



# First Report of a Papilloma in an Invasive Tropical House Gecko, *Hemidactylus mabouia* (Gekkonidae), in Cuba

Rafael Borroto-Páez<sup>1</sup> and Carlos Hernández Peraza<sup>2</sup>

<sup>1</sup>Instituto de Geografía Tropical, Calle F No. 302, entre 13 y 15, Vedado, La Habana, Cuba (borroto@yahoo.com)

<sup>2</sup>Instituto de Ecología y Sistemática, Carretera de Varona, #11835 Boyeros, Habana, Cuba

When invasive species arrive in new locations, they are always accompanied by their pathogens, parasites, and disease vectors. All can affect biodiversity, ecosystem function and services, and human health (Crowl et al. 2008). In particular, identifying and evaluating accompanying viruses is necessary to understand the pathogenic challenges facing both invasive and sympatric native populations and, in addition, could facilitate pandemic preparedness by aiding diagnoses of disease outbreaks and assisting in the conservation of threatened populations (Harding et al. 2022).

The Tropical House Gecko (*Hemidactylus mabouia*) arrived in Cuba in the 16th Century with the slave trade. It is widely distributed and abundant in Cuba, essentially ubiquitous in areas occupied by humans and sometimes present in neighboring natural areas (Borroto-Páez et al. 2015). However, knowledge of its pathogens and parasites in Cuba and on other Caribbean Islands is sparse.

In December 2024, while evaluating the abundance of Tropical House Geckos in the Hotel Florida in Camaguey Province (21.531066, -78.233785), we encountered 45 individuals in the evenings of two different days. We collected a few specimens to evaluate states of health and para-

site loads of orange mites (*Geckobia hemidactyli*, Actinedida: Pterygosomatidae) (Borroto-Páez and Reyes Pérez 2022). One adult male (SVL 121 mm) collected on 3 December had a wartlike lump near its right eye that we identified as a papilloma (Fig. 1). We attempted to keep the gecko in captivity, offering termites as food, but it died three days later and was preserved in 95% ETOH.

Papillomaviruses (PV), which are widespread in the animal kingdom, cause papillomatous lesions, defined as branching fronds of hyperplastic epidermis supported by a fibrovascular stalk (Schmidt et al. 2015). PV are epitheliotrophic, infecting skin, mucosal, and nasolacrimal epithelia, and can infect internal organs such as those of the reproductive and digestive tracts of their hosts (Truchado et al. 2018). These viruses generally exhibit high host specificity, although some PV can infect several species (Agius et al. 2019). Most PV are non-pathogenic and cause subclinical infections in infected individuals, often self-limiting papillomatous lesions, such as the benign wart-like lesion we observed in the gecko. However, a few PV strains (e.g., some types of the Human Papillomavirus [HPV]) are oncogenic and are associated with the development of malignant neoplasms (Munday and Kiupel 2010).



**Figure 1.** Dorsal and lateral views of a papilloma on a Tropical House Gecko (*Hemidactylus mabouia*) collected at Hotel Florida, Camaguey, Cuba. Photographs by Rafael Borroto-Páez.

Our diagnosis considered the characteristics, position in the host, and configuration of the wartlike lesion (i.e., infecting an epithelial surface as a peduncled filiform wart with a grained and branched surface), all of which suggested a lesion caused by PV. When diagnosing HPV, identification usually is clinical, based on the aspect and characteristics of the lesions, with histological and molecular analysis required only in special circumstances.

To the best of our knowledge, this is the first time that a PV-induced lesion has been identified in *Hemidactylus mabouia*, although Agius et al. (2019) described PV in two Common House Geckos (*Hemidactylus frenatus*) from Christmas and Cocos Islands in Oceania, the first report of a sauropsid clade of PV in lizards and only the third and fourth in reptiles. In the case reported herein, we must still conduct a molecular analysis and identify the PV strain, which we hope to do as soon as the means become available. We also intend to examine the affected gecko in order to detect additional internal lesions.

