. As [cold-blooded](/wiki/Ectotherm) predators, they have a very slow [metabolism](/wiki/Metabolism), so they can survive long periods without food. Despite their appearance of being slow, crocodiles have a very fast strike and are top [predators](/wiki/Predator) in their environment, and various species have been observed attacking and killing other [predators](/wiki/Predator) such as [sharks](/wiki/Shark) and [big cats](/wiki/Big_cat).<ref name = NGeographicCroc>[Template:Cite web](/wiki/Template:Cite_web)</ref>[[39]](#cite_note-39) As opportunistic predators, crocodiles would also prey upon young and dying [elephants](/wiki/Elephant) and [hippos](/wiki/Hippos) when given the chance.[[40]](#cite_note-40)[[41]](#cite_note-41)[[42]](#cite_note-42) Crocodiles are also known to be aggressive [scavengers](/wiki/Scavenger) who feed upon [carrion](/wiki/Carrion) and steal from other predators.[[43]](#cite_note-43) Evidence suggests that crocodiles also feed upon fruits, based on the discovery of seeds in stools and stomachs from many subjects as well as accounts of them feeding.[[44]](#cite_note-44)[[45]](#cite_note-45) Crocodiles have the most acidic stomach of any vertebrate. They can easily digest bones, hooves and horns. The [BBC TV](/wiki/BBC_TV)[[46]](#cite_note-46) reported that a [Nile crocodile](/wiki/Nile_crocodile) that has lurked a long time underwater to catch prey builds up a large [oxygen debt](/wiki/Oxygen_debt). When it has caught and eaten that prey, it closes its right [aortic arch](/wiki/Aortic_arch) and uses its left aortic arch to flush blood loaded with [carbon dioxide](/wiki/Carbon_dioxide) from its muscles directly to its stomach; the resulting excess acidity in its blood supply makes it much easier for the stomach lining to secrete more [stomach acid](/wiki/Stomach_acid) to quickly dissolve bulks of swallowed prey flesh and bone. Many large crocodilians swallow stones (called gastroliths or stomach stones), which may act as ballast to balance their bodies or assist in crushing food,<ref name=ausfauna/> similar to grit ingested by birds. [Herodotus](/wiki/Herodotus) claimed that Nile crocodiles had a [symbiotic relationship](/wiki/Symbiosis) with certain birds, such as the [Egyptian plover](/wiki/Egyptian_plover), which enter the crocodile's mouth and pick [leeches](/wiki/Leech) feeding on the crocodile's blood; with no evidence of this interaction actually occurring in any crocodile species, it is most likely mythical or allegorical fiction.[[47]](#cite_note-47)[thumb|Even a cruising crocodile is difficult to locate](/wiki/File:Crocodile_at_Ranganathittu,_Mysore,_Karnataka.JPG)

