



# The Indian Star Tortoise, *Geochelone elegans* (Schoepff 1795): An Unusual Color Morph and the Threat of Roadkills in Gujarat, India

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The Indian Star Tortoise (*Geochelone elegans*) is widely distributed in arid regions of Pakistan, India, and Sri Lanka (Das 1991). In India, this species is legally protected under Schedule IV of the Wildlife Protection Act (1972; amended 2005), is listed in CITES Appendix I (CITES 2021), is considered Vulnerable (VU) on the IUCN Red List (Choudhury et al. 2020), and is facing various threats in most of its natural habitat (Vyas 2010, 2015).

In the early morning of 1 October 2018, we encountered a road-killed gravid female Indian Star Tortoise (~12–15 years old, 18 cm carapace length) (Fig. 1) on state highway SH132, 3 km south of Dantiwada, Banaskantha District, in northern Gujarat, India (24°18'57.60"N, 72°19'41.82"E). We estimated age based on the number of growth rings on carapacial shields (Gibbons 1976; Vyas 2011a). The road at the site was surrounded by agricultural fields and scrubland. These areas of thorny scrub provide ideal habitat for tortoises in Gujarat (Vyas 2011b). This location also is very close to the Jessore Wildlife Sanctuary. We spoke to local residents and roadside business owners about the prevalence of the spe-

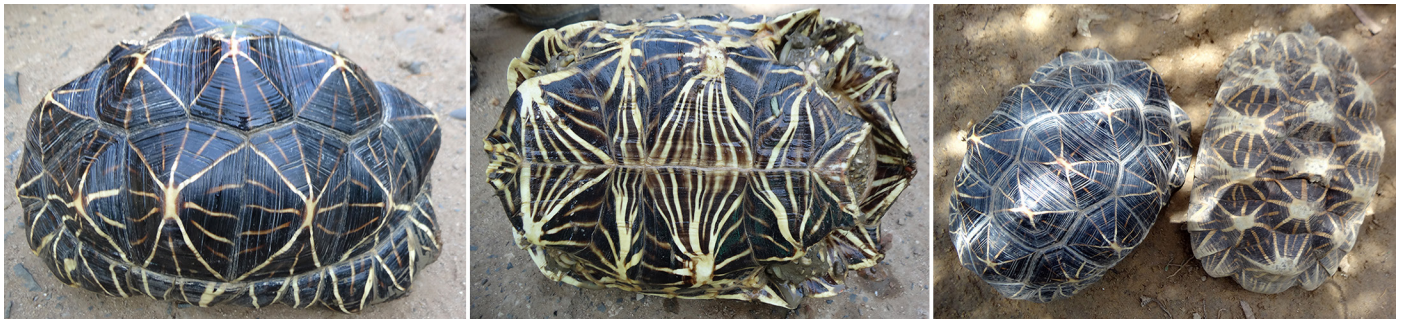
cies. Responses indicated that the species was less commonly encountered in the area than previously but was frequently found walking on the road, especially during the monsoon but rarely in winter. Also, some farmers maintained small captive populations of Indian Star Tortoises. We found one such farmer that had several tortoises in his backyard, one an unusual color morph (Fig. 2). Indian Star Tortoises usually have a dark carapace with yellow areolae and numerous yellow streaks forming radiating patterns; plastra likewise are dark with radiating yellow lines (D’Cruze et al. 2018). The unusual tortoise had very thin yellow radial markings on a distinctly darker ground color.

In August 2012, an unpublished record documented a live Indian Star Tortoise that had been found with a fractured carapace on the outskirts of Ahmedabad City, Gujarat. It was medically treated by a local NGO with the help of veterinarians. The fractured carapace was repaired using screws and steel wire (Fig. 3).

