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Crocodile Project

Prof. Vinay Kumar Singh

Professor

Department of Zoology &
Environmental Science

DDU Gorakhpur University, Gorakhpur

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Convener- Rovers & Rangers; in-charge- EDP Cell; in-charge- Environmental Science
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Crocodile Project:

Present Scenario-

The International Union for Conservation of Nature (IUCN) classifies Gharials as critically endangered. “Even a very conservative calculation of 5,000 individuals in 1943 and 1,000 currently gives a decline of 80%. Decline in three generations is confidently inferred to exceed the criterion for Critically Endangered,” the 2019 IUCN report justified. The three species of crocodilians—saltwater, Mugger and Gharial— breeding programmes had been started in 1975 in 34 places in West Bengal, Madhya Pradesh, Uttar Pradesh, Bihar and other states in India. In India, the number of Gharials increased from 905 in 2012 to 1,896 in 2019. The threats to their existence include major water control and extraction activities, mortality due to fishing gear and increased disruptions by humans on river-banks where Gharials are typically found, said IUCN. “These threats are known, continuing and not reversible. The expansion of threats and major declines has intensified since the 1950s, and continue presently with increasing demand for river resources.

There are gradual increase of the reptiles between 2000 and 2019. “A total of 1,192 estuarine crocodiles were counted during the reptile census of 2000, whereas in the 2001 census, the number of crocodiles reached 1,330. But 1,308 crocodiles were counted in 2002. In 2003, 1,342 and in 2004, 1,355 crocodiles were found. In 2005, the census figure was 1,449. In 2006, 1,454 crocodiles and in 2007, 1,482 crocodiles were found in Bhitarkanika. In 2008, 1,482 crocodiles were sighted. In 2009, 1,572 crocodiles and in 1,610 crocodiles were found in 2010. In 2011, the forest officials counted 1,654 but in 2012, the population of crocodiles decreased marginally as 1,646 reptiles were sighted. In 2013, 1,649 crocodiles were counted. In 2014, we counted 1,644 crocodiles and in 2015, we counted 1,665 crocodiles. In 2016, we found 1,671 and in 2017, the numbers of the reptile reached 1,682 .The increases in population was primarily due to the far-sighted measures of the government. “In 1975, the Union Ministry of Forest and Environment, in collaboration with the United Nations Development Programme, had started a crocodile breeding

and rearing project in Dangamala within the Bhitarkanika Park. Nine years back, the Guinness Book of World Records recorded a 23-foot-long saltwater crocodile in Bhitarkanika as the largest crocodile in the world.

In one range of the sanctuary, many eggs hatched and 4,141 gharials were born. In another range, 1,202 gharials took birth. Apart from gharials, 400 mugger crocodiles (*Crocodylus palustris*) also hatched out of eggs in the two months at the sanctuary and will soon be released into the river. The numbers are significant and have enthused forest officials and environmentalists. The number of gharials was 905 in 2012 and increased to 1,896 in 2019. On the other hand, the sanctuary had 205 mugger crocodiles in 2012 and their number rose to 706 in the past seven years.

The numbers are the culmination of a long-term conservation project to save the gharials from extinction. The Chambal, which is roughly 1,000 kilometres long, originates in western Madhya Pradesh and meanders its way through Rajasthan and Uttar Pradesh before joining the Yamuna in Jalaun, a district in south Uttar Pradesh. “The course of the Chambal was through forests or ravines or scrubland, away from human settlement. Hence, wildlife flourished in the river and on its banks. Gharials were found in abundance but their number alarmingly reduced to 200 in 1975. It was then, towards the late seventies, that an area of land along the course of the river was declared as a sanctuary. The sanctuary has its limits in Madhya Pradesh, Rajasthan and Uttar Pradesh and spreads over an area of 5,500 sq km. The forest departments of the three states are responsible for the sanctuary.

Crocodiles (subfamily **Crocodylinae**) or **true crocodiles** are large aquatic reptiles that live throughout the tropics in Africa, Asia, the Americas and Australia. Crocodylinae, in which all its members are considered true crocodiles, is classified as a biological subfamily. A broader sense of the term crocodile, Crocodylidae that includes *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 members of the order Crocodylia, which includes *Tomistoma*, the alligators and caimans (family Alligatoridae), the gharials (family Gavialidae), and all other living and fossil Crocodylomorpha.