#### Bite[[edit](/index.php?title=(none)&action=edit&section=13)]

Since they feed by grabbing and holding onto their prey, they have [evolved](/wiki/Evolution) sharp teeth for piercing and holding onto flesh, and powerful muscles to close the jaws and hold them shut. The teeth are not well-suited to tearing flesh off of large prey items as is the dentition and claws of many mammalian carnivores, the hooked bills and talons of raptorial birds, or the serrated teeth of sharks. However, this is an advantage rather than a disadvantage to the crocodile since the properties of the teeth allow it to hold onto prey with the least possibility of the prey animal to escape. Otherwise combined with the exceptionally high [bite force](/wiki/Bite), the flesh would easily cut through; thus creating an escape opportunity for the prey item. The jaws can bite down with immense force, by far the strongest bite of any animal. The force of a large crocodile's bite is more than [Template:Convert](/wiki/Template:Convert), which was measured in a [Template:Convert](/wiki/Template:Convert) [Nile crocodile](/wiki/Nile_crocodile), on the field,[[48]](#cite_note-48) compared to just [Template:Convert](/wiki/Template:Convert) for a [Rottweiler](/wiki/Rottweiler), [Template:Convert](/wiki/Template:Convert) for a [great white shark](/wiki/Great_white_shark), [Template:Convert](/wiki/Template:Convert) for a [hyena](/wiki/Hyena), or [Template:Convert](/wiki/Template:Convert) for an [American alligator](/wiki/American_alligator).[[49]](#cite_note-49)[Template:Failed verification](/wiki/Template:Failed_verification) A [Template:Convert](/wiki/Template:Convert) long saltwater crocodile has been confirmed as having the strongest [bite force](/wiki/Bite) ever recorded for an animal in a laboratory setting. It was able to apply a bite force value of [Template:Convert](/wiki/Template:Convert), and thus surpassed the previous record of [Template:Convert](/wiki/Template:Convert) made by a [Template:Convert](/wiki/Template:Convert) long [American alligator](/wiki/American_alligator).[[50]](#cite_note-50)[[51]](#cite_note-51) Taking the measurements of several [Template:Convert](/wiki/Template:Convert) crocodiles as reference, the bite forces of 6-m individuals were estimated at [Template:Convert](/wiki/Template:Convert).<ref name=autogenerated1>[Template:Cite web](/wiki/Template:Cite_web)</ref> The study, led by Dr. [Gregory M. Erickson](/wiki/Gregory_M._Erickson), also shed light to the larger, [extinct](/wiki/Extinct) species of [crocodilians](/wiki/Crocodilian). Since crocodile [anatomy](/wiki/Anatomy) has changed only slightly for the last 80 million years, current data on modern crocodilians can be used to estimate the bite force of extinct species. An [Template:Convert](/wiki/Template:Convert) long [Deinosuchus](/wiki/Deinosuchus) would apply a force of [Template:Convert](/wiki/Template:Convert), twice that of the latest, higher bite force estimations of [Tyrannosaurus](/wiki/Tyrannosaurus).[[5]](#cite_note-5) The extraordinary bite of crocodilians is a result of their [anatomy](/wiki/Anatomy). The space for the jaw muscle in the [skull](/wiki/Skull) is very large, which is easily visible from the outside as a bulge at each side. The nature of the [muscle](/wiki/Muscle) is so stiff, it is almost as hard as bone to touch, as if it were the continuum of the skull. Another trait is that most of the muscle in a crocodile's jaw is arranged for clamping down. Despite the strong muscles to close the jaw, crocodiles have extremely small and weak muscles to open the jaw. Crocodiles can thus be subdued for study or transport by [taping](/wiki/Duct_tape) their jaws or holding their jaws shut with large [rubber bands](/wiki/Rubber_band) cut from automobile [inner tubes](/wiki/Tire).

### Locomotion[[edit](/index.php?title=(none)&action=edit&section=14)]

[thumb|A crocodile, in a farm, gaping to thermoregulate](/wiki/File:Crocodile_farm_in_Mexico.JPG) Crocodiles are very fast over short distances, even out of water. The [land speed](/wiki/Land_speed) record for a crocodile is [Template:Convert](/wiki/Template:Convert) measured in a galloping [Australian freshwater crocodile](/wiki/Freshwater_crocodile).[[52]](#cite_note-52) Maximum speed varies from species to species. Certain species can indeed gallop, including Cuban crocodiles, New Guinea crocodiles, [African dwarf crocodiles](/wiki/Dwarf_crocodile), and even small [Nile crocodiles](/wiki/Nile_crocodiles). The fastest means by which most species can move is a kind of "belly run", where the body moves in a snake-like fashion, limbs splayed out to either side paddling away frantically while the tail whips to and fro. Crocodiles can reach speeds of [Template:Convert](/wiki/Template:Convert) when they "belly run", and often faster if slipping down muddy riverbanks. Another form of locomotion is the "high walk", where the body is raised clear of the ground. Crocodiles may possess a form of [homing instinct](/wiki/Homing_instinct). In northern Australia, three rogue saltwater crocodiles were relocated [Template:Convert](/wiki/Template:Convert) by [helicopter](/wiki/Helicopter), but had returned to their original locations within three weeks, based on data obtained from tracking devices attached to them.[[53]](#cite_note-53)

