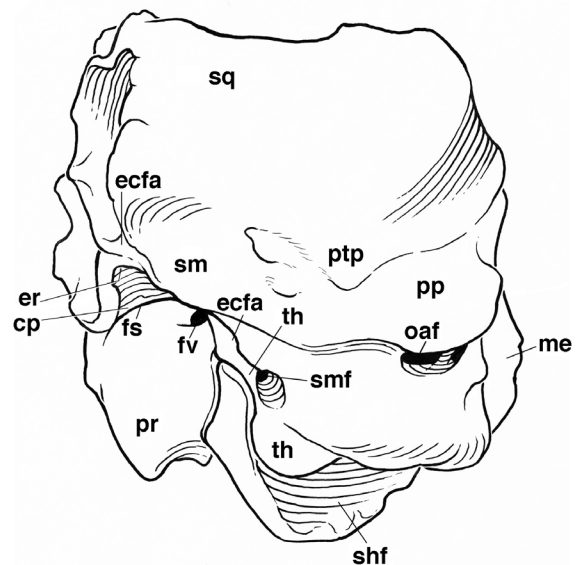


**ISOLATED PETROSAL OF THE EXTINCT SLOTH  
*GLOSSOTHERIUM TROPICORUM* (XENARTHRA,  
FOLIVORA, MYLODONTIDAE) FROM THE ISLAND OF  
TRINIDAD**

**Timothy J. Gaudin and Joseph Broome**



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Cover image: Lateral view of an isolated left petrosal (UF 240205) of *Glossotherium tropicorum* from Pleistocene tar pits of Trinidad.

# ISOLATED PETROSAL OF THE EXTINCT SLOTH *GLOSSOTHERIUM TROPICORUM* (XENARTHRA, FOLIVORA, MYLODONTIDAE) FROM THE ISLAND OF TRINIDAD

Timothy J. Gaudin<sup>1</sup> and Joseph Broome<sup>1</sup>

## ABSTRACT

This report is the first to identify the presence of the extinct ground sloth *Glossotherium tropicorum* from Pleistocene-aged tar pit deposits in Trinidad. *G. tropicorum* is known primarily from extensive skeletal material recovered from the Pleistocene of western Ecuador and Peru. Our identification is based on an isolated left petrosal bone, which exhibits a variety of derived diagnostic features of mylodontid sloths in general, e.g., the presence of an epitympanic recess, and the genus *Glossotherium* in particular, including a reduced anteroventral process of the tegmen tympani. This represents only the second published record of the genus *Glossotherium* from outside continental South America, and is a substantial range extension for the species *G. tropicorum*. The present study also represents the first published description of a mylodontid sloth fossil from Trinidad. The specimen is part of a collection that was initially documented in an unpublished Master's thesis, and that includes additional sloths and other Pleistocene mammals. This fauna confirms the presence of extensive savanna-type habitats on Trinidad during the Pleistocene, and is consistent with the presence of a land bridge connection between the island and mainland South America at that time.

**KEY WORDS:** Sloths, *Glossotherium*, Trinidad, Pleistocene, tar pit, ear region, skull, anatomy

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## INTRODUCTION

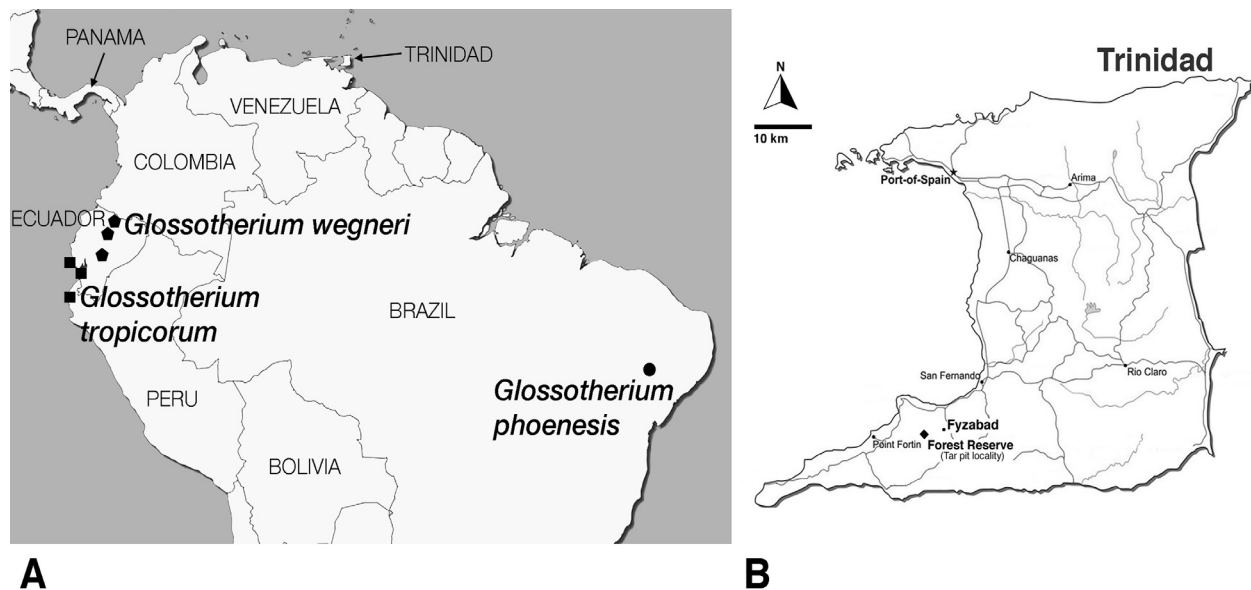
Sloths are herbivorous members of the Xenarthra. Living sloths comprise a small clade of two genera and six species placed in two different families confined to the rainforests of South and Central America and a Caribbean island (Anderson and Handley, 2002; Gaudin, 2004; Varela et al., 2018; Preslee et al., 2019; Delsuc et al., 2019). They represent only a small remnant of a much more diverse radiation that was found throughout the Americas, from Alaska to Patagonia, including some of the islands of the Caribbean, and numbering at least 100 genera (e.g., McKenna and Bell, 1997; McDonald and De Iuliis, 2008; Pujos et al., 2012). The majority of these extinct sloths were terrestrial, and had a body size much greater than that of living sloths, some at least as large as modern-day elephants, and likely displayed more dietary diversity than living forms (e.g., McDonald and De Iuliis, 2008; Bargo and Vizcaíno, 2009; Pujos et al., 2012; Resar et al., 2013; Dantas et al., 2017). However, all large terrestrial sloths became extinct in the megafaunal extinction event at the end of the Pleistocene (McDonald and De Iuliis, 2008), except for some Antillean taxa (Steadman et al., 2005). Our knowledge of this great sloth radiation has increased rapidly over the past few decades, and numerous new taxa have been recognized (e.g., McDonald and De Iuliis, 2008; Pujos et al., 2012; Varela et al., 2018; Boscaini et al., 2019). One such recently recognized taxon is a mylodontine sloth *Glossotherium tropicorum*, which is known from localities in northwestern South America, including parts of southwestern Ecuador and the northernmost portions of Peru (Fig. 1; De Iuliis et al., 2017).

