



# LETTER:

## FROM GEOSITES TO KARST LANDSCAPES: ROBERTO GUTIÉRREZ DOMECH *IN MEMORIAM*

Yasmani CEBALLOS IZQUIERDO<sup>1</sup>

Roberto Gutiérrez Domech (1947–2024) was a distinguished Cuban geologist, karstologist, speleologist, and paleontologist whose extensive work significantly advanced the understanding and preservation of Cuba's geological heritage (Gutiérrez-Domech, 2010; Gutiérrez-Domech et al. 2005, 2007, 2011a, 2011b; Gutiérrez-Domech and Rivero Glean, 1999; Pantaleón-Vento et al. 2011, 2013). Born in Havana on January 14, 1947, Gutiérrez Domech dedicated his life to the study of geosites and karst landscapes, leaving an indelible mark on the scientific community.

Gutiérrez Domech's journey into the natural sciences began early in life, marked by a deep fascination with the geological formations that define the Cuban landscape. He pursued higher education in Geography and graduated in 1977. His academic focus evolved toward karst topography and speleology—the study of caves—shaping a career that would make him synonymous with the study and protection of Cuba's unique geological features.

Throughout his career, Gutiérrez Domech held several key positions within Cuban scientific institutions. He spent more than two decades conducting paleontological and applied geological research at the National Institute of Hydraulic Resources and the National Enterprise of Applied Research, before becoming a senior researcher and head of the Department of Paleontology and in the Mario Sánchez Roig Museum at the Institute of Geology and Paleontology of Cuba. He also served as an associate professor at the Enrique José Varona Higher Pedagogical Institute. His leadership extended beyond these institutions, playing a pivotal role in the development of significant scientific works both in Cuba and internationally.

In addition to his academic and professional roles, Gutiérrez Domech was a key figure in the scientific community as the founder of the Martel Speleological Group, the Cuban Speleological Society, and the Cuban Geological Society, where he held leadership positions. His influence extended to more than 60 scientific articles and co-authorship of books, solidifying his legacy in the fields of geology, karstology, geography, and paleontology.

As a prolific author, one of his most notable works is *Minieografía de Cuba* (Gutiérrez-Domech and Rivero Glean, 1997), which offers a comprehensive exploration of the island's diverse geological features. This book has become an essential resource for students and researchers seeking to understand Cuba's natural landscapes. In karstology, Gutiérrez-Domech made countless contributions, both through fieldwork and written works, disseminating knowledge about Cuba's unique geological formations (Acevedo-González and Gutiérrez-Domech, 1974a; Gutiérrez-Domech, 1998a, b, 2010; Gutiérrez-Domech and Farrah Pascual, 1967; Gutiérrez-Domech and Martínez-Salcedo, 1998; Gutiérrez-Domech and Barriento-Duarte, 2001; Iturralde-Vinent and Gutiérrez-Domech, 1994, 1998). One example of this is an article published in this very journal (Gutiérrez-Domech et al. 2015). His studies on the development of karstification in the Cordillera de Guaniguanico (Pinar del Río), western Cuba, provided valuable insights into the region's geological evolution (Acevedo-González and Gutiérrez-Domech, 1974a). He also conducted extensive research on cave systems such as the Majaguas-Cantera cave system in Pinar del Río, which has become a benchmark for speleological studies in Cuba and beyond (Acevedo-González

<sup>1</sup> Calle 40, #2702 e/27 y 29, Madruga, Mayabeque Cuba



**Figure 1.** Roberto Gutiérrez-Domech collecting geological samples from a large limestone block at the Aguacate Quarry, Madruga, western Cuba (c. 2020). This fieldwork effort, undertaken alongside the author, aimed to relocate and document a fossil turtle site originally discovered decades earlier.

and Gutiérrez-Domech, 1974b, 1976b). Additionally, he studied the karst landscapes of the Cayajabos (Madruga, western Cuba) area and its geomorphology, further expanding the understanding of these unique formations (Gutiérrez-Domech and Rivero-Reyes, 1975a, 1975b).