### Longevity[[edit](/index.php?title=(none)&action=edit&section=15)]

Measuring crocodile age is unreliable, although several techniques are used to derive a reasonable guess. The most common method is to measure lamellar growth rings in bones and teeth—each ring corresponds to a change in growth rate which typically occurs once a year between dry and wet seasons.[[54]](#cite_note-54) Bearing these inaccuracies in mind, it can be safely said that all crocodile species have an average lifespan of at least 30–40 years, and in the case of larger species an average of 60–70 years. The oldest crocodiles appear to be the largest species. [*C. porosus*](/wiki/Saltwater_crocodile) is estimated to live around 70 years on average, with limited evidence of some individuals exceeding 100 years.[[55]](#cite_note-55) In captivity, some individuals are claimed to have lived for over a century. A male crocodile lived to an estimated age of 110–115 years in a Russian zoo in [Yekaterinburg](/wiki/Yekaterinburg).<ref name=yeka/> Named Kolya, he joined the zoo around 1913 to 1915, fully grown, after touring in an animal show, and lived until 1995.<ref name=yeka>[Template:Cite news](/wiki/Template:Cite_news)</ref> A male freshwater crocodile lived to an estimated age of 120–140 years at the [Australia Zoo](/wiki/Australia_Zoo).<ref name=campbell2010>[Template:Cite news](/wiki/Template:Cite_news)</ref> Known affectionately as “Mr. Freshie”, he was rescued around 1970 by [Bob Irwin](/wiki/Bob_Irwin) and [Steve Irwin](/wiki/Steve_Irwin), after being shot twice by hunters and losing an eye as a result, and lived until 2010.<ref name=campbell2010/> Crocworld Conservation Centre, in [Scottburgh](/wiki/Scottburgh), South Africa, claims to have a male [Nile crocodile](/wiki/Nile_crocodile) that was born in [Template:Birth year and age](/wiki/Template:Birth_year_and_age). Named Henry, the crocodile is said to have lived in [Botswana](/wiki/Botswana) along the [Okavango River](/wiki/Okavango_River), according to centre director Martin Rodrigues.[[56]](#cite_note-56)[[57]](#cite_note-57)

### Social behaviour and vocalization[[edit](/index.php?title=(none)&action=edit&section=16)]

[thumbnail|right|Captive crocodiles resting together with open jaws.](/wiki/File:Crocodiles_resting_together.jpeg) Crocodiles are the most social of reptiles. Even though they do not form social groups, many species congregate in certain sections of [rivers](/wiki/River), tolerating each other at times of [feeding](/wiki/Feeding) and [basking](/wiki/Body_temperature). Most species are not highly territorial, with the exception of the saltwater crocodile, which is a highly [territorial](/wiki/Territory_(animal)) and aggressive species. A mature male will not tolerate any other males at any time of the year. Most other species are more flexible. There is a certain form of [hierarchy](/wiki/Hierarchy) in crocodiles: the largest and heaviest males are at the top, having access to the best basking site, while females are priority during a group feeding of a big kill or carcass. A good example of the hierarchy in crocodiles would be the case of the [Nile crocodile](/wiki/Nile_crocodile). This species clearly displays all of these behaviours. Studies in this area are not thorough, however, and many species are yet to be studied in greater detail.[[58]](#cite_note-58) [Mugger crocodiles](/wiki/Mugger_crocodile) are also known to show toleration in group feedings and tend to congregate in certain areas. However, males of all species are aggressive towards each other during mating season, to gain access to females.

Crocodiles are also the most vocal of all reptiles, producing a wide variety of sounds during various situations and conditions, depending on species, age, size and sex. Depending on the context, some species can communicate over 20 different messages through [vocalizations](/wiki/Animal_communication) alone.[[59]](#cite_note-59) Some of these vocalizations are made during social communication, especially during [territorial](/wiki/Territory_(animal)) displays towards the same sex and [courtship](/wiki/Courtship) with the opposite sex; the common concern being [reproduction](/wiki/Reproduction). Therefore most [conspecific](/wiki/Conspecific) vocalization is made during the [breeding season](/wiki/Breeding_season), with the exception being year-round [territorial behaviour](/wiki/Territorial_behaviour) in some species and quarrels during feeding. Crocodiles also produce different distress calls and in aggressive displays to their own kind and other animals; notably other predators during [interspecific](/wiki/Interspecific_competition) predatory confrontations over carcasses and terrestrial kills.