The subject of the present report is a single fossil specimen housed in the collections of the Florida Museum of Natural History, recovered from tar pit deposits on the present-day island of Trinidad, which is situated just off the Venezuelan coast of northern South America (Fig. 1). The fossil is an isolated petrosal bone from a mylodontine sloth, and it is our contention that this specimen likely pertains to *Glossotherium tropicorum*.

Although Trinidad is an island today, it lies on the coastal shelf of South America as the closest member of the Antillean chain to mainland South America. Given the repeated glaciation events during the Pleistocene epoch (2.6 Ma to 11.7Ka), and the concomitant sea level changes (Kurtén and Anderson, 1980; Pielou, 1981; Ogg et al., 2016), it is likely that Trinidad was connected repeatedly to South America over the course of its recent geological history (Comeau, 1991; Mychajliw et al., 2020). Moreover, Pleistocene climate oscillations changed not only the physiographic features of the landscape, but also the structure of ecological communities. Areas that today are largely forested were at various points in the past covered by savannah type environments (Comeau, 1991; Webb, 1991), and this likely includes Trinidad (Wing, 1962; Comeau, 1991; Mychajliw et al., 2020). Given this, perhaps it would not be surprising to find a large, terrestrial, grazing sloth in the fossil record of the island, and yet, such reports are scarce.

The likelihood of finding such records is enhanced by the presence of tar pits on the island (=asphaltic deposits or asphaltic seeps, Wing, 1962; Mychajliw et al., 2020 – Wing refers to these as “oil sand” deposits). Tar pits represent a particularly valuable source of information on the paleoecology of the Pleistocene (Harris, 2015). These sites often contain a large abundance and diversity of very well-preserved fossils. Tar pits are found in all parts of the world, and may closely reflect the ecosystem of their surrounding region. The sticky tar can act as a trap to ensnare passing animals (McDonald et al., 2015; Mychajliw et al., 2020) and other parts of the biota, a function that may be facilitated by water or plant debris accumulating on the surface of the tar. Fossils of *Glossotherium tropicorum* have been recovered from several tar pit deposits in Ecuador and Peru (Fig. 1; De Iuliis et al., 2017).

The goal of the present study is to report on the identification of a fossil of *Glossotherium tropicorum*, a typically South American large bodied, terrestrial, grazing extinct sloth in a Pleistocene-aged tar pit deposit from Trinidad. This will



**Figure 1.** A. Map of northern South America, including Trinidad and the Panamanian isthmus. The black squares represent localities where specimens of *Glossotherium tropicorum* have been recovered (De Iuliis et al., 2017). The black polygons represent localities where specimens of *G. wegneri* have been recovered (De Iuliis et al., 2020). The black circle represents the location of the single site where fossils of *G. phoenesis* (Cartelle et al., 2019) have been found. B. Map of the island of Trinidad, depicting the location of the village of Fyzabad, and nearby, the site of the Texaco Forest Reserve, where the fossil that is the subject of the present study was recovered.

enhance our understanding of the biogeography of this sloth species, as well as the Quaternary biogeographic history of Trinidad and nearby portions of northern South America.

