A test of the Integrated Evolutionary Speed Hypothesis in a Neotropical amphibian radiation

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ABSTRACT

Aim The Evolutionary Speed Hypothesis is a mechanistic explanation for the latitudinal biodiversity gradient. The recently extended Integrated Evolutionary Speed Hypothesis (IESH) proposes that temperature, water availability, population size and spatial heterogeneity influence rates of molecular evolution which, in turn, affect diversification. However, the evidence for some of the associations predicted by the IESH is not conclusive and in some cases, contradictory.

Location Neotropics

Methods Using a comparative Bayesian method we tested the following predictions of the IESH: the association between rate of molecular evolution and temperature (and elevation and latitude, as proxies), water availability (using precipitation and relative humidity as proxies), productivity, and rate of diversification. We also accounted for the potential confounding effects of body size and UVB radiation. We tested these predictions separately in mitochondrial and nuclear genes.

Results Substitution rates of mitochondrial and nuclear genes were positively associated with temperature and negatively with elevation, while only the mitochondrial coding gene rate was associated with UVB radiation. However, when controlling for temperature, the association between substitution rate and elevation and UVB radiation disappeared, while a negative association with precipitation emerged. Moreover, diversification events were positively correlated with the rate of molecular evolution but only in mitochondrial genes.

Main conclusions Our results support two key predictions of the IESH. They highlight the important association between rate of molecular evolution and temperature within a recently diverged group and also confirm the positive association between molecular evolution and diversification rate, although only in mitochondrial genes. However, the lack of association between diversification and temperature and low effect size of the relationship between substitution rates and diversification in mitochondrial genes emphasize the important role other factors, such as time, spatial heterogeneity and population size might have in the origin and maintenance of the latitudinal biodiversity gradient.

Key words: Amphibians, diversification, evolutionary speed hypothesis, latitudinal biodiversity gradient, molecular evolution, substitution rate, temperature.

INTRODUCTION

The striking difference in biodiversity between tropical and temperate regions is probably the oldest pattern described in ecology (Hawkins, 2001). Despite previous attempts at explaining the latitudinal biodiversity gradient, the underlying drivers remain elusive (Hillebrand, 2004; Jablonski *et al.*, 2006; Mittelbach *et al.*, 2007). There is nonetheless a certain consensus that this pattern must be the result of latitudinal differences in the rates of speciation, extinction and migration, or any combination thereof (Dowle *et al.,* 2013). Many studies have attempted to explain the latitudinal biodiversity gradient by focusing on the factors that influence the rate of molecular evolution and its effect on the rate of diversification (reviewed in Dowle *et al.*, 2013). Among them, the explanation having attracted most attention is the 'Evolutionary Speed Hypothesis'. Rensch (1959) suggested that organisms in warmer environments have shorter generation times, which increases the pace of selection and therefore the evolutionary speed. The idea was extended by Rohde (1992) who proposed that organisms in warmer environments have a higher rate of molecular evolution via shorter generation times and higher mutation rate that lead to faster adaptation and differentiation. Recently, Gillman & Wright (2014) proposed an integrative version of the hypothesis recognising that the relationship between temperature and rate of molecular evolution is not monotonic, and that in hot climates limited water availability may in fact lead to reduced rates of molecular evolution either directly (e. g. Goldie *et al.*, 2010) or indirectly through its effect on primary productivity. The latter is also proposed to influence the rate of molecular evolution based on the fact that it is a good predictor of species richness (Gillman & Wright 2014). In addition, the effects of population size and spatial heterogeneity, which can favour isolation of populations as well as the potential for new mutations to be fixed, were also incorporated into the hypothesis. These additions to the original Evolutionary Speed Hypothesis resulted in the "Integrated Evolutionary Speed Hypothesis" (hereafter, IESH; Gillman & Wright 2014). The predicted end result of the faster rate of molecular evolution is an increased rate of speciation, and therefore the IESH is proposed as a mechanistic explanation of the higher diversity observed in tropical latitudes (Gillman & Wright 2014).

A diversity of taxa, including plants, invertebrates, fishes, birds, mammals, reptiles and amphibians, show a higher rate of molecular evolution in warmer environments, apparently supporting the IESH (e.g. Davies *et al.*, 2004; Gillooly *et al.*, 2005; Gillman *et al.*, 2009; Wright *et al.*, 2010; Gillman *et al.*, 2012; Lourenço *et al.*, 2013). Nonetheless, a limitation of these studies is that in most of them elevation or latitude were used as proxies for temperature (but see Davies *et al.*, 2004; Gillooly *et al.*, 2005), and while elevation and latitude can reflect differences in temperature they are also associated with other factors that may influence rate of molecular evolution (e.g. uv radiation, oxygen stress, population size, seasonality). Hence, although available evidence is consistent with the predicted positive association between temperature and rate of molecular evolution, it is not conclusive (Gillman & Wright 2014). Finally, and perhaps most importantly, only a single study has simultaneously tested two of the key predictions of the IESH (Davies *et al.*, 2004): the increase in rate of molecular evolution in warmer environments and the association between rate of molecular evolution and diversification. This study did not find support for the association between rate of molecular evolution and diversification, casting doubts on the generality of the IESH. Furthermore, to our knowledge, only one study to date has found the predicted positive relationship between water availability and rate of molecular evolution (Goldie *et al.*, 2010), while the predicted positive association between the latter and productivity remains untested.

Here, using the Neotropical amphibian family Centrolenidae as our model system, we tested four of the key predictions of the IESH and also analyzed the effects of commonly used proxies and potential confounding factors. More specifically we tested the following predicted positive associations between rate of molecular evolution and: firstly temperature, secondly water availability (measured as precipitation and relative humidity), thirdly primary productivity, and finally rate of diversification. In

addition we tested the effect of variables that are either commonly used as proxies for temperature – i.e. latitude and elevation – or could possibly have confounding effects on the predicted relationships, i.e. UVB radiation and body size. We used three proxies for the rate of molecular evolution: the synonymous and non-synonymous substitution rates (henceforth dS and dN, respectively), and the ratio of non-synonymous to synonymous substitutions (dN/dS, hereafter ω). We tested all associations in both nuclear and mitochondrial genes using a whole-tree method (Lartillot & Poujol, 2011).

Centrolenidae, commonly known as glass-frogs, because of their transparent or semi-transparent venter, is a diverse group of arboreal frogs comprised of more than 140 species included in 12 genera, originating from a relatively recent radiation (23.4 mya; 95% highest posterior density: 19.6–28.82 mya) (Guayasamin *et al.*, 2009; Castroviejo-Fisher *et al.*, 2014). The family presents a wide Neotropical distribution, from southern Mexico to Bolivia with an isolated group in southeastern Brazil and northeastern Argentina (Fig. 1) (Guayasamin *et al.*, 2009; Castroviejo-Fisher *et al.*, 2014). Centrolenids are also ecologically diverse as they are found in very distinct habitats, from sea level to high mountain ranges (3300 m.a.s.l.) (Guayasamin *et al.*, 2009). Furthermore, Centrolenids are highly dependent on water as females lay their eggs on leaves over-hanging streams, and when the eggs hatch, tadpoles fall into the water where they complete their development. Recently, a well-resolved molecular phylogeny of Centrolenidae combining mitochondrial and nuclear genes and with high species coverage has become available (Castroviejo-Fisher *et al.*, 2014). Hence, Centrolenidae offers an excellent model system to analyse the influence of environmental energy on the rate of molecular evolution in a diverse but recently diverged group of species.

MATERIAL AND METHODS

Taxa and Molecular Data

The study included 97 Centrolenidae species, some of which are yet to be named and described (Castroviejo-Fisher *et al.*, 2014). The sample represents > 65% of the estimated species richness of the clade and includes representatives from all recognized genera and habitats in which these species are present. We used the most recent and most complete phylogenetic reconstruction based on maximum likelihood inference combining mitochondrial and nuclear genes (Castroviejo-Fisher *et al.*, 2014). Prior to each analysis the tree was pruned to include only species for which we had accurate phenotypic, environmental and genetic data.

We used 3 mitochondrial (total 2.8kb) and 7 single-copy nuclear gene fragments (total 3.5kb). These genes (length, nucleotide diversity [π] (Nei & Li, 1979) and Watterson estimator [θ] (Watterson, 1975) considering only one sequence per species) are the mitochondrial rRNA genes 12S (975bp, π=0.071, θ=70.14) and 16S (892bp, π=0.096, θ=76.94); the mitochondrial protein-coding NADH dehydrogenase subunit 1 (ND1, 979bp, π=0.167, θ=94.83); and the nuclear protein-coding brain-derived neurotrophic factor (BDNF, 696bp, π=0.009, θ=13.86), proto-oncogene cellular myelocytomatosis (C-MYC, 423bp, π=0.044, θ=24.50), chemokine receptor 4 (CXCR4, 354bp, π=0.029, θ=18.67), proopiomelanocortin A (POMC, 615bp, π=0.032, θ=30.32), recombination activating gene-1 (RAG-1, 456bp, π=0.031, θ=22.47) and solute-carrier family 8 members 1 and 3 (SLC8A1, 540bp, π=0.024, θ=21.42 ; SLC8A3, 465bp, π=0.011, θ=13.23). Not all gene sequences were available for all species. A complete list of genes used per species with their GenBank accession number is available in Appendix S1 in Supporting Information.

Prior to analysing protein-coding genes, we translated them in EMBOSS Transeq (Rice *et al.*, 2000) to identify the correct open reading frame and compared the sequences to the same gene in the most closely related species using BLASTn (Altschul *et al.*, 1990). For analyses, sequences were concatenated as follows to minimize confounding effects due to potential different effects of traits on the mitochondrial and nuclear genomes: mitochondrial non-coding genes (12S and 16S; 1867bp, n=97 species) and nuclear protein-coding genes (BDNF, C-MYC, CXCR4, POMC, RAG-1, SLC8A1 and SLC8A3; 3549bp, n=83 species). The single mitochondrial protein-coding gene ND1 (960 bp, n=91 species) was analysed separately.

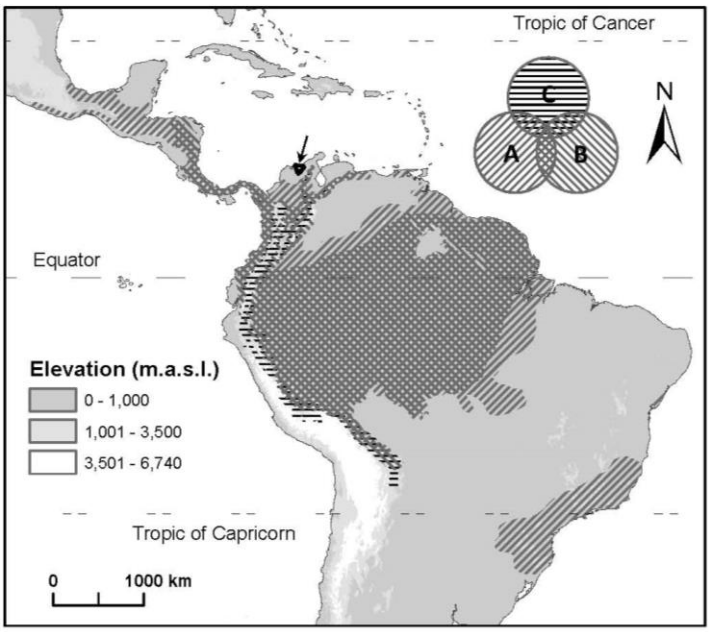

Figure 1. Geographic distribution of Centrolenidae. Clade A (right-angled lines; *Teratohyla* + *Sachatamia* + *Rulyrana* + *Cochranella* + *Espadarana* + *Chimerella* + *Vitreorana*) and Clade B (left-angled lines; *Hyalinobatrachium* + *Celsiella*) are basically distributed in lowlands, while Clade C (horizontal lines; *Nymphargus* + *Centrolene*) is mainly distributed in the Andes range. The arrow and the black area indicate the distribution of *Ikakogi tayrona*, a centrolenid species outside the three major clades, which also inhabits a mountain range. These three main clades and *Ikakogi tayrona* are represented on the phylogeny shown in Fig. 2, which graphically represents the association between temperature and synonymous substitution rate in the nuclear genes.

