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## Studies and data collection of snakes sighted in Gondia region of Maharashtra, India

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### Abstract

Living snakes are found on everywhere except Antarctica. More than 20 families are currently recognized, comprising about 500 genera and about 3,400 species (Serpents, 2008). They range in size from the tiny, 10 cm-long blind snake to the reticulated python of up to 8.7 meters (29 ft) in length. The collected road killed snake data from month of June to December 2012 provide a clear conclusion of higher mortality rate in Amravati district. The large road killed evident occurred during June to August in rainy season. The data from six families proved richness of diversity in Amravati district. Family Elapidae contain several species but according to NGO data, it was found 123 animals from the study period June to December 2012. From the project report, data collection of snakes, it has been observed that the diversity of snakes is high in Amravati region, but due to anthropological activities, unawareness and road killed mortality of snakes is also high.

**Keywords:** Snakes, mortality, snake blindness, Elapidae, python, anthropological activity

### Introduction

Reptiles arose about 310-320 million years ago during the Carboniferous period. The first reptiles evolved from advanced *reptiliomorpha labyrinthodonts*. (Laurin, M. and Resize, R. R., 1995) [6] The oldest known animal that may have been an amniotes, a reptile rather than an amphibian, is *Casineria*. (Paton, *et al.* 1999) [10]. Reptiles, in the traditional sense of the term, are defined as animals that have scales or scutes, lay land-based hard-shelled eggs, and possess ectothermic metabolisms. Due to increasing evolutionary pressure and the vast untouched niches of the land powered the evolutionary changes in amphibians to gradually become more and more land based. Environmental selection propelled the development of certain traits, such as a stronger skeletal structure, muscles, and more protective coating (scales) became more favorable; the basic foundation of reptiles were found. (Wikipedia, evolution of reptile).

As per the evolutionary aspect, the fossil record of snakes is relatively poor because snake skeletons are typically small and fragile, making fossilization uncommon. Fossils readily identifiable as snakes (though often retaining hind limbs) first appear in the fossil record during the Cretaceous period. The earliest known snake fossils come from sites in Utah and Algeria, represented by the genera *Coniophis* and *Lapparentophis*, respectively. These fossil sites have been tentatively dated to the Albian or Cenomanian age of the late Cretaceous, between 112 and 94 million year ago (Mya), an even greater age has been suggested for one of the Algerian sites, which may be as old as the Aptian, 125 to 112 mya (Durand, J.F., 2004; Vidal, N., *et al.* 2009) [4, 12]. All snakes are strictly carnivorous, eating small animals including lizards, other snakes, small mammals, birds, eggs, fish, snails or insects. Because snakes cannot bite or tear their food to pieces, they must swallow prey whole. The body size of a snake has a major influence on its eating habits. Smaller snakes eat smaller prey. Juvenile pythons might start out feeding on lizards or mice and graduate to small deer or antelope as an adult. (Behler 1979 p. 581.) [1].

Snake venoms are complex mixtures of proteins, and are stored in poison glands at the back of the head. In all venomous snakes, these glands open through ducts into grooved or hollow teeth in the upper jaw. These proteins can potentially be a mix of neurotoxins (which attack the nervous system), haemotoxins (which attack the circulatory system), cytotoxins, bungarotoxins and many other toxins that affect the body in different ways. Almost all snake venom contains *hyaluronidase*, an enzyme that ensures rapid diffusion of the venom.

Amravati city and its allied region surrounded with the dry deciduous forest which is one of the richest biodiversity areas because of it directly influenced under the great Satpuda Mountain Ranges. But from 2-3 decades, most land had undergone the development such as civilization, agriculture modification and highways construction destructs the habitation of

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many species directly and indirectly. Due to all these manmade factors, many species have high mortality rate and becoming major eco-bio-sensitive problems. The present project work was carried out to record the data of snakes sighted alive or killed in Amravati region.

## Material and Method

### Selection of Study Area

The area of Gondia and territory is rich with biodiversity of various flora and fauna with well and dense forestry area. Gondia is located at the dry deciduous forest, covers Gondia territory. The present work was carried out during June 2012 to December 2012. During this period, road killed snake as well as snakes rescued by different NGO's were recorded after proper consent.

Road killed snakes were identified with the help of scale count and other morphological characters as well as snake rescue details were collected from some NGO's. Identification of snakes was done with the help of "Snakes of India" by Captain (2004), Checklist of Maharashtra and Goa (Snake) by Nilimkumar Khaire (2010).

### Result and Discussion

In this study data were recorded from each respective family of the snakes in both cases lives and road killed from the months of July to December. The family wise description are summarised below.