Over the course of his career, Gutiérrez Domech also made remarkable contributions to Cuban paleontology, documenting numerous significant and rare discoveries, including microforaminifera, ammonites, Campanian-Maastrichtian decapods, and Cenozoic rays (Furrázola-Bermúdez, et al. 1998; Gutiérrez-Domech, 1966, 1967, 1968; Gutiérrez-Domech et al, 1977a, b; Iturralde-Vinent et al. 1998; Oliva-Martín et al, 2017; Vega et al., 2024). Among his most guarded treasures was the holotype of the Cuban pterosaur *Cacibupteryx caribensis*, which he meticulously preserved at the institute, underscoring his role as a custodian of Cuba's paleontological heritage. His particular interest in the Madruga region was shared with the author, with whom he engaged in fruitful discussions about the Madruga Formation. This same interest led him to return to Madruga a few years ago, alongside the author of this work, to relocate an outcrop at the Aguacate Quarry where a fossil turtle had been discovered decades earlier (Fig. 1). Following this visit, he also shared valuable information about the foraminifera from the quarry.

In 1981, he published a very interesting report in the journal *Voluntad Hidráulica*, describing two large 'dinosaur' bones discovered in western Cuba—findings of considerable importance to the paleontological record, had they been confirmed (Gutiérrez-Domech, 1981). Al-



**Figure 2.** Unpublished photograph of a block containing fossil bone fragments reported by Roberto Gutiérrez-Domech in 1981, discovered in western Cuba. These bones, later lost, were tentatively attributed to Late Jurassic dinosaurs; however, the absence of physical material precludes definitive verification of their taxonomic identity. Images and historical context were generously shared by Gutiérrez-Domech.



Figure 3. Historical photograph of a controversial specimen purportedly a reptilian bone from the Santa Cruz River, Pinar del Río, western Cuba. This specimen, described anecdotally as a dinosaur bone, remains unassessable due to the absence of physical material, and it cannot be confirmed whether it represents a fossil bone or a natural geological formation.

though the fossil material was later lost and cannot be evaluated, I was fortunate to access unpublished photographs of the specimens and firsthand historical information, kindly shared by Gutiérrez-Domech himself (Fig. 2). Another controversial discovery was a supposed dinosaur bone from the Santa Cruz River, of which the author retains an old photograph (Fig. 3); this specimen too remains unassessable.

Beyond his academic achievements, Gutiérrez Domech was a dedicated educator. He mentored countless students and professionals, inspiring a new generation of scientists committed to the study and conservation of geological heritage. His methodologies for diagnosing and classifying geosites have been adopted in various

conservation initiatives, ensuring the lasting protection of Cuba's unique geological features. His advocacy for environmental conservation underscored his belief in the intrinsic value of preserving natural landscapes for future generations.

The passing of Roberto Gutiérrez Domech marks a significant loss for the geological and speleological communities. His life's work—from the meticulous study of geosites to the exploration of karst landscapes—has left an enduring legacy that continues to enrich the scientific understanding of Cuba's natural history. As we reflect on his contributions, we honor his memory by continuing the pursuit of knowledge and the preservation of the natural world he so passionately advocated for.

## REFERENCES

- Acevedo-González, M., Gutiérrez-Domech, R., 1974a. Contribución al estudio de la estratigrafía del Cuaternario del occidente de Cuba. *Voluntad Hidráulica*, 11(29): 59-62.
- Acevedo-González, M., Gutiérrez-Domech, R., 1974b. The Majaguas-Cantera cave system, Pinar del Río, Cuba. *Bulletin of the Venezuelan Speleology Society*, 5(10): 125-142.
- Acevedo-González, M., Gutiérrez-Domech, R., 1976a. Nuevos reportes sobre manifestaciones pseudocársticas en rocas no carbonatadas. *Voluntad Hidráulica*, 12(40): 33-35.
- Acevedo-González, M., Gutiérrez-Domech, R., 1976b. El Sistema Cavernario Majaguas-Cantera. *Voluntad Hidráulica*, 13(37): 18-30.
- Furrazola-Bermúdez, G., Gutiérrez-Domech, R., Torres-Silva, A.I., Pantaleón, G., 1998. Los ammonites y aptychus del Mesozoico de Cuba. Actualización. En: *Geología y Minería, Memorias I (III Congreso de Geología y Minería)*, La Habana.
- Gutiérrez-Domech, R., 1966. *Globigerina haoi*, un nuevo foraminífero planctónico del Eoceno de Cuba. Instituto Nacional de Recursos Hidráulicos, Publicación Especial Número 2, La Habana, 17-25.
- Gutiérrez-Domech, R., 1967. Nueva especie de foraminífero planctónico del Eoceno Superior de la provincia de Matanzas. Instituto Nacional de Recursos