Traits

We used midpoint elevation, midpoint latitude, mean annual temperature, mean annual precipitation, mean annual relative humidity, mean net primary productivity and mean annual UVB radiation across each species' distribution to characterize correlations between environmental traits and the rate of molecular evolution. Known centrolenid distributions were adjusted based on recent sampling and corrected misidentifications (details in Appendix S2), and analysed with ArcGIS 10 (Environmental Systems Research Institute, 2011) to obtain the values of all these traits, except midpoint elevation. Midpoint elevation values were obtained from the IUCN database (2012), published literature, and our own unpublished data (details in Appendix S3). Midpoint latitude was estimated using the addXY command with the Geospatial Modelling Environment (GME) extension (Spatial Ecology, 2012). We used the absolute value of the latitude midpoint, because our interest lay in the distance to the equator regardless of the location in the northern or southern hemisphere. We obtained temperature and precipitation data (30 arc-seconds resolution; ~ 1 km) from the WorldClim climatic maps (Hijmans *et al.*, 2005), relative humidity (30 arc-minute; ~ 60 km) from the Atlas of the Biosphere (New et al., 1999), net primary productivity data (15 arc-minute; ~ 28 km) from the HANNP datasets (Imhoff et al., 2004; Imhoff & Bounoua, 2006) and UVB radiation data (15 arc-minute resolution; ~ 28 km) from the glUV dataset (Beckmann et al., 2014). We obtained the mean value for each trait for each species' distribution including only distribution points within the known altitudinal range. One might wonder about the relevance of studying the influence of UVB on nocturnal animals such as centrolenids. However, Cisneros-Heredia and McDiarmid (2007) reported that absence of pigments from ventral skin (i.e. transparent parietal peritoneum) was associated with presence of pigments (i.e. iridophores) covering viscera (e.g. liver, digestive track). These authors hypothesized that pigments covering viscera protect enzymatic activity against the potentially detrimental effects of light and temperature, which could be linked to the rate of molecular evolution via mutagenesis. Finally, we obtained lineage-specific cladogenetic events (a proxy for diversification events) by counting the number of nodes between the root and each tip of the phylogeny, excluding the root node (*sensu* Freckleton *et al.*, 2008) (Appendix S4). We note that although the latter is a non-parametric method, which assumes that rate of extinction is equal across all clades and time, a recent study suggests that extinction in Centrolenidae plays a minor role in explaining current richness patterns (Castroviejo-Fisher *et al*., 2014). All data are shown in Appendix S3.

To control for the potentially confounding effects of generation time, longevity and metabolic rate (for which no data are available) we used body size as a proxy. Body size is positively associated with generation time (Galtier *et al.*, 2009) and longevity (Nabholz *et al.*, 2008), and

		MITOCHONDRIAL GENES				NUCLEAR GENES		
		Non-coding	*Coding*			*Coding*		
		Sub. rate	**dS**	**dN**	**ω**	**dS**	**dN**	**ω**
Body Size	*cov*	-0.03	-0.02	0.00	0.00	-0.01	-0.01	-0.01
	r^2	0.04	0.04	0.00	0.01	0.02	0.01	0.00
	pp	0.08	0.06	0.51	0.62	0.25	0.30	0.40
Div. events	*cov*	**0.06**	**0.03**	0.03	-0.00	0.01	0.01	0.01
	r^2	**0.10**	**0.06**	0.03	0.00	0.00	0.00	0.00
	pp	**1.00**	**0.97**	0.86	0.51	0.60	0.56	0.56
Elev.	*cov*	**-0.31** *	**-0.16** *	**-0.20** *	-0.00	**-0.21** *	0.02	0.20
	r^2	**0.14**	**0.08**	**0.10**	0.00	**0.24**	0.00	0.12
	pp	**0.00**	**0.03**	**0.05**	0.52	**0.01**	0.55	0.92
Lat.	*cov*	-0.12	-0.11	0.11	0.02	-0.11	-0.09	-0.01
	r^2	0.01	0.01	0.01	0.00	0.02	0.00	0.00
	pp	0.28	0.25	0.65	0.54	0.25	0.41	0.48
Temp.	*cov*	**0.07**	**0.05**	**0.05**	-0.00	**0.04**	-0.00	**-0.04**
	r^2	**0.31**	**0.34**	**0.25**	0.00	**0.35**	0.00	**0.18**
	pp	**1.00**	**1.00**	**0.99**	0.48	**1.00**	0.40	**0.04**
RH	*cov*	-0.00	0.00	0.01	0.00	0.01	-0.00	-0.01
	r^2	0.00	0.01	0.04	0.00	0.07	0.01	0.08
	pp	0.49	0.73	0.81	0.54	0.87	0.35	0.14
NPP	*cov*	0.06	-0.03	0.04	0.00	0.06	0.01	-0.05
	r^2	0.02	0.01	0.01	0.00	0.10	0.00	0.04
	pp	0.82	0.32	0.69	0.48	0.92	0.49	0.18
Precip.	*cov*	-0.01 †	-0.01 †	0.04	0.00	0.06	-0.06	-0.13
	r^2	0.00	0.00	0.01	0.00	0.07	0.04	0.17
	pp	0.41	0.46	0.70	0.53	0.86	0.23	0.06
UVB	*cov*	0.00	**-0.02** *	-0.01	-0.00	-0.01	0.01	0.01
	r^2	0.00	**0.07**	0.03	0.00	0.04	0.00	0.03
	pp	0.53	**0.04**	0.22	0.51	0.19	0.59	0.76

Table 1. Covariance matrix between substitution rate (Subst. rate in mitochondrial non-coding genes or synonymous (dS) and non-synonymous (dN) substitution rates, and the ratio of non-synonymous to synonymous substitutions (ω) in mitochondrial and nuclear coding genes) and body size, diversification events (Div. events), elevation (Elev.), latitude (Lat.), temperature (Temp.), relative humidity (RH), net primary productivity (NPP), preciptiation (Precip.) and UVB radiation (UVB). We show covariances (cov), which indicate the direction of the correlation, the effect size (r^2) and the posterior probabilities (pp); values ≤ 0.05 or ≥ 0.95 can be taken as indicating that the relationships are extremely unlikely to occur by chance and are shown in bold. When controlling for the effect of temperature: correlations indicated by * are no longer significant, while those indicated by † become significant (see details in the Results section and in Appendix S7).

negatively associated with metabolic rate (Martin & Palumbi, 1993), all of which might influence the rate of molecular evolution (i.e. Gillooly *et al.*, 2005; Nabholz *et al.*, 2008; Lartillot & Poujol, 2011; Santos, 2012). We used body size, measured as the midpoint of snout-vent length (SVL; tip of snout to anterior margin of cloaca). Midpoint SVL was obtained from the IUCN database (2012), published literature, and our own unpublished data (details in Appendix S3). Estimates of midpoint SVL included both males and females.

Analyses

An essential first step, prior to testing whether there is any association between phenotypic traits or environmental variables and rate of substitution, is to discard any potential confounding effects of the node-density artefact, an underestimation of the branch lengths in areas of the tree with few taxa (Venditti *et al.*, 2006). We tested for the presence of the node-density artefact using the *Test for Punctuational Evolution and the Node-Density Artifact* available online (http://www.evolution.reading.ac.uk/pe/index.html) (Webster *et al.*, 2003; Venditti *et al.*, 2006). Presence of a node-density effect was discarded (δ<1).

To analyse the association between the rate of molecular evolution and the different traits we used Coevol (v1.4) (Lartillot & Poujol, 2011). We analysed correlations between traits and dS, dN and ω. Note that only an overall

substitution rate can be calculated for non-coding genes (12S and 16S mitochondrial rRNA). Coevol estimates the correlations jointly modelled as a multivariate Brownian diffusion process along all branches of the tree (whole-tree method). 'Whole-tree' methods now enable analyses including all the information obtained from a phylogenetic reconstruction of the clade of interest taking into account the phylogenetic dependence (Lanfear *et al.*, 2010). The input was the multiple sequence alignment, a matrix of log-transformed continuous traits for the same taxa, and the phylogenetic tree. A covariance matrix is estimated using a Bayesian Markov Chain Monte Carlo (MCMC) method. We used a geodesic averaging method for computing branch-specific mean values of the molecular evolution parameters, as it is suggested to be more precise than an arithmetic averaging method (Lartillot & Poujol, 2011). We ran each analysis twice until stabilization of all estimated parameters, which was visually verified by plotting the trace file of each trait. We ensured convergence by comparing the two independent runs of each analysis using the tracecomp module of Coevol. Burnin was set after stabilization (checked visually). To compute posterior estimates of the covariance matrix, we used the component readcoevol. We tested the key association between temperature and diversification predicted by the IESH using phylogenetic generalized least squares (Martins & Hansen 1997) in the R package 'caper' (Orme *et al*. 2012) to control for phylogenetic non-independence. Analyses were run under a Brownian motion model of evolution with the lambda parameter, which estimates the necessary correction for phylogenetic non-independence of the residuals (Freckleton *et al*., 2002; Revell 2010). Data were log transformed prior to analyses to meet assumptions of the model of evolution. Figure 2, depicting the main result of these analyses, was constructed using the phytools package (Revell, 2012) in R (R Development Core Team, 2012).

RESULTS

We confirmed the convergence of the two independent runs of each analysis. In all cases effective sample sizes of parameters and discrepancy between independent runs were well within range of values for the runs to be considered as good, with a single exception, a run for which some values were in the range for it to be considered as acceptable (see Appendix S5 for details). The number of cycles, burnin and number of sampled iterations in the posterior distribution for all analyses are shown in Appendix S6.

An overview of the main results is presented in Table 1 (see Appendix S7 for a comprehensive description). Following the prediction of the IESH, substitution rate and dS were positively correlated with temperature in mitochondrial non-coding genes, and mitochondrial and nuclear coding genes (Fig. 2). Temperature was only positively correlated with dN in the mitochondrial coding gene and negatively correlated with ω in the nuclear genes. However, contrary to the predictions of the IESH substitution rates were not correlated with mean annual precipitation, mean annual relative humidity or mean annual net primary productivity for the mitochondrial or the nuclear genes. Finally, in agreement with the IESH, the substitution rate in the mitochondrial non-coding genes as well as dS in the mitochondrial coding gene were positively correlated with diversification rate. However, dN and ω in the mitochondrial coding gene and substitution rates (dN or dS) and ω in the nuclear genes were not correlated with diversification rate.

With regard to potential confounding factors and commonly used proxies for temperature we found that, firstly, body size was not correlated with substitution rate (dS or dN) or ω in the mitochondrial or the nuclear genes, thus we can rule out confounding effects of body size. Secondly, midpoint latitude was not correlated with substitution rates or ω in the mitochondrial or the nuclear genes. On the other hand, midpoint elevation was negatively correlated with the rate of substitution in mitochondrial non-coding genes, and also with the rate of synonymous (dS) and non-synonymous (dN) substitution in the mitochondrial coding gene, but it was only correlated with the rate of synonymous substitution (dS) in the nuclear coding gene. Midpoint elevation was not correlated with the ratio of non-synonymous to synonymous substitutions (ω) in any gene. Finally, contrary to what we expected, UVB radiation was negatively

correlated with dS in the mitochondrial coding gene while all other relationships were non-significant.