Unfortunately, few studies have addressed parasites and pathogens in invasive species, although they potentially affect the health of native fauna and even humans. In only a few years of monitoring invasive populations of Tropical House Geckos in Cuba, without the specific intention of finding pathogens, one of us (RBP) has reported the first filariid nematode in this host (Borrito-Páez et al. 2022), new information on the distribution and abundance of orange mites (*Geckobia hemidactyli*, Actiniedida: Pterygosomatidae) (Borrito-Páez et al. 2020; Borrito-Páez and Reyes Pérez 2022), and now a probable papillomavirus. This is a clear example of why invasive species, especially human commensals such as house geckos, must be monitored for pathogens and parasites, in order to identify any risks of transmission to humans and native species.

### Acknowledgements

This work was made possible by expedition funds of the international and national project “Coastal Resilience to Climate

Changes in Cuba through Ecosystem Based Adaptation in the South Zone of Cuba (Mi Costa)” with funds from the Green Climate Fund, UNEP. We thank our colleagues Dra. Ramona Oviedo and Msc. Ricardo Rosa Angulo from the Institute of Ecology and Systematics for organizing the expedition to the southern coastal zone of Ciego de Avila, Camaguey and Granma Provinces, to evaluate biodiversity and invasive species in November–December 2024; and local environmental authorities for their support during implementation of this project.

### Literature Cited

- Agius, J.E., D.N. Phalen, K. Rose, and J.-S. Eden. 2019. New insights into sauropsid *Papillomaviridae* evolution and epizootiology: discovery of two novel papillomaviruses in native and invasive island geckos. *Virus Evolution* 5: vez051. <https://doi.org/10.1093/ve/vez051>.
- Borrito-Páez, R. and D. Reyes Pérez. 2022. Record number of mites, *Geckobia hemidactyli* (Pterygosomatidae), on a Tropical House Gecko (*Hemidactylus mabouia*) in Cuba. *Reptiles & Amphibians* 29: 290–293. <https://doi.org/10.17161/randa.v29i1.17058>.
- Borrito-Páez, R., R. Alonso Bosch, B.A. Fabres, and O. Alvarez Garcia. 2015. Introduced amphibians and reptiles in the Cuban Archipelago. *Herpetological Conservation and Biology* 10: 985–1012.
- Borrito-Páez, R., C. Martínez Rivera, and D. Reyes Pérez. 2020. Mites (*Geckobia hemidactyli*, Actiniedida: Pterygosomatidae) in Tropical House Geckos (*Hemidactylus mabouia*) in Cuba: A review with new distribution records. *Reptiles & Amphibians* 27: 1–8. <https://doi.org/10.17161/randa.v27i3.14852>.
- Borrito-Páez, R., D. Reyes Pérez, S.R. Goldberg, and C.R. Bursey. 2022. Erster Bericht über einen Filariidennematoden (Filarioidea) im tropischen Hausgecko, *Hemidactylus mabouia* (Squamata: Gekkonidae) aus Kuba. First report of a filariid nematode (Filarioidea) in the Tropical House Gecko, *Hemidactylus mabouia* (Squamata: Gekkonidae) from Cuba. *Sauria* 44 (4): 69–70.
- Crowl, T.A., T.O. Crist, R.R. Parmenter, G. Belovsky, and A.E. Lugo. 2008. The spread of invasive species and infectious disease as drivers of ecosystem change. *Frontiers in Ecology and the Environment* 6: 238–246. <https://doi.org/10.1890/070151>.
- Harding, E.F., A.G. Russo, G.J.H. Yan, L.K. Mercer and P.A. White. 2022. Revealing the uncharacterised diversity of amphibian and reptile viruses. *ISME Communications* 2: 95. <https://doi.org/10.1038/s43705-022-00180-x>.
- Munday, J.S. and M. Kiupel. 2010. Papillomavirus-associated cutaneous neoplasia in mammals. *Veterinary Pathology* 47: 254–64. <https://doi.org/10.1177/0300985809358604>.
- Schmidt, R.E., D.R. Reavill, and D.N. Phalen (eds.). 2015. *Pathology of Pet and Aviary Birds*. Second edition. John Wiley and Sons, Ames, Iowa, USA.
- Truchado, D.A., R.A.J. Williams, and L. Benitez. 2018. Natural history of avian papillomaviruses. *Virus Research* 252: 58–67. <https://doi.org/10.1016/j.virusres.2018.05.014>.