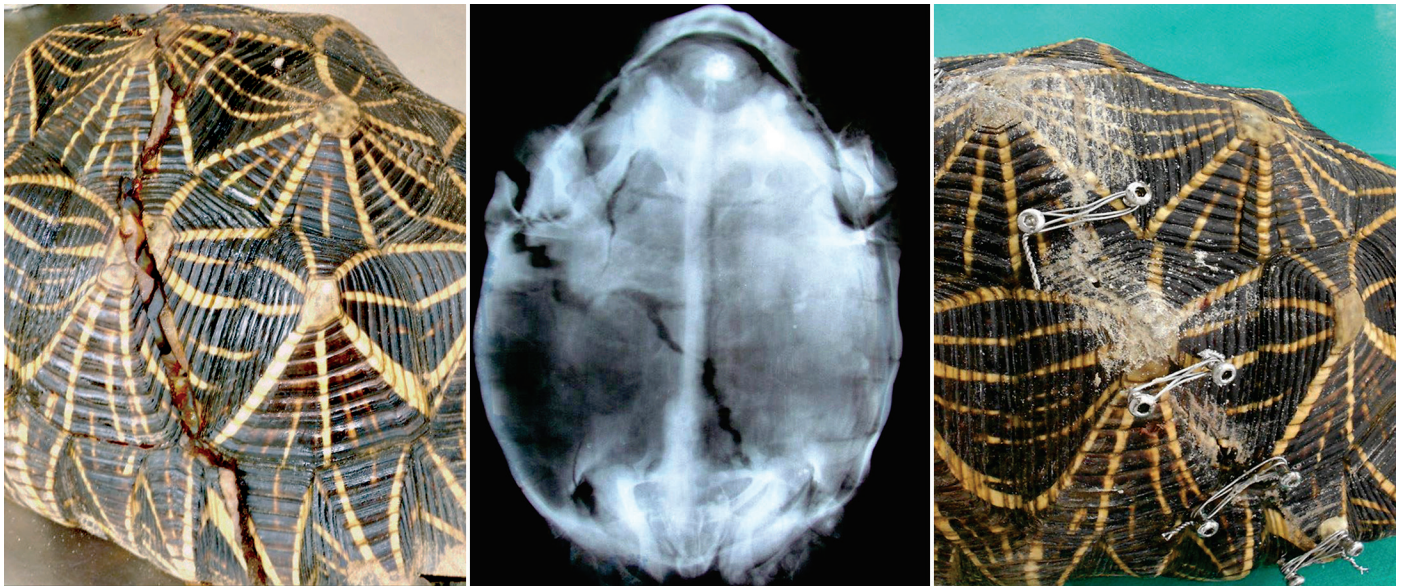
A considerable number of wild animals are recorded from agricultural fields, scrublands, and suburban fringes



**Fig. 1.** A road-killed gravid female Indian Star Tortoise (*Geochelone elegans*) near Dantiwada, Banaskantha, Gujarat, India. Note the eggs in the background. Photographs by Mital Patel.



**Fig. 2.** An unusually colored female Indian Star Tortoise (*Geochelone elegans*): Carapace (left), plastron (center), and comparison of the dark morph and a typically pigmented individual (right). Photographs by Raju Vyas.



**Fig. 3.** A previously unpublished record of a large Indian Star Tortoise (*Geochelone elegans*) injured by a vehicle near Ahmedabad, Gujarat, India, showing the fractured carapace (left), an X-ray of the injured tortoise (center), and treatment of the broken carapace (right). Photographs courtesy of the Jivdaya Charitable Trust, Ahmedabad.



**Fig. 4.** A large female Indian Star Tortoise (*Geochelone elegans*) crossing the Modasar Road, Bhuj, Gujarat, India. Photograph by Pratik Joshi.

are noticeably fragmented, they often harbor Indian Star Tortoises, especially in Gujarat (Vyas 2006). Fragmentation is largely attributable to anthropogenic structures, including irrigation canals, railway tracks, and roads. Consequently, tortoises must cross such roads (Fig. 4) to fully exploit the fragmented habitats (Parasharya and Tere 2007).

Threats faced by *G. elegans* include roadkills, agricultural equipment such as brush-mowers, and even discarded fishing nets (de Silva 2003, 2015), none of which are adequately documented especially for reptilian species (Vyas and Vasava 2019; Vyas et al. 2020, 2021; Vyas and Chauhan 2021). Collectively, these threats, particularly linear infrastructural intrusions like roads, are likely to have significant negative effects on populations of Indian Star Tortoises.

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shared by species residing in adjacent protected areas (Vyas and Parasharya 2000). Although these peripheral habitats

injured tortoise treatment; Pratik Joshi (Bhuj) for granting permission to use his image of a tortoise crossing a road; and the Deputy Conservator of Forest, Jessore Wildlife Sanctuary, Banaskantha, Gujarat, for logistical support.

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