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ORIGINAL RESEARCH

A new species of *Myrcia* s. lat. (Myrtaceae) from the eastern Amazon

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Abstract
Myrcia spiciformis, a new species from the eastern Amazon, is described and illustrated. It is characterized by twigs with dense rufous pubescence, a spiciform panicle, pedicels absent or up to 3 mm long, and flowers with 4–5 sepals. The staminal ring is glabrous and the hypanthium is pubescent. Morphologically, *M. spiciformis* is related to *M. coumete*. The new species is endemic to the Amazon Biome, with records from Maranhão and Pará states, where it grows in both non-flooded upland (*terra-firme*) and seasonally flooded (*várzea*) forests. It is provisionally assessed as Endangered (EN) according to the IUCN Red List criteria, due to restricted distribution of the species and vegetation loss resulting from anthropogenic pressure in the occurrence area.

Keywords Endangered · Maranhão · *Myrcia* sect. *Myrcia* · Myrteae · Neotropical flora · Pará

Introduction

Myrtaceae Juss. comprises 6,547 species and 130 genera (WFO, 2025), with diversity centers in Tropical America, Australia, Southeast Asia, and Africa (Wilson et al., 2001; Vasconcelos et al., 2017). Two subfamilies are recognized, Myrtoideae Sweet and Heteropyxidoideae Reveal, circumscribing 20 tribes (Wilson et al., 2001, 2005, 2022; Lucas et al., 2007). Tribe Myrteae DC. comprises all American fleshy-fruited species, with 46 genera and more than 2,800 species (Wilson et al., 2001; Lucas et al., 2007; Vasconcelos et al., 2017; WFO, 2025), including *Myrcia* DC., one of the largest Neotropical genera of Myrtaceae (Lucas et al., 2018).

Myrcia sensu lato (sensu Lucas et al., 2018, and adopted here) comprises 800 species (WFO, 2025). In this circumscription, the genus is monophyletic and includes the previously accepted genera *Calyptranthes* Sw., *Gomidesia* O. Berg, *Marlierea* Cambess., and *Myrcia* (Lucas et al., 2018; Santos et al., 2021). The species of *Myrcia* s. lat. have foliaceous, folded cotyledons encircled by a long hypocotyl, soft seed coats, bi- to trilocular ovaries containing two ovules per locule, inflorescences in regularly branching, sometimes very reduced, panicles, 4–5-merous perianths, and a hypanthium extending into a tube beyond the ovary.

Myrcia is the second-most species-rich genus of Myrtaceae in Brazil, comprising 410 species, primarily in the

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Atlantic Forest (254 spp.), the Amazon (112 spp.), and the Cerrado (93 spp.) (Santos et al., 2025). The Brazilian Amazon includes all or part of nine states (IBGE, 2022), and gaps in biological knowledge persist because of low sampling effort and relatively few botanists working in this vast region (Malhado et al., 2013).

Species of *Myrcia* occur across a variety of Amazonian habitats, as campinaranas, ironstone outcrops, non-flooded upland (*terra firme*) forests and seasonally flooded (*várzea*) forests (Amorim & Almeida Jr., 2021; Gaem et al., 2022; Natividade et al., 2024; Trindade et al. 2018). *Myrcia* exhibits relatively low diversity in the Amazon (Santos et al., 2017), accounting for only ~ 25% of the Brazilian species of the genus (Gaem et al., 2022), despite being listed among the largest Amazonian genera in terms of tree species (Cardoso et al., 2017). This apparent low diversity likely reflects underestimation. The Amazonian *Myrcia* remain understudied, poorly understood, and difficult to classify (Lucas et al., 2018).