Interestingly, some of the significant correlations described above disappeared and others became significant when tested by controlling for other factors with which they were correlated. The partial correlations we analysed suggest that elevation and UVB radiation are correlated with the rate of molecular evolution via temperature, since their association with rate of molecular evolution disappeared when controlling for the effect of temperature. Surprisingly, when controlling for temperature we found a significantly negative correlation between precipitation and substitution rate and dS in mitochondrial non-coding genes and the mitochondrial coding gene, respectively.

DISCUSSION

Temperature is the key factor related with the rate of molecular evolution

The bivariate correlations show that the rate of molecular evolution is significantly correlated with temperature, elevation and UVB radiation (Table 1). The IESH predicts that these factors, with the exception of UVB radiation, are associated directly or indirectly with the rate of molecular evolution, and all were included within the idea of biologically available energy (Wright *et al.,* 2006). According to the IESH, ectothermic species living in environments with higher biologically available energy have higher body temperature and therefore higher metabolic rate (Allen *et al.*, 2006; Wright *et al.*, 2010), increasing the production of reactive oxygen species that may lead to higher mutation rate. A recent study with poison frogs empirically tested the relationship between metabolic rate and rate of molecular evolution and showed that indeed higher active metabolic rate, but not resting metabolic rate, is associated with higher rate of molecular evolution in both mitochondrial and nuclear genes (Santos, 2012). We propose that the observed correlations between temperature, elevation, UVB radiation and the rate of molecular evolution are the result of an increased rate of mutation in warmer environments, in support of the IESH. Indeed, the fact that the correlations between rate of molecular evolution and elevation or UVB radiation disappear when we control for temperature supports our interpretation and emphasizes the crucial role of temperature as the principal factor behind these associations. The absence of an association between latitude and the rate of molecular evolution can be explained by the lack of correlation between latitude and temperature (Pearson's r=0.07). Centrolenid species present a mainly tropical distribution and this limited variation in the latitudinal range (Fig. 1) is a potential explanation for why variation in temperature is linked to altitudinal rather than latitudinal differences. Our results also stress the importance of testing the IESH using the environmental variable proposed to play the key role, temperature, rather than proxies as these may not always accurately reflect differences in environmental temperature.

According to IESH, reduced water availability is proposed to limit the rate of molecular evolution, as was observed in Australian plants (Goldie *et al.* 2010). Somewhat contrary to this prediction, we found that precipitation is negatively correlated with substitution rate and dS in mitochondrial non-coding genes and the mitochondrial coding gene, respectively, but only after controlling for the effect of temperature. It is certainly possible that, since centrolenids require a relatively wet microhabitat, our data measured over the entire distribution range does not properly reflect water stress. Relative humidity, however, was not associated with the rate of molecular evolution. We propose two non-mutually exclusive explanations for why, for a given temperature, in drier conditions centrolenids present higher rate of molecular evolution in mitochondrial genes. On the one hand, under hydric stress mitochondria might produce higher amounts of reactive oxygen species, which could in turn lead to higher mutation rate. Alternatively, it is possible that in adverse conditions the population size of centrolenids, which depend on liquid water for reproduction, presents more pronounced demographic fluctuations resulting in higher rate of molecular evolution (Balloux & Lehmann, 2011). Our results do not allow us to distinguish between these two potential explanations.

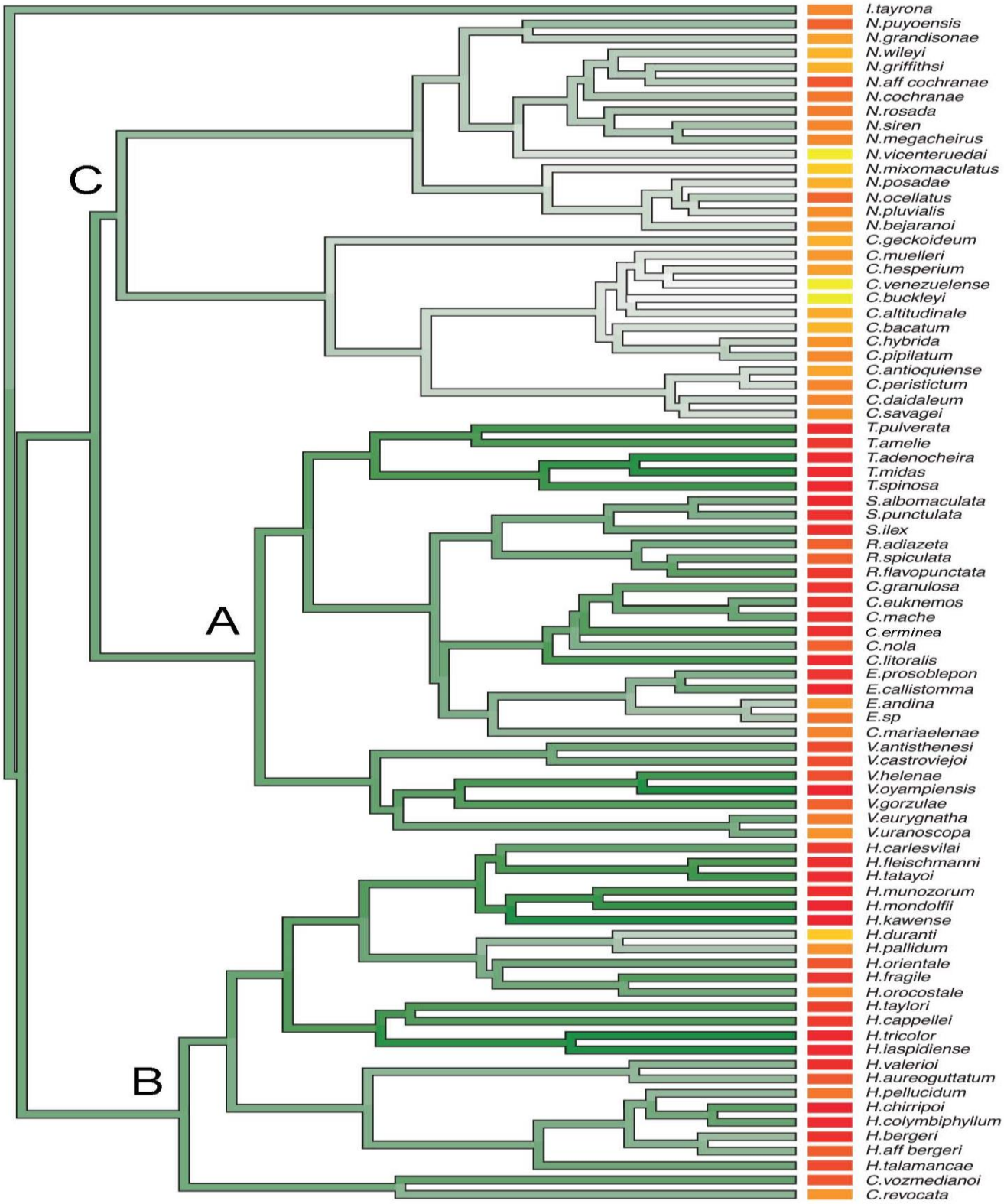

Figure 2. Phylogenetic tree of Centrolenidae. Colours of branches represent the synonymous substitution rate (dS) of the nuclear genes: where the rate of substitution increases from light grey to dark green. Rectangles at the tips of the phylogeny represent the mean annual temperature of the species' distribution range (mean annual temperature increases from yellow to red). This figure highlights the faster synonymous substitution rate in species inhabiting warmer habitats (Clades A and B versus C). Letters indicate the three major clades whose distribution is shown in Fig. 1.

Contrary to the prediction of the IESH, we did not find any correlation between net primary production and the rate of molecular evolution (Table 1) (Gillman & Wright, 2014). We cannot rule out that there is insufficient variation in net primary productivity in this mainly tropical clade for a significant association to be detected. Nonetheless, we note that the relationship is based on the fact that productivity is a good predictor of species richness. But, as discussed below, the rate of molecular evolution may not be directly associated with species richness, as other factors may also play important roles therefore mitigating the correlation between molecular evolution and primary productivity. The absence of a correlation between productivity and rate of molecular evolution suggests that the relationship between temperature and/or water availability with the rate of molecular evolution might not be via productivity.

In sum, our results are in accord with previous studies in ectotherms (Wright *et al.*, 2010; Lourenço *et al.*, 2013) and endotherms (Gillman *et al.*, 2009, 2012) that found faster substitution rates for species living in warmer environments. The observed discrepancies between mitochondrial and nuclear data might be due to differences in the statistical power to detect associations or natural differences between both kinds of genomes, such as the lower effective population size (Wright 1931) and the higher mutation rate of the mitochondrial genome (Martin and Palumbi 1993).

Elevated diversification is correlated with increased rate of molecular evolution in mitochondrial genes

The IESH also predicts that the faster rate of molecular evolution in warmer environments favours diversification because of the more rapid build-up of incompatibilities between populations (Dowle *et al.*, 2013). Hence, a positive correlation between diversification and rate of molecular evolution would be expected. In agreement with this prediction, we found a correlation between diversification events and the rate of molecular evolution in mitochondrial genes (Table 1). However, the effect size of the correlation between substitution rates and diversification was relatively low, range from 6 to 10% (Table 1), indicating that other factors possibly play an important role in the association with rate of molecular evolution. The absence of a correlation between diversification events and substitution rates in nuclear genes (Table 1) is surprising and counter to results of theoretical and empirical studies (Ohta, 1992; Balloux & Lehmann, 2011; Buschiazzo *et al.*, 2012; Popadin *et al.*, 2013). As mentioned above, it is possible that our sample of nuclear genes is not sufficient to allow us to detect the association, in contrast with previous studies (e.g. Barraclough & Savolainen, 2001; Lanfear *et al.*, 2010). Compared to the mitochondrial genome, the nuclear genome has a higher effective population size that can dilute the effect of demographic fluctuations associated with diversification events (Popadin *et al.*, 2013).

Body size is not correlated with the rate of molecular evolution

We did not find any correlation between body size and substitution rates or ω in mitochondrial or nuclear genes (Table 1). This result contrasts with previous findings in mantellid and poison frogs (Wollenberg *et al.*, 2011; Santos, 2012). The absence of a relationship between body size and the rate of molecular evolution in Centrolenidae may be a result of the reduced variation in body size in this clade. Excluding the exceptionally large *Centrolene geckoideum* (71.3 mm SVL), the largest species is only twice as large as the smallest Centrolenidae (SVL range: 18.5–36.4 mm). On the other hand, the difference between the smallest and largest species is one order of magnitude or more in mantellids (SVL range: 10–110 mm SVL) and poison-frogs (range: 0.2–6 g). The lack of correlation between body size and molecular evolution rate places the focus on the influence of environmental variables ruling out potential confounding effects of allometry.

Do our results support the Integrated Evolutionary Speed Hypothesis?