Specific vocalisations include -

**Chirp**: When about to hatch, the young make a “peeping” noise, which encourages the female to excavate the nest. The female then gathers the hatchlings in her mouth and transports them to the water, where they remain in a group for several months, protected by the female[[60]](#cite_note-60) **Distress call**: A high-pitched call mostly used by younger animals that alerts other crocodiles to imminent danger or an animal being attacked.

**Threat call**: A hissing sound that has also been described as a coughing noise.

**Hatching call**: Emitted by females when breeding to alert other crocodiles that she has laid eggs in her nest.

**Bellowing**: Male crocodiles are especially vociferous. Bellowing choruses occur most often in the spring when breeding groups congregate, but can occur at any time of year. To bellow, males noticeably inflate as they raise the tail and head out of water, slowly waving the tail back and forth. They then puff out the throat and with a closed mouth, begin to vibrate air. Just before bellowing, males project an [infrasonic](/wiki/Infrasonic) signal at about 10 Hz through the water which vibrates the ground and nearby objects. These low-frequency vibrations travel great distances through both air and water to advertise the male's presence and are so powerful they result in the water appearing to 'dance’.[[61]](#cite_note-61)

### Reproduction[[edit](/index.php?title=(none)&action=edit&section=17)]

[thumb|150px|Crocodile eggs](/wiki/File:Nile_crocodile_eggs.jpg) Crocodiles lay [eggs](/wiki/Egg_(biology)), which are either laid in hole or mound [nests](/wiki/Nest), depending on species. A hole nest is usually excavated in sand and a mound nest is usually constructed out of vegetation. [Nesting](/wiki/Nest) period ranges from a few weeks up to six months. [Courtship](/wiki/Courtship) takes place in a series of behavioural interactions that include a variety of snout rubbing and submissive display that can take a long time. Mating always takes place in water, where the pair can be observed mating several times. Females can build or dig several trial nests which appear incomplete and abandoned later. Egg laying usually takes place at night and about 30–40 minutes.[[62]](#cite_note-62) Females are highly protective of their nests and young. The egg are hard shelled but translucent at the time of egg-laying. Depending on the species crocodile, a number of 7-95 eggs are laid. Crocodile [embryos](/wiki/Embryo) do not have sex chromosomes, and unlike humans, sex is not determined genetically. [Sex is determined by temperature](/wiki/Temperature-dependent_sex_determination), where at [Template:Convert](/wiki/Template:Convert) or less most hatchlings are females and at [Template:Convert](/wiki/Template:Convert), offspring are of both sexes. A temperature of [Template:Convert](/wiki/Template:Convert) gives mostly males whereas above [Template:Convert](/wiki/Template:Convert) in some species continues to give males but in other species resulting in females, which are sometimes called as high-temperature females.[[63]](#cite_note-63) Temperature also affects growth and survival rate of the young, which may explain the [sexual dimorphism](/wiki/Sexual_dimorphism) in crocodiles. The average [incubation period](/wiki/Incubation_period) is around 80 days, and also is dependent on temperature and species that usually ranges from 65 to 95 days.[[64]](#cite_note-64) The eggshell structure is very conservative through evolution but there are enough changes to tell different species apart by their eggshell microstructure.[[65]](#cite_note-65) At the time of hatching, the young start calling within the eggs. They have an [egg-tooth](/wiki/Egg-tooth) at the tip of their snouts, which is developed from the skin, helps them pierce out of the shell. Hearing the calls, the female usually excavates the nest and sometimes takes the unhatched eggs in her mouth, slowly rolling the eggs to help the process. The young is usually carried to the water in the mouth. She would then introduce her hatchlings to the water and even feed them herself.[[66]](#cite_note-66) The mother would then take care of her young for over a year before the next mating season. In the absence of the mother crocodile, the father would substitute itself to take care of the young.[[67]](#cite_note-67) However even with a sophisticated [parental nurturing](/wiki/Maternal_care), young crocs have a very high mortality rate due to their vulnerability to predation.[[68]](#cite_note-68) A group of [hatchlings](/wiki/Hatchling) is called a pod or [crèche](/wiki/Crèche_(zoology)) and may be protected for months.[[62]](#cite_note-62)

