

SHORT COMMUNICATION

First report on presence and status of introduced invasive species Red-eared Slider, *Trachemys scripta elegans* in Goa, India

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ABSTRACT

State wide survey was conducted in the geographical region of Goa, India from June 2012– December 2015 to assess the diversity of freshwater turtles in Goa. During the survey the presence of Red-eared Slider (*Trachemys scripta elegans*), an invasive species of freshwater turtle was recorded for the first time in the geographical province of Goa. The import of this invasive species *Trachemys scripta elegans* to Goa and the subsequent illegal introduction of species in nature are examined. This study emphasizes on the need for further investigation as the presence of an invasive species is of greatest concern especially its impact on the native species needs to be investigated.

KEYWORDS: Status, Goa, invasive species, *Trachemys scripta elegans*.

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Introduction

The *Trachemys scripta elegans* (Red-eared slider), is native to the southern United States (Iverson, 1992; Ernst, Lovich and Barbour, 1994) and is naturally distributed in the Mississippi Valley area (Pendlebury, 2006). *Trachemys scripta elegans* was grown on farms and imported to other countries on large scale in Europe in pet trade (Pendlebury, 2006). There was an illegal trade which led to unplanned introduction of this species into the importing countries (Pupins, 2007). The Invasive Species Specialist Group has reported the presence of *T. scripta elegans* in 21 countries of the world (Pendlebury, 2006) and India (Pupins, 2007). This species is included in the list of the hundred most invasive biological species of the world (Lowe, Browne and Boudjelas, 2000). Envisaging where the invasive species may establish is very important for conservation as the invasive species intimidate biodiversity (Kikillus, Hare and Hartley, 2009). Hence the presence of *T. scripta elegans* in Goa can have a direct impact on the native species of Goa. The present study discusses the occurrence and the need for further research on the occurrence of *T. scripta elegans* in Goa.

Materials and methods

The field survey was conducted from June 2012–December 2015 across the geographical province of Goa (Fig. 1)

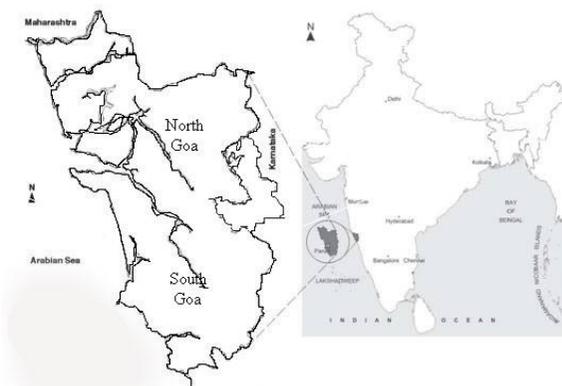


Figure 1. Map showing the study site (Goa).

following the methodology of Akbar, Mushtaq-ul-Hassan and Nisa, 2006. Locals were also interviewed about observation of *T. scripta elegans* in nature. Active searches in the undergrowth were carried out using visual encounter method (Litzgus and Mousseau, 2004). Exact location of the area was recorded using GPS (Geographical Positioning System). This study was conducted along with the study of distribution and diversity of freshwater turtles in Goa. Turtles were collected by hands or using dip nets (Spinks et al. 2003). Individuals encountered during the study were weighed and their morphometric measurements such as i)

Carapace length (CL), ii) Carapace width (CW), iii) Carapace height (CH), iv) Plastron length (PL), v) Plastron width (PW), vi) Tail length (TL) and Body weight (gms) were recorded.

Result

Four individuals of *T. scripta elegans* (Figure 1) were recorded from three sites, two from North District of Goa and one from South District. Among them, one individual (female) was recorded from Khandepar River, Khandepar, Ponda Taluka (N 15° 24' 59.59", E 74° 03' 08.07"). The habitat is characterized by a riverine system with riparian vegetation, the surrounding area is used for recreational purposes and constitutes of orchard land and spice farm. Certain regions at the site were inaccessible. Numerous freshwater fishes (not identified) were observed at the site. Repeated field survey at Khandepar region did not yield any further records and the locals reported that this was the first time this species was observed in the area.

