

Supplementary Information

Brazilian montane rainforest expansion induced by Heinrich Stadial 1 event

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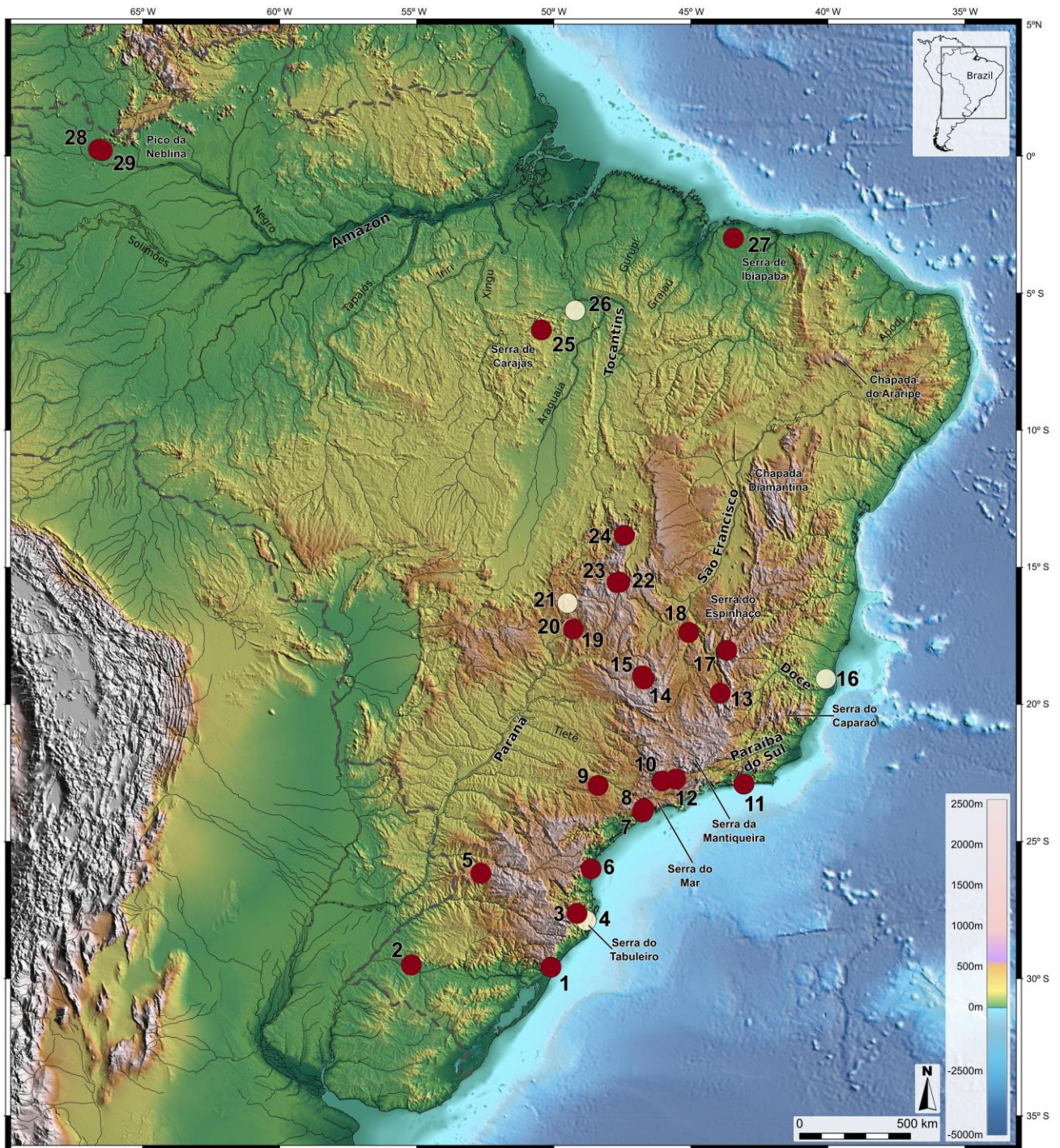
List of montane taxa belonging to Myrtaceae Juss., Ericaceae Juss. and Arecaceae Bercht. & J. Presl (sin. Palmae Juss., palms) found in humid and cold habitats in Brazil:

Family Myrtaceae Juss. is represented in the Brazilian Highlands by a total of 17 genera and 53 species, as follows: *Blepharocalyx salicifolius* (Kunth) O. Berg, *Calycorectes acutatus* (Miq.) Toledo, *Calyptranthes clusiifolia* (Miq.) O. Berg, *Calyptranthes concinna* DC., *Calyptranthes grandifolia* O. Berg, *Campomanesia eugeniioides* (Cambess.) D. Legrand, *Campomanesia guazumifolia* (Cambess.) O. Berg, *Campomanesia hirsuta* Gardner, *Campomanesia laurifolia* Gardner, *Campomanesia neriiflora* (O. Berg) Nied., *Campomanesia xanthocarpa* (Mart.) O. Berg, *Eugenia brasiliensis* Lam., *Eugenia cerasiflora* Miq., *Eugenia glazioviana* Kiaersk., *Eugenia involucrata* DC., *Eugenia macrosperma* DC., *Eugenia multicostata* D. Legrand, *Eugenia pluriflora* DC., *Eugenia rostrifolia* D. Legrand, *Eugenia schuechiana* O. Berg, *Eugenia sonderiana* O. Berg, *Eugenia sprengelii* DC., *Eugenia xiriricana* Mattos, *Feijoa sellowiana* Berg, *Gomidesia affinis* (Cambess.) D. Legrand, *Gomidesia lindeniana* O. Berg, *Gomidesia sellowiana* O. Berg, *Mosiera prismatica* (D. Legrand) Landrum, *Myrceugenia miersiana* (Gardner) D. Legrand & Kausel, *Myrceugenia regnelliana* (O. Berg) Legrand & Kausel, *Myrcia crassifolia* Kiaersk., *Myrcia glabra* (O. Berg) D. Legrand, *Myrcia rostrata* DC., *Myrcia tomentosa* (Aubl.) DC., *Myrcianthes pungens* (O. Berg) D. Legrand, *Myrciaria cauliflora* (Mart.) O. Berg, *Myrciaria coronata* Mattos, *Myrciaria cuspidata* O. Berg, *Myrciaria delicatula* (DC.) O. Berg, *Myrciaria floribunda* (H. West ex Willd.) O. Berg, *Myrciaria disticha* O. Berg, *Myrciaria glazioviana* (Kiaersk.) G.M. Barroso ex Sobral, *Myrciaria grandifolia* Mattos, *Myrciaria phitrantha* (Kiaersk.) Mattos, *Myrciaria strigipes* O. Berg, *Myrciaria tenella* (DC.) O. Berg, *Myrciaria trunciflora* O. Berg, *Neomitranthes gemballae* (D. Legrand) D. Legrand, *Pimenta pseudocaryophyllus* (Gomes) Landrum, *Plinia rivularis* (Cambess.) Rotman, *Psidium oblongatum* O. Berg, *Siphoneugena densiflora* O. Berg, *Siphoneugena widgreniana* O. Berg.

