

Ecography

ECOG-00643

Arellano, G., Cayola, L., Loza, I., Torrez, V. and Macía, M. J. 2014. Commonness patterns and the size of the species pool along a tropical elevational gradient: insights using a new quantitative tool. – *Ecography* 37: xxx–xxx.

Supplementary material

Appendix 1. R functions to calculate h_p indexes of species (commonness of species), the h_h of the community (the proportion of common species) and the list of common species. These are calculated from a typical composition matrix M based on abundances, with one row per plot and one column per species.

```

> hp.function <- function(M) # two-dimensional commonness of species
{
  hp <- apply(M /rowSums(M), 2, function(x) max((1:nrow(M)/nrow(M))[sort(x,
decreasing=T)>=(1:nrow(M)/nrow(M))]))

  hp [which(hp == "-Inf")] <- 0 # assigns  $h_p=0$  to very uncommon species

  names(hp) <- colnames(M) # assigns the name of the species

  return(hp)
}

> hh.function <- function(M) # observed proportion of common species, and
ordered list of common species
{
  hp <- hp.function(M) # calculates  $h_p$  indexes

  hh <- max(((1:ncol(M))/ncol(M))[sort(hp, decreasing=T)/max(hp)] >=
((1:ncol(M))/ncol(M))) # calculates  $h_h$  index

  a <- cbind(hp, colSums(M))

  common <- rownames(a[order(-a[, 1], -a[, 2]), ])[1:(hh*ncol(M))] # names of
common species (ordered by  $h_p$  indexes and total abundances)

  return(list(hh=hh, common=common)) # output with the  $h_h$  index of the
community and the names of the common species
}

```

1 Appendix 2. List of common species below 500 m in the Madidi region (Bolivia). * after the
 2 h_p index indicates if the species also has been considered oligarchic in other regions in the
 3 Amazonia, according to Appendix 1 of Pitman et al. (2013) and, in the case of lianas, Table 3
 4 of Burnham (2002).

Family	Species	h_p index (%)
Amaranthaceae	<i>Hebanthe occidentalis</i> (R.E. Fr.) Borsch & Pedersen (liana)	3.03
Anacardiaceae	<i>Tapirira guianensis</i> Aubl.	1.52 *
Annonaceae	<i>Crematosperma leiophyllum</i> (Diels) R.E. Fr.	3.03
	<i>Duguetia hadrantha</i> (Diels) R.E. Fr.	1.52
	<i>Duguetia spixiana</i> Mart.	4.55
	<i>Mosannonna parva</i> Chatrou	3.03
	<i>Oxandra</i> aff. <i>acuminata</i> = Manuel J. Macía 5777	3.03
	<i>Ruizodendron ovale</i> (Ruiz & Pav.) R.E. Fr.	1.52 *
	<i>Unonopsis floribunda</i> Diels	1.52
Apocynaceae	<i>Forsteronia graciloides</i> Woodson (liana)	3.03
Araliaceae	<i>Dendropanax arboreus</i> (L.) Decne. & Planch.	1.52 *
Arecaceae	<i>Astrocaryum murumuru</i> Mart.	3.03 *
	<i>Attalea phalerata</i> Mart. ex Spreng.	1.52
	<i>Bactris major</i> Jacq.	4.55
	<i>Chamaedorea angustisecta</i> Burret	1.52
	<i>Euterpe precatoria</i> Mart.	4.55 *
	<i>Iriarteia deltoidea</i> Ruiz & Pav.	10.61 *
	<i>Mauritia flexuosa</i> L. f.	4.55
	<i>Oenocarpus mapora</i> H. Karst.	3.03
	<i>Socratea exorrhiza</i> (Mart.) H. Wendl.	6.06 *