One individual (male) was recorded in water body (in abandoned agriculture field) at Taleigao, Tiswadi Taluka (N 15° 28' 38.07", E 74° 49' 38.45"). Locals interviewed at Taleigao site reported that *T. scripta elegans* was observed first time in the area. Repeated field survey in this area reported the presence of another individual (female). Thorough investigation with the locals revealed that the turtles were released in the area by a family who initially purchased the hatchling from Mumbai, India as pet and after learning that keeping wild animals as pet amounts to wildlife crime the same were released at the site. The turtles were handed over to the Wildlife Division, Goa Forest Department, Government of Goa, Campal, Panaji-Goa. The third individual recorded was a juvenile encountered at Upasnagar, Marmugoa Taluka, South Goa. The individual was collected from a pond by a local volunteer.

The morphometric details of the three individuals (adults) of *Trachemys scripta elegans* is provided in Table 1. The females were larger in size than the male.



Figure 2. *T. scripta elegans* in natural habitat at Khandepar river, Khandepar, Ponda-Goa.

Discussion

This study is the first report on the occurrence of *Trachemys scripta elegans*, an introduced invasive turtle species in the State of Goa, India. Literature records on occurrence of *T. scripta elegans* in India is scanty except for Pupins (2007), the study mentioned its presence in India but details of locality is not provided. It was observed that the occurrence of this invasive species was reported in both northern and southern region of Goa in rural and sub-urban areas. The number of individuals sighted is rare indicating erratic presence of wild population. The presence of male and female in Taleigao area is imperative of the presence of progeny of this species in the area. This is supported by the morphometric details of these individuals which suggests that both the individuals are adults, also at this site the turtles were found in the water body in abandoned agricultural land which were released by the owners however the exact date and time of release is not known, there are equal chances of turtle migration, however, evidences to ascertain the same is wanting. Similarly, in Khandepar area only one female of *T. scripta elegans* was observed. The riverine system and presence of ample fish resource in the river indicates a favorable condition for this species to flourish.

Table 1. Morphometric details of *T. scripta elegans*. * indicates the individuals recorded from Taleigao site.

Sr. no	Characteristics	1 ^o individual*	2 ^o individual*	3 ^o individual
1	Sex	Male	Female	Female
2	Body weight (gms)	1402	1598	1625
3	Carapace length (cm)	20.6	22	21.2
4	Carapace Width (cm)	17.5	21.5	19.5
5	Carapace height (cm)	6	6.4	6.3
6	Plastron length (cm)	19.8	21	19.8
7	Plastron width (cm)	14	15	14.7
8	Total tail length	7	5	5.6

However, records of recreational activities in the adjoining areas may disturb this species thus leading the species to evacuate the area, the inaccessibility of the area at certain points should also be considered. The juvenile was collected by a local volunteer in Upasnagar, hence the other details are wanting. Thus, these speculations make it difficult to comment on the population size of this species.

As reported by locals the *T. scripta elegans* was brought from Mumbai, India as pets. This has led to illegal introduction of this species in Goa. Trade of this species as pet has led to its introduction in many freshwater ecosystems (Cadi and Joly, 2003). This species is also known to be the most exotic species in nature (Drews, 2005) and are known to interact with native turtles (Cadi and Joly, 2003). The intrusion of foreign species alters the biological processes of ecosystem thus affecting its functioning which in turn affects the native species. (Herbold and Moyle, 1986; Williamson, 1996). Thus, the presence of this invasive species in the natural environment of Goa is of serious concern as it is likely to affect the native turtle species. The dynamics of introduction of this species in natural environment is yet to be understood. Joly (2000) has emphasized on careful investigation of invasive species as the likely impact of these species on biotic relationships is unpredictable.

This study thus is the first report on the occurrence of *Trachemys scripta elegans* in Goa. The species is present as individuals and probably as a group of adult animals. The findings accentuate the need of further exhaustive study on the occurrence of this species not only in Goa but also in the entire Country.

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