Ericaceae Juss., an almost exclusive montane family of shrubs and trees, is represented in the Brazilian Highlands by 12 genera, 99 species and 27 varieties. Very widespread arboreal taxa of montane forests are *Agarista coriifolia* (Thunb.) Hook. ex Nied., *Agarista oelifoilia* (Cham.) G. Don var. *glabra* (Meisn.) Sleumer, *Gaylussacia brasiliensis* (Spreng.) Meisn. var. *nervosa* Meisn., *Gaylussacia densa* Cham., *Gaylussacia harleyi* Kin.-Gouv., *Gaylussacia incana* Cham. & Schltdl. and *Gaylussacia reticulata* Mart. Ex Meisn. var. *salviifolia* Sleumer.

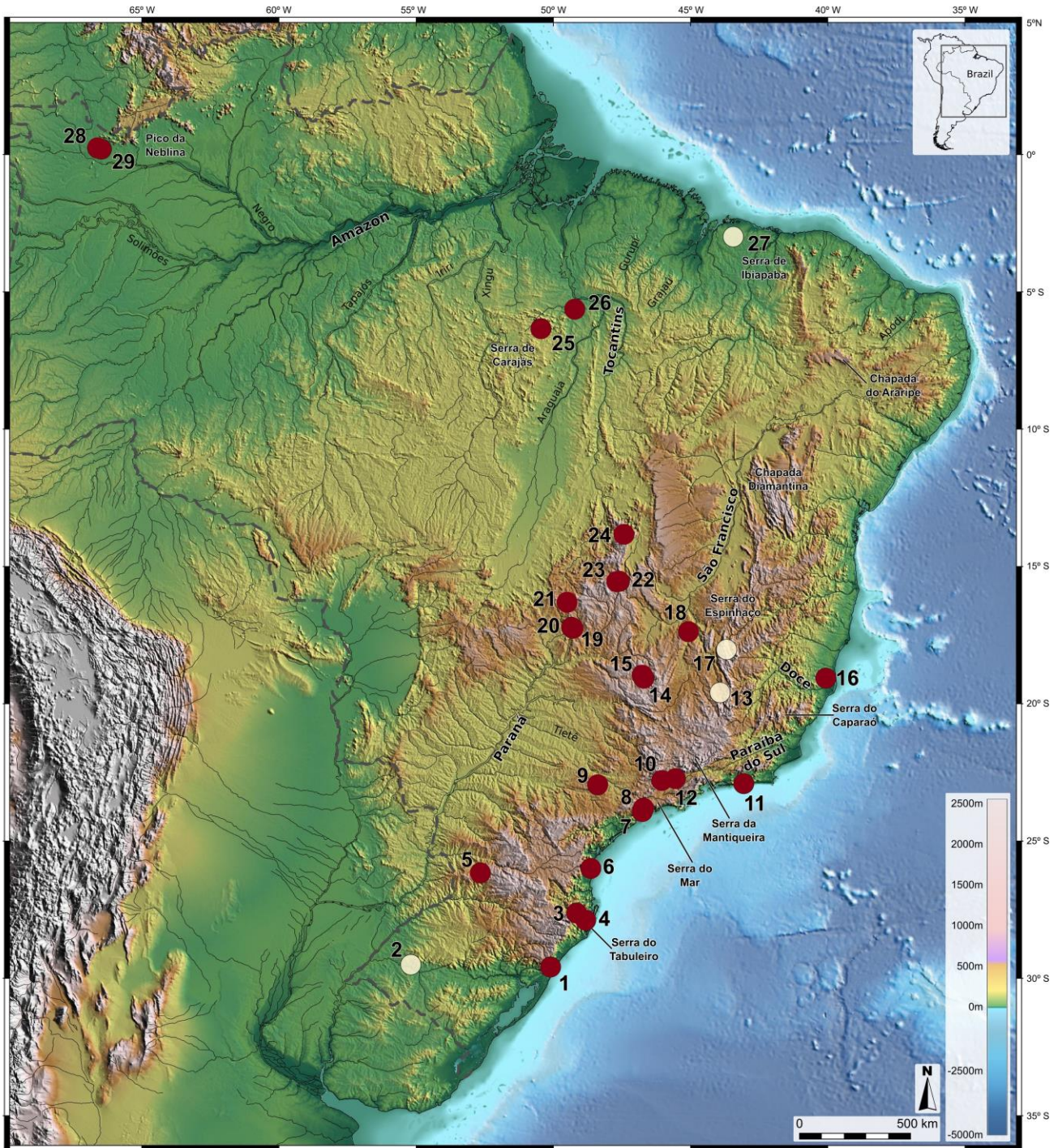
Family Arecaceae Bercht. & J. Presl (sin. Palmae Juss., palms), is represented in Brazilian montane forests with subtropical humid climate, with occasional sub-zero temperatures, by 5 genera and 19 species, as follows: *Acrocomia aculeata* (Jacq.) Lodd., *Arecastrum romanzoffianum* (Cham.) Becc., *Butia archeri* (Glassman) Glassman, *Butia eriospatha* (Mart. ex Drude) Becc., *Butia exilata* Deble & Marchiori, *Butia lallemantii* Deble & Marchiori, *Butia microspadix* Burret, *Butia yatay* (Mart.) Becc., *Geonoma blanchetiana* H. Wendl., *Geonoma brevispatha* Barb. Rodr., *Geonoma gamiova* Barb. Rodr., *Geonoma maxima* (Poit.) Kunth, *Geonoma schottiana* Mart., *Syagrus flexuosa* (Mart.) Becc., *Syagrus oleracea* (Mart.) Becc., *Syagrus pleioclada* Burret, *Syagrus romanzoffiana* (Cham.) Glassman, *Syagrus sancona* (Kunth) H. Karst., *Syagrus werdermannii* Burret.