### Intelligence[[edit](/index.php?title=(none)&action=edit&section=18)]

Crocodiles have shown signs of intelligence.[[69]](#cite_note-69)[[70]](#cite_note-70)[[71]](#cite_note-71) They are one of a few predators that can observe behaviour, such as patterns when animals come to the river to drink at the same time each day. In one study by Vladimir Dinets of the University of Tennessee, he observed that crocodiles use [twigs as bait](/wiki/Tool_use_by_animals#In_reptiles) for birds looking for raw materials in nesting.[[72]](#cite_note-72) The sticks are placed on their snouts and submerge themselves, and when the birds swooped in to get them, the crocodiles would then catch them. Crocodiles only do this in spring nesting seasons of the birds, when there is high demand for sticks to be used for building nests. Vladimir also discovered other similar observations from various scientists, some dating back to the 19th century.[[69]](#cite_note-69)[[71]](#cite_note-71) Aside from using sticks, crocodiles are also capable of [cooperative hunting](/wiki/Cooperative_hunting).[[71]](#cite_note-71)[[73]](#cite_note-73) Large numbers of crocodiles would swim in circles in order to trap fish and take turns snatching them. In hunting larger prey, crocodiles would swarm in with one holding the prey down as the others rip it apart.

## Taxonomy and phylogeny[[edit](/index.php?title=(none)&action=edit&section=19)]

Most species are grouped into the [genus](/wiki/Genus) *Crocodylus*. The other [extant](/wiki/Extant_taxon) genus, [*Osteolaemus*](/wiki/Osteolaemus), is [monotypic](/wiki/Monotypic) (as is [*Mecistops*](/wiki/Mecistops), if recognized). [thumb|](/wiki/File:Crocfarm.jpg)[Crocodile farming](/wiki/Crocodile_farm) in Australia [right|thumb|A bask of crocodiles](/wiki/File:Crocadiles.jpg) [right|thumb|right|](/wiki/File:Crocodylus_acutus_mexico_01.jpg)[American crocodile](/wiki/American_crocodile) at [La Manzanilla, Jalisco, Mexico](/wiki/La_Manzanilla,_Jalisco,_Mexico) [thumb|A skull of the extinct](/wiki/File:Voay_robustus.JPG) [*Voay robustus*](/wiki/Voay_robustus)

