

Ecography

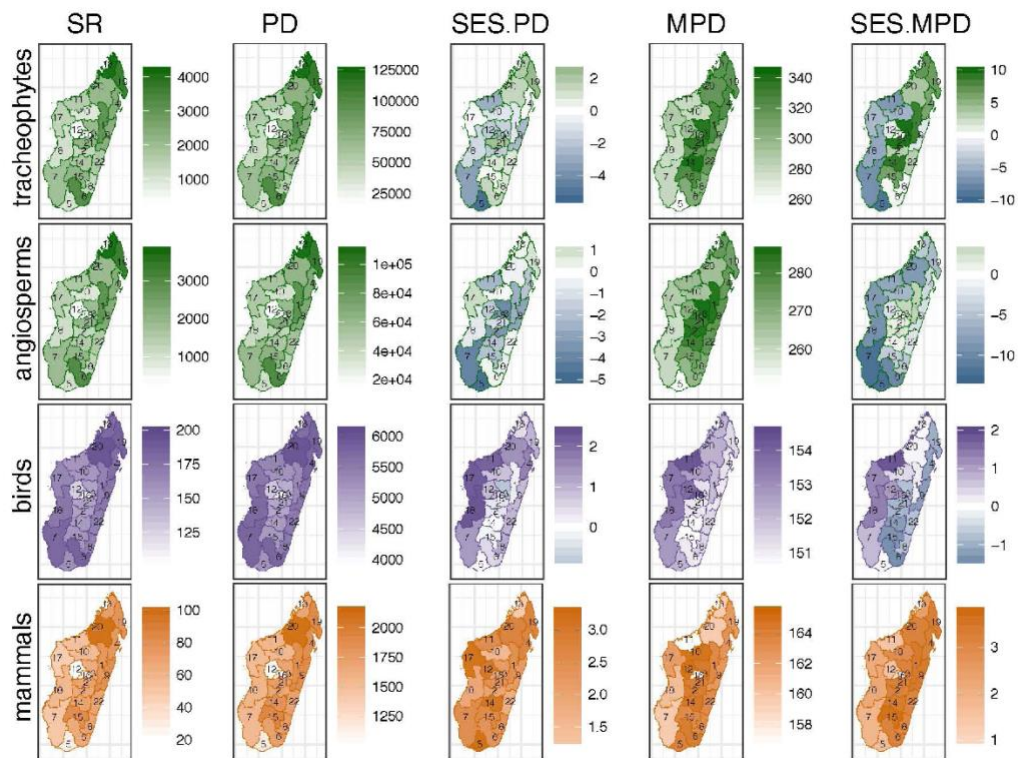
**ECOG-03825**

Park, D. S. and Razafindratsima, O. H. 2018. Anthropogenic threats can have cascading homogenizing effects on the phylogenetic and functional diversity of tropical ecosystems. – *Ecography* doi: 10.1111/ecog.03825

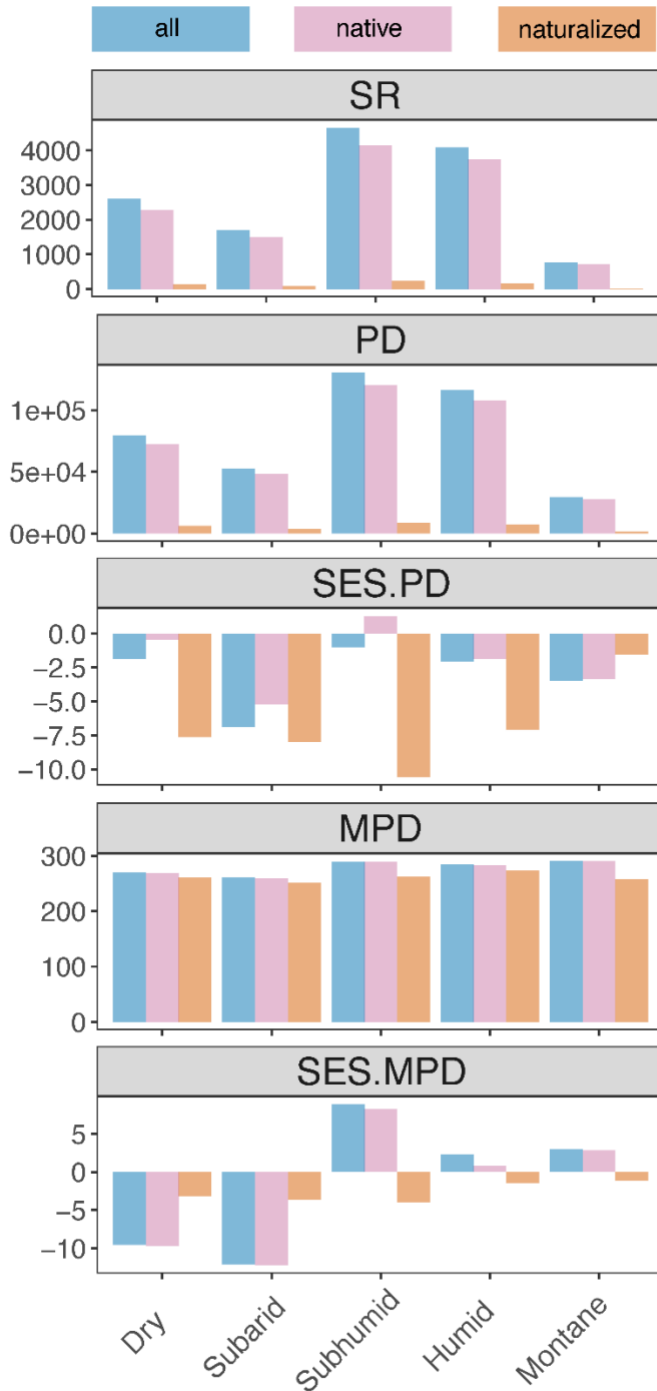
**Supplementary material**

## Appendix 1.

**Figure A1.** Patterns of biodiversity in Madagascar. Species richness (SR), phylogenetic diversity (PD), the standardized effect size of phylogenetic diversity (SES.PD), mean phylogenetic distance (MPD), the standardized effect size of phylogenetic distance (SES.MPD) are depicted at the regional level. Regions are: (1) Alaotra Mangoro, (2) Amoron'i Mania, (3) Analamanga, (4) Analanjirofo, (5) Androy, (6) Anosy, (7) Atsimo Andrefana, (8) Atsimo Atsinanana, (9) Atsinanana, (10) Betsiboka, (11) Boeny, (12) Bongolava, (13) Diana, (14) Haute Matsiatra, (15) Ihorombe, (16) Itasy, (17) Melaky, (18) Menabe, (19) Sava, (20) Sofia, (21) Vakinankaratra, and (22) Vatovavy Fitovinany.

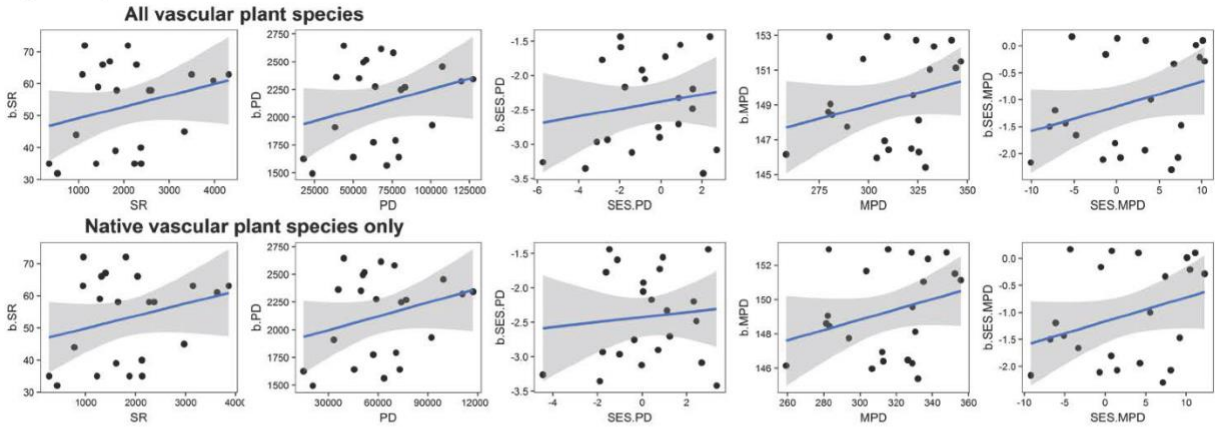


**Figure A2.** Angiosperm diversity by bioclimatic zones. Bars represent the diversity of all species (all), only native species (native), and only exotic naturalized species (naturalized), in order. Species richness (SR), phylogenetic diversity (PD), the standardized effect size of phylogenetic diversity (SES.PD), mean phylogenetic distance (MPD), the standardized effect size of phylogenetic distance (SES.MPD) are depicted.

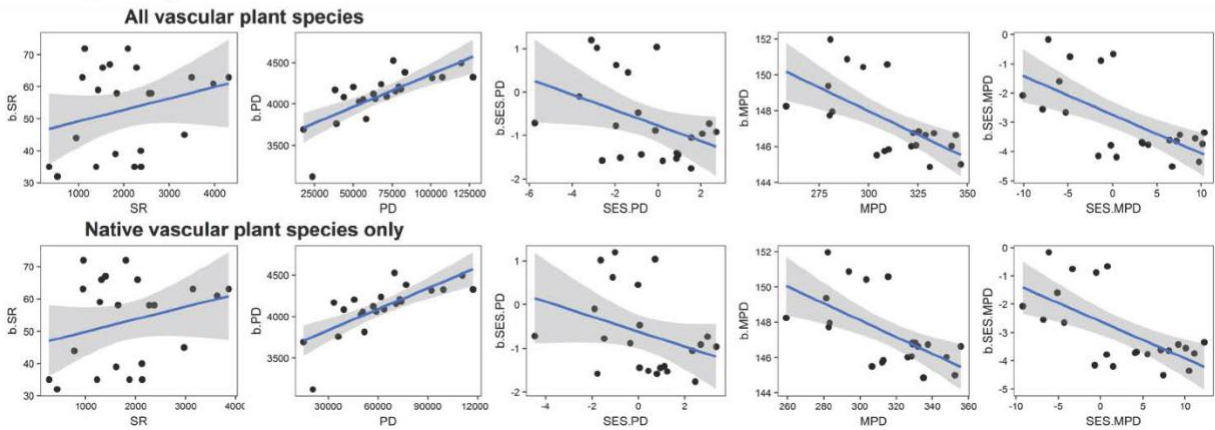


**Figure A3.** Relationship of the taxonomic and phylogenetic diversity of vascular plants with the taxonomic and phylogenetic diversity of non-migratory birds, at the regional level across Madagascar. SR: Species richness, PD: Faith's phylogenetic diversity, MPD: Mean Phylogenetic Distance, SES: Standardized Effect Size of each metric. Lines correspond to the relationship as measured using generalized linear models, and grey shading represent standard errors from the models.

**Migratory birds**



**Non-migratory birds**



**Table A1.** List of study species

<b>Group</b>	<b>Order</b>	<b>Family</b>	<b>Genus</b>	<b>Species</b>
Bird	Accipitriformes	Accipitridae	Accipiter	<i>Accipiter francesiae</i>
Bird	Accipitriformes	Accipitridae	Accipiter	<i>Accipiter henstii</i>
Bird	Accipitriformes	Accipitridae	Accipiter	<i>Accipiter madagascariensis</i>
Bird	Passeriformes	Acrocephalidae	Acrocephalus	<i>Acrocephalus newtoni</i>
Bird	Charadriiformes	Scolopacidae	Actitis	<i>Actitis hypoleucos</i>
Bird	Charadriiformes	Jacaniidae	Actophilornis	<i>Actophilornis albinucha</i>
Bird	Psittaciformes	Psittacidae	Agapornis	<i>Agapornis canus</i>
Bird	Columbiformes	Columbidae	Alectroenas	<i>Alectroenas madagascariensis</i>
Bird	Passeriformes	Locustellidae	Amphilais	<i>Amphilais seebohmi</i>
Bird	Anseriformes	Anatidae	Anas	<i>Anas bernieri</i>
Bird	Anseriformes	Anatidae	Anas	<i>Anas erythrorhyncha</i>
Bird	Anseriformes	Anatidae	Anas	<i>Anas melleri</i>
Bird	Ciconiiformes	Ciconiidae	Anastomus	<i>Anastomus lamelligerus</i>
Bird	Suliformes	Anhingidae	Anhinga	<i>Anhinga rufa</i>
Bird	Apodiformes	Apodidae	Apus	<i>Apus affinis</i>
Bird	Apodiformes	Apodidae	Apus	<i>Apus balstoni</i>
Bird	Pelecaniformes	Ardeidae	Ardea	<i>Ardea alba</i>
Bird	Pelecaniformes	Ardeidae	Ardea	<i>Ardea cinerea</i>
Bird	Pelecaniformes	Ardeidae	Ardea	<i>Ardea humbloti</i>
Bird	Pelecaniformes	Ardeidae	Ardea	<i>Ardea purpurea</i>
Bird	Procellariiformes	Procellariidae	Ardenna	<i>Ardenna pacifica</i>
Bird	Pelecaniformes	Ardeidae	Ardeola	<i>Ardeola idae</i>
Bird	Pelecaniformes	Ardeidae	Ardeola	<i>Ardeola ralloides</i>
Bird	Charadriiformes	Scolopacidae	Arenaria	<i>Arenaria interpres</i>
Bird	Passeriformes	Vangidae	Artamella	<i>Artamella viridis</i>
Bird	Strigiformes	Strigidae	Asio	<i>Asio capensis</i>
Bird	Strigiformes	Strigidae	Asio	<i>Asio madagascariensis</i>
Bird	Coraciiformes	Brachypteraciidae	Atelornis	<i>Atelornis crossleyi</i>
Bird	Coraciiformes	Brachypteraciidae	Atelornis	<i>Atelornis pittoides</i>
Bird	Strigiformes	Strigidae	Athene	<i>Athene superciliaris</i>
Bird	Accipitriformes	Accipitridae	Aviceda	<i>Aviceda madagascariensis</i>
Bird	Anseriformes	Anatidae	Aythya	<i>Aythya innotata</i>
Bird	Passeriformes	Bernieridae	Bernieria	<i>Bernieria madagascariensis</i>
Bird	Coraciiformes	Brachypteraciidae	Brachypteracias	<i>Brachypteracias leptosomus</i>
Bird	Passeriformes	Locustellidae	Bradypterus	<i>Bradypterus brunneus</i>
Bird	Pelecaniformes	Ardeidae	Bubulcus	<i>Bubulcus ibis</i>
Bird	Accipitriformes	Accipitridae	Buteo	<i>Buteo brachypterus</i>
Bird	Pelecaniformes	Ardeidae	Butorides	<i>Butorides striata</i>
Bird	Passeriformes	Vangidae	Calicalicus	<i>Calicalicus madagascariensis</i>