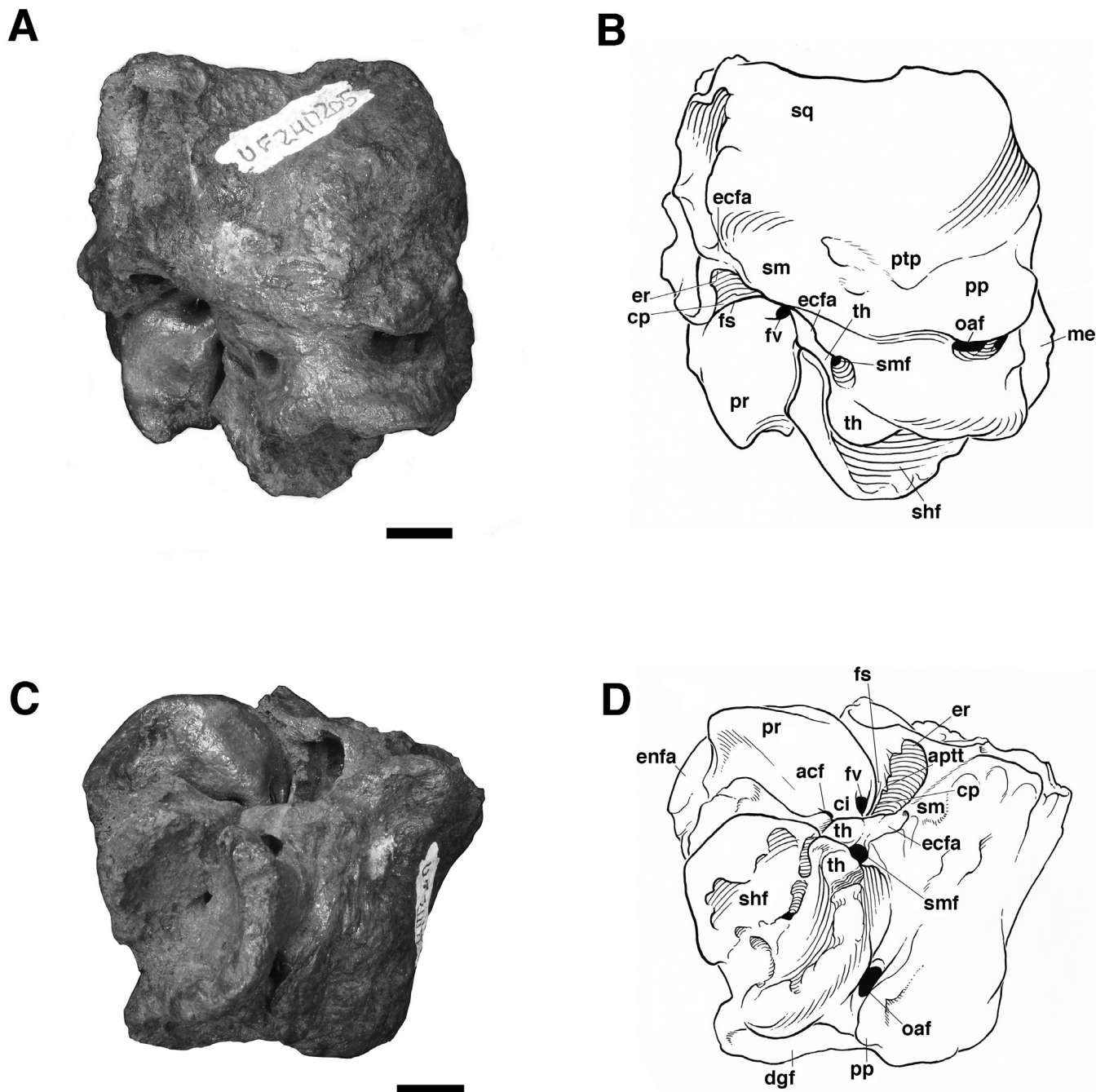
## MATERIALS AND METHODS

The fossil mylodontine sloth specimen is an isolated left petrosal (UF 240205, Figs. 2–3) housed at the Florida Museum of Natural History (University of Florida, Gainesville, FL). It was part of a collection recovered and described by Wing (1962), though the specimen itself was not reported in Wing’s (1962) unpublished Master’s thesis. Wing’s study area was in the Texaco Forest Reserve near Fyzabad in southwestern Trinidad and dates to the late Pleistocene (Fig. 1; 34Ka, Wing, 1962; Lujanian SALMA, Woodburne et al., 2014). This locality has yielded other Pleistocene mammal remains (Wing, 1962), including gomphotheriid proboscidean teeth, a nearly complete skeleton of the ar-

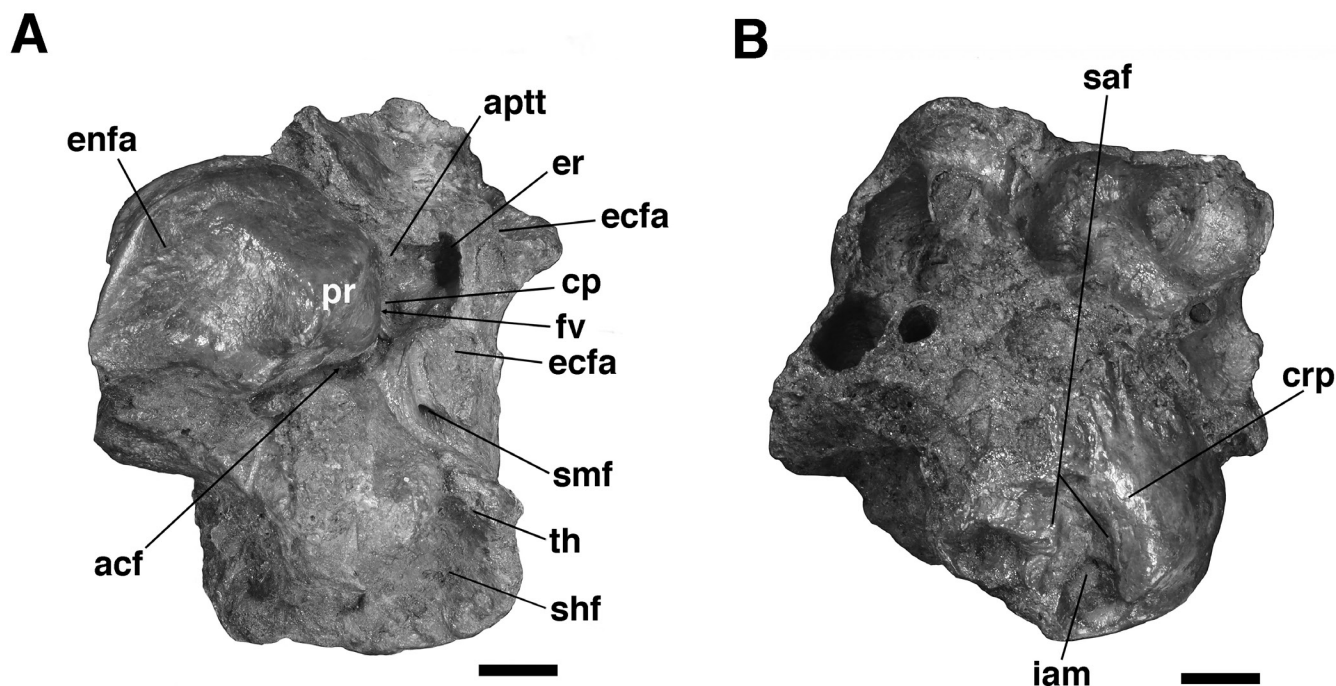
mored cingulate *Glyptodon* sp., a partial tooth and other skeletal remains assigned to the giant megatheriine sloth “*Megatherium americanum*” (almost certainly pertaining instead to the species *Eremotherium laurillardii*; see Cartelle and De Iuliis, 1995), and a single tooth ascribed to the genus “*Myiodon*.” The latter likely pertains to *Glossotherium tropicorum* as well. The Forest Reserve fauna has not been the subject of a published study, the only report being Wing’s (1962) thesis. The fossils themselves are housed at the Florida Museum of Natural History and the American Museum of Natural History (Wing, 1962).