* **Subfamily Crocodylinae**
  + Genus [*Crocodylus*](/wiki/Crocodylus)
    - [*Crocodylus acutus*](/wiki/Crocodylus_acutus), [American crocodile](/wiki/American_crocodile)
    - [*Crocodylus cataphractus*](/wiki/Crocodylus_cataphractus), [slender-snouted crocodile](/wiki/Slender-snouted_crocodile) (studies in [DNA](/wiki/DNA) and [morphology](/wiki/Morphology_(biology)) suggest this species may be more [basal](/wiki/Basal_(phylogenetics)) than [*Crocodylus*](/wiki/Crocodylus), so belongs in its own genus, [*Mecistops*](/wiki/Mecistops)).[[74]](#cite_note-74)\*\*\* [*Crocodylus intermedius*](/wiki/Crocodylus_intermedius), [Orinoco crocodile](/wiki/Orinoco_crocodile)
    - [*Crocodylus johnsoni*](/wiki/Crocodylus_johnsoni), [freshwater crocodile](/wiki/Freshwater_crocodile), or Johnstone's crocodile
    - [*Crocodylus mindorensis*](/wiki/Crocodylus_mindorensis), [Philippine crocodile](/wiki/Philippine_crocodile)
    - [*Crocodylus moreletii*](/wiki/Crocodylus_moreletii), [Morelet's crocodile](/wiki/Morelet's_crocodile) or Mexican crocodile
    - [*Crocodylus niloticus*](/wiki/Crocodylus_niloticus), [Nile crocodile](/wiki/Nile_crocodile) or African crocodile (the subspecies found in Madagascar is sometimes called the black crocodile)
    - [*Crocodylus novaeguineae*](/wiki/Crocodylus_novaeguineae), [New Guinea crocodile](/wiki/New_Guinea_crocodile)
    - [*Crocodylus palustris*](/wiki/Crocodylus_palustris), [mugger](/wiki/Mugger_Crocodile), marsh or Indian crocodile
    - [*Crocodylus porosus*](/wiki/Crocodylus_porosus), [saltwater crocodile](/wiki/Saltwater_crocodile) or estuarine crocodile
    - [*Crocodylus rhombifer*](/wiki/Crocodylus_rhombifer), [Cuban crocodile](/wiki/Cuban_crocodile)
    - [*Crocodylus siamensis*](/wiki/Crocodylus_siamensis), [Siamese crocodile](/wiki/Siamese_crocodile) (may be extinct in the wild)
    - [*Crocodylus suchus*](/wiki/Crocodylus_suchus), West African crocodile, desert or sacred crocodile
  + Genus [*Osteolaemus*](/wiki/Osteolaemus)
    - [*Osteolaemus tetraspis*](/wiki/Osteolaemus_tetraspis), [dwarf crocodile](/wiki/Dwarf_crocodile) (There has been controversy as to whether or not this is actually two species; recent (2010) DNA analysis indicate three distinct species: *O. tetraspis*, *O. osborni* and a third, currently unnamed.)
  + Genus †[*Euthecodon*](/wiki/Euthecodon)
  + Genus †[*Rimasuchus*](/wiki/Rimasuchus) (formerly *Crocodylus lloydi*)
  + Genus †[*Voay*](/wiki/Voay) Brochu, 2007 (formerly *Crocodylus robustus*)

### Phylogeny[[edit](/index.php?title=(none)&action=edit&section=20)]

The [cladogram](/wiki/Cladogram) below follows the topology from a 2012 analysis of [morphological](/wiki/Morphology_(biology)) traits by Christopher A. Brochu and Glenn W. Storrs.<ref name=C.thorbjarnarsoni>[Template:Cite journal](/wiki/Template:Cite_journal)</ref> Many extinct species of *Crocodylus* might represent different genera. *"Crocodylus" pigotti*, for example, was placed in the newly erected genus [*Brochuchus*](/wiki/Brochuchus) in 2013.<ref name=Brochuchus>[Template:Cite journal](/wiki/Template:Cite_journal)</ref> *C. suchus* was not included because its morphological codings were identical to those of *C. niloticus*. However, the authors suggested that the lack of differences was due to limited specimen sampling, and considered the two species to be distinct. This analysis found weak support for the clade Osteolaeminae.<ref name=C.thorbjarnarsoni/> Brochu named Osteolaeminae in 2003 as a subfamily of Crocodylidae separate from Crocodylinae, but the group has since been classified within Crocodylinae. It includes the living genus *Osteolaemus* as well as the extinct species [*Voay robustus*](/wiki/Voay_robustus) and [*Rimasuchus lloydi*](/wiki/Rimasuchus_lloydi).

[Template:Clade](/wiki/Template:Clade)

A 2013 analysis by Jack L. Conrad, Kirsten Jenkins, Thomas Lehmann, and others did not support Osteolaeminae as a true clade but rather a [paraphyletic](/wiki/Paraphyletic) group consisting of two smaller clades. They informally called these clades "osteolaemins" and "mecistopins". "Osteolaemins" include *Osteolaemus*, *Voay*, *Rimasuchus*, and *Brochuchus* and "mecistopins" include *Mecistops* and [*Euthecodon*](/wiki/Euthecodon).<ref name=Brochuchus/>