Bird	Passeriformes	Vangidae	Calicalicus	<i>Calicalicus rufocarpalis</i>
Bird	Charadriiformes	Scolopacidae	Calidris	<i>Calidris alba</i>
Bird	Charadriiformes	Scolopacidae	Calidris	<i>Calidris ferruginea</i>
Bird	Charadriiformes	Scolopacidae	Calidris	<i>Calidris minuta</i>
Bird	Procellariiformes	Procellariidae	Calonectris	<i>Calonectris borealis</i>
Bird	Caprimulgiformes	Caprimulgidae	Caprimulgus	<i>Caprimulgus madagascariensis</i>
Bird	Passeriformes	Campephagidae	Ceblepyris	<i>Ceblepyris cinereus</i>
Bird	Cuculiformes	Cuculidae	Centropus	<i>Centropus toulou</i>
Bird	Charadriiformes	Charadriidae	Charadrius	<i>Charadrius bifrontatus</i>
Bird	Charadriiformes	Charadriidae	Charadrius	<i>Charadrius hiaticula</i>
Bird	Charadriiformes	Charadriidae	Charadrius	<i>Charadrius leschenaultii</i>
Bird	Charadriiformes	Charadriidae	Charadrius	<i>Charadrius marginatus</i>
Bird	Charadriiformes	Charadriidae	Charadrius	<i>Charadrius pecuarius</i>
Bird	Charadriiformes	Charadriidae	Charadrius	<i>Charadrius thoracicus</i>
Bird	Charadriiformes	Laridae	Chlidonias	<i>Chlidonias hybrida</i>
Bird	Charadriiformes	Laridae	Chlidonias	<i>Chlidonias leucopterus</i>
Bird	Passeriformes	Nectariniidae	Cinnyris	<i>Cinnyris notatus</i>
Bird	Passeriformes	Nectariniidae	Cinnyris	<i>Cinnyris sovimanga</i>
Bird	Accipitriformes	Accipitridae	Circus	<i>Circus macrosceles</i>
Bird	Passeriformes	Cisticolidae	Cisticola	<i>Cisticola cherina</i>
Bird	Passeriformes	Muscicapidae	Copsychus	<i>Copsychus albospectularis</i>
Bird	Passeriformes	Muscicapidae	Copsychus	<i>Copsychus pica</i>
Bird	Psittaciformes	Psittacidae	Coracopsis	<i>Coracopsis nigra</i>
Bird	Psittaciformes	Psittacidae	Coracopsis	<i>Coracopsis vasa</i>
Bird	Passeriformes	Corvidae	Corvus	<i>Corvus albus</i>
Bird	Coraciiformes	Alcedinidae	Corythornis	<i>Corythornis madagascariensis</i>
Bird	Coraciiformes	Alcedinidae	Corythornis	<i>Corythornis vintsioides</i>
Bird	Galliformes	Phasianidae	Coturnix	<i>Coturnix coturnix</i>
Bird	Galliformes	Phasianidae	Coturnix	<i>Coturnix delegorguei</i>
Bird	Cuculiformes	Cuculidae	Coua	<i>Coua caerulea</i>
Bird	Cuculiformes	Cuculidae	Coua	<i>Coua coquereli</i>
Bird	Cuculiformes	Cuculidae	Coua	<i>Coua cristata</i>
Bird	Cuculiformes	Cuculidae	Coua	<i>Coua cursor</i>
Bird	Cuculiformes	Cuculidae	Coua	<i>Coua gigas</i>
Bird	Cuculiformes	Cuculidae	Coua	<i>Coua olivaceiceps</i>
Bird	Cuculiformes	Cuculidae	Coua	<i>Coua pyropyga</i>
Bird	Cuculiformes	Cuculidae	Coua	<i>Coua reynaudii</i>
Bird	Cuculiformes	Cuculidae	Coua	<i>Coua ruficeps</i>
Bird	Cuculiformes	Cuculidae	Coua	<i>Coua serriana</i>
Bird	Cuculiformes	Cuculidae	Coua	<i>Coua verreauxi</i>
Bird	Passeriformes	Bernieridae	Crossleyia	<i>Crossleyia tenebrosa</i>

Bird	Passeriformes	Bernieridae	Crossleyia	<i>Crossleyia xanthophrys</i>
Bird	Passeriformes	Bernieridae	Cryptosylvicola	<i>Cryptosylvicola randrianasoloi</i>
Bird	Cuculiformes	Cuculidae	Cuculus	<i>Cuculus rochii</i>
Bird	Passeriformes	Vangidae	Cyanolanius	<i>Cyanolanius madagascarinus</i>
Bird	Apodiformes	Apodidae	Cypsiurus	<i>Cypsiurus parvus</i>
Bird	Anseriformes	Anatidae	Dendrocygna	<i>Dendrocygna bicolor</i>
Bird	Anseriformes	Anatidae	Dendrocygna	<i>Dendrocygna viduata</i>
Bird	Passeriformes	Dicruridae	Dicrurus	<i>Dicrurus forficatus</i>
Bird	Casuariiformes	Dromadidae	Dromas	<i>Dromas ardeola</i>
Bird	Gruiformes	Rallidae	Dryolimnas	<i>Dryolimnas cuvieri</i>
Bird	Pelecaniformes	Ardeidae	Egretta	<i>Egretta ardesiaca</i>
Bird	Pelecaniformes	Ardeidae	Egretta	<i>Egretta gularis</i>
Bird	Passeriformes	Alaudidae	Eremopterix	<i>Eremopterix hova</i>
Bird	Passeriformes	Vangidae	Euryceros	<i>Euryceros prevostii</i>
Bird	Coraciiformes	Coraciidae	Eurystomus	<i>Eurystomus glaucurus</i>
Bird	Accipitriformes	Accipitridae	Eutriorchis	<i>Eutriorchis astur</i>
Bird	Falconiformes	Falconidae	Falco	<i>Falco concolor</i>
Bird	Falconiformes	Falconidae	Falco	<i>Falco eleonora</i>
Bird	Falconiformes	Falconidae	Falco	<i>Falco newtoni</i>
Bird	Falconiformes	Falconidae	Falco	<i>Falco peregrinus</i>
Bird	Falconiformes	Falconidae	Falco	<i>Falco zoniventris</i>
Bird	Passeriformes	Vangidae	Falculea	<i>Falculea palliata</i>
Bird	Passeriformes	Ploceidae	Foudia	<i>Foudia madagascariensis</i>
Bird	Passeriformes	Ploceidae	Foudia	<i>Foudia omissa</i>
Bird	Suliformes	Fregatidae	Fregata	<i>Fregata ariel</i>
Bird	Suliformes	Fregatidae	Fregata	<i>Fregata minor</i>
Bird	Procellariiformes	Oceanitidae	Fregetta	<i>Fregetta tropica</i>
Bird	Gruiformes	Rallidae	Fulica	<i>Fulica cristata</i>
Bird	Caprimulgiformes	Caprimulgidae	Gactornis	<i>Gactornis enarratus</i>
Bird	Charadriiformes	Scolopacidae	Gallinago	<i>Gallinago macrodactyla</i>
Bird	Gruiformes	Rallidae	Gallinula	<i>Gallinula chloropus</i>
Bird	Coraciiformes	Brachypteraciidae	Geobiastes	<i>Geobiastes squamiger</i>
Bird	Charadriiformes	Glareolidae	Glareola	<i>Glareola ocularis</i>
Bird	Accipitriformes	Accipitridae	Haliaeetus	<i>Haliaeetus vociferoides</i>
Bird	Passeriformes	Bernieridae	Hartertula	<i>Hartertula flavoviridis</i>
Bird	Passeriformes	Sturnidae	Hartlaubius	<i>Hartlaubius auratus</i>
Bird	Charadriiformes	Recurvirostridae	Himantopus	<i>Himantopus himantopus</i>
Bird	Charadriiformes	Laridae	Hydroprogne	<i>Hydroprogne caspia</i>
Bird	Passeriformes	Vangidae	Hypositta	<i>Hypositta corallirostris</i>
Bird	Passeriformes	Pycnonotidae	Hypsipetes	<i>Hypsipetes madagascariensis</i>
Bird	Pelecaniformes	Ardeidae	Ixobrychus	<i>Ixobrychus minutus</i>

Bird	Charadriiformes	Laridae	Larus	<i>Larus cirrocephalus</i>
Bird	Charadriiformes	Laridae	Larus	<i>Larus dominicanus</i>
Bird	Passeriformes	Estrildidae	Lepidopygia	<i>Lepidopygia nana</i>
Bird	Passeriformes	Vangidae	Leptopterus	<i>Leptopterus chabert</i>
Bird	Leptosomiformes	Leptosomidae	Leptosomus	<i>Leptosomus discolor</i>
Bird	Charadriiformes	Scolopacidae	Limosa	<i>Limosa lapponica</i>
Bird	Pelecaniformes	Threskiornithidae	Lophotibis	<i>Lophotibis cristata</i>
Bird	Accipitriformes	Accipitridae	Macheiramphus	<i>Macheiramphus alcinus</i>
Bird	Galliformes	Phasianidae	Margaroperdix	<i>Margaroperdix madagarensis</i>
Bird	Gruiformes	Rallidae	Mentocrex	<i>Mentocrex beankaensis</i>
Bird	Gruiformes	Rallidae	Mentocrex	<i>Mentocrex kioloides</i>
Bird	Coraciiformes	Meropidae	Merops	<i>Merops superciliosus</i>
Bird	Mesitornithiformes	Mesitornithidae	Mesitornis	<i>Mesitornis unicolor</i>
Bird	Mesitornithiformes	Mesitornithidae	Mesitornis	<i>Mesitornis variegatus</i>
Bird	Suliformes	Phalacrocoracidae	Microcarbo	<i>Microcarbo africanus</i>
Bird	Accipitriformes	Accipitridae	Milvus	<i>Milvus migrans</i>
Bird	Mesitornithiformes	Mesitornithidae	Monias	<i>Monias benschi</i>
Bird	Passeriformes	Muscicapidae	Monticola	<i>Monticola erythronotus</i>
Bird	Passeriformes	Muscicapidae	Monticola	<i>Monticola imerina</i>
Bird	Passeriformes	Muscicapidae	Monticola	<i>Monticola sharpei</i>
Bird	Passeriformes	Motacillidae	Motacilla	<i>Motacilla flaviventris</i>
Bird	Ciconiiformes	Ciconiidae	Mycteria	<i>Mycteria ibis</i>
Bird	Passeriformes	Vangidae	Mystacornis	<i>Mystacornis crossleyi</i>
Bird	Passeriformes	Philepittidae	Neodrepanis	<i>Neodrepanis coruscans</i>
Bird	Passeriformes	Philepittidae	Neodrepanis	<i>Neodrepanis hypoxantha</i>
Bird	Passeriformes	Cisticolidae	Neomixis	<i>Neomixis pallidior</i>
Bird	Passeriformes	Cisticolidae	Neomixis	<i>Neomixis striatigula</i>
Bird	Passeriformes	Cisticolidae	Neomixis	<i>Neomixis tenella</i>
Bird	Passeriformes	Cisticolidae	Neomixis	<i>Neomixis viridis</i>
Bird	Passeriformes	Acrocephalidae	Nesillas	<i>Nesillas lantzii</i>
Bird	Passeriformes	Acrocephalidae	Nesillas	<i>Nesillas typica</i>
Bird	Columbiformes	Columbidae	Nesoenas	<i>Nesoenas picturatus</i>
Bird	Anseriformes	Anatidae	Nettapus	<i>Nettapus auritus</i>
Bird	Passeriformes	Vangidae	Newtonia	<i>Newtonia amphichroa</i>
Bird	Passeriformes	Vangidae	Newtonia	<i>Newtonia archboldi</i>
Bird	Passeriformes	Vangidae	Newtonia	<i>Newtonia brunneicauda</i>
Bird	Passeriformes	Vangidae	Newtonia	<i>Newtonia fanovanae</i>
Bird	Charadriiformes	Scolopacidae	Numenius	<i>Numenius arquata</i>
Bird	Charadriiformes	Scolopacidae	Numenius	<i>Numenius phaeopus</i>
Bird	Pelecaniformes	Ardeidae	Nycticorax	<i>Nycticorax nycticorax</i>
Bird	Procellariiformes	Oceanitidae	Oceanites	<i>Oceanites oceanicus</i>