Bignoniaceae	<i>Cydista lilacina</i> A.H. Gentry (liana)	3.03
	<i>Roentgenia bracteomana</i> (K. Schum. ex Sprague)	1.52
	Urb. (liana)	
	<i>Xylophragma pratense</i> (Bureau & K. Schum.)	3.03
	Sprague (liana)	
Boraginaceae	<i>Cordia nodosa</i> Lam.	1.52
Burseraceae	<i>Protium amazonicum</i> (Cuatrec.) D.C. Daly	3.03 *
	<i>Protium rhynchophyllum</i> (Rusby) D.C. Daly	3.03
	<i>Tetragastris altissima</i> (Aubl.) Swart	3.03 *
Buxaceae	<i>Styloceras brokawii</i> A.H. Gentry & R.B. Foster	3.03
Cannabaceae	<i>Celtis iguanaea</i> (Jacq.) Sarg.	1.52
	<i>Celtis schippii</i> Standl.	4.55 *
Celastraceae	<i>Hippocratea volubilis</i> L. (liana)	3.03
	<i>Cheiloclinium cognatum</i> (Miers) A.C. Sm.	1.52
	<i>Salacia impressifolia</i> (Miers) A.C. Sm.	1.52
Chrysobalanaceae	<i>Hirtella bullata</i> Benth.	1.52
	<i>Hirtella racemosa</i> Lam.	6.06
	<i>Licania brittoniana</i> Fritsch	1.52
Clusiaceae	<i>Garcinia gardneriana</i> (Planch. & Triana) Zappi	1.52
	<i>Garcinia madruno</i> (Kunth) Hammel	4.55
Combretaceae	<i>Combretum laxum</i> Jacq. (liana)	1.52 *
	<i>Terminalia amazonia</i> (J.F. Gmel.) Exell	1.52 *
Cyatheaceae	<i>Cyathea amazonica</i> R.C. Moran	3.03
Dichapetalaceae	<i>Tapura juruana</i> (Ule) Rizzini	1.52
Elaeocarpaceae	<i>Sloanea fragrans</i> Rusby	1.52 *
	<i>Sloanea guianensis</i> (Aubl.) Benth.	3.03

Euphorbiaceae	<i>Mabea anadena</i> Pax & K. Hoffm.	1.52
Fabaceae	<i>Dalbergia frutescens</i> (Vell.) Britton (liana)	3.03
	<i>Inga thibaudiana</i> DC.	3.03 *
Hernandiaceae	<i>Sparattanthelium amazonum</i> Mart. (liana)	1.52
Lacistemataceae	<i>Lacistema aggregatum</i> (P.J. Bergius) Rusby	1.52
Lauraceae	<i>Aiouea grandifolia</i> van der Werff	1.52
	<i>Aniba panurensis</i> (Meisn.) Mez	1.52
	<i>Nectandra pulverulenta</i> Nees	1.52 *
Lecythidaceae	<i>Cariniana estrellensis</i> (Raddi) Kuntze	3.03
	<i>Eschweilera andina</i> (Rusby) J.F. Macbr.	1.52 *
Loganiaceae	<i>Strychnos asperula</i> Sprague & Sandwith (liana)	3.03
Malvaceae	<i>Byttneria pescapriifolia</i> Britton (liana)	3.03
	<i>Pentaplaris davidsmithii</i> Dorr & C. Bayer	6.06
	<i>Quararibea wittii</i> K. Schum. & Ulbr.	6.06 *
	<i>Theobroma cacao</i> L.	1.52 *
Melastomataceae	<i>Miconia centrodesma</i> Naudin	3.03
	<i>Mouriri myrtilloides</i> (Sw.) Poir.	3.03
	<i>Tococa guianensis</i> Aubl.	4.55
Meliaceae	<i>Guarea gomma</i> Pulle	3.03 *
	<i>Guarea guidonia</i> (L.) Sleumer	1.52
	<i>Guarea kunthiana</i> A. Juss.	3.03 *
	<i>Guarea macrophylla</i> Vahl	6.06 *
	<i>Guarea pterorhachis</i> Harms	1.52 *
	<i>Trichilia pleeana</i> (A. Juss.) C. DC.	3.03
Menispermaceae	<i>Abuta grandifolia</i> (Mart.) Sandwith	1.52
Monimiaceae	<i>Mollinedia ovata</i> Ruiz & Pav.	3.03