## Relationship with humans[[edit](/index.php?title=(none)&action=edit&section=21)]

### Danger to humans[[edit](/index.php?title=(none)&action=edit&section=22)]

[Template:Main](/wiki/Template:Main) [thumb|Crocodile warning sign,](/wiki/File:Marine_Stingers_Sign_Cairns.JPG) [Trinity Beach, Queensland](/wiki/Trinity_Beach,_Queensland), Australia The larger species of crocodiles are very dangerous to humans, mainly because of their ability to strike before the person can react.<ref name=iucncsg>[Template:Cite web](/wiki/Template:Cite_web)</ref> The [saltwater crocodile](/wiki/Saltwater_crocodile) and [Nile crocodile](/wiki/Nile_crocodile) are the most dangerous, killing hundreds of people each year in parts of Southeast Asia and Africa. The [mugger crocodile](/wiki/Mugger_crocodile) and [American crocodile](/wiki/American_crocodile) are also dangerous to humans.

### Crocodile products[[edit](/index.php?title=(none)&action=edit&section=23)]

[Template:Main](/wiki/Template:Main) [thumb|left|Crocodile leather wallets from a](/wiki/File:Crocodile_wallets.jpg) [Bangkok](/wiki/Bangkok) crocodile farm [thumb|right|Chiang Mai crocodile leather belt](/wiki/File:Chiang_Mai_crocodile_leather_belt.JPG) [thumb|left|A plate of crocodile meat in](/wiki/File:Teriyaki_CrocTail.jpg) [teriyaki sauce](/wiki/Teriyaki_sauce) in [Helsinki](/wiki/Helsinki), [Finland](/wiki/Finland). Crocodiles are protected in many parts of the world, but they also are farmed commercially. Their hides are tanned and used to make leather goods such as shoes and [handbags](/wiki/Handbag); crocodile meat is also considered a delicacy.[[75]](#cite_note-75) The most commonly farmed species are the saltwater and Nile crocodiles, while a hybrid of the saltwater and the rare [Siamese crocodile](/wiki/Siamese_crocodile) is also bred in Asian farms. Farming has resulted in an increase in the saltwater crocodile population in [Australia](/wiki/Australia), as eggs are usually harvested from the wild, so landowners have an incentive to conserve their habitat. Crocodile leather can be made into goods such as wallets, briefcases, purses, handbags, belts, hats, and shoes. [Crocodile oil](/wiki/Crocodile_oil) has been used for various purposes.[[76]](#cite_note-76)

### Crocodiles in religion[[edit](/index.php?title=(none)&action=edit&section=24)]

Crocodiles have appeared in various forms in religions across the world. [Ancient Egypt](/wiki/Ancient_Egypt) had [Sobek](/wiki/Sobek), the crocodile-headed god, with his cult-city [Crocodilopolis](/wiki/Crocodilopolis), as well as [Taweret](/wiki/Taweret), the goddess of childbirth and fertility, with the back and tail of a crocodile.[[77]](#cite_note-77) The [Jukun shrine in the Wukari Federation](/wiki/Wukari_Federation#Religion), Nigeria is dedicated to crocodiles in thanks for their aid during migration.[[78]](#cite_note-78) Crocodiles appear in different forms in [Hinduism](/wiki/Hinduism). [Varuna](/wiki/Varuna), a [Vedic](/wiki/Historical_Vedic_religion) and Hindu god, rides a part-crocodile [makara](/wiki/Makara_(Hindu_mythology)); his consort [Varuni](/wiki/Varuni) rides a crocodile.[[73]](#cite_note-73) Similarly the goddess personifications of the [Ganga](/wiki/Ganges) and [Yamuna](/wiki/Yamuna) rivers are often depicted as riding crocodiles.[[79]](#cite_note-79)[[80]](#cite_note-80)[[81]](#cite_note-81) Also in India, in [Goa](/wiki/Goa), crocodile worship is practised, including the annual *Mannge Thapnee* ceremony.[[82]](#cite_note-82) In Latin America, [Cipactli](/wiki/Cipactli) was the giant earth crocodile of the [Aztec](/wiki/Aztec) and other [Nahua peoples](/wiki/Nahua_peoples).[[83]](#cite_note-83)