Bird	Columbiformes	Columbidae	Oena	<i>Oena capensis</i>
Bird	Charadriiformes	Laridae	Onychoprion	<i>Onychoprion anaethetus</i>
Bird	Charadriiformes	Laridae	Onychoprion	<i>Onychoprion fuscatus</i>
Bird	Passeriformes	Vangidae	Oriolia	<i>Oriolia bernieri</i>
Bird	Strigiformes	Strigidae	Otus	<i>Otus rutilus</i>
Bird	Passeriformes	Bernieridae	Oxylabes	<i>Oxylabes madagascariensis</i>
Bird	Cuculiformes	Cuculidae	Pachycoccyx	<i>Pachycoccyx audeberti</i>
Bird	Pelecaniformes	Pelecanidae	Pelecanus	<i>Pelecanus rufescens</i>
Bird	Phaethontiformes	Phaethontidae	Phaethon	<i>Phaethon lepturus</i>
Bird	Phaethontiformes	Phaethontidae	Phaethon	<i>Phaethon rubricauda</i>
Bird	Passeriformes	Hirundinidae	Phedina	<i>Phedina borbonica</i>
Bird	Passeriformes	Philepittidae	Philepitta	<i>Philepitta castanea</i>
Bird	Passeriformes	Philepittidae	Philepitta	<i>Philepitta schlegeli</i>
Bird	Bucerotiformes	Phoenicopteridae	Phoeniconaias	<i>Phoeniconaias minor</i>
Bird	Bucerotiformes	Phoenicopteridae	Phoenicopterus	<i>Phoenicopterus roseus</i>
Bird	Pelecaniformes	Threskiornithidae	Platalea	<i>Platalea alba</i>
Bird	Pelecaniformes	Threskiornithidae	Plegadis	<i>Plegadis falcinellus</i>
Bird	Passeriformes	Ploceidae	Ploceus	<i>Ploceus nelicourvi</i>
Bird	Passeriformes	Ploceidae	Ploceus	<i>Ploceus sakalava</i>
Bird	Charadriiformes	Charadriidae	Pluvialis	<i>Pluvialis squatarola</i>
Bird	Accipitriformes	Accipitridae	Polyboroides	<i>Polyboroides radiatus</i>
Bird	Gruiformes	Rallidae	Porphyrio	<i>Porphyrio alleni</i>
Bird	Gruiformes	Rallidae	Porphyrio	<i>Porphyrio porphyrio</i>
Bird	Passeriformes	Vangidae	Pseudobias	<i>Pseudobias wardi</i>
Bird	Pteroclidiformes	Pteroclididae	Pterocles	<i>Pterocles personatus</i>
Bird	Gruiformes	Rallidae	Rallus	<i>Rallus madagascariensis</i>
Bird	Passeriformes	Bernieridae	Randia	<i>Randia pseudozosterops</i>
Bird	Passeriformes	Hirundinidae	Riparia	<i>Riparia cowani</i>
Bird	Charadriiformes	Rostratulidae	Rostratula	<i>Rostratula benghalensis</i>
Bird	Anseriformes	Anatidae	Sarkidiornis	<i>Sarkidiornis melanotos</i>
Bird	Gruiformes	Rallidae	Sarothrura	<i>Sarothrura insularis</i>
Bird	Gruiformes	Rallidae	Sarothrura	<i>Sarothrura watersi</i>
Bird	Passeriformes	Muscicapidae	Saxicola	<i>Saxicola torquatus</i>
Bird	Passeriformes	Vangidae	Schetba	<i>Schetba rufa</i>
Bird	Pelecaniformes	Scopidae	Scopus	<i>Scopus umbretta</i>
Bird	Anseriformes	Anatidae	Spatula	<i>Spatula hottentota</i>
Bird	Charadriiformes	Laridae	Sterna	<i>Sterna dougallii</i>
Bird	Charadriiformes	Laridae	Sterna	<i>Sterna hirundo</i>
Bird	Charadriiformes	Laridae	Sternula	<i>Sternula saundersi</i>
Bird	Suliformes	Sulidae	Sula	<i>Sula leucogaster</i>
Bird	Suliformes	Sulidae	Sula	<i>Sula sula</i>

Bird	Podicipediformes	Podicipedidae	Tachybaptus	<i>Tachybaptus pelzelinii</i>
Bird	Podicipediformes	Podicipedidae	Tachybaptus	<i>Tachybaptus ruficollis</i>
Bird	Apodiformes	Apodidae	Tachymarptis	<i>Tachymarptis melba</i>
Bird	Passeriformes	Monarchidae	Terpsiphone	<i>Terpsiphone mutata</i>
Bird	Procellariiformes	Diomedidae	Thalassarche	<i>Thalassarche carteri</i>
Bird	Charadriiformes	Laridae	Thalasseus	<i>Thalasseus bengalensis</i>
Bird	Charadriiformes	Laridae	Thalasseus	<i>Thalasseus bergii</i>
Bird	Anseriformes	Anatidae	Thalassornis	<i>Thalassornis leuconotus</i>
Bird	Passeriformes	Bernieridae	Thamnornis	<i>Thamnornis chloropetoides</i>
Bird	Pelecaniformes	Threskiornithidae	Threskiornis	<i>Threskiornis bernieri</i>
Bird	Columbiformes	Columbidae	Treron	<i>Treron australis</i>
Bird	Charadriiformes	Scolopacidae	Tringa	<i>Tringa glareola</i>
Bird	Charadriiformes	Scolopacidae	Tringa	<i>Tringa nebularia</i>
Bird	Charadriiformes	Turnicidae	Turnix	<i>Turnix nigricollis</i>
Bird	Passeriformes	Vangidae	Tylas	<i>Tylas eduardi</i>
Bird	Strigiformes	Tytonidae	Tyto	<i>Tyto alba</i>
Bird	Strigiformes	Tytonidae	Tyto	<i>Tyto soumagnei</i>
Bird	Bucerotiformes	Upipidae	Upupa	<i>Upupa marginata</i>
Bird	Coraciiformes	Brachypteraciidae	Uratelornis	<i>Uratelornis chimaera</i>
Bird	Passeriformes	Vangidae	Vanga	<i>Vanga curvirostris</i>
Bird	Passeriformes	Bernieridae	Xanthomixis	<i>Xanthomixis apperti</i>
Bird	Passeriformes	Bernieridae	Xanthomixis	<i>Xanthomixis cinereiceps</i>
Bird	Passeriformes	Bernieridae	Xanthomixis	<i>Xanthomixis zosterops</i>
Bird	Passeriformes	Vangidae	Xenopirostris	<i>Xenopirostris damii</i>
Bird	Passeriformes	Vangidae	Xenopirostris	<i>Xenopirostris polleni</i>
Bird	Passeriformes	Vangidae	Xenopirostris	<i>Xenopirostris xenopirostris</i>
Bird	Charadriiformes	Scolopacidae	Xenus	<i>Xenus cinereus</i>
Bird	Gruiformes	Rallidae	Zapornia	<i>Zapornia olivieri</i>
Bird	Gruiformes	Rallidae	Zapornia	<i>Zapornia pusilla</i>
Bird	Apodiformes	Apodidae	Zoonavena	<i>Zoonavena grandidieri</i>
Bird	Passeriformes	Zosteropidae	Zosterops	<i>Zosterops maderaspatanus</i>
Mammal	Primates	Cheirogaleidae	Allocebus	<i>Allocebus trichotis</i>
Mammal	Primates	Indriidae	Avahi	<i>Avahi betsileo</i>
Mammal	Primates	Indriidae	Avahi	<i>Avahi cleesei</i>
Mammal	Primates	Indriidae	Avahi	<i>Avahi laniger</i>
Mammal	Primates	Indriidae	Avahi	<i>Avahi meridionalis</i>
Mammal	Primates	Indriidae	Avahi	<i>Avahi mooreorum</i>
Mammal	Primates	Indriidae	Avahi	<i>Avahi occidentalis</i>
Mammal	Primates	Indriidae	Avahi	<i>Avahi peyrierasi</i>
Mammal	Primates	Indriidae	Avahi	<i>Avahi ramanantsoavanai</i>
Mammal	Primates	Indriidae	Avahi	<i>Avahi unicolor</i>

Mammal	Rodentia	Nesomyidae	Brachytarsomys	<i>Brachytarsomys albicauda</i>
Mammal	Rodentia	Nesomyidae	Brachytarsomys	<i>Brachytarsomys villosa</i>
Mammal	Rodentia	Nesomyidae	Brachyuromys	<i>Brachyuromys betsileoensis</i>
Mammal	Rodentia	Nesomyidae	Brachyuromys	<i>Brachyuromys ramirohitra</i>
Mammal	Chiroptera	Molossidae	Chaerephon	<i>Chaerephon jobimena</i>
Mammal	Chiroptera	Molossidae	Chaerephon	<i>Chaerephon atsinanana</i>
Mammal	Primates	Cheirogaleidae	Cheirogaleus	<i>Cheirogaleus crossleyi</i>
Mammal	Primates	Cheirogaleidae	Cheirogaleus	<i>Cheirogaleus major</i>
Mammal	Primates	Cheirogaleidae	Cheirogaleus	<i>Cheirogaleus medius</i>
Mammal	Primates	Cheirogaleidae	Cheirogaleus	<i>Cheirogaleus minusculus</i>
Mammal	Primates	Cheirogaleidae	Cheirogaleus	<i>Cheirogaleus sibreei</i>
Mammal	Chiroptera	Emballonuridae	Coleura	<i>Coleura kibomalandy</i>
Mammal	Carnivora	Eupleridae	Cryptoprocta	<i>Cryptoprocta ferox</i>
Mammal	Primates	Daubentoniiidae	Daubentonia	<i>Daubentonia madagascariensis</i>
Mammal	Afrosoricida	Tenrecidae	Echinops	<i>Echinops telfairi</i>
Mammal	Chiroptera	Pteropodidae	Eidolon	<i>Eidolon dupreanum</i>
Mammal	Rodentia	Nesomyidae	Eliurus	<i>Eliurus antsingy</i>
Mammal	Rodentia	Nesomyidae	Eliurus	<i>Eliurus danieli</i>
Mammal	Rodentia	Nesomyidae	Eliurus	<i>Eliurus ellermani</i>
Mammal	Rodentia	Nesomyidae	Eliurus	<i>Eliurus grandidieri</i>
Mammal	Rodentia	Nesomyidae	Eliurus	<i>Eliurus majori</i>
Mammal	Rodentia	Nesomyidae	Eliurus	<i>Eliurus minor</i>
Mammal	Rodentia	Nesomyidae	Eliurus	<i>Eliurus myoxinus</i>
Mammal	Rodentia	Nesomyidae	Eliurus	<i>Eliurus penicillatus</i>
Mammal	Rodentia	Nesomyidae	Eliurus	<i>Eliurus petteri</i>
Mammal	Rodentia	Nesomyidae	Eliurus	<i>Eliurus tanala</i>
Mammal	Rodentia	Nesomyidae	Eliurus	<i>Eliurus webbi</i>
Mammal	Chiroptera	Emballonuridae	Emballonura	<i>Paraemballonura atrata</i>
Mammal	Chiroptera	Emballonuridae	Emballonura	<i>Paraemballonura tiavato</i>
Mammal	Primates	Lemuridae	Eulemur	<i>Eulemur albifrons</i>
Mammal	Primates	Lemuridae	Eulemur	<i>Eulemur cinereiceps</i>
Mammal	Primates	Lemuridae	Eulemur	<i>Eulemur collaris</i>
Mammal	Primates	Lemuridae	Eulemur	<i>Eulemur coronatus</i>
Mammal	Primates	Lemuridae	Eulemur	<i>Eulemur flavifrons</i>
Mammal	Primates	Lemuridae	Eulemur	<i>Eulemur fulvus</i>
Mammal	Primates	Lemuridae	Eulemur	<i>Eulemur macaco</i>
Mammal	Primates	Lemuridae	Eulemur	<i>Eulemur mongoz</i>
Mammal	Primates	Lemuridae	Eulemur	<i>Eulemur rubriventer</i>
Mammal	Primates	Lemuridae	Eulemur	<i>Eulemur rufifrons</i>
Mammal	Primates	Lemuridae	Eulemur	<i>Eulemur rufus</i>
Mammal	Primates	Lemuridae	Eulemur	<i>Eulemur sanfordi</i>

