

## Mortality data of reptilian fauna due to vehicular traffic in south eastern Rajasthan, India

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### ABSTRACT

Road kill is an animal or animals that have been struck and killed by motor vehicles. It occurs because animals (pets and wild) and people driving vehicles are on the roads simultaneously. Both cannot predict the behavior of one another. Wildlife may wander onto roadways for various reasons and become road kill. The south eastern Rajasthan is having important National park, Tiger reserve and wildlife sanctuaries which are rich in biodiversity. The reptilian fauna is commonly found in, around and outside these protected areas. This rich biodiversity is under threat due to extension and up gradation of roads, state highways and national highways. This study makes an effort to give an account of heavy toll of reptilian fauna due to NH 27 and NH 12 which are passing through south eastern Rajasthan, in, around and outside these protected areas. Present paper describes this particular problem and threat to reptilian diversity from south eastern Rajasthan, India for the first time.

**KEY WORDS:** REPTILIAN FAUNA, VEHICULAR TRAFFIC

### INTRODUCTION

The impact of vehicular traffic on certain reptile species is tried to document and population consequences of associated mortality from collision with vehicles can be significant from biodiversity conservation point of view. Whether such collision by vehicle drivers is a Global phenomenon had not been studied properly. Vehicle collision resulting in animal mortality is a common daily occurrence, although few studies have considered the impact on herpetofauna in urban areas.

Fauna mortality as result of road kill can be very significant for species with small populations. According to a study, road kill is estimated to be responsible for 50% of deaths of Florida panthers, and is the largest factor for European badger

deaths in England. Road kill is considered to significantly contribute to the population decline of many threatened species, including moose, wolf, koala and eastern quoll. In Tasmania, Australia the most common species affected by roadkill are brushtail possums and Tasmanian pademelons. In 1993, 25 schools throughout New England, United States participated in a roadkill study involving 1,923 animal deaths. By category, the fatalities were: 81% mammals, 15% birds, 3% reptiles and amphibians 1% indiscernible. This study may not have considered differences in observability among taxa (e.g. dead mammals are easier to see than dead frogs and reptiles).

A recent study showed that insects, too, are prone to a very high risk of road kill incidence. Research showed interesting patterns in insect/butterfly road kills in relation to the vehicle density. Although a broad range of wildlife is variously affected by roads (Ashley, and Robinson, 1996; Foreman and Alexander, 1998; Trombulak and Frissell, 2000) some species of reptiles appear to be especially vulnerable to vehicle collisions because of their vagility, behaviour, and life-history strategies of late sexual maturity and low reproductive and

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recruitment rates (Haxton, 2000; Enge and Wood, 2002). With more roads, increased vehicle speeds, and traffic volume, reptile death from vehicle collisions is an increasing problem that has been implicated in local and wide-scale population declines of some reptile species and populations (Rosen and Lowe, 1994; Haxton, 2000; Gibbs and Shriver, 2002; von Seckendorff Hoff and Marlow, 2002) and shifts in population structure (Gibbs and Steen, 2005).

Reptiles may frequently cross roads as they forage, disperse from natal sites, migrate between seasonal habitats, and undertake movements associated with reproduction (Bernardino and Dalrymple, 1992; Joyal, McCullough, and Hunter, 2001), but roads also attract reptiles as well. Therefore, we undertook this scientific study to explore the mortality of reptilian fauna due to vehicular traffic in south eastern Rajasthan, India.

## MATERIAL AND METHODS

The present study was conducted in the south eastern Rajasthan, India along the two prominent national highways (NH 27 and NH 12) that interface with the Durrah wildlife sanctuary and Ramgarh sanctuary. This covered four revenue districts of Rajasthan state namely, Baran, Bundi, Jhalwar and Kota. The area was surveyed on foot over a 3 year period (2010 - 2013), two to four days a week, typically soon after dawn. We also took few rounds on motorcycle along state highways and mega highway joining these highways in search of road kills.

Surveys were made to find out reptilian carcasses (dead bodies and parts thereof) on the NH 12, NH 12, Baran Khanpur Jhalawar mega highway and Bundi Nainwa state highway. Over a 3 year period (2010 - 2013), 84 km of National highways (NH 27 and NH 12) that interface with the Durrah wildlife sanctuary and Ramgarh sanctuary, was surveyed on foot two to four days a week, typically soon after dawn. During walk, on sighting the carcass species was tried to identify and notes regarding condition of the dead remains and surround-

ings were taken. These were photographed after examining and removed from the road. Das (2000), Daniel (2002) and Whitaker (2004) were used for identifying reptiles.

## RESULTS AND DISCUSSION

Over a 3 year period (2010 - 2013), 84 km of National highways (NH 27 and NH 12) that interface with the Durrah wildlife sanctuary and Ramgarh sanctuary, was surveyed on foot two to four days a week, typically soon after dawn. Over the period a total of 88 reptiles that represented 12 species: 40% of the lizard, 59% of snake species and 01 % others known from the area were seen and examined as road kills due to collision with vehicles. This equated to approximately two individual per month that was collected across the 3 years.

The most commonly found species of lizards were Indian Garden Lizard *Calotes versicolor* (Daudin), Bengal Monitor *Varanus bengalensis* (Daudin), and skinks *Mabuya carinata* (Schnieder). Among snakes cobra *Naja naja* (Linn.), domuhi *Eryx conicus* (Schnieder), Viper and Python were common. Once tortoise was seen near Hindoli (District Bundi).

Since snakes and lizards have a daily activity pattern, these come for basking in winter mid-days. In other parts of year, these remain active during early morning and evening. They are nocturnal, slow moving and devoid of locomotory organs for fast movement and hence are more vulnerable than other animals that can run or fly.

Results of present study shows the serious and damaging impact of vehicular traffic on reptile biodiversity which is in agreement with earlier studies done in Tamil Nadu (Gokula 1997, Kannan, 2007). Although an average death rate of two reptiles per month may be considered negligible, the cumulative loss of reptiles due to vehicle collision in the region is an ecological disaster (Shine *et al.*, 2004; Shinar and Compton, 2004). A detailed and long term study is needed to measure the impact on reptile fauna in particular and other animal species in general.



**Varanus bengalensis crushed on a road**

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