### Crocodile tears[[edit](/index.php?title=(none)&action=edit&section=25)]

[Template:Main](/wiki/Template:Main) The term "[Crocodile tears](/wiki/Crocodile_tears)" (and equivalents in other languages) refers to a false, insincere display of emotion, such as a [hypocrite](/wiki/Hypocrite) crying fake tears of [grief](/wiki/Grief). It is derived from an ancient anecdote that crocodiles weep in order to lure their prey, or that they [cry](/wiki/Crying) for the victims they are eating, first told in the [*Bibliotheca*](/wiki/Bibliotheca_(Photius)) by [Photios](/wiki/Photios).[[84]](#cite_note-84) The story is repeated in bestiaries such as [*De bestiis et aliis rebus*](/wiki/List_of_medieval_bestiaries#DeBestiis). This tale was first spread widely in English in the stories of the travels of [Sir John Mandeville](/wiki/Sir_John_Mandeville) in the 14th century, and appears in several of [Shakespeare's](/wiki/Shakespeare) plays.[[85]](#cite_note-85) In fact, crocodiles can and do generate tears, but they do not actually cry.[[86]](#cite_note-86)

## See also[[edit](/index.php?title=(none)&action=edit&section=26)]

[Template:Portal](/wiki/Template:Portal)

* [Alligator meat](/wiki/Alligator_meat)
* [*The Crocodile Hunter*](/wiki/The_Crocodile_Hunter) [Crocodilian armor](/wiki/Crocodilian_armor)
* [Game (hunting)](/wiki/Game_(hunting))
* [Sewer alligator](/wiki/Sewer_alligator)
* [Sobek](/wiki/Sobek) - an ancient Egyptian deity associated with the Nile crocodile

## References[[edit](/index.php?title=(none)&action=edit&section=27)]

[Template:Reflist](/wiki/Template:Reflist)

## Further reading[[edit](/index.php?title=(none)&action=edit&section=28)]

* Iskandar, DT (2000). *Turtles and Crocodiles of Insular Southeast Asia and New Guinea*. ITB, Bandung.
* Crocodilian Biology Database, FAQ. [FLMNH.ufl.edu](http://www.flmnh.ufl.edu/cnhc/cbd-faq-q3.htm), "How long do crocodiles live for?" [Template:Sic](/wiki/Template:Sic) Adam Britton.
* Crocodilian Biology Database, FAQ. [FLMNH.ufl.edu](http://www.flmnh.ufl.edu/cnhc/cbd-faq-q4.htm), "How fast can a crocodile run?" Adam Britton.

## External links[[edit](/index.php?title=(none)&action=edit&section=29)]

[Template:Wiktionary](/wiki/Template:Wiktionary) [Template:Wikispecies](/wiki/Template:Wikispecies) [Template:Wikiversity](/wiki/Template:Wikiversity)

* [Template:Commons-inline](/wiki/Template:Commons-inline)
* [Crocodilian Online](http://www.crocodilian.com/)
* [Crocodilian Biology Database](http://www.flmnh.ufl.edu/cnhc/cbd.html)
* [Crocodile Attacks in Australia](http://www.nit.com.au/travel/story.aspx?id=3696)
* [BBC news finds powerful agent in crocodile blood](http://news.bbc.co.uk/2/hi/science/nature/680840.stm)
* [Crocodylidae](http://www.jcvi.org/reptiles/families/crocodylidae.php)

[Template:Crocodilia](/wiki/Template:Crocodilia) [Template:Crocs](/wiki/Template:Crocs) [Template:Meat](/wiki/Template:Meat) [Template:Use dmy dates](/wiki/Template:Use_dmy_dates)

[\*](/wiki/Category:Crocodilians) [Category:Crocodylidae](/wiki/Category:Crocodylidae) [Category:Apex predators](/wiki/Category:Apex_predators) [Category:Reptiles of Asia](/wiki/Category:Reptiles_of_Asia) [Category:Reptiles of Africa](/wiki/Category:Reptiles_of_Africa) [Category:Reptiles of Australia](/wiki/Category:Reptiles_of_Australia) [Category:Reptiles of North America](/wiki/Category:Reptiles_of_North_America) [Category:Reptiles of South America](/wiki/Category:Reptiles_of_South_America) [Category:Extant Ypresian first appearances](/wiki/Category:Extant_Ypresian_first_appearances)