Species of *Myrcia* display extreme morphological homogeneity, so reliable delimitation often depends on cryptic characters. Several monographs and taxonomic treatments have advanced knowledge of Amazonian Myrtaceae by providing morphological data, new occurrence records, and new species descriptions (McVaugh, 1958, 1969; Souza et al., 1999; Holst et al., 2003; Trindade et al., 2018; Amorim & Almeida Jr., 2021; Amorim et al., 2022; Gaem et al., 2022). However, relatively few studies have focused on Amazonian *Myrcia* (Rosário & Secco, 2006, 2014a,b); Rosário et al., 2017), and few taxonomists have undertaken comprehensive systematic revisions the genus across the Amazon, leaving many *Myrcia* specimens in regional collections undetermined. Studies of Amazonian collections, therefore, can reveal the discovery of species new to science (Sobral et al., 2015). During the analysis of the Amazonian Myrtaceae collection, we found some species *Myrcia* that could not be assigned to any described species of the genus. Here, we described and illustrated a new species of *Myrcia* from the eastern Amazon, an area with high rates of forest loss.

Materials & Methods

We propose the new species following the morphological species concept (McDade, 1995). The species description is based on dried material deposited in the following herbaria and examined in person: IAN, INPA, MG, NY, and K (herbarium acronyms follow Thiers, 2025). In addition, high-resolution images of collections from F, S, and US were consulted, accessed through SpeciesLink (https://specieslink.net/search/), the Reflora Virtual Herbarium (https://reflora.jbrj.gov.br/reflora/herbarioVirtual/), and GBIF (https://www.gbif.org/).

Morphological terminology follows Harris & Harris (2001). Measurements are given as length × width. Descriptions and measurements were based solely on specimens with young and mature fruits, as none with mature flower were available; floral characters (stamens, anthers, stigmas, hypanthium, and staminal ring) were described from remnant floral structures in young fruits.

Geographic distribution, habit, and phenology data were obtained from specimen labels. The preliminary conservation status was assessed following IUCN (2024) criteria. The extent of occurrence (EOO) and area of occupancy (AOO) were estimated using *GeoCAT* (Geospatial Conservation Assessment Tool; https://geocat.iucnredlist.org/; Bachman et al., 2011).

Taxonomic Treatment

Myrcia spiciformis G. Amorim, L.L. Santos & E.B. Almeida, **sp. nov.** TYPE: Brazil: Pará. BR 22, Km 64, 1°38'21.1" S; 46°47'42.1" W, 25 Aug 1964 (fr.), *G.T. Prance & N.T. Silva 58874* (holotype: NY, barcode NY 01472814 [!]; isotypes: F, barcode V0121548F [image!], K, barcode K000344947[!], S, barcode S17-10361 [image!], U, barcode 1444113 [n.v.], US, barcode 01893242 [image!]). Figs. 1–2.

Diagnosis. Trees or treelets, branches, adaxial leaf surfaces, and inflorescences with dense rufous pubescence, leaves bullate, axillary spiciform panicle; hypanthium densely rufous-pubescent, staminal ring glabrous, globose fruits, densely pubescent when young and sparsely when mature. Morphologically related to *Myrcia coumete* (Aubl.) DC., but can be distinguished by the abaxial surface densely rufous-pubescent (*vs*. glabrous in *M. coumete*), spiciform panicle (*vs*. pyramidal), pedicels absent or up to 3 mm (*vs*. 2–6 mm), staminal ring glabrous (*vs*. pubescent), style glabrous (vs. pubescent in the base), pubescent young fruits and sparsely when mature (*vs*. glabrous fruits) and globose fruits (*vs*. ellipsoid).