Mammal	Carnivora	Eupleridae	Eupleres	<i>Eupleres goudotii</i>
Mammal	Carnivora	Eupleridae	Eupleres	<i>Eupleres major</i>
Mammal	Carnivora	Eupleridae	Fossa	<i>Fossa fossana</i>
Mammal	Carnivora	Eupleridae	Galidia	<i>Galidia elegans</i>
Mammal	Carnivora	Eupleridae	Galidictis	<i>Galidictis fasciata</i>
Mammal	Carnivora	Eupleridae	Galidictis	<i>Galidictis grandidieri</i>
Mammal	Afrosoricida	Tenrecidae	Geogale	<i>Geogale aurita</i>
Mammal	Rodentia	Nesomyidae	Gymnuromys	<i>Gymnuromys roberti</i>
Mammal	Primates	Lemuridae	Hapalemur	<i>Hapalemur alaotrensis</i>
Mammal	Primates	Lemuridae	Hapalemur	<i>Hapalemur aureus</i>
Mammal	Primates	Lemuridae	Hapalemur	<i>Hapalemur griseus</i>
Mammal	Primates	Lemuridae	Hapalemur	<i>Hapalemur meridionalis</i>
Mammal	Primates	Lemuridae	Hapalemur	<i>Hapalemur occidentalis</i>
Mammal	Afrosoricida	Tenrecidae	Hemicentetes	<i>Hemicentetes nigriceps</i>
Mammal	Afrosoricida	Tenrecidae	Hemicentetes	<i>Hemicentetes semispinosus</i>
Mammal	Chiroptera	Hipposideridae	Hipposideros	<i>Hipposideros commersoni</i>
Mammal	Rodentia	Nesomyidae	Hypogeomys	<i>Hypogeomys antimena</i>
Mammal	Primates	Indriidae	Indri	<i>Indri indri</i>
Mammal	Primates	Lemuridae	Lemur	<i>Lemur catta</i>
Mammal	Primates	Lepilemuridae	Lepilemur	<i>Lepilemur aeeclis</i>
Mammal	Primates	Lepilemuridae	Lepilemur	<i>Lepilemur ahmansonorum</i>
Mammal	Primates	Lepilemuridae	Lepilemur	<i>Lepilemur ankaranensis</i>
Mammal	Primates	Lepilemuridae	Lepilemur	<i>Lepilemur betsileo</i>
Mammal	Primates	Lepilemuridae	Lepilemur	<i>Lepilemur dorsalis</i>
Mammal	Primates	Lepilemuridae	Lepilemur	<i>Lepilemur edwardsi</i>
Mammal	Primates	Lepilemuridae	Lepilemur	<i>Lepilemur fleuretae</i>
Mammal	Primates	Lepilemuridae	Lepilemur	<i>Lepilemur grewcockorum</i>
Mammal	Primates	Lepilemuridae	Lepilemur	<i>Lepilemur hollandorum</i>
Mammal	Primates	Lepilemuridae	Lepilemur	<i>Lepilemur hubbardorum</i>
Mammal	Primates	Lepilemuridae	Lepilemur	<i>Lepilemur jamesorum</i>
Mammal	Primates	Lepilemuridae	Lepilemur	<i>Lepilemur leucopus</i>
Mammal	Primates	Lepilemuridae	Lepilemur	<i>Lepilemur microdon</i>
Mammal	Primates	Lepilemuridae	Lepilemur	<i>Lepilemur milanoii</i>
Mammal	Primates	Lepilemuridae	Lepilemur	<i>Lepilemur mittermeieri</i>
Mammal	Primates	Lepilemuridae	Lepilemur	<i>Lepilemur mustelinus</i>
Mammal	Primates	Lepilemuridae	Lepilemur	<i>Lepilemur otto</i>
Mammal	Primates	Lepilemuridae	Lepilemur	<i>Lepilemur petteri</i>
Mammal	Primates	Lepilemuridae	Lepilemur	<i>Lepilemur randrianasoloi</i>
Mammal	Primates	Lepilemuridae	Lepilemur	<i>Lepilemur ruficaudatus</i>
Mammal	Primates	Lepilemuridae	Lepilemur	<i>Lepilemur sahalamazensis</i>
Mammal	Primates	Lepilemuridae	Lepilemur	<i>Lepilemur scottorum</i>

Mammal	Primates	Lepilemuridae	Lepilemur	<i>Lepilemur seali</i>
Mammal	Primates	Lepilemuridae	Lepilemur	<i>Lepilemur septentrionalis</i>
Mammal	Primates	Lepilemuridae	Lepilemur	<i>Lepilemur tymerlachsonorum</i>
Mammal	Primates	Lepilemuridae	Lepilemur	<i>Lepilemur wrightae</i>
Mammal	Afrosoricida	Tenrecidae	Limnogale	<i>Microgale mergulus</i>
Mammal	Rodentia	Nesomyidae	Macrotrarsomys	<i>Macrotrarsomys bastardi</i>
Mammal	Rodentia	Nesomyidae	Macrotrarsomys	<i>Macrotrarsomys ingens</i>
Mammal	Rodentia	Nesomyidae	Macrotrarsomys	<i>Macrotrarsomys petteri</i>
Mammal	Primates	Cheirogaleidae	Microcebus	<i>Microcebus arnholdi</i>
Mammal	Primates	Cheirogaleidae	Microcebus	<i>Microcebus berthae</i>
Mammal	Primates	Cheirogaleidae	Microcebus	<i>Microcebus bongolavensis</i>
Mammal	Primates	Cheirogaleidae	Microcebus	<i>Microcebus danfossorum</i>
Mammal	Primates	Cheirogaleidae	Microcebus	<i>Microcebus gerpi</i>
Mammal	Primates	Cheirogaleidae	Microcebus	<i>Microcebus griseorufus</i>
Mammal	Primates	Cheirogaleidae	Microcebus	<i>Microcebus jollyae</i>
Mammal	Primates	Cheirogaleidae	Microcebus	<i>Microcebus lehilahytsara</i>
Mammal	Primates	Cheirogaleidae	Microcebus	<i>Microcebus macarthurii</i>
Mammal	Primates	Cheirogaleidae	Microcebus	<i>Microcebus mampiratra</i>
Mammal	Primates	Cheirogaleidae	Microcebus	<i>Microcebus margotmarshae</i>
Mammal	Primates	Cheirogaleidae	Microcebus	<i>Microcebus marohita</i>
Mammal	Primates	Cheirogaleidae	Microcebus	<i>Microcebus mittermeieri</i>
Mammal	Primates	Cheirogaleidae	Microcebus	<i>Microcebus murinus</i>
Mammal	Primates	Cheirogaleidae	Microcebus	<i>Microcebus myoxinus</i>
Mammal	Primates	Cheirogaleidae	Microcebus	<i>Microcebus ravelobensis</i>
Mammal	Primates	Cheirogaleidae	Microcebus	<i>Microcebus rufus</i>
Mammal	Primates	Cheirogaleidae	Microcebus	<i>Microcebus sambiranensis</i>
Mammal	Primates	Cheirogaleidae	Microcebus	<i>Microcebus simmonsii</i>
Mammal	Primates	Cheirogaleidae	Microcebus	<i>Microcebus tavaratra</i>
Mammal	Afrosoricida	Tenrecidae	Microgale	<i>Microgale brevicaudata</i>
Mammal	Afrosoricida	Tenrecidae	Microgale	<i>Microgale cowani</i>
Mammal	Afrosoricida	Tenrecidae	Microgale	<i>Nesogale dobsoni</i>
Mammal	Afrosoricida	Tenrecidae	Microgale	<i>Microgale drouhardi</i>
Mammal	Afrosoricida	Tenrecidae	Microgale	<i>Microgale dryas</i>
Mammal	Afrosoricida	Tenrecidae	Microgale	<i>Microgale fotsifotsy</i>
Mammal	Afrosoricida	Tenrecidae	Microgale	<i>Microgale gracilis</i>
Mammal	Afrosoricida	Tenrecidae	Microgale	<i>Microgale grandidieri</i>
Mammal	Afrosoricida	Tenrecidae	Microgale	<i>Microgale gymnorrhyncha</i>
Mammal	Afrosoricida	Tenrecidae	Microgale	<i>Microgale jenkinsae</i>
Mammal	Afrosoricida	Tenrecidae	Microgale	<i>Microgale jobihely</i>
Mammal	Afrosoricida	Tenrecidae	Microgale	<i>Microgale longicaudata</i>
Mammal	Afrosoricida	Tenrecidae	Microgale	<i>Microgale majori</i>

Mammal	Afrosoricida	Tenrecidae	Microgale	<i>Microgale monticola</i>
Mammal	Afrosoricida	Tenrecidae	Microgale	<i>Microgale nasoloi</i>
Mammal	Afrosoricida	Tenrecidae	Microgale	<i>Microgale parvula</i>
Mammal	Afrosoricida	Tenrecidae	Microgale	<i>Microgale principula</i>
Mammal	Afrosoricida	Tenrecidae	Microgale	<i>Microgale pusilla</i>
Mammal	Afrosoricida	Tenrecidae	Microgale	<i>Microgale soricoides</i>
Mammal	Afrosoricida	Tenrecidae	Microgale	<i>Microgale taiva</i>
Mammal	Afrosoricida	Tenrecidae	Microgale	<i>Nesogale talazaci</i>
Mammal	Afrosoricida	Tenrecidae	Microgale	<i>Microgale thomasi</i>
Mammal	Chiroptera	Vespertilionidae	Miniopterus	<i>Miniopterus gleni</i>
Mammal	Chiroptera	Vespertilionidae	Miniopterus	<i>Miniopterus majori</i>
Mammal	Chiroptera	Vespertilionidae	Miniopterus	<i>Miniopterus manavi</i>
Mammal	Chiroptera	Vespertilionidae	Miniopterus	<i>Miniopterus petersoni</i>
Mammal	Chiroptera	Vespertilionidae	Miniopterus	<i>Miniopterus sororculus</i>
Mammal	Primates	Cheirogaleidae	Mirza	<i>Mirza coquereli</i>
Mammal	Primates	Cheirogaleidae	Mirza	<i>Mirza zaza</i>
Mammal	Rodentia	Nesomyidae	Monticolomys	<i>Monticolomys koopmani</i>
Mammal	Chiroptera	Molossidae	Mops	<i>Mops leucostigma</i>
Mammal	Chiroptera	Molossidae	Mops	<i>Mops midas</i>
Mammal	Chiroptera	Molossidae	Mormopterus	<i>Mormopterus jugularis</i>
Mammal	Carnivora	Eupleridae	Mungotictis	<i>Mungotictis decemlineata</i>
Mammal	Chiroptera	Vespertilionidae	Myotis	<i>Myotis goudoti</i>
Mammal	Chiroptera	Myzopodidae	Myzopoda	<i>Myzopoda aurita</i>
Mammal	Chiroptera	Myzopodidae	Myzopoda	<i>Myzopoda schliemanni</i>
Mammal	Chiroptera	Vespertilionidae	Neoromicia	<i>Neoromicia malagasyensis</i>
Mammal	Chiroptera	Vespertilionidae	Neoromicia	<i>Neoromicia matroka</i>
Mammal	Chiroptera	Vespertilionidae	Neoromicia	<i>Neoromicia melckorum</i>
Mammal	Chiroptera	Vespertilionidae	Neoromicia	<i>Neoromicia nana</i>
Mammal	Rodentia	Nesomyidae	Nesomys	<i>Nesomys audeberti</i>
Mammal	Rodentia	Nesomyidae	Nesomys	<i>Nesomys lambertoni</i>
Mammal	Rodentia	Nesomyidae	Nesomys	<i>Nesomys rufus</i>
Mammal	Chiroptera	Nycteridae	Nycteris	<i>Nycteris madagascariensis</i>
Mammal	Afrosoricida	Tenrecidae	Oryzorictes	<i>Oryzorictes hova</i>
Mammal	Afrosoricida	Tenrecidae	Oryzorictes	<i>Oryzorictes tetradactylus</i>
Mammal	Chiroptera	Molossidae	Otomops	<i>Otomops madagascariensis</i>
Mammal	Primates	Cheirogaleidae	Phaner	<i>Phaner electromontis</i>
Mammal	Primates	Cheirogaleidae	Phaner	<i>Phaner furcifer</i>
Mammal	Primates	Cheirogaleidae	Phaner	<i>Phaner pallescens</i>
Mammal	Primates	Cheirogaleidae	Phaner	<i>Phaner parienti</i>
Mammal	Chiroptera	Vespertilionidae	Pipistrellus	<i>Pipistrellus anchietae</i>
Mammal	Chiroptera	Vespertilionidae	Pipistrellus	<i>Pipistrellus hesperidus</i>