The integrated evolutionary speed hypothesis is proposed as an explanation for the latitudinal species gradient (Gillman & Wright, 2014). Our results support two key predictions of the IESH in a recently diverged clade of Neotropical amphibians. Firstly, we found that the rate of molecular evolution is positively correlated with

temperature. Secondly, we found that the rate of molecular evolution is positively associated with diversification, although only in mitochondrial genes and with a small effect size (r^2= 6-10%). Hence, at first sight our results appear to support the IESH. However, our results do not support the additional tested predictions of the IESH: namely the positive associations between rate of molecular evolution and productivity or water availability. The absence of a correlation between temperature and diversification events in centrolenids (λ=1, β=0.16187, s.e.=0.1543, t-value=1.0491, p-value=0.2968) is not necessarily contrary to the IESH. As indicated by Rohde (1992) and Gillman and Wright (2014), the relationship between temperature and speciation (or species richness) is indirect and other key factors intervene, such as time or possibility of genetic isolation. A recent study points to the early colonization of mountain ranges, in combination with time allowing for richness to build up, as potential explanations for Centrolenid diversity (Hutter *et al.*, 2013) and other studies of Neotropical amphibians also suggest mountain ranges play a key role favouring isolation of populations and therefore diversification (e.g. Gonzalez-Voyer *et al.*, 2011; Santos *et al.*, 2009). We suggest that while lowland habitats are indeed associated with higher rate of molecular evolution, as a result of higher temperature, they nonetheless lack the ecological and geographical features favouring isolation of populations, and hence speciation, compared with mountain ranges such as the Andes. A recent study supports this suggestion as it found higher genetic divergences among frog species in mountains compared to lowlands (Guarnizo & Cannatella, 2013). Spatial heterogeneity therefore appears to overlay the important effect of temperature via the rate of molecular evolution favouring speciation.

In conclusion, we found that species inhabiting warmer environments have a higher rate of molecular evolution, which increases even more in the mitochondrial genes in drier conditions. We also found that a higher rate of molecular evolution is positively correlated with the rate of diversification in mitochondrial genes. As far as we know, this is the first study to show both an association between temperature and higher rate of molecular evolution as well as a positive correlation between the rate of molecular evolution and diversification rate. These results support the IESH, emphasizing the important association between rate of molecular evolution and temperature (r^2=25-35%) even within a relatively short timescale and the relationship between the latter and the rate of diversification. However, the absence of a positive correlation between temperature and diversification, together with the small effect size of the relationship between substitution rates and diversification (r^2=6-10%), highlight the influence of other factors, such as time, spatial heterogeneity or population size that must be taken into consideration (Gillman & Wright 2014).

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Supporting Information

Appendix S1 GenBank accession numbers for each species and gene.

Appendix S2 References used to adjust IUCN distributions, when necessary.

Appendix S3 Matrix of characters used in the analyses.

Appendix S4 Phylogenetic tree with the number of nodes.

Appendix S5 Convergence diagnostics.

Appendix S6 Details for the Coevol analyses.

Appendix S7 Comprehensive results of the Coevol analyses.

Appendix S1. GenBank accession numbers for all genes used in analyses. Ribosomal DNA 12S (12S) and 16S (16S), NADH dehydrogenase subunit 1 (ND1), brain-derived neurotrophic factor (BDNF), nuclear proto-oncogene cellular myelocytomatosis (C-MYC), chemokine receptor 4 (CXCR4), proopiomelanocortin A (POMC), recombination activating gene-1 (RAG-1), solute-carrier family 8 members 1 and 3 (SLC8A1; SLC8A3).

Species	12S	16S	ND1	BDNF	c-MYC	CXCR4	POMC	RAG-1	SLC8A1	SLC8A3
Celsiella revocata	EU663379	EU663019	EU663113	KF534278	EU663281	KF534374	EU663204	EU663479	KF534113	KF534195
Celsiella vozmedianoi	EU663385	EU663025	EU663163	—	EU663324	KF534375	EU663247	EU663531	KF534114	—
Centrolene altitudinale	EU663333	EU662974	EU663070	KF534280	EU663249	KF534377	EU663165	EU663433	KF534116	KF534197
Centrolene antioquiense	EU663336	EU662977	EU663073	KF534281	EU663251	KF534378	EU663167	EU663436	KF534117	KF534198
Centrolene bacatum	EU663337	EU662978	EU663074	—	EU663252	KF534379	EU663168	EU663437	KF534118	KF534199
Centrolene ballux	KF639754	JX126954	HG764783	—	—	—	—	—	—	—
Centrolene buckleyi	EU663338	EU662979	EU663075	KF534282	EU663253	KF534380	EU663169	—	—	KF534200
Centrolene charapita	KF639760	KF534358	—	—	—	—	—	—	—	—
Centrolene condor	KF639755	JX126955	JX187513	—	—	—	—	—	—	—
Centrolene daidaleum	EU663366	EU663007	EU663101	KF534283	EU663465	KF534381	EU663272	EU663465	KF534119	KF534201
Centrolene geckoideum	EU663341	EU662982	EU663077	—	—	KF534382	—	EU663440	KF534120	KF534202
Centrolene heloderma	KF639757	JX126956	JX187509	—	—	—	—	—	—	—
Centrolene hesperium	EU663345	EU662986	EU663081	KF534284	EU663258	KF534383	KF639777	EU663444	KF534121	KF534203
Centrolene hybrida	EU663346	EU662987	EU663082	KF534285	EU663259	KF534384	EU663175	EU663445	KF534122	KF534204
Centrolene lynchi	KF639758	JX126957	JX187508	—	—	—	—	—	—	—
Centrolene muelleri	KF639759	JX126958	HG764785	KF534286	KF534458	KF534385	KF639778	—	KF534123	KF534205
Centrolene peristictum	EU663352	EU662993	EU663088	KF534288	EU663266	KF534387	EU663181	EU663451	KF534124	KF534207
Centrolene pipilatum	EU663353	EU662994	EU663089	KF534289	KF534459	KF534388	KF639779	EU663452	KF534125	KF534208
Centrolene savagei	EU663380	EU663020	EU663114	KF534290	EU663282	KF534389	EU663205	EU663480	KF534126	KF534209
Centrolene venezuelense	EU663360	EU663001	EU663095	KF534291	EU663267	KF534390	EU663186	EU663459	KF534127	KF534210
Chimerella corleone	KF639761	KF534359	—	—	—	—	—	—	—	—
Chimerella mariaelenae	EU663350	EU662991	EU663086	KF534292	EU663263	KF534391	EU663179	EU663449	KF534128	KF534211
Cochranella erminea	KF639762	KF534360	HG764786	KF534293	KF534460	KF534392	KF639780	—	KF534129	KF534212
Cochranella euknemos	EU663367	EU663008	EU663102	—	KF534461	KF534393	EU663193	EU663466	—	KF534213

Species	12S	16S	ND1	BDNF	c-MYC	CXCR4	POMC	RAG-1	SLC8A1	SLC8A3
Cochranella granulosa	EU663370	EU663010	EU663195	KF534294	EU663274	KF534394	KF639781	EU663469	KF534130	KF534214
Cochranella guayasamini	KF639764	KF534362	—	—	—	—	—	—	—	—
Cochranella litoralis	EU663349	EU662990	EU663085	KF534295	EU663262	KF534395	EU663178	EU663448	KF534131	KF534215
Cochranella mache	EU663373	EU663013	EU663107	KF534296	EU663277	KF534396	EU663198	EU663472	KF534132	KF534216
Cochranella nola	EU663381	EU663021	EU663115	KF534297	EU663283	KF534397	EU663206	EU663481	KF534133	KF534217
Cochranella resplendens	KF639763	KF534361	HG764787	—	—	—	—	—	—	—
Espadarana andina	EU663335	EU662976	EU663072	KF534298	EU663250	KF534398	EU663166	EU663435	KF534134	KF534218
"Espadarana audax"	KF639753	KF534355	HG764782	—	—	—	—	—	—	—
Espadarana callistomma	EU663340	EU662981	EU663076	KF534299	EU663255	KF534399	EU663171	EU663439	KF534135	KF534219
"Espadarana durrellorum"	KF639756	KF534356	HG764784	—	—	—	—	—	—	—
Espadarana prosoblepon	EU663354	EU662995	AY819466	—	AY819170	KF534400	AY819085	EU663453	KF534136	KF534220
Espadarana sp	EU663355	EU662996	EU663090	KF534300	KF534462	KF534401	EU663182	EU663454	KF534137	KF534221
Hyalinobatrachium aff *bergeri*	EU663393	EU663026	EU663119	KF534301	EU663290	KF534402	EU663210	EU663485	KF534138	KF534222
Hyalinobatrachium aureoguttatum	EU663391	EU663032	EU663124	KF534302	EU663288	KF534403	EU663214	EU663491	KF534139	KF534223
Hyalinobatrachium bergeri	EU663392	EU663033	EU663125	KF534303	EU663289	KF534404	EU663215	EU663492l	KF534140	KF534224
Hyalinobatrachium cappellei	EU663401	EU663040	EU663132	KF534304	EU663297	—	EU663222	EU663499	KF534141	KF534225
Hyalinobatrachium carlesvilai	EU663388	EU663030	EU663122	KF534305	EU663291	KF534405	EU663212	EU663489i	KF534142	KF534226
Hyalinobatrachium chirripoi	EU663398	EU663037	EU663129	KF534307	EU663294	KF534407	EU663219	EU663496	KF534144	KF534228
Hyalinobatrachium colymbiphyllum	EU663400	EU663039	EU663131	KF534308	EU663296	KF534408	EU663221	EU663498	KF534145	KF534229
Hyalinobatrachium duranti	EU663402	EU663041	EU663133	KF534309	EU663298	KF534409	EU663223	EU663500	KF534146	KF534230
Hyalinobatrachium fleischmanni	EU663406	EU663045	EU663137	KF534310	EU663300	KF534410	EU663225	EU663504	KF534147	KF534231
Hyalinobatrachium fragile	EU663407	EU447286	EU663138	KF534311	EU663301	KF534411	EU663226	EU663505	KF534148	KF534232
Hyalinobatrachium iaspidiense	EU663408	EU663047	EU663139	KF534312	EU663302	KF534412	—	EU663506	KF534149	KF534233
Hyalinobatrachium kawense	EU663387	EU663029	EU663121	KF534314	EU663329	KF534414	EU663211	EU663488	KF534151	KF534235
Hyalinobatrachium mondolfii	EU663411	EU663050	EU663142	KF534315	EU663305	KF534415	EU663229	EU663509	KF534152	KF534236
Hyalinobatrachium munozorum	EU663395	EU663034	EU663126	—	KF534464	KF534416	EU663216	EU663493	—	KF534237
Hyalinobatrachium orientale	EU663413	EU447289	EU663144	KF534316	EU663306	KF534417	EU663230	EU663511	KF534153	KF534238
Hyalinobatrachium orocostale	EU663414	EU447284	EU663145	KF534317	EU663307	KF534418	EU663231	EU663512	KF534154	KF534239