- sos Hidráulicos, Publicación Especial Número 2, La Habana, 3-13.
- Gutiérrez-Domech, R., 1968. Breve reseña sobre el período Jurásico en la Provincia de Pinar del Río. Instituto Nacional de Recursos Hidráulicos, Publicación Especial Número 5, La Habana, 3-23.
- Gutiérrez-Domech, R., 1969. Una localidad cotipo de la Formación Consuelo en la provincia de La Habana, Cuba. Instituto Nacional de Recursos Hidráulicos, Publicación Especial Número 7, La Habana, 31-52.
- Gutiérrez-Domech, R., 1981. Hallazgo de restos de reptil en rocas jurásicas en Punta de la Sierra, provincia Pinar del Río. *Voluntad Hidráulica*, 18(56): 4-11.
- Gutiérrez-Domech, R., 1998a. El carso en el archipiélago cubano. En: Furrázola-Bermúdez, G., y Nuñez-Cambra, K., (Editores) *Estudios sobre Geología de Cuba*. Instituto de Geología y Paleontología, Centro Nacional de la Información Geológica.
- Gutiérrez-Domech, R., 1998b. El Karst en el archipiélago cubano y la región Caribe-Antillana. *Minería y Geología*, 15(3): 39-52.
- Gutiérrez-Domech, R., 2010. Protecting the Cuban geological heritage. *The Open Geology Journal*, 4: 1-14.
- Gutiérrez-Domech, R., Alvarez, N.O., y Quesada, V., 1977a. La bioestratigrafía del Neógeno en Cuba Occidental. *Voluntad Hidráulica*, 14(42): 35-41.
- Gutiérrez-Domech, R., Alvarez, N.O., y Quesada, V., 1977b. La bioestratigrafía del Neógeno en Cuba Occidental. *Voluntad Hidráulica*, 14(43): 3-14.
- Gutiérrez-Domech, R., y Barriento-Duarte, A., 2001. Las unidades litoestratigráficas carsificadas de Cuba occidental. En: IV Congreso Cubano de Geología y Minería, *Memorias Geomin 2001*, La Habana, marzo 19-23.
- Gutiérrez-Domech, R., Barrientos Duarte, A., Balado Piedra, E., Flores Valdés, L., Furrázola-Bermúdez, G., Pantaleón, G., 2007. Observaciones sobre la conservación del patrimonio geológico en la provincia de La Habana. En: *Memorias, Trabajos y Resúmenes. II Convención Cubana de Ciencias de la Tierra (Geociencias'2007)*. Centro Nacional de Información Geológica, Instituto de Geología y Paleontología de Cuba, La Habana, CD-Rom.
- Gutiérrez-Domech, R., Barriento-Duarte, A., Furrázola-Bermúdez, G., 2005. Protección y Conservación del Patrimonio Geológico de Cuba. En: *Memorias, Trabajos y Resúmenes. I Convención de Ciencias de la Tierra (Geociencias'2005)*. Comisión Taller Conservación del Patrimonio y la Herencia Geológica. Centro Nacional de Información Geológica, Instituto de Geología y Paleontología de Cuba, La Habana, CD-Rom.
- Gutiérrez-Domech, R., Bernal-Rodríguez, L., Barriento-Duarte, A., 2011a. Formas cársicas de interés patrimonial en la llanura cársica meridional Habana-Matanzas. En: *Memorias, Trabajos y Resúmenes. IV Convención Cubana de Ciencias de la Tierra (Geociencias' 2011)*. Centro Nacional de Información Geológica, Instituto de Geología y Paleontología de Cuba, La Habana, CD-Rom.
- Gutiérrez-Domech, R., Bernal-Rodríguez, L., Grau, E., Balado-Piedra, E., Pantaleón-Vento, G.J., Barriento-Duarte, A., Furrázola-Bermúdez, G., 2011b. Geositi- os de interés patrimonial y práctico de la provincia Matanzas. En: *Memorias, Trabajos y Resúmenes. IV Convención Cubana de Ciencias de la Tierra (Geociencias' 2011)*. Centro Nacional de Información Geológica, Instituto de Geología y Paleontología de Cuba, La Habana, CD-Rom.
- Gutiérrez-Domech, R., Farrah Pascual, F., 1967. Observaciones generales sobre el carso del macizo del Guaso, Guantánamo, Oriente. Instituto Nacional de Recursos Hidráulicos, Publicación Especial No. 4, La Habana, 23-33.
- Gutiérrez-Domech, R., Knez, M., Slabe, T., 2015. Felo Pérez Mogote (Viñales, Pinar del Río, Cuba): Typical shaping of rock surface below dense tropical vegetation. *Acta Carsologica*, 44 (1): 47-57.
- Gutiérrez-Domech, R., Martínez-Salcedo, J., 1998. El karst en el Eoceno de Cuba. *Geología y Minería, Memorias I (III Congreso de Geología y Minería)*, La Habana.
- Gutiérrez-Domech, R., Rivero Glean, M., 1997. Mini-geografía de Cuba. Editorial Científico-Técnica, 144 pp., La Habana, Cuba.
- Gutiérrez-Domech, R., Rivero Glean, M., 1999. Regiones naturales de la isla de Cuba. Editorial Científico-Técnica. 146 pp., La Habana, Cuba.
- Gutiérrez-Domech, R., Rivero-Reyes, F., 1975a. Estudio geólogo-geomorfológico de la zona de Cayajabos, Madruga. *Serie Geográfica*, 12: 1-34.
- Gutiérrez-Domech, R., Rivero-Reyes, F., 1975b. El carso en la zona de Cayajabos, Madruga. *Voluntad Hidráulica*, 12 (35): 44-52.
- Iturralde-Vinent, M., Gutiérrez-Domech, R., 1994. Cuban tropical karst: some examples. *AGID News*, 76: 9-12.
- Iturralde-Vinent, M., Gutiérrez-Domech, R., 1999. Some examples of karst development in Cuba. *Boletín Informativo, Comisión de Geoespeleología FEALC*, 14, Noviembre, pp. 1-4.
- Iturralde-Vinent, M., Mora, C.L., Rojas-Consuegra, R., Gutiérrez-Domech, R., 1998. Myliobatidae (Elasmobranchii: Batomorphii) del Terciario de Cuba. *Revista de la Sociedad Mexicana de Paleontología* 8 (2): 135-145.