For comparative purposes, we examined petrosals of *Glossotherium tropicorum* recovered from tar pits in Ecuador and Peru (De Iuliis et al., 2017) and housed at the Royal Ontario Museum (Toronto, Canada), including a partial skull (ROM 3146), an isolated right petrosal and squamosal bone (ROM 12673, Figs. 4–5), and an isolated left petrosal (ROM 12674, Fig. 5), the latter two likely





**Figure 2.** Isolated left petrosal (UF 240205) of *Glossotherium tropicorum* from Pleistocene tar pits of Trinidad. A, B, lateral view (anterior to left), photograph and line drawing. C, D, ventrolateral view (anterior toward top), photograph and line drawing. Abbreviations: acf, aperture of the cochlear fossula (containing fenestra cochleae); aptt, anteroventral process of tegmen tympani; ci, crista interfenestralis; cp, crista parotica; dgf, digastric fossa; ecfa, ectotympanic facet; enfa, entotympanic facet/roof of internal carotid artery sulcus; er, epitympanic recess; fs, facial sulcus; fv, fenestra vestibuli; me, mastoid exposure of petrosal; ptp, posttympanic process of squamosal; pp, paroccipital process of petrosal; pr, promontorium of petrosal; oaf, occipital artery foramen; shf, stylohyal fossa; sm, superficies meatus; smf, stylomastoid foramen; sq, squamosal; th, tympanohyal.



**Figure 3.** Isolated left petrosal (UF 240205) of *Glossotherium tropicorum* from Pleistocene tar pits of Trinidad. A, ventral view (anterior toward top). B, Medial view (anterior to right). Abbreviations: acf, aperture of the cochlear fossula (containing fenestra cochleae); aptt, anteroventral process of tegmen tympani; cp, crista parotica; crp, crista petrosa; ecfa, ectotympanic facet; enfa, entotympanic facet/roof of internal carotid artery sulcus; er, epitympanic recess; fv, fenestra vestibuli; iam, internal auditory meatus; pr, promontorium of petrosal; saf, subarcuate fossa; shf, stylohyal fossa; smf, stylomastoid foramen; th, tympanohyal.

from juvenile individuals based on bone texture and the presence of open sutures. We also compared the Trinidad fossil to published descriptions of other mylodontine petrosals (Guth, 1961; Patterson et al., 1992; Boscaini et al., 2018; Román-Carrión and Brambilla, 2019).

**ABBREVIATIONS:** **ROM**, Royal Ontario Museum, Toronto, Canada; **SALMA**, South American Land Mammal Age; **UF**, Florida Museum of Natural History, University of Florida, Gainesville, USA.