Moraceae	<i>Brosimum alicastrum</i> Sw.	3.03 *
	<i>Clarisia biflora</i> Ruiz & Pav.	1.52 *
	<i>Naucleopsis krukovii</i> (Standl.) C.C. Berg	3.03 *
	<i>Poulsenia armata</i> (Miq.) Standl.	1.52
	<i>Pseudolmedia laevis</i> (Ruiz & Pav.) J.F. Macbr.	4.55 *
	<i>Pseudolmedia macrophylla</i> Trécul	4.55 *
	<i>Sorocea briquetii</i> J.F. Macbr.	3.03 *
	<i>Sorocea guilleminiana</i> Gaudich.	3.03
Myristicaceae	<i>Otoba glyccarpa</i> (Ducke) W. Rodrigues & T.S.	3.03 *
	Jaramillo	
	<i>Otoba parvifolia</i> (Markgr.) A.H. Gentry	3.03 *
	<i>Virola sebifera</i> Aubl.	1.52 *
Myrtaceae	<i>Calyptanthes lanceolata</i> O. Berg	3.03
	<i>Eugenia florida</i> DC.	1.52
	<i>Myrciaria floribunda</i> (H. West ex Willd.) O. Berg	1.52
Phyllanthaceae	<i>Hieronyma alchorneoides</i> Allemão	1.52
Piperaceae	<i>Piper glabratum</i> Kunth	4.55
	<i>Piper heterophyllum</i> Ruiz & Pav.	3.03
	<i>Piper obliquum</i> Ruiz & Pav.	4.55
	<i>Piper reticulatum</i> L.	3.03
Poaceae	<i>Guadua sarcocarpa</i> Londoño & P. M. Peterson	3.03
Polygonaceae	<i>Triplaris americana</i> L.	1.52
	<i>Triplaris setosa</i> Rusby	4.55
Primulaceae	<i>Stylogyne ambigua</i> (Mart.) Mez	3.03
	<i>Stylogyne cauliflora</i> (Mart. & Miq.) Mez	3.03
Putranjivaceae	<i>Drypetes amazonica</i> Steyerem.	3.03 *

Rubiaceae	<i>Uncaria guianensis</i> (Aubl.) J.F. Gmel. (liana)	3.03 *
	<i>Uncaria tomentosa</i> (Willd.) DC. (liana)	3.03
	<i>Ixora peruviana</i> (Spruce ex K. Schum.) Standl.	3.03
	<i>Psychotria viridis</i> Ruiz & Pav.	1.52
Rutaceae	<i>Erythrochiton fallax</i> Kallunki	1.52
Sabiaceae	<i>Meliosma herbertii</i> Rolfe	1.52 *
Salicaceae	<i>Casearia sylvestris</i> Sw.	1.52 *
	<i>Hasseltia floribunda</i> Kunth	1.52 *
	<i>Lunania parviflora</i> Spruce ex Benth.	3.03 *
Sapindaceae	<i>Allophylus floribundus</i> (Poepp.) Radlk.	3.03
Sapotaceae	<i>Pouteria bangii</i> (Rusby) T.D. Penn.	3.03
	<i>Pouteria cladantha</i> Sandwith	3.03
	<i>Pouteria torta</i> (Mart.) Radlk.	1.52 *
	<i>Sarcaulus brasiliensis</i> (A. DC.) Eyma	1.52
	<i>Sarcaulus</i> vel. sp. nov. Radlk. = Edwin J. Ticona	3.03
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Siparunaceae	<i>Siparuna bifida</i> (Poepp. & Endl.) A. DC.	4.55
	<i>Siparuna decipiens</i> (Tul.) A. DC.	6.06 *
	<i>Siparuna guianensis</i> Aubl.	1.52
Ulmaceae	<i>Ampelocera edentula</i> Kuhlmann	1.52 *
Urticaceae	<i>Pourouma cecropiifolia</i> Mart.	1.52 *
	<i>Pourouma minor</i> Benoist	3.03 *
Verbenaceae	<i>Petrea maynensis</i> Huber (liana)	3.03 *
Violaceae	<i>Leonia crassa</i> L.B. Sm. & A. Fernández	3.03 *
	<i>Leonia glycyarpa</i> Ruiz & Pav.	6.06 *
	<i>Rinorea apiculata</i> Hekking	7.58 *

Rinorea viridifolia Rusby

10.61 *

Rinoreocarpus ulei (Melch.) Ducke

3.03 *

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