Podocarpus



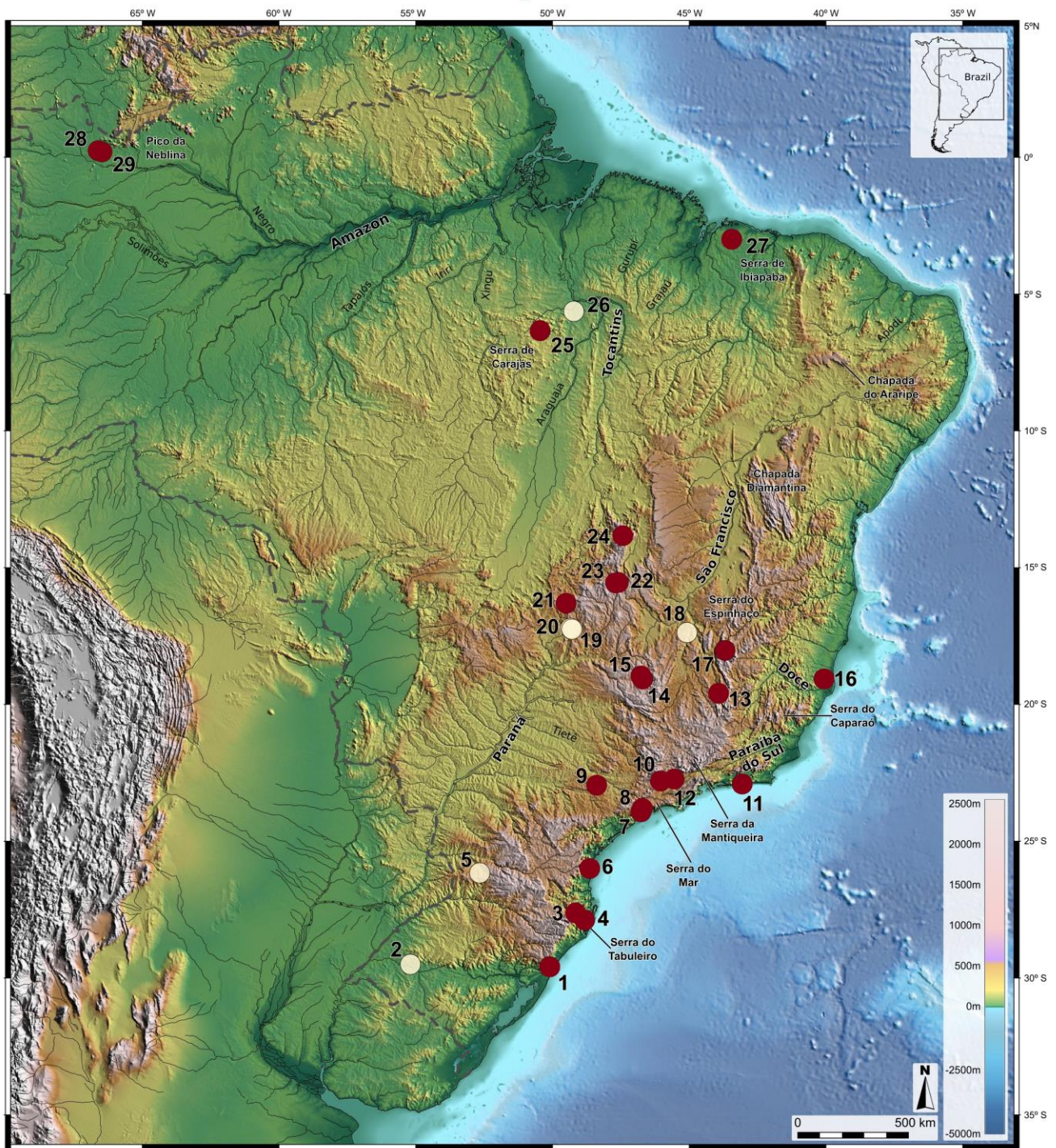
Supplementary Figure 1: Presence (red circles) and absence (clear circles) of *Podocarpus* pollen in HS1 records of Brazil. Base layer: Shaded relief image of ETOPO1 Global DEM (continental area: shaded relief illumination from 060°N, 30° above horizon, 40 times vertical exaggeration; oceanic area: illumination from 060°N, 20° above horizon, 5 times vertical exaggeration).

Ilex



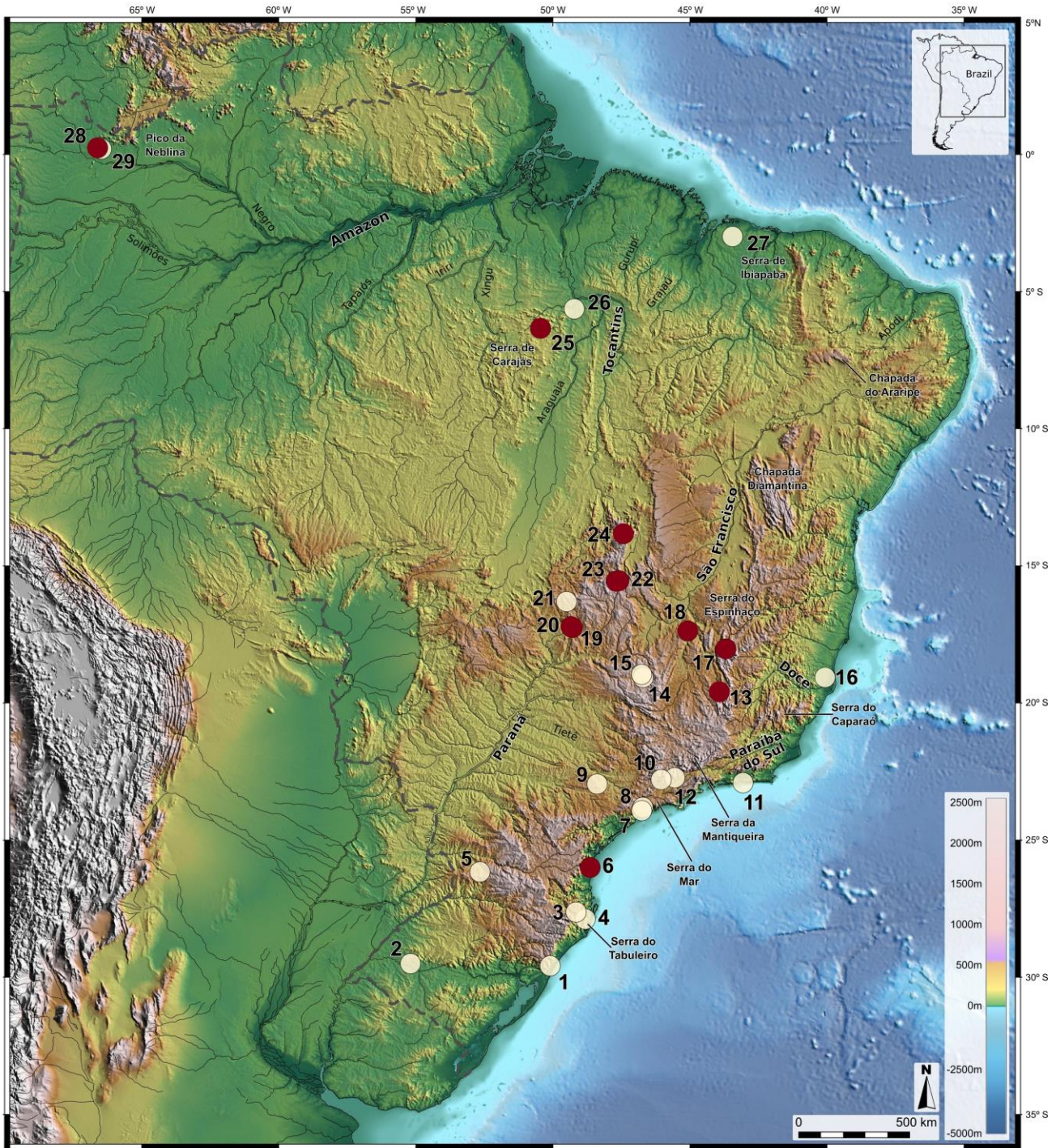
Supplementary Figure 2: Presence (red circles) and absence (clear circles) of *Ilex* pollen in HS1 records of Brazil. Base layer: Shaded relief image of ETOPO1 Global DEM (continental area: shaded relief illumination from 060°N, 30° above horizon, 40 times vertical exaggeration; oceanic area: illumination from 060°N, 20° above horizon, 5 times vertical exaggeration).