#### SYSTEMATIC PALEONTOLOGY

XENARTHRA Cope, 1889

PILOSA Flower, 1883

FOLIVORA Delsuc et al., 2001

MYLODONTIDAE Gill, 1872

*GLOSSOTHERIUM* Owen, 1840

*GLOSSOTHERIUM TROPICORUM* De Iuliis et al., 2017

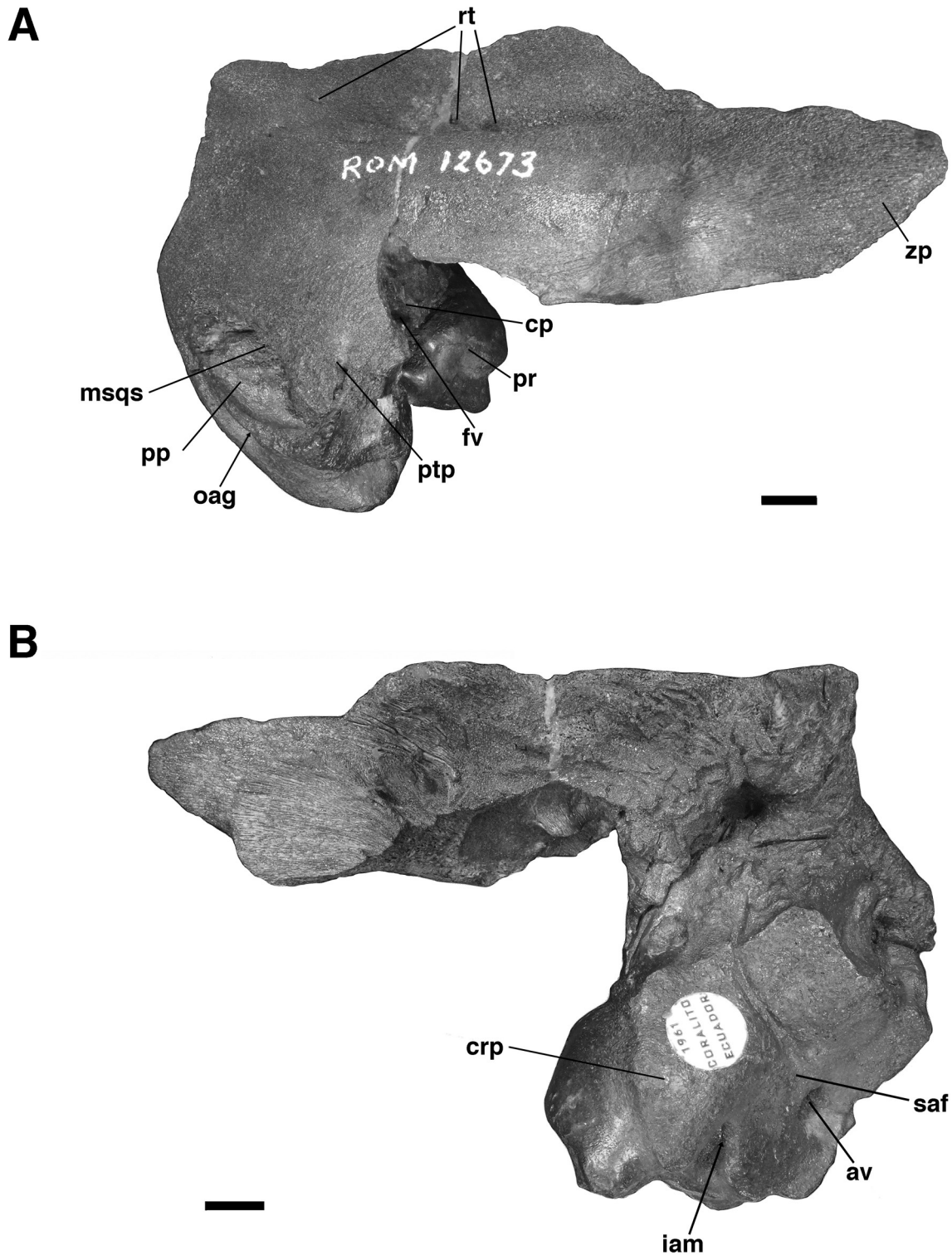
**REFERRED MATERIAL**—Isolated right petrosal bone (UF 240205) (Figs. 2–3).