Species	12S	16S	ND1	BDNF	c-MYC	CXCR4	POMC	RAG-1	SLC8A1	SLC8A3
Hyalinobatrachium pallidum	EU663415	EU663052	EU663146	KF534318	EU663292	KF534419	EU663217	EU663513	KF534155	KF534240
Hyalinobatrachium pellucidum	EU663397	EU663036	EU663128	KF534319	EU663293	KF534420	EU663218	EU663495	KF534156	KF534241
Hyalinobatrachium talamancae	EU663418	EU663054	EU663149	KF534321	EU663313	KF534422	EU663233	EU663516	KF534158	KF534243
Hyalinobatrachium tatayoi	EU663419	EU663055	EU663150	KF534322	EU663310	KF534423	EU663234	EU663517	KF534159	KF534244
Hyalinobatrachium taylori	EU663420	EU663056	EU663151	KF534323	EU663311	KF534424	EU663235	EU663518	KF534160	KF534245
Hyalinobatrachium tricolor	EU663386	EU663027	HG764789	KF534324	EU663328	KF534425	—	EU663486	KF534161	KF534246
Hyalinobatrachium valerioi	EU663421	EU663058	EU663152	KF534325	EU663312	KF534426	EU663236	EU663519	KF534162	KF534247
Ikakogi tayrona	EU663356	EU662997	EU663091	KF534326	EU663330	KF534427	EU663183	EU663455	KF534163	KF534248
Nymphargus anomalus	KF639766	KF534364	HG764790	—	—	—	—	—	—	—
Nymphargus bejaranoi	EU663422	EU663059	EU663155	KF534328	EU663314	KF534429	EU663239	EU663522	KF534165	KF534250
Nymphargus chancas	KF639767	KF534365	HG764791	—	—	—	—	—	—	—
Nymphargus cochranae	EU663425	EU663061	EU663156	KF534329	EU663317	KF534430	EU663240	EU663523	KF534166	KF534251
Nymphargus garciae	AY326022	AY326022	—	—	—	—	—	—	—	—
Nymphargus grandisonae	EU663344	EU662985	EU663080	KF534330	EU663257	KF534431	EU663174	EU663443	KF534167	KF534252
Nymphargus griffithsi	EU663426	EU663062	EU663157	KF534331	EU663318	KF534432	EU663241	EU663524	KF534168	KF534253
Nymphargus megacheirus	EU663427	EU663063	EU663158	—	EU663319	KF534433	EU663242	EU663525	KF534169	KF534254
Nymphargus mixomaculatus	KF639768	EU663064	EU663159	KF534332	EU663320	KF534434	EU663243	EU663526	KF534170	KF534255
Nymphargus ocellatus	KF639769	KF534366	HG764792	KF534333	KF534465	KF534435	KF639784	KF639787	KF534171	KF534256
Nymphargus pluvialis	EU663428	EU663065	EU663160	KF534334	EU663321	KF534436	EU663244	EU663527	KF534172	KF534257
Nymphargus posadae	KF639770	KF 534367	—	—	—	KF534437	—	EU663528	KF534173	—
Nymphargus puyoensis	KF639771	KF534368	HG764793	—	—	—	—	EU663478	—	—
Nymphargus rosada	EU663429	EU663066	EU663161	KF534335	EU663322	KF534438	EU663245	EU663529	KF534174	KF534258
Nymphargus siren	EU663430	EU663067	EU663162	KF534336	EU663323	KF534439	EU663246	EU663530	KF534175	KF534259
Nymphargus vicenteruedai	EU663424	EU663058	EU663154	KF534337	EU663316	KF534440	EU663238	EU663521l	KF534176	KF534260
Nymphargus wileyi	EU663431	EU663068	EU663164	KF534338	EU663325	KF534441	EU663248	EU663532	KF534177	KF534261
Nymphargus aff *cochranae*	EU663423	EU663060	EU663153	KF534327	EU663315	KF534428	EU663237	EU663520	KF534164	KF534249
Rulyrana adiazeta	EU663361	EU663002	EU663096	KF534339	EU663268	KF534442	EU663187	EU663460	KF534178	KF534262
Rulyrana flavopunctata	EU663368	EU663009	EU663103	KF534340	EU663273	KF534443	EU663194	EU663467	KF534179	KF534263

Species	12S	16S	ND1	BDNF	c-MYC	CXCR4	POMC	RAG-1	SLC8A1	SLC8A3
Rulyrana spiculata	EU663382	EU663022	EU663116	KF534341	EU663284	KF534444	EU663207	EU663482	KF534180	KF534264
Sachatamia albomaculata	EU663362	EU663003	EU663097	KF534343	EU663270	KF534446	EU663188	EU663461	KF534182	KF534266
Sachatamia ilex	EU663347	EU662988	EU663083	KF534344	EU663260	KF534447	EU663176	EU663446	KF534183	KF534267
Sachatamia orejuela	KF639773	KF534371	HG764794	—	—	—	—	—	—	—
Sachatamia punctulata	EU663378	EU663018	EU663112	KF534345	EU663280	KF534448	EU663203	EU663477	KF534184	KF534268
Teratohyla adenocheira	KF639774	KF534372	HG764795	KF534346	KF534466	KF534449	KF639785	KF639788	KF534185	KF534269
Teratohyla amelie	EU663365	EU663005	EU663099	KF534347	EU663327	KF534450	EU663190	EU663463	KF534186	KF534270
Teratohyla midas	EU663374	EU663014	EU663108	—	EU663278	—	EU663199	EU663473l	—	—
Teratohyla pulverata	EU663416	EU663053	EU663147	KF534348	EU663308	KF534451	EU663232	EU6635145	KF534187	KF534271
Teratohyla spinosa	EU663383	EU663023	EU663117	KF534349	EU663285	KF534452	EU663208	EU663483	KF534188	KF534272
Vitreorana antisthenesi	EU663390	EU663031	EU663123	KF534350	EU663287	KF534453	EU663213	EU663490	KF534189	KF534273
Vitreorana castroviejoi	EU663363	EU663004	EU663098	KF534351	EU663271	KF534454	EU663189	EU663462	KF534190	KF534274
Vitreorana eurygnatha	AY843595	AY843595	EU663135	—	—	—	—	AY844383	—	—
Vitreorana gorzulae	EU663343	EU662984	EU663079	KF534352	EU663256	KF534455	EU663173	EU663442	KF534191	KF534275
Vitreorana helenae	EU663372	EU663012	EU663106	KF534353	EU663276	KF534456	EU663197	EU663471	KF534192	KF534276
Vitreorana oyampiensis	EU663377	EU663017	EU663111	KF534354	EU663326	KF534457	EU663202	EU663476	KF534193	KF534277
Vitreorana uranoscopa	KF639776	KF639775	—	—	—	—	JX298142	—	—	—

Appendix S2. References used to adjust IUCN distributions, when necessary. A dash indicates no adjustment was done.

Species	IUCN Distribution adjusted according to
Celsiella revocata	-
Celsiella vozmedianoi	-
Centrolene altitudinale	[1]
Centrolene antioquiense	[2]
Centrolene bacatum	-
Centrolene ballux	-
Centrolene buckleyi	[unpub. data]
Centrolene charapita	New creation [unpub. data]
Centrolene condor	[3]
Centrolene daidaleum	[4,5]
Centrolene geckoideum	[6]
Centrolene heloderma	-
Centrolene hesperium	-
Centrolene hybrida	-
Centrolene lynchi	-
Centrolene muelleri	-
Centrolene peristictum	-
Centrolene pipilatum	-
Centrolene savagei	-
Centrolene venezuelense	[1, unpub. data]
Chimerella corleone	New creation [unpub. data]
Chimerella mariaelenae	-
Cochranella erminea	[7]
Cochranella euknemos	-
Cochranella granulosa	-
Cochranella guayasamini	-
Cochranella litoralis	-
Cochranella mache	-
Cochranella nola	[unpub. data]
Cochranella resplendens	-
Espadarana andina	[1]
"Espadarana audax"	-
Espadarana callistomma	[8]
"Espadarana durrellorum"	-
Espadarana prosoblepon	[9]
Espadarana sp	New creation [unpub. data]
Hyalinobatrachium aff *bergeri*	New creation [unpub. data]
Hyalinobatrachium aureoguttatum	-
Hyalinobatrachium bergeri	[unpub. data]
Hyalinobatrachium cappellei	[10–13]
Hyalinobatrachium carlesvilai	[14]
Hyalinobatrachium chirripoi	-

Species	IUCN Distribution adjusted according to
Hyalinobatrachium colymbiphyllum	-
Hyalinobatrachium duranti	-
Hyalinobatrachium fleischmanni	[15, unpub. data]
Hyalinobatrachium fragile	-
Hyalinobatrachium iaspidiense	[13,16,17]
Hyalinobatrachium kawense	[13]
Hyalinobatrachium mondolfii	[13,18]
Hyalinobatrachium munozorum	[18, unpub. data]
Hyalinobatrachium orientale	[unpub. data]
Hyalinobatrachium orocostale	[19]
Hyalinobatrachium pallidum	[1]
Hyalinobatrachium pellucidum	[20]
Hyalinobatrachium talamancae	-
Hyalinobatrachium tatayoi	[1]
Hyalinobatrachium taylori	[13]
Hyalinobatrachium tricolor	[13]
Hyalinobatrachium valerioi	-
Ikakogi tayrona	-
Nymphargus aff *cochranae*	New creation [unpub. data]
Nymphargus anomalus	-
Nymphargus bejaranoi	-
Nymphargus chancas	-
Nymphargus cochranae	[21]
Nymphargus garciae	-
Nymphargus grandisonae	-
Nymphargus griffithsi	-
Nymphargus megacheirus	-
Nymphargus mixomaculatus	[22]
Nymphargus ocellatus	-
Nymphargus pluvialis	-
Nymphargus posadae	-
Nymphargus puyoensis	-
Nymphargus rosada	-
Nymphargus siren	[unpub. data]
Nymphargus vicenteruedai	-
Nymphargus wileyi	-
Rulyrana adiazeta	-
Rulyrana flavopunctata	[23]
Rulyrana spiculata	-
Sachatamia albomaculata	[24]
Sachatamia ilex	-
Sachatamia orejuela	[25]
Sachatamia punctulata	-
Teratohyla adenocheira	[26,27]

Species	IUCN Distribution adjusted according to
Teratohyla amelie	[unpub. data]
Teratohyla midas	[21,28]
Teratohyla pulverata	-
Teratohyla spinosa	-
Vitreorana antisthenesi	-
Vitreorana castroviejoi	-
Vitreorana eurygnatha	-
Vitreorana gorzulae	[29]
Vitreorana helenae	[28]
Vitreorana oyampiensis	[29]
Vitreorana uranoscopa	[30–33]

Appendix S3. Matrix of characters used in the analyses. References for midpoint snout Vent Length (SVL) and midpoint elevation are included. The number of diversification events (Div. events) was extracted from the maximum-likelihood phylogenetic tree (see Appendix S4). The mean annual temperature, midpoint latitude, mean annual relative humidity (RH), mean annual net primary productivity (NPP), mean annual precipitation and mean annual UVB radiation (UVB) were obtained from the species distribution using GIS after adjustment, when necessary (see details in Material and Methods and Appendix S2).