Myrsine



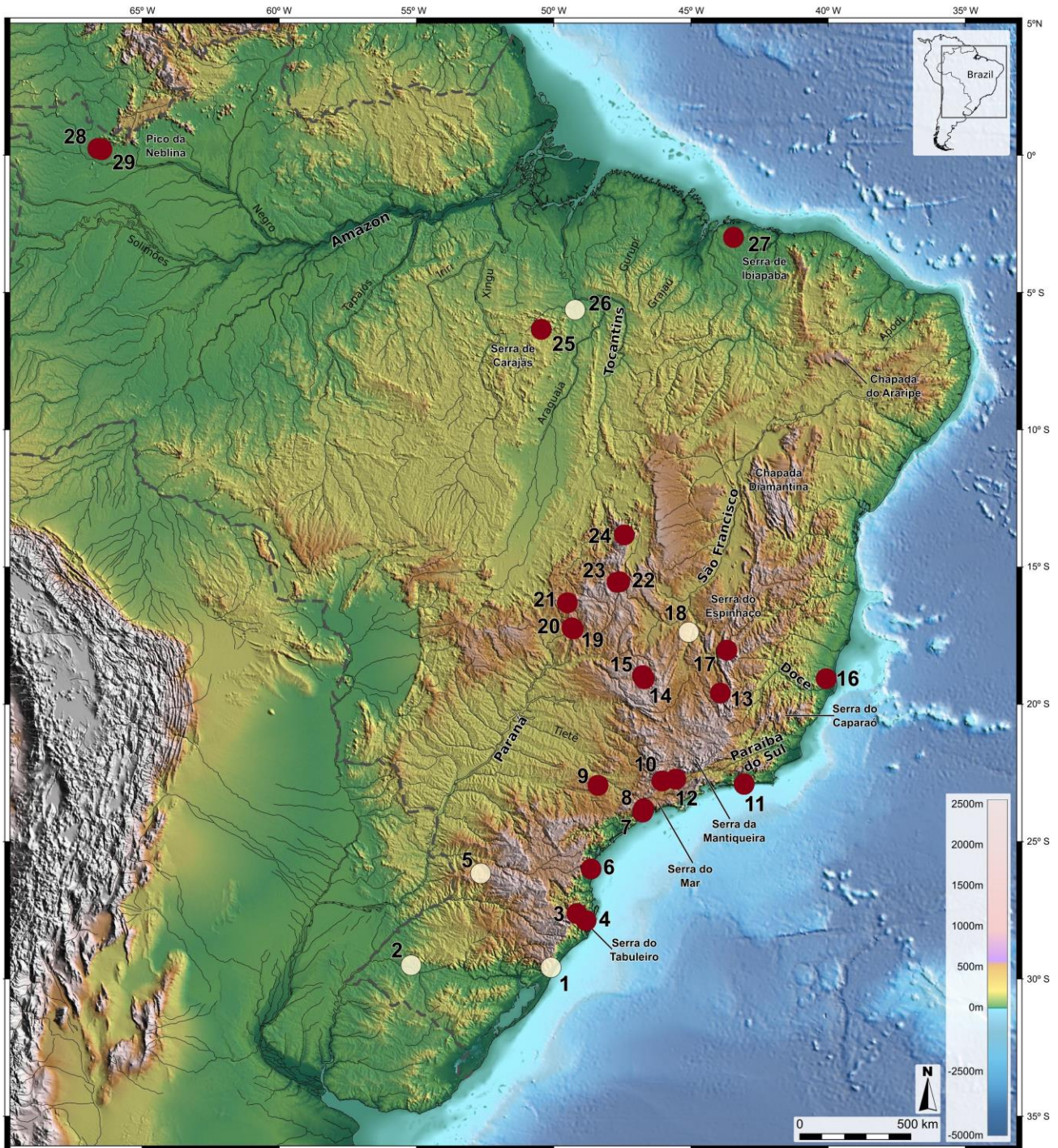
Supplementary Figure 3: Presence (red circles) and absence (clear circles) of *Myrsine* pollen in HS1 records of Brazil. Base layer: Shaded relief image of ETOPO1 Global DEM (continental area: shaded relief illumination from 060°N, 30° above horizon, 40 times vertical exaggeration; oceanic area: illumination from 060°N, 20° above horizon, 5 times vertical exaggeration).