Mammal	Chiroptera	Vespertilionidae	Pipistrellus	<i>Pipistrellus kuhlii</i>
Mammal	Chiroptera	Vespertilionidae	Pipistrellus	<i>Pipistrellus raceyi</i>
Mammal	Primates	Lemuridae	Prolemur	<i>Prolemur simus</i>
Mammal	Primates	Indriidae	Propithecus	<i>Propithecus candidus</i>
Mammal	Primates	Indriidae	Propithecus	<i>Propithecus coquereli</i>
Mammal	Primates	Indriidae	Propithecus	<i>Propithecus coronatus</i>
Mammal	Primates	Indriidae	Propithecus	<i>Propithecus deckenii</i>
Mammal	Primates	Indriidae	Propithecus	<i>Propithecus diadema</i>
Mammal	Primates	Indriidae	Propithecus	<i>Propithecus edwardsi</i>
Mammal	Primates	Indriidae	Propithecus	<i>Propithecus perrieri</i>
Mammal	Primates	Indriidae	Propithecus	<i>Propithecus tattersalli</i>
Mammal	Primates	Indriidae	Propithecus	<i>Propithecus verreauxi</i>
Mammal	Chiroptera	Pteropodidae	Pteropus	<i>Pteropus rufus</i>
Mammal	Chiroptera	Pteropodidae	Rousettus	<i>Rousettus madagascariensis</i>
Mammal	Carnivora	Eupleridae	Salanoia	<i>Salanoia concolor</i>
Mammal	Chiroptera	Vespertilionidae	Scotophilus	<i>Scotophilus marovaza</i>
Mammal	Chiroptera	Vespertilionidae	Scotophilus	<i>Scotophilus robustus</i>
Mammal	Chiroptera	Vespertilionidae	Scotophilus	<i>Scotophilus tandrefana</i>
Mammal	Afrosoricida	Tenrecidae	Setifer	<i>Setifer setosus</i>
Mammal	Eulipotyphla	Soricidae	Suncus	<i>Suncus madagascariensis</i>
Mammal	Eulipotyphla	Soricidae	Suncus	<i>Suncus murinus</i>
Mammal	Chiroptera	Molossidae	Tadarida	<i>Tadarida fulminans</i>
Mammal	Chiroptera	Emballonuridae	Taphozous	<i>Taphozous mauritanus</i>
Mammal	Afrosoricida	Tenrecidae	Tenrec	<i>Tenrec ecaudatus</i>
Mammal	Chiroptera	Hipposideridae	Triaenops	<i>Triaenops auritus</i>
Mammal	Chiroptera	Hipposideridae	Triaenops	<i>Triaenops furculus</i>
Mammal	Chiroptera	Hipposideridae	Triaenops	<i>Triaenops menamena</i>
Mammal	Primates	Lemuridae	Varecia	<i>Varecia rubra</i>
Mammal	Primates	Lemuridae	Varecia	<i>Varecia variegata</i>
Mammal	Rodentia	Nesomyidae	Voalavo	<i>Voalavo antsahebensis</i>
Mammal	Rodentia	Nesomyidae	Voalavo	<i>Voalavo gymnocaudus</i>

**Table A2.** Trait data used to measure functional diversity in this study. All data were from the Malagasy Animal trait Data Archive (MADA) by Razafindratsima et al. (2018a, b). Species with missing data were assigned genus-level means (or extrapolation for categorical variables).

Trait	Description - Range or categories
<u>Mammal</u>	
Adult body mass	2.47 – 9500 g
Diet breadth	Number of dietary categories, defined as vertebrate, invertebrate, fruit, flower/nectar/pollen/gum, seeds, other plant materials, other food items (carrion, scavenge, insect secretions etc.)*
Habitat breadth	Number of habitat layer used, categorized as above-ground dwelling, aquatic, fossorial and ground dwelling <sup>#</sup>
Trophic level	(1) Herbivore, (2) omnivore (vertebrate and/or invertebrate plus any other dietary category and (3) carnivore (vertebrate and/or invertebrate only) <sup>#</sup>
Activity cycle	(1) Nocturnal, (2) nocturnal/crepuscular, cathemeral, crepuscular or diurnal/crepuscular, and (3) diurnal <sup>#</sup>
Foraging stratum	(1) ground level (including aquatic foraging), (2) scansorial, (3) arboreal, (4) aerial <sup>\$</sup>
<u>Bird</u>	
Adult body mass	6.50 – 5445 g
Diet breadth	<i>Same as for mammals</i>
Trophic level	<i>Same as for mammals</i>
Foraging stratum	<i>Same as for mammals</i>
Activity cycle	<i>Same as for mammals</i>

\* *Categories following* Kissling et al. (2014) and Wilman et al. (2014)

<sup>#</sup> *Definition following* Jones et al. (2009)

<sup>\$</sup> *Definition following* Wilman et al. (2014)



**Table A3.** Results of generalized linear models, examining how plant diversity influence animal diversity. Metrics used: SR: Species Richness, PD: Faith's Phylogenetic Diversity, MPD: Mean pairwise Phylogenetic Distance, FD: Functional Diversity, SES: Standardized Effect Size of each metric. Significant patterns are highlighted in yellow.

plant.taxa	plant.status	animal.taxa	metric	scale	intercept	slope	t.value	p.value	AIC	Deviance
vascular	all	mammals	SR	province	84.869	0.004	0.406	0.706	53.713	998.268
vascular	all	mammals	PD	province	1883.235	0.002	0.442	0.681	80.828	91597.301
vascular	all	mammals	SES.PD	province	2.321	-0.039	-0.359	0.738	6.759	0.399
vascular	all	mammals	MPD	province	131.55	0.091	0.761	0.489	33.58	34.835
vascular	all	mammals	SES.MPD	province	3.876	-0.039	-1.021	0.365	10.811	0.783
vascular	all	birds	SR	province	152.231	0.01	0.779	0.479	57.268	1805.436
vascular	all	birds	PD	province	4877.859	0.008	0.779	0.480	93.915	811297.556
vascular	all	birds	SES.PD	province	0.936	-0.141	-0.53	0.624	17.417	2.355
vascular	all	birds	MPD	province	161.024	-0.028	-1.694	0.166	9.789	0.661
vascular	all	birds	SES.MPD	province	0.025	-0.049	-0.946	0.398	14.256	1.391
vascular	all	primates	SR	province	14.202	0.004	0.588	0.588	49.605	503.382
vascular	all	primates	PD	province	263.946	0.001	0.647	0.553	75.248	36141.547
vascular	all	primates	SES.PD	province	1.591	-0.138	-0.477	0.658	18.502	2.822
vascular	all	primates	MPD	province	14.473	0.125	2.194	0.093	24.67	7.889
vascular	all	primates	SES.MPD	province	1.681	0.054	1.699	0.165	8.455	0.529
vascular	native	mammals	SR	province	86.273	0.004	0.41	0.703	53.708	997.461
vascular	native	mammals	PD	province	1895.849	0.002	0.439	0.684	80.832	91662.22
vascular	native	mammals	SES.PD	province	2.392	-0.041	-0.405	0.706	6.709	0.395
vascular	native	mammals	MPD	province	134.613	0.081	0.761	0.489	33.581	34.837
vascular	native	mammals	SES.MPD	province	3.941	-0.041	-1.08	0.341	10.665	0.764
vascular	native	birds	SR	province	156.725	0.01	0.769	0.485	57.289	1811.641
vascular	native	birds	PD	province	4946.365	0.009	0.77	0.484	93.932	813615.32
vascular	native	birds	SES.PD	province	1.248	-0.17	-0.703	0.521	17.126	2.244
vascular	native	birds	MPD	province	159.978	-0.024	-1.655	0.173	9.903	0.673

vascular	native	birds	SES.MPD	province	0.081	-0.048	-0.913	0.413	14.33	1.408
vascular	native	primates	SR	province	15.561	0.004	0.597	0.583	49.589	502.072
vascular	native	primates	PD	province	274.03	0.002	0.647	0.553	75.247	36136.152
vascular	native	primates	SES.PD	province	1.805	-0.132	-0.487	0.651	18.488	2.816
vascular	native	primates	MPD	province	18.569	0.111	2.208	0.092	24.629	7.836
vascular	native	primates	SES.MPD	province	1.629	0.051	1.552	0.196	8.885	0.568
angiosperm	all	mammals	SR	province	82.222	0.005	0.478	0.658	53.622	983.245
angiosperm	all	mammals	PD	province	1850.034	0.002	0.543	0.616	80.687	89481.818
angiosperm	all	mammals	SES.PD	province	2.217	-0.085	-1.052	0.352	5.485	0.322
angiosperm	all	mammals	MPD	province	110.765	0.178	0.923	0.408	33.234	32.879
angiosperm	all	mammals	SES.MPD	province	3.638	-0.013	-0.402	0.709	11.963	0.949
angiosperm	all	birds	SR	province	146.677	0.012	0.909	0.415	56.989	1723.507
angiosperm	all	birds	PD	province	4751.171	0.01	0.937	0.402	93.57	765978.265
angiosperm	all	birds	SES.PD	province	0.843	0.056	0.249	0.816	17.732	2.482
angiosperm	all	birds	MPD	province	163.834	-0.042	-1.44	0.223	10.527	0.747
angiosperm	all	birds	SES.MPD	province	-0.29	-0.031	-0.772	0.483	14.632	1.481
angiosperm	all	primates	SR	province	13.631	0.004	0.618	0.570	49.555	499.19
angiosperm	all	primates	PD	province	261.495	0.002	0.694	0.526	75.162	35629.056
angiosperm	all	primates	SES.PD	province	1.215	-0.308	-1.605	0.184	15.85	1.814
angiosperm	all	primates	MPD	province	-4.759	0.211	2.287	0.084	24.394	7.535
angiosperm	all	primates	SES.MPD	province	2.059	0.053	3.208	0.033	4.073	0.255
angiosperm	native	mammals	SR	province	84.035	0.005	0.482	0.655	53.616	982.296
angiosperm	native	mammals	PD	province	1865.696	0.002	0.541	0.617	80.69	89515.84
angiosperm	native	mammals	SES.PD	province	2.353	-0.098	-1.214	0.291	5.066	0.301
angiosperm	native	mammals	MPD	province	116.269	0.159	0.878	0.430	33.334	33.434
angiosperm	native	mammals	SES.MPD	province	3.63	-0.017	-0.511	0.636	11.821	0.927
angiosperm	native	birds	SR	province	152.073	0.012	0.898	0.420	57.013	1730.355
angiosperm	native	birds	PD	province	4832.898	0.01	0.932	0.404	93.583	767571.549
angiosperm	native	birds	SES.PD	province	0.788	0.016	0.069	0.948	17.817	2.518
angiosperm	native	birds	MPD	province	163.277	-0.04	-1.501	0.208	10.352	0.726

angiosperm	native	birds	SES.MPD	province	-0.297	-0.032	-0.788	0.475	14.601	1.473
angiosperm	native	primates	SR	province	15.208	0.004	0.627	0.564	49.538	497.841
angiosperm	native	primates	PD	province	273.353	0.002	0.695	0.525	75.16	35615.729
angiosperm	native	primates	SES.PD	province	1.697	-0.342	-1.811	0.144	15.24	1.639
angiosperm	native	primates	MPD	province	-0.279	0.195	2.27	0.086	24.443	7.597
angiosperm	native	primates	SES.MPD	province	2.066	0.053	2.873	0.045	4.998	0.297
vascular	all	mammals	SR	region	37.44	0.014	4.073	0.001	188.693	5205
vascular	all	mammals	PD	region	1200.231	0.007	4.368	0.000	303.743	971824.126
vascular	all	mammals	SES.PD	region	2.552	-0.033	-0.588	0.563	41.388	6.435
vascular	all	mammals	MPD	region	153.58	0.03	1.244	0.228	109.509	142.328
vascular	all	mammals	SES.MPD	region	2.797	0.09	3.97	0.001	48.89	9.049
vascular	all	birds	SR	region	139.258	0.014	3.949	0.001	191.924	6028.578
vascular	all	birds	PD	region	4717.223	0.011	3.304	0.004	333.158	3700438.832
vascular	all	birds	SES.PD	region	0.813	-0.02	-0.203	0.841	66.202	19.878
vascular	all	birds	MPD	region	162.545	-0.033	-3.736	0.001	66.27	19.94
vascular	all	birds	SES.MPD	region	-0.019	-0.11	-3.751	0.001	60.035	15.019
vascular	all	primates	SR	region	5.21	0.005	4.296	0.000	145.085	717.098
vascular	all	primates	PD	region	74.9	0.003	4.943	0.000	264.356	162205.323
vascular	all	primates	SES.PD	region	1.807	0.203	2.046	0.054	66.224	19.898
vascular	all	primates	MPD	region	7.876	0.139	0.924	0.367	190.567	5667.895
vascular	all	primates	SES.MPD	region	1.629	0.097	3.205	0.004	61.452	16.018
vascular	native	mammals	SR	region	38.348	0.015	4.129	0.001	188.422	5141.345
vascular	native	mammals	PD	region	1212.394	0.008	4.383	0.000	303.67	968619.793
vascular	native	mammals	SES.PD	region	2.59	-0.067	-1.052	0.305	40.58	6.203
vascular	native	mammals	MPD	region	154.084	0.028	1.237	0.230	109.527	142.442
vascular	native	mammals	SES.MPD	region	2.709	0.089	3.916	0.001	49.153	9.158
vascular	native	birds	SR	region	140.291	0.016	3.979	0.001	191.775	5987.781
vascular	native	birds	PD	region	4731.684	0.012	3.338	0.003	332.999	3673804.27
vascular	native	birds	SES.PD	region	0.831	-0.02	-0.179	0.860	66.212	19.887
vascular	native	birds	MPD	region	161.652	-0.03	-3.502	0.002	67.398	20.989