#### (i) Family Typhlopidae

The rostral scale overhangs the mouth to form a shovel like burrowing structure. They live underground in burrows, and since they have no use for vision, their eyes are mostly vestigial. They have light-detecting black eyespots, and teeth occur in the upper jaw. The tail ends with a horn like scale. Most of these species are oviparous. Currently, 6 genera are recognized containing 203 species.

#### (ii) Family Boidae

Like pythons, boas have elongated supratemporal bones. The quadrate bones are also elongated, but not as much. The Boidae is a family of non-venomous snakes. Relatively primitive snakes, adults are medium to large in size, with females usually larger than the males. Two subfamilies comprising eight genera and 43 species are currently recognized. Prey is killed by a process known as constriction, after an animal has been grasped to restrain it, a number of coils are hastily wrapped around it. Then, by applying and maintaining sufficient pressure to prevent it from inhaling, the prey eventually succumbs due to asphyxiation.

#### (iii) Family Pythonidae

The Pythonidae, commonly known simply as pythons, a family of nonvenomous snakes, its members are some of the largest snakes in the world. Eight genera and 26 species are currently recognized. Most members of this family are ambush predators, in that they typically remain motionless in a camouflaged position and then strike suddenly at passing prey. They will generally not attack humans unless startled or provoked, although females protecting their eggs can be aggressive. Reports of attacks on human beings were once more common in South and Southeast Asia, but are now quite rare. Prey is killed by a process known as constriction; after an animal has been grasped to restrain it, a number of coils are hastily wrapped around it. Then, by applying and maintaining sufficient pressure to prevent it from inhaling, the

prey eventually succumbs due to asphyxiation. Larger specimens usually eat animals about the size of a house cat, but larger food items are known some large Asian species have been known to take down adult deer, and the rock python has been known to eat antelope. Prey is swallowed whole, and may take several days or even weeks to fully digest.

#### (iv) Family Colubridae

While most colubrids are non-venomous (or have venom that is not known to be harmful to humans) and are mostly harmless they have elongated, grooved teeth located in the back of the upper jaw.

#### (v) Family Elapidae

All elapids have a pair of proteroglyphous fangs used to inject venom from glands located towards the rear of the upper jaws. In outward appearance, terrestrial elapids look similar to the Colubridae almost all have long and slender bodies with smooth scales, a head covered with large shields and not always distinct from the neck, and eyes with round pupils. In addition, their behavior is usually quite active, and most are oviparous.

#### (vi) Family Viperidae

The viperids are strictly venomous, they having proteroglyphous fangs used to inject venom from glands located towards the rear of the upper jaws. They have the capacity to re-grow their fangs after dislocation of old because having 72 pairs of fangs in dormant condition. They have pits and use it for the thermodynamic activity to engulf the pray. They have the largest and the necked scales among all the snake species.

During the study period a total of 2,079 snakes were recorded in Amravati region of which (1,817) live and (589) road killed. A total of 26 species belonging to six families were found in Gondia region. Family wise abundance of species are Typhlopidae (424), Boidae (22), Pythonidae (01), Colubridae (1,748), Elapidae (123), and Viperidae (100).

The Commonest snake species found in the order of their abundance were *Ramphotyphlops braminus*, *lycodon aulicus*, *Ptyas mucosa*, *Xenochrophis piscator*, *Naja naja*, *Bungarus caeruleus*, *Daboia russelii*, *Coelognathus helena helena*, *Argerogena fasciolata*, *Grypotyphls acutus*, *Oligodon arnensis xenochrophis*, *Boiga trigonata*, *Python molurus*, *Gongylophis conicus*, *Lycodon aulicus*, *Dendrelaphis tristis*, *Lycodon striatus*, *Macropisthodon plumbicolor*, *Psammophis condanarus*, *Ahaetulla nasuta*, *Bungarus caeruleus*, *Calliophis melanurus*, *Echis carinatus trimeresurus gramineus*, *Sibynophis subpunctatus*, *Amphiesma stolatum*. Rare snake species reported here are *Elachistidon westermanni*, *Oligodon taeniolatus*, *Eryx johnii*, *Lycodon striatus*, *Lycodon flavomaculatus*, *Sybinophis brachyura*, *Bungarus sindanus walli* species, *Dendrelaphis tristis*, *Coronella* Gondia district serves great surrounding in the form of distinctive habitat which encompass and influence the diversity of greatly adapted reptiles. The current study evaluates the mortality of snakes found as road killed and NGO's data flash a broad knowledge about biodiversity of serpent's fauna in Amravati district. The two methods related to mortality rate of this fauna 1) Road killed status 2) Mortality data collected from NGO's was emphasized for this study. The mortality rate data is surprisingly focused on the 26 species of snakes belonging to six families which contain 5 species with critically endangered status.