Description. Trees or treelets up to 12 m tall; branches, adaxial leaf surfaces, and inflorescences with dense rufous pubescence. Twigs terete, the cortex occasionally detaching in longitudinal strips; internodes 5–56 × 1–4 mm. Leaves decussate, petioles 4–9 × 1 mm, densely rufous-pubescent; blades elliptic, broadly elliptic, ovate, or oblong, 35–121 × 25–62 mm, chartaceous, bullate, slightly discolorous when dry, the adaxial surface rufous-pubescent, trichomes becoming sparse on mature leaves, midvein with tufts of trichomes, the abaxial surface densely rufous-pubescent; base cuneate to slightly rounded; apex acute to rounded; midvein plain on the distal portion and slightly sulcate on the

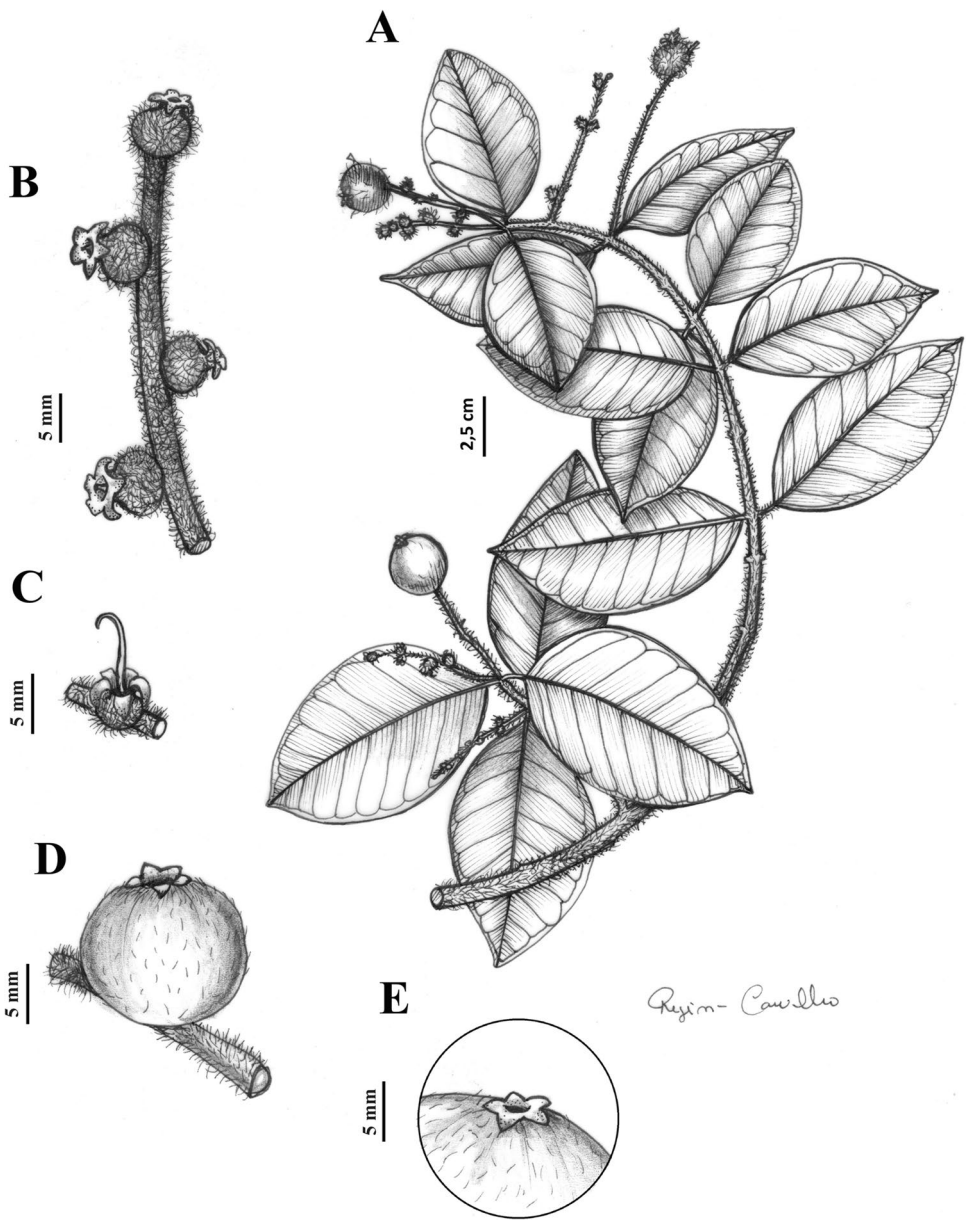

Fig. 1. *Myrcia spiciformis*. **A.** Branch, highlighting spiciform inflorescences. **B.** Inflorescence and detail of sessile immature fruits. **C.** Immature fruits with style. **D.** Mature fruits. **E.** Calyx in detail. (A–E, from the holotype, *G.T. Prance & N.T. Silva 58,874* NY.).