vascular	native	birds	SES.MPD	region	0.085	-0.107	-3.63	0.002	60.621	15.424
vascular	native	primates	SR	region	5.588	0.006	4.339	0.000	144.873	710.223
vascular	native	primates	PD	region	80.335	0.004	4.971	0.000	264.218	161190.228
vascular	native	primates	SES.PD	region	1.633	0.186	1.569	0.132	67.852	21.426
vascular	native	primates	MPD	region	15.757	0.112	0.79	0.439	190.81	5730.786
vascular	native	primates	SES.MPD	region	1.534	0.096	3.191	0.005	61.52	16.067
angiosperm	all	mammals	SR	region	37.397	0.015	3.885	0.001	189.613	5427.458
angiosperm	all	mammals	PD	region	1205.154	0.008	4.149	0.000	304.819	1020525.617
angiosperm	all	mammals	SES.PD	region	2.502	-0.041	-0.61	0.549	41.359	6.426
angiosperm	all	mammals	MPD	region	148.362	0.053	0.877	0.391	110.32	147.673
angiosperm	all	mammals	SES.MPD	region	3.208	0.06	1.704	0.104	58.691	14.129
angiosperm	all	birds	SR	region	137.738	0.016	4.11	0.001	191.135	5816.076
angiosperm	all	birds	PD	region	4674.593	0.013	3.514	0.002	332.164	3537073.945
angiosperm	all	birds	SES.PD	region	1.196	0.211	1.972	0.063	62.34	16.678
angiosperm	all	birds	MPD	region	167.658	-0.056	-2.183	0.041	73.214	27.34
angiosperm	all	birds	SES.MPD	region	-0.535	-0.076	-1.737	0.098	68.665	22.233
angiosperm	all	primates	SR	region	4.995	0.006	4.224	0.000	145.438	728.685
angiosperm	all	primates	PD	region	73.308	0.004	4.833	0.000	264.896	166234.33
angiosperm	all	primates	SES.PD	region	1.794	0.066	0.516	0.612	70.113	23.746
angiosperm	all	primates	MPD	region	53.198	-0.008	-0.021	0.983	191.485	5909.465
angiosperm	all	primates	SES.MPD	region	2.155	0.083	1.97	0.063	66.671	20.306
angiosperm	native	mammals	SR	region	38.363	0.017	3.93	0.001	189.395	5373.965
angiosperm	native	mammals	PD	region	1218.867	0.009	4.154	0.000	304.795	1019433.149
angiosperm	native	mammals	SES.PD	region	2.496	-0.075	-1.039	0.311	40.608	6.21
angiosperm	native	mammals	MPD	region	149.078	0.05	0.858	0.401	110.354	147.9
angiosperm	native	mammals	SES.MPD	region	3.198	0.06	1.598	0.126	59.03	14.348
angiosperm	native	birds	SR	region	138.784	0.018	4.163	0.000	190.876	5747.956
angiosperm	native	birds	PD	region	4689.754	0.014	3.566	0.002	331.914	3497111.016
angiosperm	native	birds	SES.PD	region	1.102	0.266	2.331	0.030	60.958	15.662
angiosperm	native	birds	MPD	region	167.262	-0.055	-2.196	0.040	73.166	27.281

angiosperm	native	birds	SES.MPD	region	-0.517	-0.075	-1.602	0.125	69.099	22.675
angiosperm	native	primates	SR	region	5.392	0.007	4.268	0.000	145.223	721.624
angiosperm	native	primates	PD	region	79.384	0.004	4.856	0.000	264.78	165359.146
angiosperm	native	primates	SES.PD	region	1.636	-0.04	-0.287	0.777	70.314	23.963
angiosperm	native	primates	MPD	region	46.767	0.016	0.042	0.967	191.484	5909.075
angiosperm	native	primates	SES.MPD	region	2.147	0.084	1.88	0.075	66.992	20.605

**Table A4.** Comparisons of plant and animal species diversity turnover/nestedness at multiple scales using partial Mantel tests. Sorenson: Sorenson's similarity index, PD: Faith's phylogenetic diversity, MPD: Mean Phylogenetic Distance, SES: Standardized Effect Size of each metric. Significant patterns are highlighted in yellow.

metric	level	comparison	r	p-value
MPD	province	angiosperms-birds	-0.506	0.892
MPD	province	angiosperms-mammals	0.353	0.247
MPD	province	vascular plants-birds	-0.506	0.846
MPD	province	vascular plants-mammals	0.384	0.203
SES.MPD	province	angiosperms-birds	-0.477	0.840
SES.MPD	province	angiosperms-mammals	-0.210	0.669
SES.MPD	province	vascular plants-birds	-0.477	0.828
SES.MPD	province	vascular plants-mammals	-0.303	0.740
PD	province	angiosperms-birds	0.363	0.176
PD	province	angiosperms-mammals	0.548	0.069
PD	province	vascular plants-birds	0.363	0.235
PD	province	vascular plants-mammals	0.492	0.101
SES.PD	province	angiosperms-birds	0.535	0.006
SES.PD	province	angiosperms-mammals	0.476	0.031
SES.PD	province	vascular plants-birds	0.535	0.011
SES.PD	province	vascular plants-mammals	0.551	0.011
sorenson	province	angiosperms-birds	0.554	0.007
sorenson	province	angiosperms-mammals	0.631	0.003
sorenson	province	vascular plants-birds	0.554	0.013
sorenson	province	vascular plants-mammals	0.640	0.003
MPD	region	angiosperms-birds	0.125	0.100
MPD	region	angiosperms-mammals	0.022	0.421
MPD	region	vascular plants-birds	0.125	0.285
MPD	region	vascular plants-mammals	-0.050	0.668
SES.MPD	region	angiosperms-birds	0.112	0.131
SES.MPD	region	angiosperms-mammals	-0.149	0.756
SES.MPD	region	vascular plants-birds	0.112	0.281
SES.MPD	region	vascular plants-mammals	-0.095	0.675
PD	region	angiosperms-birds	0.007	0.481
PD	region	angiosperms-mammals	-0.139	0.781
PD	region	vascular plants-birds	0.007	0.455
PD	region	vascular plants-mammals	-0.132	0.779
SES.PD	region	angiosperms-birds	0.089	0.060
SES.PD	region	angiosperms-mammals	-0.018	0.547
SES.PD	region	vascular plants-birds	0.089	0.102
SES.PD	region	vascular plants-mammals	-0.023	0.578

sorenson	region	angiosperms-birds	-0.050	0.606
sorenson	region	angiosperms-mammals	-0.037	0.601
sorenson	region	vascular plants-birds	-0.050	0.656
sorenson	region	vascular plants-mammals	-0.044	0.623

**Table A5.** Results of generalized linear models, examining how plant taxonomic and phylogenetic diversity influence animal functional diversity (FD). Metrics used: SR: Species Richness, PD: Faith's Phylogenetic Diversity, MPD: Mean pairwise Phylogenetic Distance, SES: Standardized Effect Size of each metric. Significant patterns are highlighted in yellow.

animal taxa	metric of plant taxa	plant.taxa	plant.status	scale	intercept	slope	t.value	p.value	AIC	Deviance
mammals	SR	vascular	all	province	2.708	0	0.438	0.684	2.738	0.204
mammals	PD	vascular	all	province	2.636	0	0.467	0.665	2.7	0.203
mammals	PD.s	vascular	all	province	2.953	0.025	0.319	0.766	2.867	0.208
mammals	MPD	vascular	all	province	6.358	-0.011	-1.36	0.245	0.737	0.146
mammals	MPD.s	vascular	all	province	3.078	-0.018	-1.011	0.369	1.654	0.17
birds	SR	vascular	all	province	2.277	0	0.729	0.506	-6.694	0.042
birds	PD	vascular	all	province	2.234	0	0.743	0.499	-6.721	0.042
birds	PD.s	vascular	all	province	2.478	0.004	0.096	0.928	-5.959	0.048
birds	MPD	vascular	all	province	4	-0.005	-1.26	0.276	-7.951	0.034
birds	MPD.s	vascular	all	province	2.534	-0.009	-1.124	0.324	-7.592	0.036
primates	SR	vascular	all	province	2.553	0	-1.229	0.286	12.137	0.977
primates	PD	vascular	all	province	2.919	0	-1.273	0.272	12.019	0.958
primates	PD.s	vascular	all	province	1.13	-0.239	-1.485	0.212	11.424	0.868
primates	MPD	vascular	all	province	5.677	-0.015	-0.668	0.541	13.425	1.211
primates	MPD.s	vascular	all	province	1.157	-0.047	-1.04	0.357	12.624	1.06
mammals	SR	vascular	all	region	1.935	0	3.678	0.001	19.451	2.374
mammals	PD	vascular	all	region	1.787	0	4.027	0.001	17.755	2.198
mammals	PD.s	vascular	all	region	2.559	0.122	3.466	0.002	20.467	2.486
mammals	MPD	vascular	all	region	-0.462	0.009	2.811	0.011	23.495	2.853
mammals	MPD.s	vascular	all	region	2.427	0.036	2.789	0.011	23.591	2.866
birds	SR	vascular	all	region	2.273	0	2.308	0.032	-35.007	0.2
birds	PD	vascular	all	region	2.249	0	2.392	0.027	-35.346	0.197
birds	PD.s	vascular	all	region	2.377	0.006	0.545	0.592	-30.137	0.249
birds	MPD	vascular	all	region	2.854	-0.002	-1.642	0.116	-32.596	0.223



birds	MPD.s	vascular	all	region	2.38	-0.005	-1.376	0.184	-31.802	0.231
primates	SR	vascular	all	region	1.394	0	-1.043	0.309	-1.439	0.919
primates	PD	vascular	all	region	1.409	0	-0.998	0.33	-1.343	0.923
primates	PD.s	vascular	all	region	1.296	-0.002	-0.072	0.943	-0.279	0.968
primates	MPD	vascular	all	region	1.208	0	0.146	0.885	-0.297	0.967
primates	MPD.s	vascular	all	region	1.297	0	0.021	0.983	-0.274	0.968
mammals	SR	vascular	native	province	2.726	0	0.447	0.678	2.725	0.204
mammals	PD	vascular	native	province	2.656	0	0.463	0.667	2.705	0.203
mammals	PD.s	vascular	native	province	2.983	-0.002	-0.029	0.979	3.017	0.214
mammals	MPD	vascular	native	province	6.028	-0.009	-1.376	0.241	0.692	0.145
mammals	MPD.s	vascular	native	province	3.104	-0.019	-1.03	0.361	1.606	0.169
birds	SR	vascular	native	province	2.302	0	0.698	0.524	-6.635	0.043
birds	PD	vascular	native	province	2.25	0	0.731	0.506	-6.697	0.042
birds	PD.s	vascular	native	province	2.474	0.003	0.085	0.936	-5.956	0.048
birds	MPD	vascular	native	province	3.823	-0.004	-1.237	0.284	-7.89	0.035
birds	MPD.s	vascular	native	province	2.546	-0.009	-1.116	0.327	-7.573	0.037
primates	SR	vascular	native	province	2.436	0	-1.264	0.275	12.042	0.962
primates	PD	vascular	native	province	2.84	0	-1.295	0.265	11.958	0.948
primates	PD.s	vascular	native	province	1.221	-0.123	-0.693	0.526	13.378	1.202
primates	MPD	vascular	native	province	4.479	-0.011	-0.55	0.612	13.622	1.251
primates	MPD.s	vascular	native	province	1.203	-0.045	-0.977	0.384	12.776	1.087
mammals	SR	vascular	native	region	1.954	0	3.711	0.001	19.292	2.357
mammals	PD	vascular	native	region	1.805	0	4.027	0.001	17.756	2.198
mammals	PD.s	vascular	native	region	2.451	0.131	3.113	0.005	22.126	2.681
mammals	MPD	vascular	native	region	-0.162	0.008	2.601	0.017	24.406	2.974
mammals	MPD.s	vascular	native	region	2.391	0.036	2.821	0.011	23.449	2.847
birds	SR	vascular	native	region	2.279	0	2.242	0.036	-34.745	0.202
birds	PD	vascular	native	region	2.253	0	2.378	0.027	-35.291	0.197
birds	PD.s	vascular	native	region	2.37	0.013	1.007	0.326	-30.901	0.241
birds	MPD	vascular	native	region	2.856	-0.002	-1.752	0.095	-32.953	0.219