The road killed snake status distribute in the 5 major families, ie. Colubridae, Elapidae, Viperidae, Typhlopidae and Boidae, belonging to 25 species such a discomfort data of road killed snakes species pauses the florescence of biodiversity due to broadening of roads and heavy traffic. The uniform reptile habitation remain in the fragments which directly affect to the species habitation, reproduction and selective regime that increases mortality rate.

The data from six families proved richness of diversity in Gondia district. Family Elapidae contain several species but according to NGO data, it was found 123 animals from the study period June to December 2012, from this data several species such as *Naja naja* (cobra), *Bungarus* (Krait), coral

snake, *Bungarus sindanus walli* (walls sind krait), were generally found belonging to Elapidae family. The species of this family have high density among all other poisonous family.

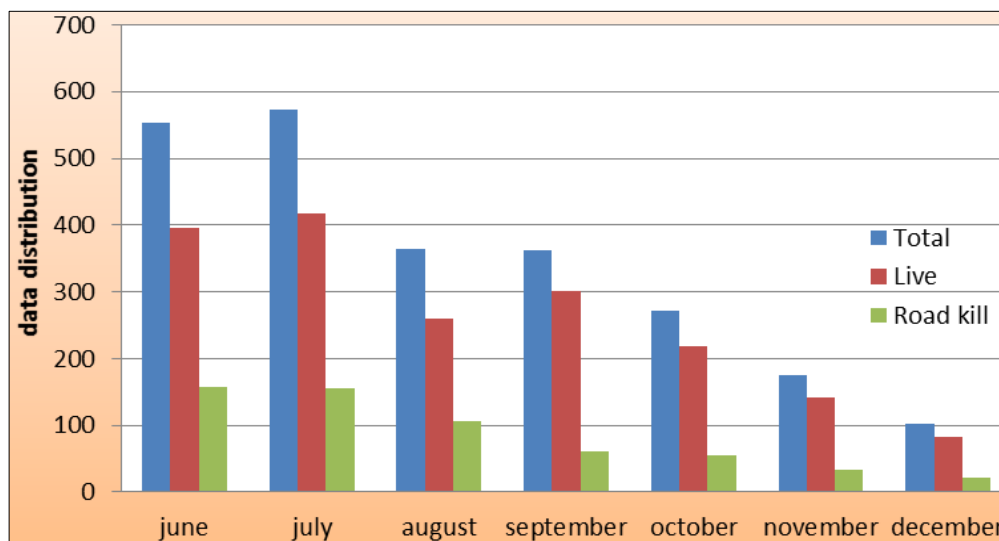
Family Viperidae found only three types of species viz. Russell's viper (*Daboia russelli*), Saw Scaled viper and bamboo pit viper, as like family boidae were found red sand boa and common sand boa. These two species were found rarely and have endangered status. Only one species was recorded from family Pythonidae, Indian rock python was recorded only once during whole study period. The species of family Colubridae were found abundantly in our study area.

**Table 1:** Details of the total, road killed and live snakes from June to December

Months	June	July	August	September	October	November	December
Total	554	573	365	363	272	176	103
Live	396	418	259	302	218	142	82
Road kill	158	155	106	61	54	34	21

**Table 2:** Family wise details of the snakes from June to December

Months	June	July	August	September	October	November	December
Typhlopidae	142	124	76	24	34	18	06
Boidae	07	02	10	02	00	01	00
Pythonidae	00	00	01	00	00	00	00
Colubridae	358	387	250	304	217	143	89
Elapidae	41	26	17	24	08	05	02
Viperidae	06	36	11	09	23	09	06



**Fig 1:** Family wise distribution of snakes found in Gondia region during study period

The collected road killed snake data from month of June to December 2012 provide a clear conclusion of higher mortality rate in Gondia district. The large road killed evident occurred during June to August in rainy season. It is due to the basic instinct of reproduction and searching for new habitat from September to December the mortality gradually decreases by means of hibernation of these species from the cold temperature. Snake species clearly shows the measuring mortality rate affect the diversity as well as species population. From the project report, data collection of snakes, it has been observed that the diversity of snakes is high in Gondia region, but due to anthropological activities, unawareness and road killed mortality of snakes is also high. Study of snake mortality on road killed as well as activity played to kill these species in human residential area has clearly concluded decreasing faunal diversity. Therefore to

overcome this problem proper knowledge for young leaders to promote about the changes in ethical issues that harmful to such a great fauna is needed.

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