**LOCALITY**—Texaco Forest Reserve near Fyzabad, southwest Trinidad (Fig. 1).

**AGE**—34 Ka (Wing, 1962; but see Mychajliw et al., 2020), Lujanian SALMA

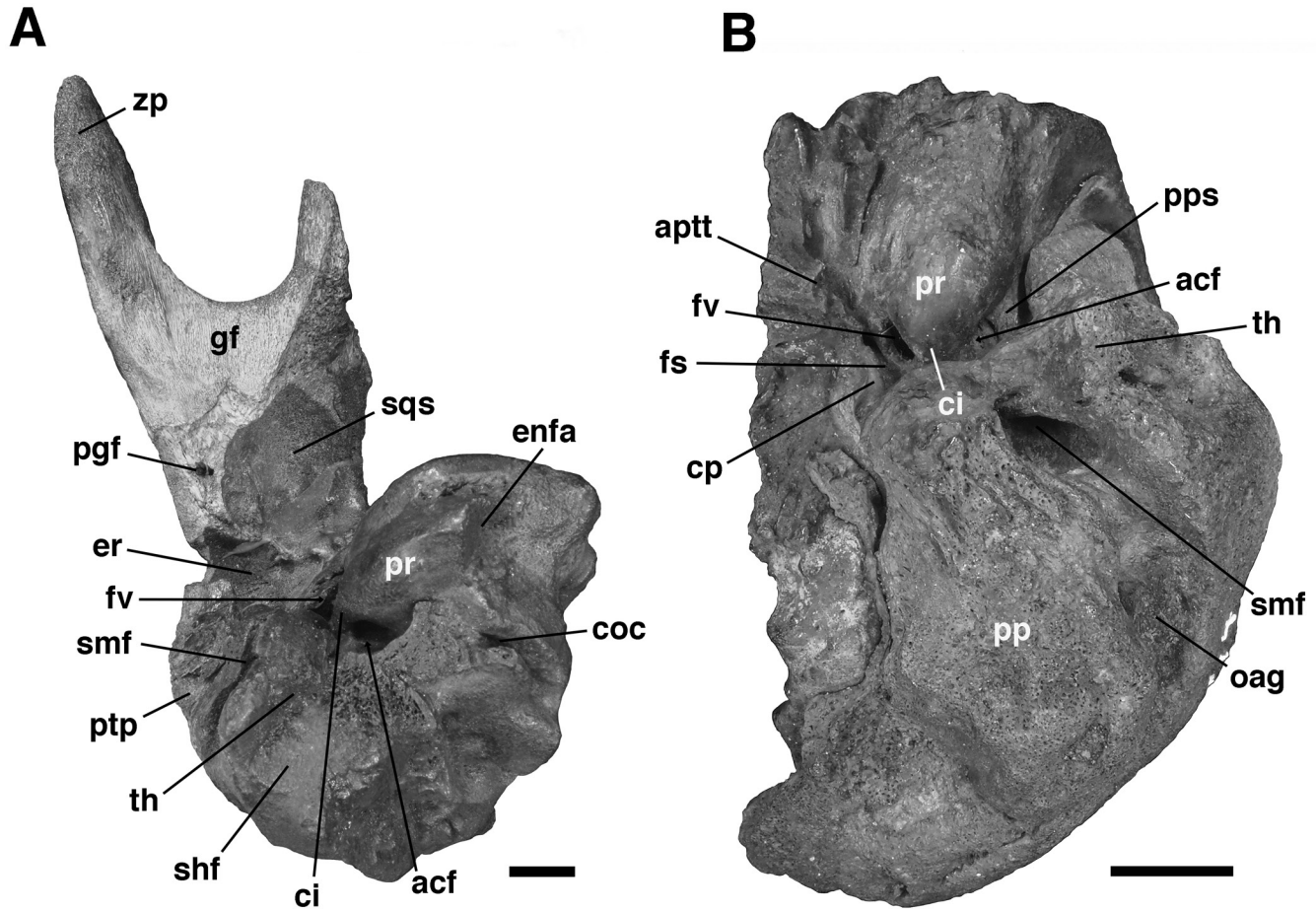
#### DESCRIPTION

The specimen UF 240205 includes most of the pars cochlearis of the left petrosal (housing the cochlear duct and saccule) and tympanohyal, but is missing most of the posterodorsal part of the pars canicularis (for the utricle and semicircular canals), including the large occipital exposure of the mastoid generally present in mylodontid sloths (Figs.



**Figure 4.** Isolated right squamosal and petrosal of juvenile *Glossotherium tropicorum* (ROM 12673) from Corralito, Ecuador (De Iuliis et al., 2017). A, lateral view (anterior to right). B, medial view. Abbreviations: av, aqueductus vestibuli; cp, crista parotica; crp, crista petrosa er, epitympanic recess; fs, facial sulcus; fv, fenestra vestibuli; iam, internal auditory meatus; msqs, mastoid/squamosal suture; ptp, posttympanic process of squamosal; pp, paroccipital process of petrosal; pr, promontorium of petrosal; oag, occipital artery groove; rt, foramina for rami temporales; saf, subarcuate fossa; zp, zygomatic process of squamosal.





**Figure 5.** Isolated right squamosal and petrosal of juvenile *Glossotherium tropicorum* (ROM 12673) from Corralito, Ecuador (De Iuliis et al., 2017). A, ventral view (anterior toward top). Isolated left petrosal juvenile *Glossotherium tropicorum* (ROM 12674) from Corralito, Ecuador (De Iuliis et al., 2017). B, ventrolateral view (anterior toward top). Abbreviations: acf, aperture of the cochlear fossula (containing fenestra cochleae); aptt, anteroventral process of tegmen tympani; ci, crista interfenestralis; coc, cochlear canaliculus; cp, crista parotica; enfa, entotympanic facet/roof of internal carotid artery sulcus; er, epitympanic recess; fs, facial sulcus; fv, fenestra vestibuli; gf, glenoid fossa; pgf, postglenoid foramen; ptp, posttympanic process of squamosal; pp, paroccipital process of petrosal; pps, postpromontorial sinus; pr, promontorium of petrosal; oag, occipital artery groove; shf, stylohyal fossa; smf, stylomastoid foramen; sqs, squamosal sinus; th, tympanohyal, zp, zygomatic process of squamosal.

2–3; Patterson et al., 1992; Boscaini et al., 2018). A small portion of the squamosal is also present, including the posttympanic process that unites with the paroccipital process of the petrosal to form the “mastoid process” of sloths (Patterson et al., 1992; Boscaini et al., 2018). It is nearly identical to the right petrosal and squamosal of *Glossotherium tropicorum* (ROM 12673, Figs. 4–5) in most re-

spects, except for some age-related differences – the latter specimen pertaining to a juvenile (based on the texture of the bone and its open sutures, e.g., between the posttympanic process of the squamosal and the paroccipital process of the petrosal), whereas UF 240205 appears fully adult, though nearly identical in size to ROM 12673.

In all specimens of *G. tropicorum* exam-

ined, including UF 240205, the pars cochlearis is dominated by an anteroposteriorly narrow, dorsoventrally elongated promontorium which is convex laterally, similar to the condition in most sloths (Patterson et al., 1992; Gaudin, 1995, 2004). In all specimens, the promontorium extends into a rounded ventral point, medial to which the ventral surface bears a strong concavity (Figs. 3, 5). This concavity either serves as the attachment surface of the missing entotympanic element, or the roof of the sulcus for the internal carotid artery, as described in *G. robustum* by Boscaini et al. (2018), or perhaps it serves both functions. Dorsally, the promontorium bears the two openings typical of mammalian petrosals, the fenestra vestibuli and the aperture for the cochlear fossula, which contains the fenestra cochleae (Wible, 2010; Boscaini et al., 2018). The former opening is ovate anteroposteriorly in UF 240205, with a nearly identical stapedial ratio (sensu Segall, 1970; =1.65) to that of ROM 12674 (=1.72), whereas the fenestra vestibuli of ROM 12673 is somewhat more elongated (stapedial ratio = 1.90). The cochlear fossula aperture of UF 240205 faces posteriorly and somewhat laterally, as is the case in other mylodontine sloths (Gaudin, 1995), but curiously, lacks a medial groove extending toward the entotympanic. This is another feature of the Mylodontinae, and is present in *G. tarijense* (Gaudin, 1995), *G. robustum* (Boscaini et al., 2018), and *G. tropicorum* ROM 12674, but is also missing in ROM 12673.