Species	Div. events (number)	Midpoint Snout Vent Length (mm)	Midpoint elevation (m)	Mean annual temperature (°C)	Midpoint latitude (degrees)	Mean annual RH (%)	Mean annual NPP (gC * 10^9)	Mean annual precipitation (mm)	Mean annual UVB (J/m^2)
Celsiella revocata	3	23.5 [34,35]	1500 [36]	18.3	10.4	78.5	59.9	1228.8	5166.0
Celsiella vozmedianoi	3	27.3 [37,38]	775 [36]	22	10.7	81.0	92.4	1808.0	5609.0
Centrolene altitudinale	10	22.2 [35,39,40]	2020 [36]	17.1	7.4	80.5	43.1	1738.4	6095.3
Centrolene antioquiense	7	20.9 [41,42]	2090 [2,36]	17.4	5.8	79.9	81.6	2948.2	5802.2
Centrolene bacatum	8	20.6 [38,39,45,46]	2150 [36]	16.4	1.2	80.5	9.9	1814.1	6037.0
Centrolene ballux	11	21.3 [47]	1962.5 [36,48]	16.9	0.4	75.8	33.3	1287.9	7036.1
Centrolene buckleyi	11	29.9 [38,49]	2700 [36]	12.8	1.1	67.7	102.3	1925.0	4914.0
Centrolene charapita	5	35.9 [unpub. data]	664 [unpub. data]	24.3	5.3	79.8	50.7	1922.3	4922.7
Centrolene condor	6	25.9 [3,50]	2003.5 [3,36]	18	3.6	77.0	80.1	2588.9	5027.9
Centrolene daidaleum	7	22.4 [51]	1430 [4,36]	19.2	6.2	79.2	50.6	2094.3	6345.6
Centrolene geckoideum	5	71.3 [53]	2137.5 [36]	16.8	3.1	79.0	43.2	1943.3	5625.2
Centrolene heloderma	8	29.6 [54]	2125 [36]	16.7	2.4	80.3	29.9	2215.7	5540.7
Centrolene hesperium	12	25.9 [55]	1650 [36]	17.8	6.9	67.0	28.8	560.5	5779.0
Centrolene hybrida	9	21.4 [39]	1715 [36]	18.5	3.6	79.5	40.9	2615.5	5021.0
Centrolene lynchi	12	25.0 [47,56–58]	1487.5 [36]	18.4	2.4	79.1	47.8	2984.3	4512.6
Centrolene muelleri	10	23.5 [44]	1915 [36]	18.2	5.8	79.5	12.3	2505.1	5361.2
Centrolene peristictum	7	19.9 [43]	1625 [57]	19.2	3.2	68.8	52.9	1055.5	5390.6
Centrolene pipilatum	9	21.3 [43]	1520 [36]	19.1	0.2	80.2	25.3	2240.8	5074.3
Centrolene savagei	7	21.9 [51]	1905 [36]	18.4	4.6	81.2	47.4	2822.7	4840.4

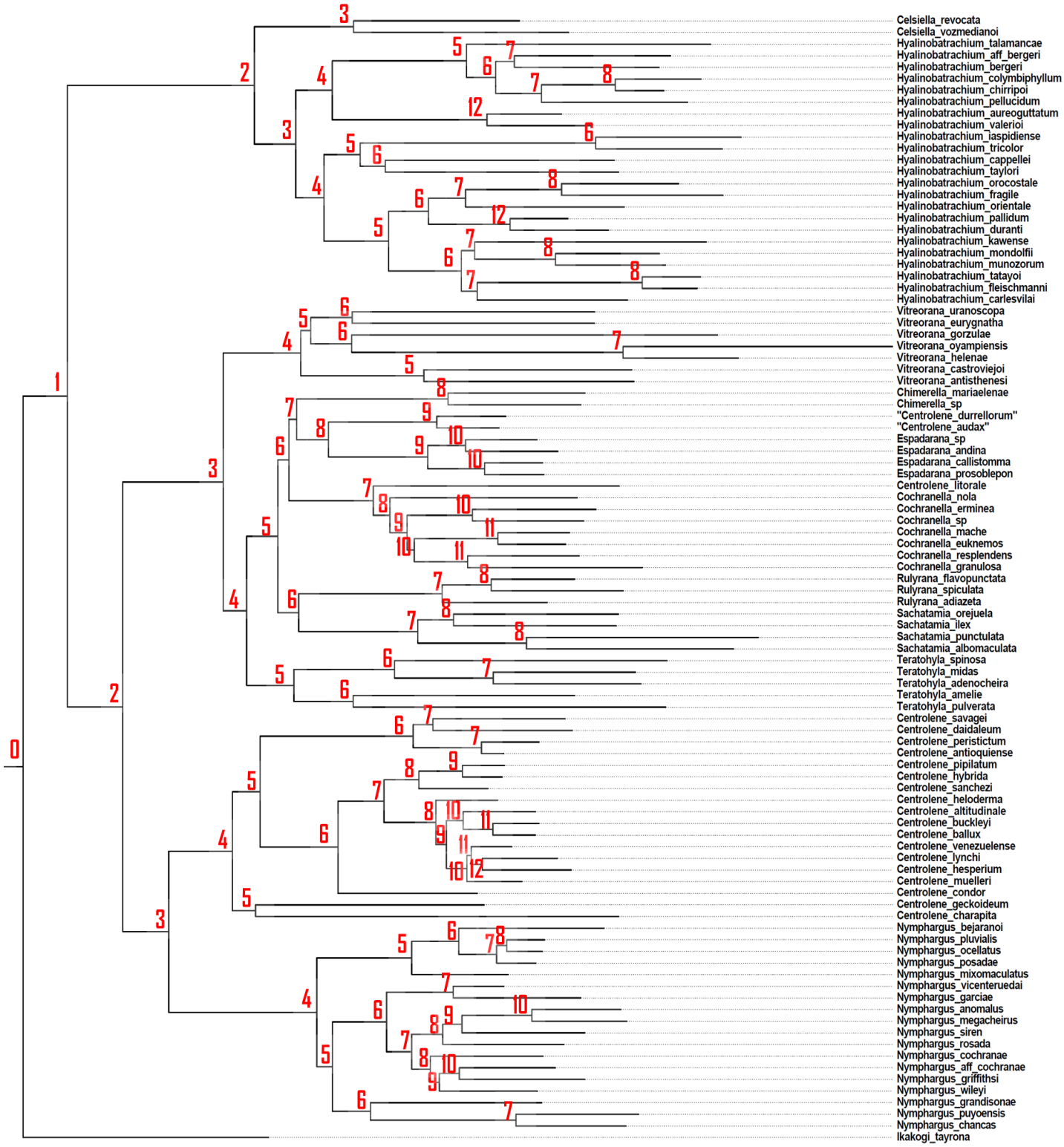
Species	Div. events (number)	Midpoint Snout Vent Length (mm)	Midpoint elevation (m)	Mean annual temperature (°C)	Midpoint latitude (degrees)	Mean annual RH (%)	Mean annual NPP (gC * 10^9)	Mean annual precipitation (mm)	Mean annual UVB (J/m^2)
Centrolene venezuelense	11	28.6 [40]	2575 [36]	13.4	8.9	78.4	46.1	2310.3	5731.9
Chimerella corleone	8	19.9 [unpub. data]	610 [unpub. data]	24.8	6.4	76.0	95.5	1647.0	5308.0
Chimerella mariaelenae	8	19.1 [23,59]	1610 [36]	19.3	2.4	74.2	28.4	1074.7	5159.8
Cochranella erminea	10	23.2 [7,60]	585 [7,36, unpub. data]	24.7	8.7	78.0	57.6	2683.8	5126.9
Cochranella euknemos	11	26.5 [61–63]	870 [36]	24.3	7.7	76.1	96.0	1519.4	5209.3
Cochranella granulosa	11	27.5 [47,51,61,64, unpub. data]	760 [36]	24.6	10.7	84.1	54.9	4479.4	4918.3
Cochranella guayasamini	10	24.8 [44]	818.5 [36]	23.9	6.6	77.7	52.1	1444.3	5464.8
Cochranella litoralis	7	19.4 [65]	160 [36]	25.3	1.1	82.3	67.1	2664.8	4822.3
Cochranella mache	11	23.8 [64]	372.5 [36]	24.5	0.7	76.8	39.1	2288.9	4616.1
Cochranella nola	8	23.2 [66,67]	1125 [36]	21.3	16.1	65.5	87.4	1847.0	4990.7
Cochranella resplendens	11	27.0 [43]	350 [36]	24.8	3.2	76.9	92.8	3104.9	5169.9
Espadarana andina	10	25.5 [35,40]	1502.5 [1,36]	18.1	7.8	82.4	57.1	5941.4	4949.8
"Espadarana audax"	9	24.2 [43,44]	1350 [36]	19.2	2.5	80.3	42.3	2513.3	5030.8
Espadarana callistomma	10	29.3 [68]	260 [8,36]	26.1	2.9	81.5	64.7	3254.0	4826.1
"Espadarana durrellorum"	9	25.9 [52]	685 [36]	23.7	2.2	78.3	91.0	3254.1	5135.9
Espadarana prosoblepon	10	25.5 [62,69]	977.5 [9,36]	24.5	6.1	84.0	92.4	3223.0	5558.0
Espadarana sp	10	No data	1500 [unpub. data]	20.3	7	82.8	49.7	4917.9	4985.9
Hyalinobatrachium aff *bergeri*	7	23.1 [unpub. data]	1120 [unpub. data]	21.5	15.1	70.3	49.8	3321.4	5117.9
Hyalinobatrachium aureoguttatum	5	22.2 [70]	807.5 [36]	21.8	11	78.4	75.9	1623.6	5237.4
Hyalinobatrachium bergeri	7	23.4 [71]	1150 [20]	24.9	4.3	79.5	97.8	2548.2	5669.5
Hyalinobatrachium cappellei	6	21.8 [13,35,72–74]	1005 [13]	23.8	2.7	69.4	84.0	3363.4	4604.5
Hyalinobatrachium carlesvilai	7	22.6 [20]	750 [20]	23.8	13.3	83.4	76.1	2733.3	4765.5
Hyalinobatrachium chirripoi	8	25.7 [61,62,75]	300 [36]	27.5	10.7	83.1	68.0	3887.7	4978.5

Species	Div. events (number)	Midpoint Snout Vent Length (mm)	Midpoint elevation (m)	Mean annual temperature (°C)	Midpoint latitude (degrees)	Mean annual RH (%)	Mean annual NPP (gC * 10^9)	Mean annual precipitation (mm)	Mean annual UVB (J/m^2)
Hyalinobatrachium colymbiphyllum	8	25.6 [61,62,76]	905 [36,53]	25.2	9.4	73.2	22.1	1263.9	5928.1
Hyalinobatrachium duranti	7	22.8 [34,35]	2100 [36]	15.5	8.6	79.4	74.0	2646.3	4989.4
Hyalinobatrachium fleischmanni	8	25.5 [69]	845 [15,36]	24.7	9.3	77.0	70.2	1253.7	5172.3
Hyalinobatrachium fragile	8	21.7 [34,35]	400 [36]	24.4	10.1	77.5	98.1	2514.4	5583.3
Hyalinobatrachium iaspidiense	6	20.7 [35,77,78]	505 [36]	25.3	0	88.9	95.7	3764.2	5381.8
Hyalinobatrachium kawense	7	20.0 [13]	5 [36]	26.1	4.6	75.2	104.3	2521.8	5730.2
Hyalinobatrachium mondolfii	8	21.4 [13,79]	142.5 [18]	26.2	0.7	77.5	88.0	3082.1	5214.7
Hyalinobatrachium munozorum	8	22.3 [43]	560 [18,20]	25.2	3.3	83.0	67.4	1416.5	5259.9
Hyalinobatrachium orientale	7	21.7 [35,40]	695 [36]	22.1	10.6	76.6	70.8	1361.7	5456.6
Hyalinobatrachium orocostale	8	21.4 [19,40]	1350 [36]	18.9	10	77.9	48.5	1996.8	6176.1
Hyalinobatrachium pallidum	7	22.5 [1,34,35,80]	1591 [36]	18.6	8.2	79.6	49.9	2438.6	5043.0
Hyalinobatrachium pellucidum	7	21.2 [43,44]	1131.5 [20,36]	20	6.4	83.6	51.1	3311.5	4521.8
Hyalinobatrachium talamancae	5	24.0 [61,62,81,82]	758 [36]	22.7	9.1	76.0	85.9	1953.0	5316.8
Hyalinobatrachium tatayoi	8	22.1 [83]	371 [1,36]	25.4	10.2	77.9	95.5	2493.5	5701.9
Hyalinobatrachium taylori	6	19.7 [35,84]	940 [36]	23.5	4.2	89.8	101.3	3807.5	5360.8
Hyalinobatrachium tricolor	6	20.7 [13]	76 [13,36]	25.8	4.5	80.9	57.7	4150.5	4808.1
Hyalinobatrachium valerioi	5	22.8 [61,62,85]	705 [57]	25.1	3.9	79.9	47.3	2396.0	4862.0
Ikakogi tayrona	0	30.9 [39]	1385 [36]	19.1	10.7	82.8	41.2	3718.4	4741.9
Nymphargus aff *cochranae*	10	No data	1960 [unpub. data]	21.9	6.1	60.7	68.7	978.0	5363.9
Nymphargus anomalus	10	24.1 [43]	1719 [36]	17.6	4	76.6	95.0	1384.7	4954.0
Nymphargus bejaranoi	6	24.3 [71]	2000 [36]	18.3	0.7	75.5	48.7	1529.0	5921.0
Nymphargus chancas	7	24.9 [44]	1170 [36]	18.3	17.7	79.4	57.8	3337.6	5041.2
Nymphargus cochranae	8	30.0 [38,86]	1350 [21,36]	20.1	2.1	79.0	39.7	1914.8	5625.3
Nymphargus garciae	7	26.0 [87]	2465 [36]	15	3	79.4	33.4	2226.3	5680.5