Hedyosmum



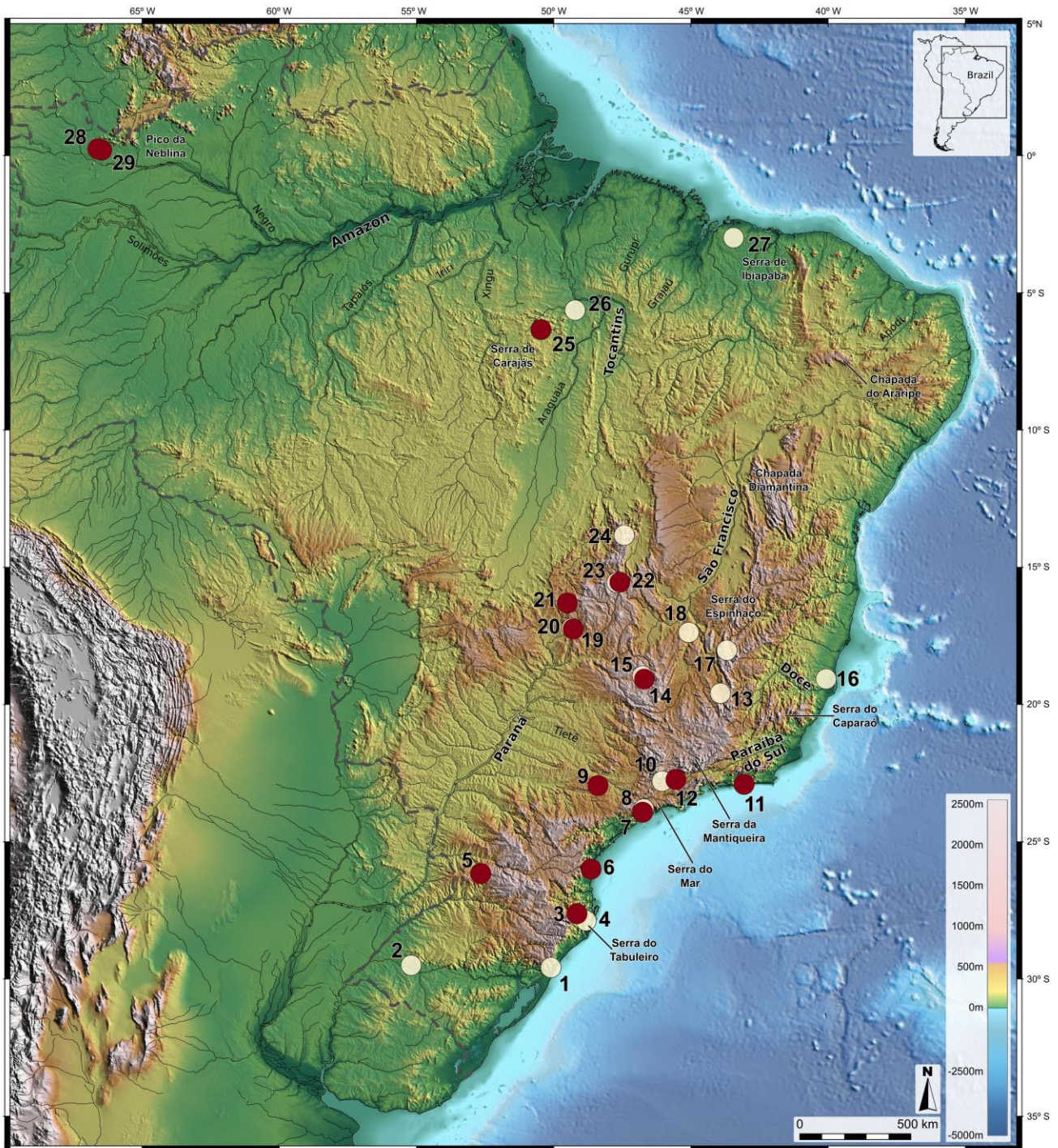
Supplementary Figure 4: Presence (red circles) and absence (clear circles) of *Hedyosmum* pollen in HS1 records of Brazil. Base layer: Shaded relief image of ETOPO1 Global DEM (continental area: shaded relief illumination from 060°N, 30° above horizon, 40 times vertical exaggeration; oceanic area: illumination from 060°N, 20° above horizon, 5 times vertical exaggeration).

Myrtaceae



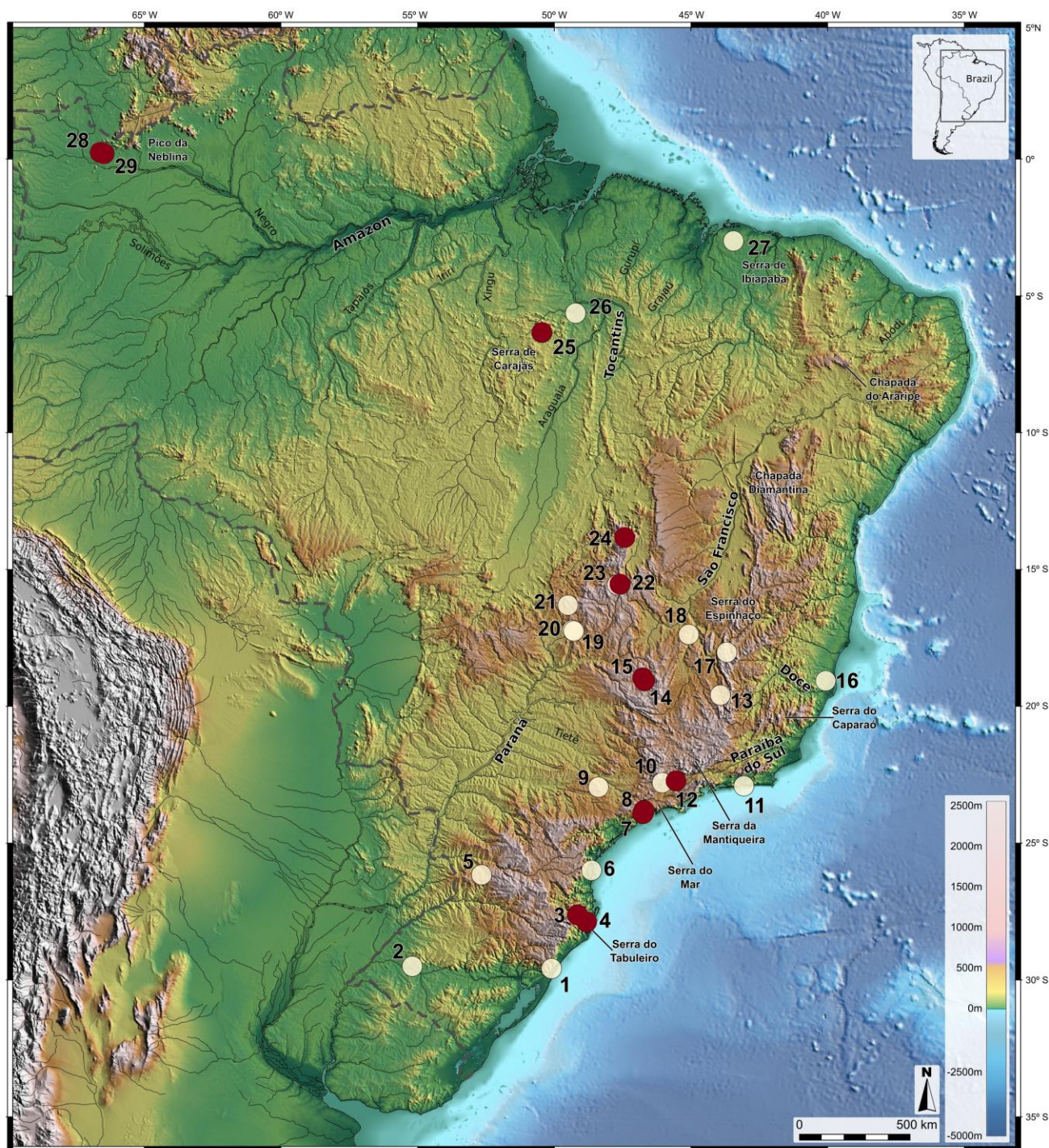
Supplementary Figure 5: Presence (red circles) and absence (clear circles) of Myrtaceae pollen in HS1 records of Brazil. Base layer: Shaded relief image of ETOPO1 Global DEM (continental area: shaded relief illumination from 060°N, 30° above horizon, 40 times vertical exaggeration; oceanic area: illumination from 060°N, 20° above horizon, 5 times vertical exaggeration).