proximal portion of the adaxial surface, raised on the abaxial surface; lateral veins 6 to 12 on each side, leaving the midvein at 50°–70°, secondary veins prominent on abaxial surface, higher-order venation barely visible on abaxial surface; marginal veins 1–2 mm from the margin, prominent on adaxial surface. Inflorescence a spiciform panicle, axillary, one, rarely two, per axil, the axis 30–67 mm, densely rufous-pubescent; bracts not seen; pedicel absent or rarely up to 3 mm; bracteoles not seen; flower buds not seen, petals not seen; floral remnants observed on young fruits: hypanthium densely rufous-pubescent, extending 2 mm, staminal ring glabrous; stamens persistent, filaments 0.5–0.9 mm, anthers elliptic; style ca. 3 mm, the stigma punctiform; ovary not seen. Fruits globose, 4–12 × 4–20 mm, densely rufous-pubescent when young and sparsely so when mature, surface marked with glands, crowned by 4–5 sepals, triangular, ca. 1 mm; seed ca. 7 mm, one per fruit, testa membranous, embryo with leafy cotyledons, and a long hypocotyl encircling the cotyledons.

Additional Specimens Examined. **BRAZIL. Maranhão:** Monçao Mun. Basin of the Rio Turiaçu; Reserva Indígena Ka'apor; within 7 km of the settlement of Urutawy, 3°09′57.7" S 45°56′17.1" W, 15 Apr 1985 (st.), *W.L. Balée & Anne Gely 884* (MG, NY, barcode NY00906347); Nova Olinda do Maranhão: S. of Fazenda Guarany, Km 133 of Br 316, 2°46' S, 45°43' W, 21

