Bulletin of the Chicago Herpetological Society 58(11):177-178, 2023

The Hunchback of Isla Piojo: First Record of Putative Kyphosis in the Spiny Chuckwalla (*Sauromalus hispidus*)

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The Spiny Chuckwalla (*Sauromalus hispidus*) (Stejneger, 1891) is a desert-dwelling iguana found only on islands in the northeastern Gulf of California, Mexico. Presence of this species has been recorded on 11 islands: Ángel de la Guarda, Mejía, Estanque, San Lorenzo (San Lorenzo Sur), Las Animas (San Lorenzo Norte), Cabeza de Caballo, La Ventana, Piojo, Mitlán, Rosa, and Coronado (Smith) (Reynoso et al., 2017; Montgomery et al., 2019). Aspects of its ecology, such as habitat use, diet composition, population size, adaptation to the desert environment, and patterns of activity have been studied (Smits, 1985a, b; Sylber, 1988; Hollingsworth, 1998, Grismer, 2002); however, morphological abnormalities have yet to be reported in this species. Here, we present the first reported case of an external, morphological abnormality in *S. hispidus*.

On 30 May 2022, at 19:40, our group found an adult individual during a sampling expedition to Isla Piojo (29.01511°N, 113.461849°W; elevation 10 m). The individual was found active on the top of a hillside. Once aware of our presence, it attempted to hide in a nearby burrow; however, it was unable to effectively hide due to a morphological abnormality. We found that the individual exhibited two vertical curvatures in the spine (potential kyphosis), one immediately behind the anterior extremities and another at the pelvic waist (Figure 1). We also observed a scar at the top of the curvature at the pelvic waist. It was evident that this morphological abnormality limited its capacity to effectively hide in the burrow; however, the individual was observed to be healthy in all other aspects.

Photos were captured of the individual and deposited at the digital collection of the Natural History Museum of Los Angeles County (LACM PC 2996) (Figure 1).

Kyphosis has been previously reported in iguanids, but only in *Cyclura cychlura* (Owens and Knapp, 2007) in the Bahamas. Spinal abnormalities in lizards are infrequently reported in scientific literature, with the majority of cases being in the genera *Sceloporus* (Phrynosomatidae) (e.g., Pérez-Delgadillo et al., 2015; Valdez-Villavicencio et al., 2016; Castillo-Juárez et al., 2020) and *Anolis* (Polychrotidae) (e.g. Ortiz-Medina and Valdez-Villavicencio, 2016). The only morphological abnormality reported in the genus *Sauromalus* was a bifurcation in the tail of a captive *Sauromalus ater* individual (Koleska et al., 2017).

Our observation of the morphological abnormality in *S.*

Figure 1. Male Spiny Chuckwalla (*Sauromalus hispidus*) from Isla Piojo, with two vertical curvatures in the spine (kyphosis). Photograph by Víctor Vásquez-Cruz.

Figure 2. *Sauromalus hispidus* habitat on Isla Piojo. Photograph by Víctor Vásquez-Cruz

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hispidus occurred during a study of herpetofauna on islands found in Bahía de los Ángeles, Baja California, Mexico. This was the only observed case of spinal curvature in all individuals found throughout the study (20–50 individuals per island over five islands). We conjecture that the potential kyphosis observed in this individual may be the result of a mechanical injury, (e.g., rock fall), an injury post predation attempt, or an injury sustained from an aggressive interaction with a conspecific. It may have also occurred due to a lack of proper nutrition during growth, malformation during embryonic development due to thermal trauma, or other possible factors. Our discovery of a morphological abnormality in a Spiny Chuckwalla (*S. hispidus*) on Isla Piojo stands as a unique observation in this species. Our finding underscores the importance of continuous investigation to uncover rare morphological anomalies and prompts further investigation into the potential causes and implications of such aberrations in herpetofauna.

Acknowledgments

We would like to thank CONANP de Zona Marina Bahía de los Ángeles for access to the field sites. We would also like to thank Neftali Camacho (LACM) for cataloguing the digital photographs. All work was funded by the National Geographic Exploration Grant (NGS-61140R-19) to M.J.M., J.L.S, C.L.P., M.B., and H.F-C. and the Theodore Roosevelt Memorial Grant from the American Museum of Natural History to M.J.M. All work was conducted under permit SEMARNAT Oficio No SGPA/DGVS/04999/22 and USF IACUC IS00008275.

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