Arecaceae



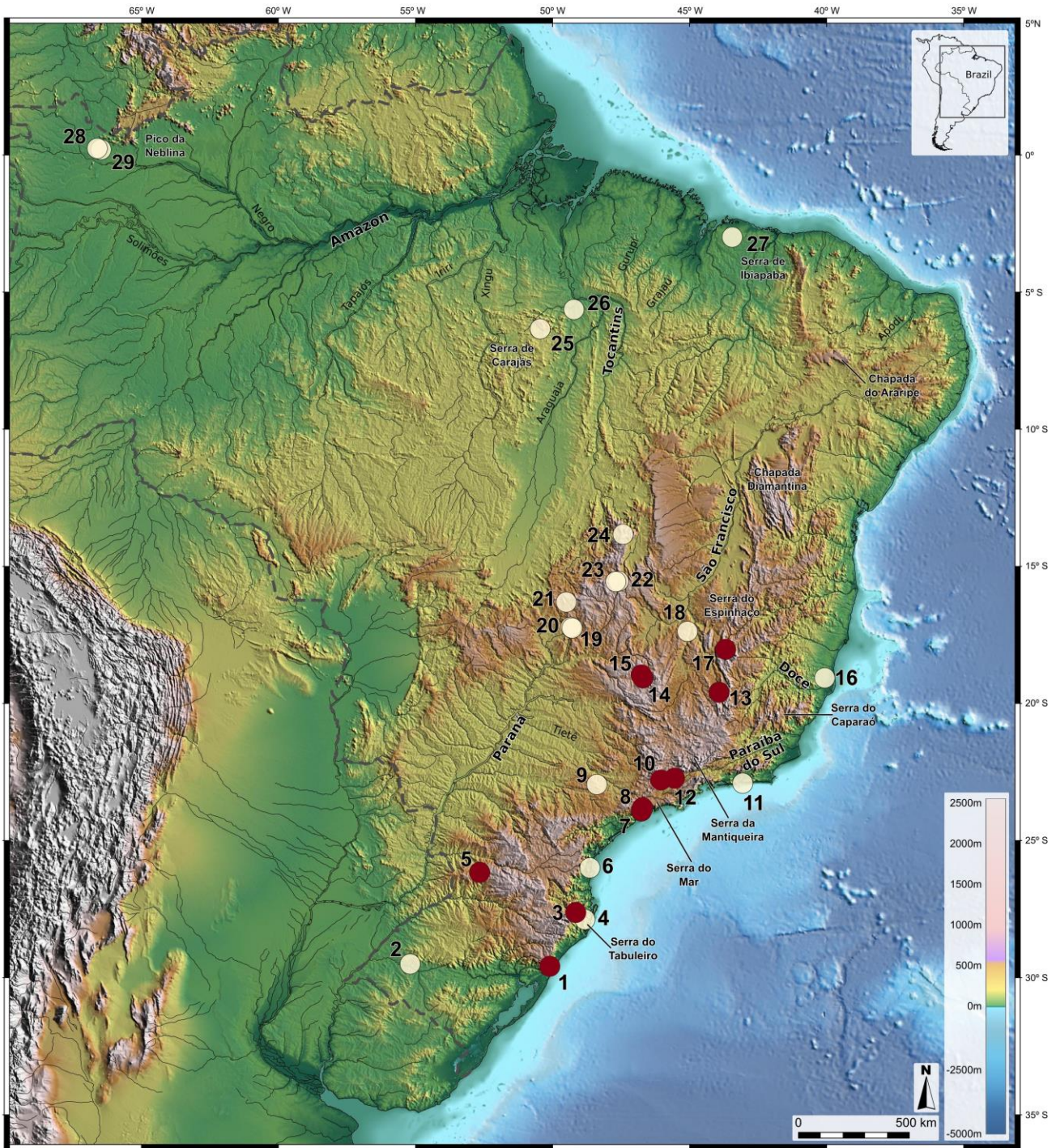
Supplementary Figure 6: Presence (red circles) and absence (clear circles) of Arecaceae pollen in HS1 records of Brazil. Base layer: Shaded relief image of ETOPO1 Global DEM (continental area: shaded relief illumination from 060°N, 30° above horizon, 40 times vertical exaggeration; oceanic area: illumination from 060°N, 20° above horizon, 5 times vertical exaggeration).