Dorsal and lateral to the fenestra vestibuli lies the deep facial sulcus for the facial nerve (CN VII), walled laterally by a strong crista parotica in all specimens examined in the present study. The crista parotica of UF 240205 in turns forms the medial wall to a large, well-preserved depression, slightly ovate anteroposteriorly, the epitympanic recess, with a smaller depression tucked into its posteromedial corner, the fossa incudis. This arrangement is typical of Mylodontidae, in contrast to other sloths in which an epitympanic sinus is present. The rostral end of the crista parotica in UF 240205 appears to bear a small anteroventral process of the tegmen tympani (Figs. 2C–D, Fig.

3A), although the size and shape of the process are somewhat obscured by matrix. Although not well preserved in the other *G. tropicorum* specimens, a similarly small process is present in *G. robustum* (Boscaini et al., 2018), and was identified as a synapomorphy of *Lestodon*, *Glossotherium*, and *Paramylodon* by Gaudin (1995).

At the opposite end of the crista parotica in UF 240205, the crest joins the base of a large tympanohyal element, which expands distally and extends ventrolaterally, its circular distal surface forming much of the stylohyal fossa so characteristic of sloths (Gaudin, 1995, 2004). Immediately lateral to the shaft of the tympanohyal is the stylo-mastoid foramen, situated immediately anterior to the stylohyal fossa and opening into a groove that extends ventrolaterally. The position of this aperture is a distinctive feature of mylodontine sloths, whereas the orientation of the groove is characteristic of Mylodontidae as a whole (Gaudin, 1995). The stylohyal fossa itself is oriented ventrolaterally in UF 240205, as in other mylodontids (Gaudin, 1995), and is circular in outline as preserved, as in most sloths, though it is missing the portions normally contributed by the entotympanic and exoccipital elements. In posterior view the stylohyal fossa is V-shaped, divided by a deep longitudinal groove (Fig. 2). This unusual arrangement is also present in *G. tropicorum* ROM 3146. This feature does not appear to be present in *G. robustum* (Boscaini et al., 2018), *G. wegneri* (Román-Carrión and Brambilla, 2019) or *G. phoenesis* (Cartelle et al., 2019), based on the published illustrations, and may be the best indication of the taxonomic affinities of UF 240205.

Dorsal and lateral to the stylohyal fossa in UF 240205 is a second large aperture, the ventral opening for the occipital artery (Fig. 2). This opening lies just medial to the paroccipital process of the petrosal, which is distinguishable by suture from the posttympanic process of the squamosal in ROM 12673 (Fig. 4A – note the two fuse to form the so-called “mastoid process” of Patterson et al. [1992] and Gaudin [1995]). Cartelle et al. (2019) note that this opening is positioned more

ventrally in *G. robustum* than in *G. tropicorum* or *G. phoenesis*, because the occipital artery is more fully enclosed by its canal. The condition in UF 240205 resembles that of the latter two taxa, with the ventral-most portion of the occipital artery exposed in an open groove that connects anteriorly to the groove emerging from the stylomastoid foramen (as in other mylodontines; see Patterson et al., 1992; Gaudin, 1995). This feature in *G. wegneri* is difficult to assess based on published photographs, but it may vary. The specimen photographed by Román-Carrión and Brambilla (2019, figure 8A) appears to resemble *G. robustum*, but at least one specimen photographed by De Iuliis et al. (2020, Appendix 2B & C) seems to exhibit a more open groove, though its morphology appears anomalous relative to the other specimens.

Lastly, the medial surface of the petrosal is also available for examination in UF 240205 (Fig. 3B). It strongly resembles the morphology described and illustrated for *G. robustum* (Boscaini et al., 2018), as well as that observed in the two juvenile specimens of *G. tropicorum* (ROM 12673 and 12674; Fig. 4B). In all these specimens, there is a large aperture for the aqueductus vestibuli in the middle of the broad, shallow subarcuate fossa. This aperture is floored by a medially directed crest that also forms the floor of the more anteriorly situated internal acoustic meatus. In all these *Glossotherium* specimens, the deep and undivided internal acoustic meatus faces not only postero-medially, as is typical for sloths, but somewhat ventrally as well, with a horizontal ventral margin to the aperture, and an arched dorsal margin. The shape of this arch is somewhat variable: V-shaped in ROM 12674, variably quadrangular or semicircular in *G. robustum* (Boscaini et al., 2018), and semicircular in both UF 240205 and ROM 12673.

## DISCUSSION

It is clear from its morphology that the isolated petrosal and squamosal, UF 240205, recovered from tar pit deposits on the island of Trinidad, is a mylodontid sloth, and more specifically, a member

of the subfamily Mylodontinae, based in particular on: 1) the presence and morphology of its epitympanic recess; 2) the shape and orientation of its stylohyal fossa; and, 3) the position and orientation of two of its foramina, the stylomastoid foramen and fenestra cochleae. In addition, the shape of its promontorium, the morphology of the medial surface of the petrosal, the presence of a small anteroventral process of the tegmen tympani, and its geographic location are all strongly indicative of its provenance in the genus *Glossotherium*. There are currently five species recognized within this genus: *G. robustum*, *G. tarijense*, *G. wegneri*, *G. tropicorum*, and *G. phoenesis* (Boscaini et al., 2019; De Iuliis et al. 2020). The first two are known largely from the southern parts of South America (McAfee, 2009; Pujos et al., 2016; Boscaini et al., 2018 – though there is a record ascribed to *G. robustum* from northern Peru in Pujos et al., 2016), and thus it seems unlikely that our petrosal pertains to one of these two species. *G. wegneri* is a high elevation species known only from the Andes mountains of Ecuador (De Iuliis et al. 2020). Although present in northern South America and geographically the closest species to Trinidad (Fig. 1), its restriction to high altitudes makes it equally unlikely to have been present in northern coastal areas adjoining Trinidad. *G. tropicorum* is from coastal regions of northern Peru and southern Ecuador, whereas *G. phoenesis* is endemic to easternmost Brazil. Based both on biogeography, topography and on the anatomy of the canal for the occipital artery, it seems likely that UF 240205 pertains to one of these latter two species. *G. tropicorum* is geographically closer than *G. phoenesis*, and also shares with UF 240205 an unusual morphology of the stylohyal fossa, both marked by a deep longitudinal groove. On this basis, we assign UF 240205 to the latter species.