birds	MPD.s	vascular	native	region	2.384	-0.005	-1.266	0.22	-31.508	0.234
primates	SR	vascular	native	region	1.388	0	-1.015	0.322	-1.379	0.921
primates	PD	vascular	native	region	1.405	0	-0.99	0.334	-1.327	0.923
primates	PD.s	vascular	native	region	1.299	-0.006	-0.233	0.818	-0.333	0.966
primates	MPD	vascular	native	region	1.191	0	0.183	0.856	-0.311	0.967
primates	MPD.s	vascular	native	region	1.297	0	0.015	0.988	-0.274	0.968
mammals	SR	angio	all	province	2.685	0	0.483	0.654	2.678	0.202
mammals	PD	angio	all	province	2.598	0	0.552	0.61	2.578	0.199
mammals	PD.s	angio	all	province	3.032	0.07	1.245	0.281	1.054	0.154
mammals	MPD	angio	all	province	7.45	-0.016	-1.192	0.299	1.194	0.158
mammals	MPD.s	angio	all	province	2.958	-0.013	-0.954	0.394	1.788	0.174
birds	SR	angio	all	province	2.267	0	0.783	0.477	-6.801	0.042
birds	PD	angio	all	province	2.226	0	0.819	0.459	-6.874	0.041
birds	PD.s	angio	all	province	2.503	0.027	0.948	0.397	-7.161	0.039
birds	MPD	angio	all	province	5.167	-0.01	-1.705	0.163	-9.222	0.028
birds	MPD.s	angio	all	province	2.467	-0.01	-1.803	0.146	-9.515	0.026
primates	SR	angio	all	province	2.419	0	-1.12	0.325	12.423	1.025
primates	PD	angio	all	province	2.677	0	-1.147	0.315	12.353	1.013
primates	PD.s	angio	all	province	0.799	-0.125	-0.819	0.459	13.129	1.153
primates	MPD	angio	all	province	8.214	-0.026	-0.708	0.518	13.351	1.196
primates	MPD.s	angio	all	province	0.859	-0.026	-0.725	0.508	13.318	1.19
mammals	SR	angio	all	region	1.932	0	3.546	0.002	20.087	2.444
mammals	PD	angio	all	region	1.791	0	3.873	0.001	18.504	2.274
mammals	PD.s	angio	all	region	2.638	0.089	1.832	0.082	27.404	3.408
mammals	MPD	angio	all	region	-0.916	0.012	1.311	0.205	29.005	3.665
mammals	MPD.s	angio	all	region	2.537	0.012	0.651	0.523	30.357	3.897
birds	SR	angio	all	region	2.264	0	2.494	0.022	-35.769	0.193
birds	PD	angio	all	region	2.239	0	2.607	0.017	-36.249	0.189
birds	PD.s	angio	all	region	2.404	0.018	1.411	0.173	-31.902	0.23
birds	MPD	angio	all	region	4.1	-0.006	-3.08	0.006	-38.353	0.172

birds	MPD.s	angio	all	region	2.31	-0.014	-3.983	0.001	-42.66	0.141
primates	SR	angio	all	region	1.402	0	-1.102	0.284	-1.571	0.913
primates	PD	angio	all	region	1.416	0	-1.043	0.309	-1.439	0.919
primates	PD.s	angio	all	region	1.295	-0.001	-0.055	0.957	-0.277	0.968
primates	MPD	angio	all	region	1.066	0.001	0.174	0.864	-0.307	0.967
primates	MPD.s	angio	all	region	1.312	0.003	0.361	0.722	-0.416	0.962
mammals	SR	angio	native	province	2.709	0	0.493	0.648	2.664	0.201
mammals	PD	angio	native	province	2.622	0	0.549	0.612	2.583	0.199
mammals	PD.s	angio	native	province	2.94	0.053	0.845	0.446	2.034	0.181
mammals	MPD	angio	native	province	7.169	-0.015	-1.209	0.293	1.149	0.157
mammals	MPD.s	angio	native	province	2.955	-0.013	-0.961	0.391	1.773	0.174
birds	SR	angio	native	province	2.295	0	0.75	0.495	-6.734	0.042
birds	PD	angio	native	province	2.244	0	0.806	0.466	-6.847	0.041
birds	PD.s	angio	native	province	2.462	0.028	0.973	0.386	-7.219	0.039
birds	MPD	angio	native	province	4.951	-0.009	-1.681	0.168	-9.151	0.028
birds	MPD.s	angio	native	province	2.466	-0.01	-1.784	0.149	-9.459	0.027
primates	SR	angio	native	province	2.302	0	-1.154	0.313	12.335	1.01
primates	PD	angio	native	province	2.592	0	-1.167	0.308	12.302	1.004
primates	PD.s	angio	native	province	0.941	-0.061	-0.366	0.733	13.862	1.302
primates	MPD	angio	native	province	7.999	-0.025	-0.746	0.497	13.279	1.182
primates	MPD.s	angio	native	province	0.851	-0.028	-0.78	0.479	13.209	1.168
mammals	SR	angio	native	region	1.952	0	3.572	0.002	19.963	2.43
mammals	PD	angio	native	region	1.811	0	3.865	0.001	18.543	2.278
mammals	PD.s	angio	native	region	2.547	0.062	1.109	0.281	29.505	3.749
mammals	MPD	angio	native	region	-0.854	0.012	1.328	0.199	28.958	3.657
mammals	MPD.s	angio	native	region	2.534	0.012	0.607	0.551	30.416	3.908
birds	SR	angio	native	region	2.27	0	2.433	0.024	-35.517	0.195
birds	PD	angio	native	region	2.242	0	2.603	0.017	-36.231	0.189
birds	PD.s	angio	native	region	2.401	0.027	2.093	0.049	-34.168	0.207
birds	MPD	angio	native	region	4.01	-0.006	-2.978	0.007	-37.887	0.175

birds	MPD.s	angio	native	region	2.31	-0.014	-3.844	0.001	-41.983	0.145
primates	SR	angio	native	region	1.396	0	-1.078	0.294	-1.515	0.915
primates	PD	angio	native	region	1.412	0	-1.038	0.311	-1.429	0.919
primates	PD.s	angio	native	region	1.291	-0.007	-0.236	0.816	-0.335	0.966
primates	MPD	angio	native	region	1.109	0.001	0.146	0.886	-0.297	0.967
primates	MPD.s	angio	native	region	1.312	0.003	0.347	0.732	-0.406	0.963

**Table A6.** Results of separate linear mixed models analyzing the effect of the sequential removal of IUCN threatened species on phylogenetic and functional diversity. Threatened species are ranked from high to low risk of extinction; critically endangered (CR), endangered (EN), and vulnerable (VU). Near threatened species (NT) are likely to become endangered in the future. Categorical coefficient estimates represent departures from the phylogenetic diversity of the current community without species loss (all). Each category removes all species of the threatened category and above. Significant p-values are highlighted in yellow.

group	effect	metric	scale	Estimate	t value	p-value
vascular plants	- CR	PD	province	-679.884	-2.856	0.010
vascular plants	- EN	PD	province	-2535.389	-10.650	0.000
vascular plants	- VU	PD	province	-4090.385	-17.182	0.000
vascular plants	- NT	PD	province	-4506.427	-18.929	0.000
vascular plants	- CR	SES.PD	province	0.276	2.406	0.026
vascular plants	- EN	SES.PD	province	0.382	3.328	0.003
vascular plants	- VU	SES.PD	province	0.405	3.534	0.002
vascular plants	- NT	SES.PD	province	0.429	3.739	0.001
vascular plants	- CR	MPD	province	-0.362	-1.181	0.252
vascular plants	- EN	MPD	province	-0.666	-2.172	0.042
vascular plants	- VU	MPD	province	-0.337	-1.098	0.285
vascular plants	- NT	MPD	province	-0.688	-2.242	0.036
vascular plants	- CR	SES.MPD	province	-0.236	-1.279	0.215
vascular plants	- EN	SES.MPD	province	-0.469	-2.543	0.019
vascular plants	- VU	SES.MPD	province	-0.368	-1.995	0.060
vascular plants	- NT	SES.MPD	province	-0.559	-3.031	0.007
vascular plants	- CR	PD	region	-233.989	-1.753	0.083
vascular plants	- EN	PD	region	-1033.851	-7.745	0.000
vascular plants	- VU	PD	region	-1756.597	-13.159	0.000
vascular plants	- NT	PD	region	-2051.866	-15.371	0.000
vascular plants	- CR	SES.PD	region	0.115	2.174	0.032
vascular plants	- EN	SES.PD	region	0.184	3.494	0.001
vascular plants	- VU	SES.PD	region	0.214	4.057	0.000
vascular plants	- NT	SES.PD	region	0.148	2.806	0.006
vascular plants	- CR	MPD	region	-0.285	-1.579	0.118
vascular plants	- EN	MPD	region	-0.448	-2.484	0.015
vascular plants	- VU	MPD	region	-0.114	-0.629	0.531
vascular plants	- NT	MPD	region	-0.548	-3.036	0.003
vascular plants	- CR	SES.MPD	region	-0.097	-1.593	0.115
vascular plants	- EN	SES.MPD	region	-0.174	-2.873	0.005
vascular plants	- VU	SES.MPD	region	-0.092	-1.513	0.134
angiosperms	- CR	PD	province	-4525.281	-11.612	0.000
angiosperms	- EN	PD	province	-6196.769	-15.901	0.000

angiosperms	- VU	PD	province	-7731.150	-19.838	0.000
angiosperms	- NT	PD	province	-8033.951	-20.615	0.000
angiosperms	- CR	SES.PD	province	-5.578	-30.231	0.000
angiosperms	- EN	SES.PD	province	-5.342	-28.955	0.000
angiosperms	- VU	SES.PD	province	-5.315	-28.808	0.000
angiosperms	- NT	SES.PD	province	-5.205	-28.211	0.000
angiosperms	- CR	MPD	province	-0.381	-1.011	0.324
angiosperms	- EN	MPD	province	-1.009	-2.677	0.014
angiosperms	- VU	MPD	province	-1.254	-3.327	0.003
angiosperms	- NT	MPD	province	-1.605	-4.260	0.000
angiosperms	- CR	SES.MPD	province	-13.705	-11.817	0.000
angiosperms	- EN	SES.MPD	province	-13.774	-11.876	0.000
angiosperms	- VU	SES.MPD	province	-13.697	-11.809	0.000
angiosperms	- NT	SES.MPD	province	-13.811	-11.908	0.000
angiosperms	- CR	PD	region	-2005.233	-9.142	0.000
angiosperms	- EN	PD	region	-2749.985	-12.537	0.000
angiosperms	- VU	PD	region	-3464.297	-15.794	0.000
angiosperms	- NT	PD	region	-3621.802	-16.512	0.000
angiosperms	- CR	SES.PD	region	-3.715	-31.311	0.000
angiosperms	- EN	SES.PD	region	-3.615	-30.469	0.000
angiosperms	- VU	SES.PD	region	-3.592	-30.277	0.000
angiosperms	- NT	SES.PD	region	-3.532	-29.764	0.000
angiosperms	- CR	MPD	region	-0.543	-2.105	0.038
angiosperms	- EN	MPD	region	-1.126	-4.367	0.000
angiosperms	- VU	MPD	region	-1.311	-5.085	0.000
angiosperms	- NT	MPD	region	-1.689	-6.551	0.000
angiosperms	- CR	SES.MPD	region	-5.596	-10.401	0.000
angiosperms	- EN	SES.MPD	region	-5.659	-10.518	0.000
angiosperms	- VU	SES.MPD	region	-5.622	-10.449	0.000
angiosperms	- NT	SES.MPD	region	-5.702	-10.598	0.000
birds	- CR	PD	province	-14.847	-0.471	0.643
birds	- EN	PD	province	-111.855	-3.548	0.002
birds	- VU	PD	province	-466.391	-14.794	0.000
birds	- NT	PD	province	-751.475	-23.837	0.000
birds	- CR	SES.PD	province	0.042	0.329	0.746
birds	- EN	SES.PD	province	0.420	3.265	0.004
birds	- VU	SES.PD	province	-0.559	-4.345	0.000
birds	- NT	SES.PD	province	-0.458	-3.560	0.002
birds	- CR	MPD	province	-0.131	-1.424	0.170
birds	- EN	MPD	province	-0.742	-8.055	0.000
birds	- VU	MPD	province	-0.711	-7.723	0.000

birds	- NT	MPD	province	-0.349	-3.792	0.001
birds	- CR	SES.MPD	province	-0.194	-1.616	0.122
birds	- EN	SES.MPD	province	-0.925	-7.714	0.000
birds	- VU	SES.MPD	province	-0.686	-5.720	0.000
birds	- NT	SES.MPD	province	-0.247	-2.060	0.053
birds	- CR	PD	region	-9.026	-0.475	0.636
birds	- EN	PD	region	-88.651	-4.665	0.000
birds	- VU	PD	region	-350.159	-18.428	0.000
birds	- NT	PD	region	-605.777	-31.880	0.000
birds	- CR	SES.PD	region	0.018	0.218	0.828
birds	- EN	SES.PD	region	0.249	3.088	0.003
birds	- VU	SES.PD	region	-0.457	-5.671	0.000
birds	- NT	SES.PD	region	-0.436	-5.412	0.000
birds	- CR	MPD	region	-0.043	-0.746	0.458
birds	- EN	MPD	region	-0.487	-8.464	0.000
birds	- VU	MPD	region	-0.554	-9.629	0.000
birds	- NT	MPD	region	-0.270	-4.688	0.000
birds	- CR	SES.MPD	region	-0.050	-0.854	0.396
birds	- EN	SES.MPD	region	-0.444	-7.607	0.000
birds	- VU	SES.MPD	region	-0.392	-6.709	0.000
birds	- NT	SES.MPD	region	-0.117	-2.008	0.048
mammals	- CR	PD	province	-62.201	-2.298	0.032
mammals	- EN	PD	province	-228.669	-8.449	0.000
mammals	- VU	PD	province	-466.087	-17.222	0.000
mammals	- NT	PD	province	-604.543	-22.338	0.000
mammals	- CR	SES.PD	province	-0.057	-0.400	0.693
mammals	- EN	SES.PD	province	-0.014	-0.099	0.922
mammals	- VU	SES.PD	province	-0.518	-3.632	0.002
mammals	- NT	SES.PD	province	-1.559	-10.925	0.000
mammals	- CR	MPD	province	1.752	1.997	0.060
mammals	- EN	MPD	province	3.844	4.381	0.000
mammals	- VU	MPD	province	0.464	0.529	0.603
mammals	- NT	MPD	province	-1.462	-1.666	0.111
mammals	- CR	SES.MPD	province	0.256	1.890	0.073
mammals	- EN	SES.MPD	province	0.124	0.916	0.371
mammals	- VU	SES.MPD	province	-1.104	-8.152	0.000
mammals	- NT	SES.MPD	province	-1.540	-11.376	0.000
mammals	- CR	PD	region	-35.593	-2.300	0.024
mammals	- EN	PD	region	-156.044	-10.082	0.000
mammals	- VU	PD	region	-333.127	-21.524	0.000
mammals	- NT	PD	region	-454.977	-29.396	0.000