Ericaceae



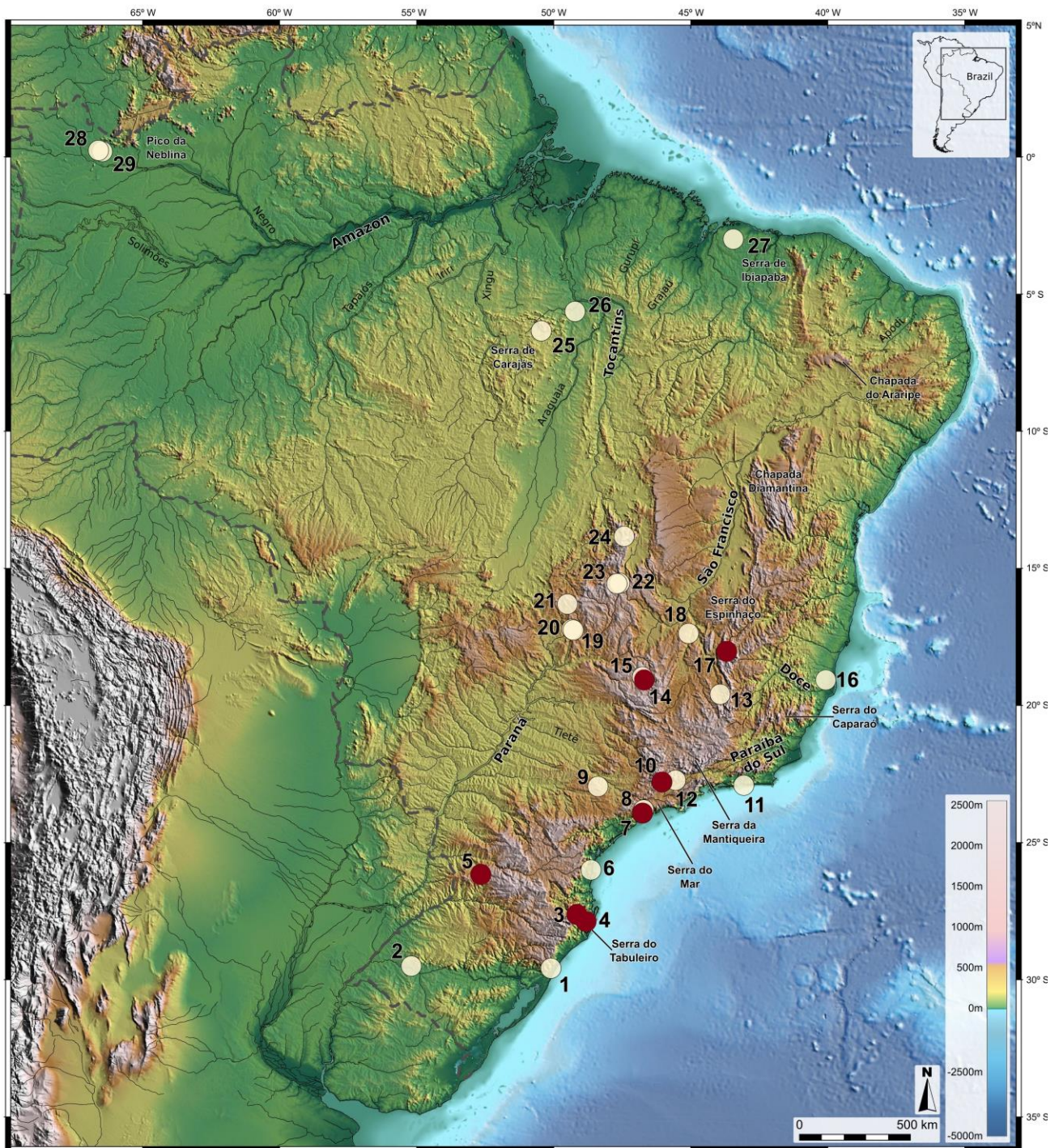
Supplementary Figure 7: Presence (red circles) and absence (clear circles) of Ericaceae pollen in HS1 records of Brazil. Base layer: Shaded relief image of ETOPO1 Global DEM (continental area: shaded relief illumination from 060°N, 30° above horizon, 40 times vertical exaggeration; oceanic area: illumination from 060°N, 20° above horizon, 5 times vertical exaggeration).

Araucaria



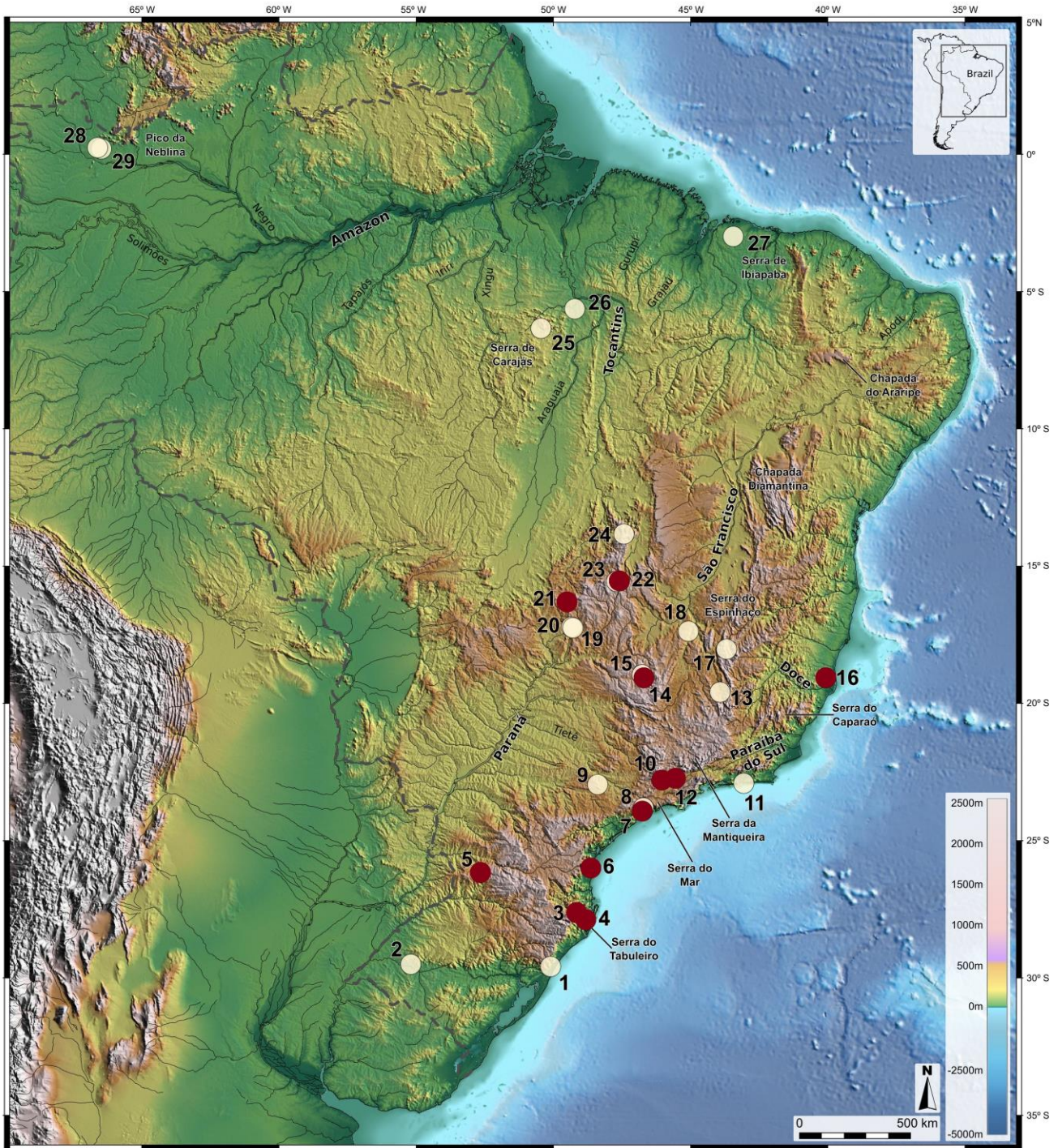
Supplementary Figure 8: Presence (red circles) and absence (clear circles) of *Araucaria* pollen in HS1 records of Brazil. Base layer: Shaded relief image of ETOPO1 Global DEM (continental area: shaded relief illumination from 060°N, 30° above horizon, 40 times vertical exaggeration; oceanic area: illumination from 060°N, 20° above horizon, 5 times vertical exaggeration).