Species	Div. events (number)	Midpoint Snout Vent Length (mm)	Midpoint elevation (m)	Mean annual temperature (°C)	Midpoint latitude (degrees)	Mean annual RH (%)	Mean annual NPP (gC * 10^9)	Mean annual precipitation (mm)	Mean annual UVB (J/m^2)
Nymphargus grandisonae	6	27.9 [56,88]	1925 [36]	17.7	3.4	80.3	21.8	2266.9	5142.0
Nymphargus griffithsi	10	23.2 [38,43,86]	2215 [36]	16.7	3.2	80.8	37.4	2450.8	5205.4
Nymphargus megacheirus	10	30.0 [43]	1525 [36]	19.1	0.2	69.0	38.6	685.3	6067.9
Nymphargus mixomaculatus	5	24.6 [22]	2687.5 [36]	15.2	9.4	75.8	75.5	1637.9	5745.4
Nymphargus ocellatus	8	25.0 [89,90]	1450 [36]	21.1	11.9	63.1	65.7	1288.4	6388.4
Nymphargus pluvialis	8	23.1 [38,91]	2035 [36]	18.7	14.4	80.2	49.6	2281.0	5516.5
Nymphargus posadae	7	32.2 [87]	1950 [36]	16.9	2.5	79.0	60.6	4404.3	4975.2
Nymphargus puyoensis	7	25.6 [92]	725 [36]	21.2	1.5	80.8	66.8	3420.8	5435.4
Nymphargus rosada	8	26.8 [41]	1550 [36]	19.7	5.9	81.2	43.7	2520.3	4858.8
Nymphargus siren	9	21.8 [43]	1505 [36]	19.2	0.1	73.0	57.9	1237.3	7557.0
Nymphargus vicenteruedai	7	25.6 [93]	2675 [36]	13.4	6	83.0	39.8	2959.2	4447.0
Nymphargus wileyi	9	25.2 [38]	2100 [36]	16.6	0.4	79.8	67.8	2652.9	5804.7
Rulyrana adiazeta	7	25.2 [87,94]	1230 [36]	21.2	5.3	76.7	97.8	1684.9	5104.6
Rulyrana flavopunctata	10	23.2 [43], [unpub. data]	650 [36]	24	0.8	78.8	80.7	3547.0	5190.6
Rulyrana spiculata	8	24.6 [90,95]	1450 [36]	21.2	12.1	74.9	80.7	1647.8	5857.3
Sachatamia albomaculata	8	26.3 [62,76]	750 [36]	25.8	8	82.0	65.3	2813.2	4815.6
Sachatamia ilex	8	30.7 [61,62,68,96]	735 [35,36]	25.1	5.6	84.0	69.4	4111.6	4806.8
Sachatamia orejuela	8	30.5 [25,47]	875 [36]	22.5	2	80.3	20.7	3129.1	4524.7
Sachatamia punctulata	8	28.1 [87]	715 [36]	24.7	5.5	77.1	93.5	2833.3	5956.8
Teratohyla adenocheira	7	23.2 [95]	230 [26,27]	25.2	10.9	82.2	97.2	2148.0	5192.9
Teratohyla amelie	6	18.5 [97]	474.5 [36,98]	24	7.3	75.0	96.8	3321.8	5242.9
Teratohyla midas	7	21.5 [43]	395 [21,36]	25.4	3.7	79.7	96.7	2348.3	5126.1
Teratohyla pulverata	6	27.5 [62,99]	426 [36]	25.3	7.8	82.1	71.4	3405.7	4829.6
Teratohyla spinosa	6	20.4 [62,76]	401 [36,53]	25.5	7.1	80.8	65.5	4256.2	4780.9
Vitreorana antisthenesi	5	24.2 [35,100]	710 [36]	22.6	10.2	77.3	61.5	1140.4	5109.1

Species	Div. events (number)	Midpoint Snout Vent Length (mm)	Midpoint elevation (m)	Mean annual temperature (°C)	Midpoint latitude (degrees)	Mean annual RH (%)	Mean annual NPP (gC * 10^9)	Mean annual precipitation (mm)	Mean annual UVB (J/m^2)
Vitreorana castroviejoi	5	23.2 [37]	690 [36]	22.3	10.7	79.2	40.9	1943.3	5440.4
Vitreorana eurygnatha	6	21.0 [101,102]	900 [36,103]	19.7	20.4	77.7	77.1	1419.8	4335.9
Vitreorana gorzulae	6	20.4 [77]	1175 [29,36]	21.4	5.6	78.0	96.0	2141.8	5697.6
Vitreorana helenae	7	19.8 [35,77]	715 [36]	22.5	5.3	77.9	82.6	2313.2	5805.3
Vitreorana oyampiensis	7	20.5 [104]	205 [36]	26.2	2.7	79.7	101.6	2346.2	5729.8
Vitreorana uranoscopa	6	22.8 [102,105]	934.5 [30,36]	18.5	23.6	76.5	78.3	1520.3	4256.7

Appendix S4 Phylogenetic tree with the number of nodes



Appendix S5. Minimum effective size and maximum discrepancy were obtained from the tracecomp module of Coevol for all parameters for each pair of independent analyses to assess convergence. A minimum effective size of 300 and maximum discrepancy of 0.1 are necessary for a run to be considered as good. If the minimum effective size is 50 and maximum discrepancy is below 0.3 a run is considered acceptable (yielding qualitatively correct results).

MITOCHONDRIAL NON-CODING GENES					
Parameters	Effective size	Discrepancy	Parameters	Effective size	Discrepancy
#logprior	4936	0.005	sigma_6_9	4997	0.009
lnL	4025	0.017	sigma_6_10	3433	0.021
length	5097	0.002	sigma_7_8	5620	0.011
rootage	5620	0.002	sigma_7_9	5397	0.002
sigma_1_2	5620	0.019	sigma_7_10	5620	0.013
sigma_1_3	3937	0.010	sigma_8_9	5620	0.007
sigma_1_4	5147	0.000	sigma_8_10	5620	0.010
sigma_1_5	5497	0.038	sigma_9_10	5593	0.006
sigma_1_6	5620	0.024	sigma_1_1	5620	0.014
sigma_1_7	5620	0.000	sigma_2_2	5620	0.017
sigma_1_8	4515	0.023	sigma_3_3	5620	0.006
sigma_1_9	4357	0.008	sigma_4_4	3209	0.009
sigma_1_10	4647	0.034	sigma_5_5	4447	0.021
sigma_2_3	5365	0.006	sigma_6_6	5620	0.019
sigma_2_4	5620	0.005	sigma_7_7	5289	0.005
sigma_2_5	4979	0.011	sigma_8_8	5620	0.007
sigma_2_6	5347	0.003	sigma_9_9	5620	0.025
sigma_2_7	5273	0.027	sigma_10_10	3769	0.009
sigma_2_8	5620	0.043	dim	5620	0.000
sigma_2_9	5620	0.015	root_1	2392	0.048
sigma_2_10	5620	0.014	root_2	3865	0.022
sigma_3_4	5620	0.032	root_3	4409	0.040
sigma_3_5	5620	0.034	root_4	5620	0.044
sigma_3_6	5620	0.010	root_5	5620	0.036
sigma_3_7	5620	0.026	root_6	4071	0.046
sigma_3_8	5620	0.003	root_7	5085	0.009
sigma_3_9	5620	0.013	root_8	3577	0.010
sigma_3_10	5620	0.009	root_9	3993	0.046
sigma_4_5	5620	0.020	root_10	5620	0.035
sigma_4_6	4085	0.007	statent	5620	0.019
sigma_4_7	5152	0.010	rrent	4734	0.008
sigma_4_8	3768	0.003	diag0	5620	0.006
sigma_4_9	4953	0.003	diag1	5620	0.011
sigma_4_10	5620	0.017	diag2	4191	0.004
sigma_5_6	5620	0.035	diag3	5620	0.001
sigma_5_7	5620	0.008	diag4	5620	0.008
sigma_5_8	5107	0.008	diag5	5620	0.003
sigma_5_9	5620	0.009	diag6	4056	0.007
sigma_5_10	4913	0.010	diag7	4178	0.031
sigma_6_7	5620	0.000	diag8	5620	0.018
sigma_6_8	3424	0.003	diag9	5620	0.008

MITOCHONDRIAL CODING GENE (dN)					
Parameters	Effective size	Discrepancy	Parameters	Effective size	Discrepancy
#logprior	4264	0.072	sigma_6_10	10037	0.001
lnL	3460	0.003	sigma_6_11	8261	0.004
length	2442	0.029	sigma_7_8	9707	0.013
dN	2520	0.018	sigma_7_9	13720	0.026
rootage	13086	0.014	sigma_7_10	8716	0.018
sigma_1_2	4651	0.000	sigma_7_11	11351	0.001
sigma_1_3	8077	0.034	sigma_8_9	5479	0.021
sigma_1_4	13720	0.016	sigma_8_10	5877	0.007
sigma_1_5	13157	0.032	sigma_8_11	8082	0.025
sigma_1_6	12836	0.005	sigma_9_10	10674	0.001
sigma_1_7	5023	0.025	sigma_9_11	8667	0.015
sigma_1_8	11226	0.005	sigma_10_11	11177	0.003
sigma_1_9	2322	0.062	sigma_1_1	3921	0.011
sigma_1_10	5440	0.023	sigma_2_2	4928	0.032
sigma_1_11	2722	0.013	sigma_3_3	13720	0.014
sigma_2_3	8259	0.006	sigma_4_4	9981	0.017
sigma_2_4	8334	0.022	sigma_5_5	7120	0.041
sigma_2_5	2161	0.006	sigma_6_6	2154	0.035
sigma_2_6	10131	0.005	sigma_7_7	10893	0.018
sigma_2_7	2397	0.010	sigma_8_8	4128	0.042
sigma_2_8	8029	0.024	sigma_9_9	5593	0.037
sigma_2_9	3887	0.015	sigma_10_10	3657	0.006
sigma_2_10	4832	0.020	sigma_11_11	7281	0.029
sigma_2_11	4383	0.019	dim	13720	0.000
sigma_3_4	13720	0.024	root_1	3693	0.026
sigma_3_5	8280	0.017	root_2	7888	0.012
sigma_3_6	13720	0.026	root_3	2514	0.059
sigma_3_7	13720	0.008	root_4	8321	0.005
sigma_3_8	9793	0.008	root_5	8855	0.013
sigma_3_9	13720	0.012	root_6	3853	0.053
sigma_3_10	12518	0.004	root_7	8231	0.034
sigma_3_11	13720	0.029	root_8	11551	0.003
sigma_4_5	10365	0.001	root_9	4285	0.003
sigma_4_6	13720	0.014	root_10	8597	0.021
sigma_4_7	9247	0.015	root_11	11891	0.022
sigma_4_8	13720	0.002	statent	989	0.063
sigma_4_9	13720	0.009	rrent	469	0.085
sigma_4_10	13720	0.004	diag0	5625	0.028
sigma_4_11	13720	0.016	diag1	3885	0.041
sigma_5_6	11366	0.009	diag2	13720	0.010
sigma_5_7	13720	0.015	diag3	13720	0.006
sigma_5_8	8263	0.008	diag4	10555	0.009
sigma_5_9	13720	0.022	diag5	13150	0.005
sigma_5_10	11790	0.030	diag6	5869	0.023
sigma_5_11	12086	0.006	diag7	8586	0.032
sigma_6_7	12649	0.007	diag8	13720	0.022
sigma_6_8	13720	0.013	diag9	13720	0.014
sigma_6_9	8595	0.022	diag10	10484	0.025