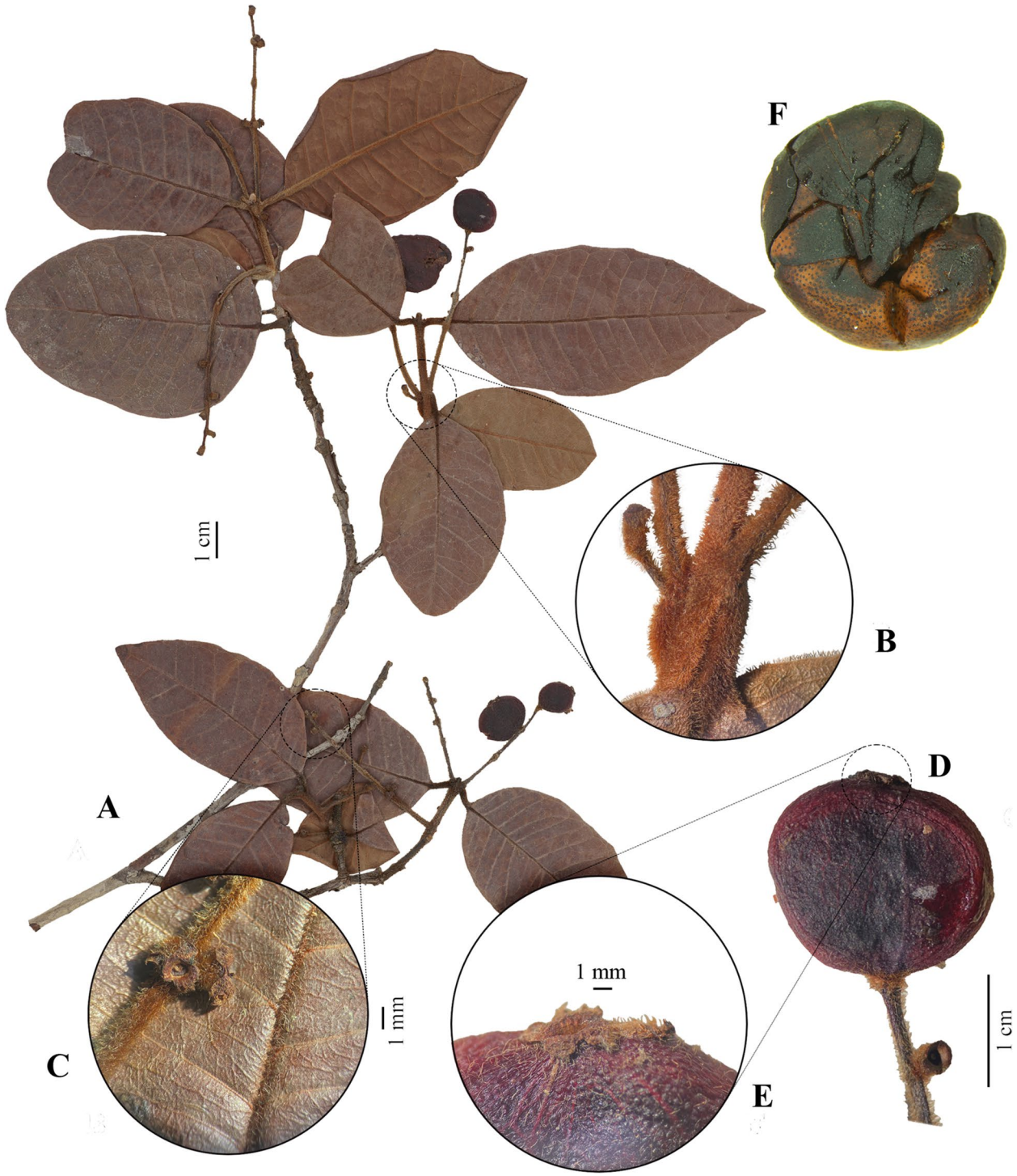

Fig. 2. **A**. Branch of *Myrcia spiciformis*. **B.** Details of dense rufous pubescence on branches. **C.** Adaxial surface of blade leaf with details of trichomes. **D.** Mature fruit. **E.** Details of calyx in mature fruit. **F.** Embryo and details of leafy cotyledons and long hypocotyl. (Photos by Gabriela Amorim and Eduardo B. de Almeida Jr. of plants vouchered by *G.T. Prance & N.T. Silva 58,874* K, NY.).

Sept 1980 (fr.), *D.C. Daly* et al. *D140* (INPA, barcode 116,281 [!], K, barcode K000344977 [!], MO, barcode 3,205,449 [n.v.], NY, barcode NY 00908427 [image!], US, barcode 01894816 [image!]). **Pará:** Road BR 22, Capanema to Maranhão, Km. 64, vicinity of Piritoro, 1°38′21.1" S; 46°47′42.1" W, 05 Nov 1965 (fr.), *G.T. Prance & T.D. Pennington 1991* (F, barcode V0121549F [image!], IAN, barcode IAN117425 [!], K, barcode K000344948 [!], L, barcode U.1444112 [n.v.], NY, barcode

Table 1. Comparison of diagnostic characters of *M. spiciformis* and *M. coumete.*

Characters	*M. spiciformis*	*M. coumete*
Leaf indument	abaxial surface densely rufous-pubescent	glabrous
Inflorescence	spiciform panicle	pyramidal panicle
Pedicels	absent, rare to 3 mm long	2–6 mm long
Staminal ring	glabrous	pubescent
Style	glabrous	pubescent in the base
Fruits	globose, pubescent young fruits and sparsely when mature	ellipsoid, glabrous

NY01478072 [!], S, barcode S17-10,367 [image!], US, barcode US01893243 [image!]).