Although they appear to be similar to the untrained eye, crocodiles, alligators and the gharial belong to separate biological families. The gharial having a narrow snout is easier to distinguish, while morphological 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 the upper and lower jaws of the crocodiles are the same width, and 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 where the lower teeth fit into. 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, the species belongs to. Crocodiles have more webbing on the toes of the hind feet and can better tolerate saltwater due to specialized salt glands 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.

Crocodile size, morphology, behavior and ecology somewhat differs between species. However, they have many similarities in these areas as well. All crocodiles are semiaquatic and tend to congregate in freshwater habitats such as rivers, lakes, wetlands and sometimes in brackish water

and saltwater. They are carnivorous animals, feeding mostly on vertebrates such as fish, reptiles, birds and mammals, and sometimes on invertebrates such as molluscs and crustaceans, depending on species and age. All crocodiles are tropical species that unlike alligators, are very sensitive to cold. They first separated from other crocodilians during the Eocene epoch, about 55 million years ago. Many species are at the risk of extinction, some being classified as critically endangered.

Etymology

The word "crocodile" comes from the Ancient Greek κροκόδιλος (*crocodilos*), "lizard," used in the phrase *ho krokódilostou potamoú*, "the lizard of the (Nile) river". There are several variant Greek forms of the word attested, including the later form κροκόδειλος (*crocodeilos*) found cited in many English reference works. In the Koine Greek of Roman times, *crocodilos* and *crocodeilos* would have been pronounced identically, and either or both may be the source of the Latinized form *crocodīlus* used by the ancient Romans. *Crocodilos* or *crocodeilos* is a compound of *krokè* ("pebbles"), and *drilos/dreilos* ("worm"), although *drilos* is only attested as a colloquial term for "penis". It is ascribed to Herodotus, and supposedly describes the basking habits of the Egyptian crocodile.

Biology and behavior-

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-

Crocodiles have very good night vision, and are mostly nocturnal hunters. They use the disadvantage of most prey animals' poor nocturnal vision, to their advantage. The light receptors in crocodilians' eyes include both cones and numerous rods, so it is assumed all crocodilians can see colors.

Olfaction-

Crocodilian sense of smell 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.

Chemoreception in crocodiles is especially interesting because they hunt both in terrestrial and in aquatic surroundings. Crocodiles have only one olfactory chamber and the vomeronasal organ is absent in the adults indicating all olfactory perception is limited to the olfactory system. Behavioral 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. Unlike turtles, crocodiles close their nostrils when submerged, so olfaction underwater is unlikely. Underwater food detection is presumably gustatory and tactile.

Hearing

Crocodiles can hear well; their tympanic membranes are concealed by flat flaps that may be raised or lowered by muscles.

Longevity

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. 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* is estimated to live around 70 years on average, with limited evidence of some individuals exceeding 100 years.

Reproduction

Crocodiles reproduce by laying eggs, which are either laid in hole or mound nests, depending on species. A hole nest is usually excavated in sand and a mound nest is usually constructed out of vegetation. Nesting period ranges from a few weeks up to six months. Courtship takes place in a series of behavioral 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.^[64] 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 do not have sex chromosomes, and unlike humans, sex is not determined genetically. Sex is determined by temperature, where at 30 °C (86 °F) or less most hatchlings are females and at 31 °C (88 °F), offspring are of both sexes. A temperature of 32 °C (90 °F) to 33 °C (91 °F) gives mostly males whereas above 33 °C (91 °F) in some species continues to give males but in other species resulting in females, which are sometimes called as high-temperature females. Temperature also affects growth and survival rate of the young, which may explain the sexual dimorphism in crocodiles. The average incubation period is around 80 days, and also is dependent on temperature and species that usually ranges from 65 to 95 days. At the time of hatching, the young start calling within the eggs. They have an 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. A group of hatchlings is called a pod or crèche and may be protected for months.

Crocodile products

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; crocodile meat is also considered a delicacy. The most commonly farmed species are the saltwater and Nile crocodiles, while a hybrid of the saltwater and the rare Siamese crocodile is also bred in Asian farms. Farming has resulted in an increase in the saltwater crocodile population in 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 meat is consumed in some countries, such as Australia, Ethiopia, Thailand, South Africa, China and also Cuba (in pickled form); it can also be found in specialty restaurants in some parts of the United States. The meat is white and its nutritional composition compares favourably with that of other meats. It tends to have a slightly higher cholesterol level than other meats. Crocodile meat has a delicate flavour; some describe it as a cross between chicken and crab. Cuts of meat include backstrap and tail fillet. Crocodile oil has been used for various purposes.

Down to Earth- Wild life and Biodiversity

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