Drimys



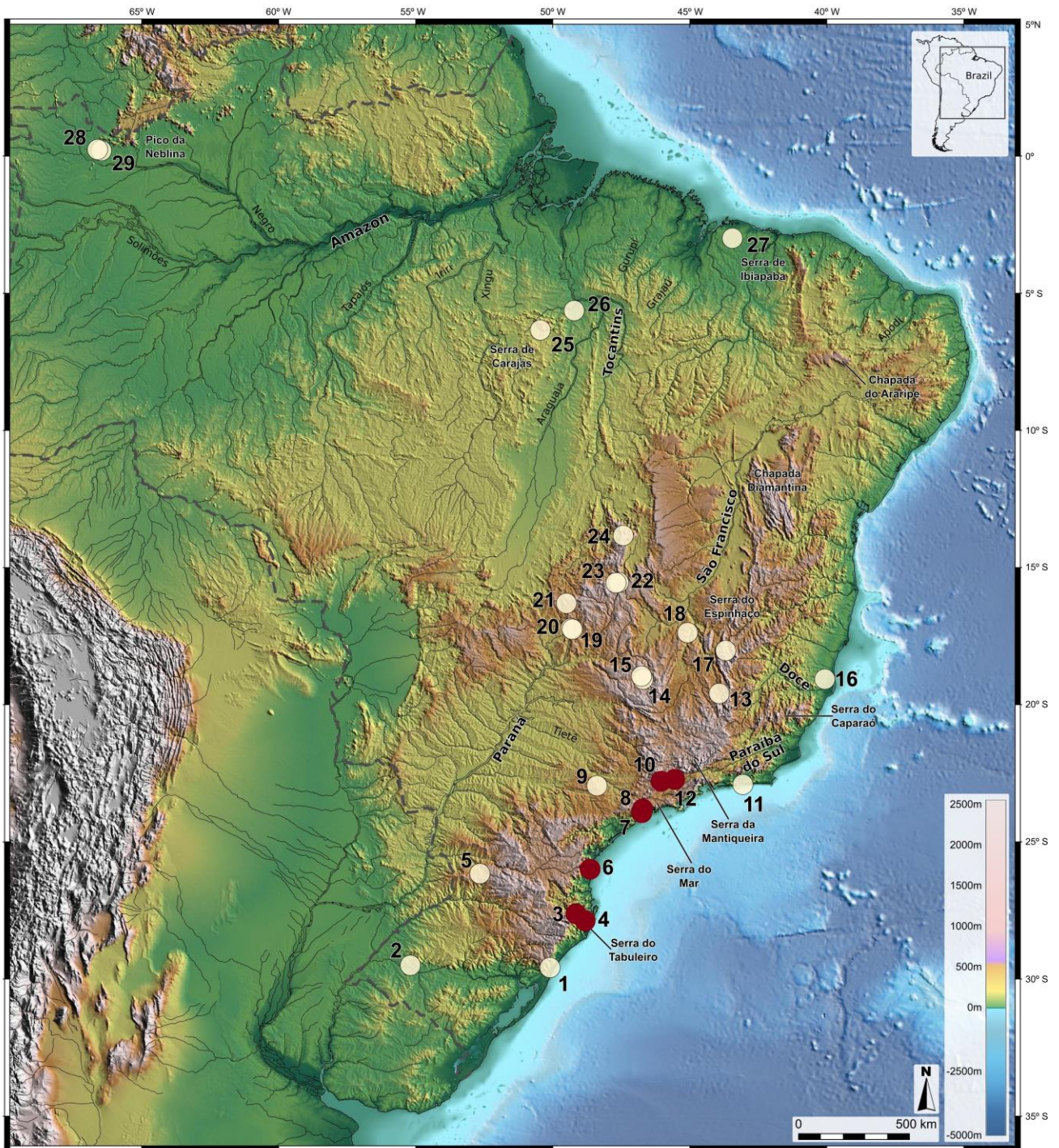
Supplementary Figure 9: Presence (red circles) and absence (clear circles) of *Drimys* pollen in HS1 records of Brazil. Base layer: Shaded relief image of ETOPO1 Global DEM (continental area: shaded relief illumination from 060°N, 30° above horizon, 40 times vertical exaggeration; oceanic area: illumination from 060°N, 20° above horizon, 5 times vertical exaggeration).

Symplocos



Supplementary Figure 10: Presence (red circles) and absence (clear circles) of *Symplocos* pollen in HS1 records of Brazil. Base layer: Shaded relief image of ETOPO1 Global DEM (continental area: shaded relief illumination from 060°N, 30° above horizon, 40 times vertical exaggeration; oceanic area: illumination from 060°N, 20° above horizon, 5 times vertical exaggeration).

Weinmannia



Supplementary Figure 11: Presence (red circles) and absence (clear circles) of *Weinmannia* pollen in HS1 records of Brazil. Base layer: Shaded relief image of ETOPO1 Global DEM (continental area: shaded relief illumination from 060°N, 30° above horizon, 40 times vertical exaggeration; oceanic area: illumination from 060°N, 20° above horizon, 5 times vertical exaggeration).