mammals	- CR	SES.PD	region	-0.042	-0.430	0.668
mammals	- EN	SES.PD	region	-0.338	-3.445	0.001
mammals	- VU	SES.PD	region	-0.772	-7.861	0.000
mammals	- NT	SES.PD	region	-1.691	-17.223	0.000
mammals	- CR	MPD	region	0.603	1.316	0.192
mammals	- EN	MPD	region	0.608	1.327	0.188
mammals	- VU	MPD	region	-2.726	-5.948	0.000
mammals	- NT	MPD	region	-4.536	-9.896	0.000
mammals	- CR	SES.MPD	region	0.026	0.285	0.776
mammals	- EN	SES.MPD	region	-0.207	-2.293	0.024
mammals	- VU	SES.MPD	region	-1.074	-11.895	0.000
mammals	- NT	SES.MPD	region	-1.420	-15.728	0.000
primates	- CR	PD	province	-62.201	-2.464	0.023
primates	- EN	PD	province	-236.005	-9.348	0.000
primates	- VU	PD	province	-366.187	-14.505	0.000
primates	- NT	PD	province	-428.420	-16.970	0.000
primates	- CR	SES.PD	province	-0.199	-0.464	0.648
primates	- EN	SES.PD	province	-1.333	-3.100	0.006
primates	- VU	SES.PD	province	-2.341	-5.443	0.000
primates	- NT	SES.PD	province	-3.878	-9.017	0.000
primates	- CR	MPD	province	0.400	0.103	0.919
primates	- EN	MPD	province	-3.536	-0.910	0.371
primates	- VU	MPD	province	-10.119	-2.605	0.015
primates	- NT	MPD	province	-32.880	-8.466	0.000
primates	- CR	SES.MPD	province	-0.196	-0.517	0.611
primates	- EN	SES.MPD	province	-1.816	-4.784	0.000
primates	- VU	SES.MPD	province	-2.885	-7.602	0.000
primates	- NT	SES.MPD	province	-4.533	-11.945	0.000
primates	- CR	PD	region	-35.593	-2.004	0.048
primates	- EN	PD	region	-156.340	-8.803	0.000
primates	- VU	PD	region	-239.160	-13.467	0.000
primates	- NT	PD	region	-282.702	-15.919	0.000
primates	- CR	SES.PD	region	-0.059	-0.221	0.825
primates	- EN	SES.PD	region	-1.573	-5.883	0.000
primates	- VU	SES.PD	region	-2.182	-8.160	0.000
primates	- NT	SES.PD	region	-3.148	-11.777	0.000
primates	- CR	MPD	region	0.920	0.320	0.750
primates	- EN	MPD	region	-4.994	-1.737	0.086
primates	- VU	MPD	region	-9.776	-3.400	0.001
primates	- NT	MPD	region	-31.767	-11.050	0.000
primates	- CR	SES.MPD	region	0.014	0.052	0.959



primates	- EN	SES.MPD	region	-1.685	-6.445	0.000
primates	- VU	SES.MPD	region	-2.267	-8.670	0.000
primates	- NT	SES.MPD	region	-3.260	-12.467	0.000
mammals	- CR	FD	province	-0.179	-3.013	0.007
mammals	- EN	FD	province	-0.425	-7.137	0.000
mammals	- VU	FD	province	-0.679	-11.398	0.000
mammals	- NT	FD	province	-0.631	-10.606	0.000
mammals	- CR	SES.FD	province	0.010	0.026	0.979
mammals	- EN	SES.FD	province	-0.008	-0.020	0.984
mammals	- VU	SES.FD	province	-0.604	-1.588	0.125
mammals	- NT	SES.FD	province	-0.335	-0.882	0.386
mammals	- CR	FD	region	-0.088	-3.028	0.003
mammals	- EN	FD	region	-0.304	-10.410	0.000
mammals	- VU	FD	region	-0.504	-17.253	0.000
mammals	- NT	FD	region	-0.472	-16.159	0.000
mammals	- CR	SES.FD	region	-0.113	-0.674	0.502
mammals	- EN	SES.FD	region	-0.531	-3.172	0.002
mammals	- VU	SES.FD	region	-1.059	-6.322	0.000
mammals	- NT	SES.FD	region	-0.927	-5.533	0.000
birds	- CR	FD	province	-0.020	-0.988	0.335
birds	- EN	FD	province	-0.044	-2.145	0.044
birds	- VU	FD	province	-0.041	-2.012	0.058
birds	- NT	FD	province	-0.064	-3.134	0.005
birds	- CR	SES.FD	province	-1.672	-4.170	0.000
birds	- EN	SES.FD	province	-1.682	-4.197	0.000
birds	- VU	SES.FD	province	-1.710	-4.264	0.000
birds	- NT	SES.FD	province	-1.701	-4.242	0.000
birds	- CR	FD	region	-0.011	-1.382	0.171
birds	- EN	FD	region	-0.034	-4.408	0.000
birds	- VU	FD	region	-0.032	-4.175	0.000
birds	- NT	FD	region	-0.048	-6.329	0.000
birds	- CR	SES.FD	region	-0.459	-2.940	0.004
birds	- EN	SES.FD	region	-0.514	-3.290	0.001
birds	- VU	SES.FD	region	-0.532	-3.405	0.001
birds	- NT	SES.FD	region	-0.600	-3.840	0.000

**Table A7.** Results of separate linear mixed models analyzing the effect of removing naturalized aliens from the flora of Madagascar. The categorical coefficient estimates represent departures from the phylogenetic diversity of the current community with both native and non-native species.

group	effect	metric	scale	Estimate	Std. Error	df	t value	Pr(> t )
tracheophytes	non-native removal	PD	province	-4160.005	170.398	5.074	-24.414	0.000
tracheophytes	non-native removal	PD.s	province	0.821	0.120	5.000	6.821	0.001
tracheophytes	non-native removal	MPD	province	2.331	0.506	5.001	4.602	0.006
tracheophytes	non-native removal	MPD.s	province	0.778	0.111	5.005	7.013	0.001
tracheophytes	non-native removal	PD	region	-2048.145	169.872	20.773	-12.057	0.000
tracheophytes	non-native removal	PD.s	region	0.368	0.082	21.000	4.502	0.000
tracheophytes	non-native removal	MPD	region	2.055	0.313	21.028	6.565	0.000
tracheophytes	non-native removal	MPD.s	region	0.460	0.052	21.029	8.860	0.000
angiosperms	non-native removal	PD	province	-4100.987	174.210	5.062	-23.540	0.000
angiosperms	non-native removal	PD.s	province	0.808	0.118	5.000	6.831	0.001
angiosperms	non-native removal	MPD	province	0.475	0.192	5.003	2.467	0.057
angiosperms	non-native removal	MPD.s	province	0.500	0.110	5.023	4.534	0.006
angiosperms	non-native removal	PD	region	-2020.675	169.642	21.362	-11.911	0.000
angiosperms	non-native removal	PD.s	region	0.336	0.089	21.000	3.785	0.001
angiosperms	non-native removal	MPD	region	0.264	0.119	21.030	2.224	0.037
angiosperms	non-native removal	MPD.s	region	0.256	0.056	21.032	4.606	0.000

**Table A8.** Results of separate linear mixed models analyzing the effect of species native status on phylogenetic distance. The categorical coefficient estimates represent departures from the phylogenetic distance among native taxa (nat-nat). Phylogenetic distance between exotic naturalized species and natives (exo-nat) and among naturalized species (exo-exo) were examined.

group	effect	metric	scale	Estimate	t value	p-value
vascular plants	exo-nat	PD	province	-120534.453	-20.389	NA
vascular plants	exo-exo	PD	province	-116374.448	-19.685	NA
vascular plants	exo-nat	PD.s	province	-77.935	-80.100	0.000
vascular plants	exo-exo	PD.s	province	-51.092	-52.511	0.000
vascular plants	exo-nat	MPD	province	-22.658	-4.618	0.001
vascular plants	exo-exo	MPD	province	-56.705	-11.557	0.000
vascular plants	exo-nat	MPD.s	province	-10.815	-4.686	0.001
vascular plants	exo-exo	MPD.s	province	-14.464	-6.268	0.000
vascular plants	exo-nat	PD	region	-59643.289	-13.311	NA
vascular plants	exo-exo	PD	region	-57595.144	-12.853	NA
vascular plants	exo-nat	PD.s	region	-63.726	-35.269	0.000
vascular plants	exo-exo	PD.s	region	-49.163	-27.209	0.000
vascular plants	exo-nat	MPD	region	-19.730	-5.851	0.000
vascular plants	exo-exo	MPD	region	-53.680	-15.920	0.000
vascular plants	exo-nat	MPD.s	region	-4.821	-3.284	0.002
vascular plants	exo-exo	MPD.s	region	-6.975	-4.751	0.000
angiosperms	exo-nat	PD	province	-108861.212	-18.908	NA
angiosperms	exo-exo	PD	province	-104760.225	-18.195	NA
angiosperms	exo-nat	PD.s	province	-79.108	103.620	0.000
angiosperms	exo-exo	PD.s	province	-49.230	-64.485	0.000
angiosperms	exo-nat	MPD	province	-3.967	-1.713	0.117
angiosperms	exo-exo	MPD	province	-17.397	-7.513	0.000
angiosperms	exo-nat	MPD.s	province	0.408	0.142	0.890
angiosperms	exo-exo	MPD.s	province	-2.465	-0.856	0.412
angiosperms	exo-nat	PD	region	-53243.038	-13.496	0.000
angiosperms	exo-exo	PD	region	-51222.363	-12.983	0.000
angiosperms	exo-nat	PD.s	region	-65.811	-39.404	0.000
angiosperms	exo-exo	PD.s	region	-45.474	-27.227	0.000
angiosperms	exo-nat	MPD	region	-1.405	-0.951	0.347
angiosperms	exo-exo	MPD	region	-15.150	-10.247	0.000
angiosperms	exo-nat	MPD.s	region	4.121	3.940	0.000
angiosperms	exo-exo	MPD.s	region	2.601	2.487	0.017

## Appendix 2.

We estimated the current and future (2050, 2070) monthly precipitation levels under four different emission scenarios using data obtained from the WorldClim dataset <sup>1</sup>, at 2.5' resolution. Future climate predictions were based on the predictions of the Hadley Centre Global Environment Model version 2 (HadGEM2-ES, rcp60; <sup>2</sup>. We fit a linear mixed model to determine whether each level of emissions had a significant effect on precipitation levels. Bioclimatic zones and month were included as random effects.

### Results of the analyses

The categorical coefficient estimates represent departures from present levels of precipitation.

(A) *precipitation ~ year + 1/bioclimate region*

emission	year	Estimate	t value	p-value
he26	2050	-8.15814	-30.313	< 2.2e-16
	2070	-9.1157	-33.871	< 2.2e-16
he45	2050	-1.79517	-6.43151	1.26E-10
	2070	-4.70446	-16.8546	< 2.2e-16
he60	2050	-3.97253	-14.148	< 2.2e-16
	2070	-3.43206	-12.2231	< 2.2e-16
he85	2050	-8.98543	-32.4743	< 2.2e-16
	2070	-11.3322	-40.9558	< 2.2e-16

(B) *precipitation ~ year + 1/bioclimate region + 1/month*

emission	year	Estimate	t value	p-value
he26	2050	-8.15814	-71.5215	< 2.2e-16
	2070	-9.1157	-79.9163	< 2.2e-16
he45	2050	-1.79517	-14.8829	< 2.2e-16
	2070	-4.70446	-39.0026	< 2.2e-16
he60	2050	-3.97253	-32.9826	< 2.2e-16
	2070	-3.43206	-28.4952	< 2.2e-16
he85	2050	-8.98543	-77.2177	< 2.2e-16
	2070	-11.3322	-97.385	< 2.2e-16

### Literature cited

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