If this taxonomic assignment is indeed correct, this new record represents an important range extension for *G. tropicorum*, which is currently known with certainty only from localities in north-westernmost Peru and southwestern Ecuador (De Iuliis et al., 2017), in the westernmost, coastal part



of northern South America. This results in a range extension of more than 3500 km. It is worth noting that De Iuliis et al. (2017) identify unconfirmed specimens assigned to *G. tropicorum* from Panama (Gazin, 1957; 2100 km from Trinidad) and northern Venezuela (Bocquentin-Villanueva, 1979; 1200 km from Trinidad). Pujos et al. (2016) also note the presence of *Glossotherium* sp. remains from Venezuela, which, if confirmed as *G. tropicorum*, might serve as a further geographic link between our specimen and the mainland records of this species. Moreover, our new record, along with the other unconfirmed records, suggest that the range of *G. tropicorum* may have encompassed much of northern, or at least northwestern, South America.

In addition to extending the range of *G. tropicorum*, this specimen constitutes only the second record of the genus *Glossotherium* from outside continental South America (the first being Gazin's [1957] record from Panama). As noted in Boscaini et al. (2019), the distinction between the genus *Paramylodon* and *Glossotherium* is largely a geographic one, with the former occupying North America and the latter occupying South America. It would appear, however, that the historic range of *Glossotherium* extended beyond modern South America, albeit not a great distance. This (and the other Trinidad Pleistocene sloth records) also represents a second, much later incursion by sloths into the islands of the Caribbean, separate from the middle Cenozoic immigration event that produced the endemic radiation of Antillean megalonychid sloths (Iturralde-Vinent and MacPhee, 1999; McDonald and De Iuliis, 2008; Phillipon et al., 2020).

This new record of *G. tropicorum* represents the first published, detailed description and illustration of a mylodontid sloth fossil from the island of Trinidad, and one of very few reports of sloth fossils of any kind from the island. Wing (1962), in her Master's thesis, previously documented the presence of fossil sloths on Trinidad, but she did not illustrate any specimens, and never published her findings. She reports the presence of the genus "*Myiodon*" based on an isolated molar, but giv-

en the new data from the present study, it seems likely that the molar derives from *Glossotherium tropicorum* instead. MacPhee and Reguero (2010) published an illustration of tooth histology from a specimen of *Glossotherium* (AMNHVP 143455, listed as "*Glossotherium* sp.", but likely *G. tropicorum*) from Trinidad, but included no real description of the specimen. Wing (1962) also reported the presence of the megatheriid sloth "*Megatherium*" based on a partial tooth and other isolated skeletal remains, but based on what we know of megatheriid biogeography, these were almost certainly specimens of *Eremotherium laurillardi* (Cartelle and De Iuliis, 1995, 2006; Pujos et al., 2016). Schaub (1935) had earlier recorded the presence of this extinct sloth on Trinidad, based on an isolated partial astragalus that he described but did not figure.

Lastly, the presence of *G. tropicorum* on Trinidad in the Pleistocene provides further confirmation of the presence of open habitats on the island at this time, as well as the existence of a savannah corridor that connected South America to surrounding islands and the Central American isthmus during the Great American Biotic Interchange (GABI; Comeau, 1991; Webb, 1991; Mychajliw et al., 2020). The change in flora from savannah to tropical evergreen and deciduous forest is documented in the fossil record of Trinidad, as reflected particularly in midden deposits recovered from the island (Wing, 1962; Comeau, 1991). The record also confirms that the plant life of Trinidad oscillated between the tropical forest typical of modern Trinidad during interglacial periods, and drier deciduous forest and savannah during colder and more arid periods corresponding to glacial intervals (Wing, 1962; Comeau, 1991; Mychajliw et al., 2020). This is reflected in the faunal remains, as indicated by the presence of other savannah-dwelling Pleistocene mammal species, including gomphotheres and glyptodonts (Blair, 1927; Wing, 1962; Sánchez-Chillón et al., 2003; Vizcaíno et al., 2011; Mychajliw et al., 2020). Unsurprisingly, the Trinidad flora and fauna resemble South American plant and animals during the Pleistocene (Blair 1927; Wing, 1962; Comeau, 1991; Mychajliw et



al., 2020), likely due both to their proximity and intermittent land bridge connections between the island and the mainland.

## CONCLUSION

The morphology of an isolated petrosal recovered from Pleistocene-aged tar pit deposits on the island of Trinidad strongly indicate a taxonomic provenance with the large bodied, terrestrial extinct sloth species *Glossotherium tropicorum*. This represents the first published description of a mylodontid sloth fossil from Trinidad, and represents a significant range extension for the species *G. tropicorum*, as well as only the second record of the well-known, widespread genus *Glossotherium* from outside mainland South America. It also represents a late Cenozoic emigration of sloths into the Caribbean, distinct from the much earlier event that led to the endemic radiation of Antillean megalonychid sloths. Finally, this record provides further confirmation of the presence of savannah-like, open habitats on Trinidad during the Pleistocene, as part of the savannah corridor linking North and South America during the GABI.

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