- Oliva-Martín, A., Domínguez Samalea, Y., Delgado Carballo, I.L., Gutiérrez-Domech, R., Hidalgo Griff, D., 2017. El catálogo de ammonites de Cuba un producto del Instituto de Geología y Paleontología / Servicio Geológico de Cuba para la divulgación del conocimiento geocientífico. Póster, Instituto de Geología y Paleontología.
- Pantaleón-Vento, G.J., Gutiérrez-Domech, R., Bernal Rodríguez, L., Barriento-Duarte, A., Llanes-Castro, A.I., Flores Váldez, L., 2011. Patrimonio geológico de las provincias occidentales. Mapa de los geositos a escala 1: 250 000. En: Memorias, Trabajos y Resúmenes. IV Convención Cubana de Ciencias de la Tierra (Geociencias' 2011). Centro Nacional de Información Geológica, Instituto de Geología y Paleontología de Cuba, La Habana, CD-Rom.
- Pantaleón-Vento, G.J., Gutiérrez-Domech, R., Bernal Rodríguez, L., Barriento-Duarte, A., Machado García, A., 2013. Estratotipos que constituyen patrimonio geológico en la provincia de Villa Clara. En: Memorias, Trabajos y Resúmenes. V Convención Cubana de Ciencias de la Tierra (Geociencias' 2013). Sociedad Cubana de Geología, La Habana, CD-Rom.
- Vega, F. J., Nyborg, T., Garassino, A., Pasini, G., Aguilar-Pérez, J., Borges-Sellén, C. R., Gutiérrez-Domech, R. M. (2024). Upper Cretaceous Crustacea from Central Cuba. *Journal of South American Earth Sciences*, 138, 104845.