Distribution & Habitat. *Myrcia spiciformis* is presently known only in eastern Amazonia, in the Brazilian states of Maranhão and Pará. The specimens were found growing in non-flooded upland (*terra-firme*) and seasonally flooded (*várzea*) forests.

Phenology. This species was collected fruiting in August, September, and November.

Etymology. The specific epithet refers to the spiciform panicle, which is a 'spike-shaped' inflorescence, uncommon in the genus.

Vernacular Names. According to specimen labels, this species is locally known by *u'itymamarã* (*W.L. Balée & Anne Gely 884*). We could not identify the language of origin of this word; however, we believed this is Tupi-Guarani. William Balée, who made notes about the vernacular name, studied the ethnobotanical knowledge of the Ka'apor people who lived in the Ka'apor Indigenous Reserve, actually the Alto Turiaçu Indigenous Territory, and who speak a language from the Tupi-Guarani family (López-Garcés et al., 2024).

Preliminary Conservation Assessment. The three known georeferenced localities of *Myrcia spiciformis* provide an EOO of 3,103 km^2 and an AOO of 12 km^2. Given the small number of locations and the continuing decline of this species (described below), we preliminarily propose the category of EN (endangered) under criteria B2ab(i,ii,iii,iv).

In Maranhão, only two populations of *Myrcia spiciformis* have been recorded in the northwestern part of the state, a region with extensive forest fragmentation, where forest core areas were reduced by 63% between 1985 and 2017 (Silva-Junior et al. 2022). One this population was found in the Turiaçu Indigenous Territory (Ka'apor Indigenous Reserve). This Indigenous Territory was established in 1982, extends across five municipalities in Maranhão State and connects with the Caru Indigenous Territory and the Gurupi Biological Reserve, together representing the most homogeneous Amazonian forest remnant in the state (Paiva et al. 2020). Recent analyses of deforestation in the Amazon showed that Alto Turiaçu is among the few areas with a significant reduction in deforestation rates; despite this, in the is under intense anthropogenic pressure from illegal logging (Celentano et al., 2018; Paiva et al. 2020). The second population was found in forests in the Fazenda Guarany along BR-316, a federal highway opened in the 1960s. These forests are unprotected and threatened by ongoing human activities, particularly deforestation.

In Pará, both populations of *M. spiciformis* were found along the highway BR-22 (now BR-316), near km 64. This highway was built in the 1960 s to connect the northern and northeastern regions of Brazil, serving as part of the agrarian reform program and to integrate the Amazon into the national economy (Neto, 2013). In Pará, BR-316 partially traverses the region known as the "Arc of Deforestation," which encompasses municipalities characterized by the highest deforestation rates in Brazil. Within this region, deforestation levels remain high; however, a marked reduction has been observed since the initiation of systematic monitoring in the 1990s (Lopes & Steink, 2024).

Notes. *Myrcia spiciformis* is morphologically similar to *Myrcia coumete* (Aubl.) DC. (Table 1), which occurs from Costa Rica to northern South America and Brazil (Amapá) (POWO, 2025). *Myrcia spiciformis* appears to be morphologically related to a group of species placed in *Myrcia* sect. *Myrcia*, and shares the following characteristics with species of this section: a hypanthium elevated up to 2 mm that is still visible in fruit, and branches and inflorescences with dense rufous pubescence.

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Authors' Contributions

GA wrote the original draft of the manuscript and collected morphological data; EBAJ reviewed and edited the manuscript and collected morphological data; LLS, MRVB, and WWT reviewed and edited the manuscript.

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Data Availability

All specimens examined in this study are deposited in publicly accessible herbaria, and all relevant collection data, including locality information and herbarium accession numbers, are provided in the article. No additional datasets were generated.

Declarations

Competing interests

The authors have no competing interests to declare that are relevant to the content of this article.

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