MITOCHONDRIAL CODING GENE (ω)					
Parameters	Effective size	Discrepancy	Parameters	Effective size	Discrepancy
#logprior	466	0.082	sigma_6_10	8497	0.003
lnL	3353	0.018	sigma_6_11	7180	0.017
length	750	0.027	sigma_7_8	6206	0.029
ω	1799	0.002	sigma_7_9	8410	0.012
rootage	9158	0.001	sigma_7_10	9163	0.027
sigma_1_2	6065	0.025	sigma_7_11	7771	0.004
sigma_1_3	5212	0.052	sigma_8_9	10839	0.017
sigma_1_4	6266	0.045	sigma_8_10	6105	0.034
sigma_1_5	7551	0.004	sigma_8_11	8899	0.030
sigma_1_6	2161	0.029	sigma_9_10	10839	0.027
sigma_1_7	3200	0.015	sigma_9_11	10229	0.033
sigma_1_8	7094	0.052	sigma_10_11	7174	0.030
sigma_1_9	2565	0.045	sigma_1_1	670	0.004
sigma_1_10	6043	0.097	sigma_2_2	2777	0.017
sigma_1_11	6253	0.014	sigma_3_3	8236	0.002
sigma_2_3	5474	0.030	sigma_4_4	9312	0.038
sigma_2_4	3511	0.011	sigma_5_5	9393	0.026
sigma_2_5	8200	0.009	sigma_6_6	5015	0.011
sigma_2_6	2254	0.007	sigma_7_7	8662	0.036
sigma_2_7	3399	0.012	sigma_8_8	8937	0.037
sigma_2_8	4666	0.046	sigma_9_9	7661	0.004
sigma_2_9	4229	0.003	sigma_10_10	9344	0.065
sigma_2_10	7253	0.002	sigma_11_11	8962	0.028
sigma_2_11	5239	0.028	dim	10839	0.000
sigma_3_4	10839	0.000	root_1	2277	0.026
sigma_3_5	10839	0.013	root_2	1332	0.002
sigma_3_6	7830	0.001	root_3	10839	0.000
sigma_3_7	9707	0.008	root_4	9310	0.032
sigma_3_8	10839	0.016	root_5	4104	0.020
sigma_3_9	10839	0.014	root_6	5364	0.014
sigma_3_10	8179	0.021	root_7	9228	0.024
sigma_3_11	10839	0.006	root_8	10839	0.013
sigma_4_5	10839	0.003	root_9	9842	0.043
sigma_4_6	7332	0.024	root_10	7989	0.027
sigma_4_7	7929	0.023	root_11	7474	0.008
sigma_4_8	9691	0.036	statent	864	0.042
sigma_4_9	10839	0.013	rrent	3726	0.023
sigma_4_10	10443	0.032	diag0	1665	0.020
sigma_4_11	9234	0.027	diag1	2010	0.012
sigma_5_6	10839	0.021	diag2	10839	0.001
sigma_5_7	10839	0.021	diag3	10839	0.033
sigma_5_8	6960	0.014	diag4	9710	0.001
sigma_5_9	7631	0.004	diag5	9358	0.000
sigma_5_10	10839	0.001	diag6	7616	0.043
sigma_5_11	10839	0.043	diag7	10839	0.029
sigma_6_7	10839	0.000	diag8	10839	0.003
sigma_6_8	10839	0.006	diag9	10839	0.008
sigma_6_9	10839	0.034	diag10	10839	0.001

NUCLEAR CODING GENES (dN)					
Parameters	Effective size	Discrepancy	Parameters	Effective size	Discrepancy
#logprior	224	0.029	sigma_6_10	23387	0.014
lnL	3389	0.015	sigma_6_11	8329	0.008
length	3265	0.018	sigma_7_8	11785	0.010
dN	1249	0.034	sigma_7_9	11260	0.009
rootage	32825	0.017	sigma_7_10	10472	0.010
sigma_1_2	1995	0.016	sigma_7_11	10842	0.011
sigma_1_3	15184	0.013	sigma_8_9	11271	0.011
sigma_1_4	9715	0.019	sigma_8_10	10583	0.011
sigma_1_5	21586	0.034	sigma_8_11	10593	0.012
sigma_1_6	12264	0.025	sigma_9_10	10074	0.009
sigma_1_7	13985	0.010	sigma_9_11	10992	0.012
sigma_1_8	13923	0.018	sigma_10_11	11354	0.012
sigma_1_9	21813	0.013	sigma_1_1	1995	0.012
sigma_1_10	8605	0.004	sigma_2_2	1070	0.005
sigma_1_11	18320	0.022	sigma_3_3	11883	0.011
sigma_2_3	13804	0.016	sigma_4_4	12930	0.009
sigma_2_4	8581	0.017	sigma_5_5	16417	0.010
sigma_2_5	6044	0.019	sigma_6_6	25920	0.001
sigma_2_6	7645	0.010	sigma_7_7	13751	0.007
sigma_2_7	17944	0.014	sigma_8_8	11570	0.011
sigma_2_8	14813	0.019	sigma_9_9	11923	0.007
sigma_2_9	21543	0.017	sigma_10_10	11747	0.004
sigma_2_10	18876	0.025	sigma_11_11	10394	0.014
sigma_2_11	12176	0.020	dim	36746	0.000
sigma_3_4	10952	0.013	root_1	4347	0.001
sigma_3_5	10005	0.010	root_2	1227	0.041
sigma_3_6	9868	0.006	root_3	9191	0.022
sigma_3_7	9676	0.008	root_4	11335	0.018
sigma_3_8	10123	0.009	root_5	16922	0.025
sigma_3_9	10380	0.009	root_6	6626	0.012
sigma_3_10	9948	0.010	root_7	24272	0.008
sigma_3_11	10853	0.012	root_8	16795	0.005
sigma_4_5	9147	0.011	root_9	26382	0.009
sigma_4_6	10870	0.009	root_10	20193	0.007
sigma_4_7	14335	0.008	root_11	18903	0.012
sigma_4_8	11436	0.011	statent	30168	0.006
sigma_4_9	12659	0.011	rrent	2112	0.011
sigma_4_10	12735	0.012	diag0	2015	0.032
sigma_4_11	11465	0.013	diag1	536	0.020
sigma_5_6	12024	0.005	diag2	36291	0.006
sigma_5_7	14218	0.009	diag3	29354	0.017
sigma_5_8	9975	0.011	diag4	17520	0.010
sigma_5_9	14682	0.010	diag5	36746	0.003
sigma_5_10	22888	0.017	diag6	9711	0.002
sigma_5_11	8531	0.014	diag7	33620	0.007
sigma_6_7	12096	0.003	diag8	31775	0.028
sigma_6_8	9834	0.007	diag9	31721	0.004
sigma_6_9	18305	0.004	diag10	31227	0.007

NUCLEAR CODING GENES (ω)					
Parameters	Effective size	Discrepancy	Parameters	Effective size	Discrepancy
#logprior	415	0.091	sigma_6_10	5379	0.036
lnL	1910	0.022	sigma_6_11	5369	0.031
length	1714	0.019	sigma_7_8	7576	0.024
ω	1262	0.018	sigma_7_9	5197	0.027
rootage	7576	0.018	sigma_7_10	5409	0.039
sigma_1_2	2669	0.008	sigma_7_11	5655	0.022
sigma_1_3	1273	0.019	sigma_8_9	3256	0.031
sigma_1_4	3224	0.052	sigma_8_10	7576	0.004
sigma_1_5	7504	0.002	sigma_8_11	5594	0.040
sigma_1_6	900	0.063	sigma_9_10	2614	0.017
sigma_1_7	1688	0.008	sigma_9_11	4896	0.000
sigma_1_8	2819	0.001	sigma_10_11	4436	0.009
sigma_1_9	1217	0.047	sigma_1_1	2204	0.048
sigma_1_10	1606	0.078	sigma_2_2	1760	0.037
sigma_1_11	2789	0.033	sigma_3_3	4627	0.002
sigma_2_3	940	0.009	sigma_4_4	6938	0.025
sigma_2_4	4186	0.047	sigma_5_5	4775	0.022
sigma_2_5	1250	0.046	sigma_6_6	6735	0.029
sigma_2_6	2839	0.056	sigma_7_7	5565	0.021
sigma_2_7	956	0.015	sigma_8_8	6290	0.002
sigma_2_8	3552	0.040	sigma_9_9	3457	0.014
sigma_2_9	1920	0.010	sigma_10_10	5310	0.033
sigma_2_10	3551	0.026	sigma_11_11	6219	0.021
sigma_2_11	3100	0.017	dim	7576	0.000
sigma_3_4	5805	0.021	root_1	2016	0.015
sigma_3_5	5440	0.032	root_2	5602	0.052
sigma_3_6	2700	0.001	root_3	4413	0.004
sigma_3_7	5077	0.016	root_4	5336	0.004
sigma_3_8	6696	0.014	root_5	6844	0.043
sigma_3_9	3153	0.033	root_6	6592	0.020
sigma_3_10	3500	0.021	root_7	5262	0.057
sigma_3_11	3732	0.014	root_8	7576	0.006
sigma_4_5	6301	0.018	root_9	5279	0.036
sigma_4_6	4806	0.020	root_10	7576	0.024
sigma_4_7	6351	0.001	root_11	6774	0.013
sigma_4_8	7176	0.009	statent	5934	0.006
sigma_4_9	6003	0.027	rrent	888	0.046
sigma_4_10	3496	0.020	diag0	2767	0.044
sigma_4_11	6090	0.037	diag1	2000	0.029
sigma_5_6	7027	0.003	diag2	7576	0.023
sigma_5_7	5002	0.039	diag3	7576	0.015
sigma_5_8	5528	0.030	diag4	7576	0.022
sigma_5_9	7576	0.039	diag5	7576	0.009
sigma_5_10	6712	0.024	diag6	2419	0.025
sigma_5_11	5504	0.032	diag7	5942	0.008
sigma_6_7	5371	0.009	diag8	7541	0.008
sigma_6_8	4115	0.015	diag9	7576	0.004
sigma_6_9	4613	0.039	diag10	7576	0.009

Appendix S6. Number of cycles, burnin and read points per sequence analysed in Coevol.

Analysis	# Cycles	Burnin	Read points
Mitochondrial			
Non-coding 1	6800	1000	5800
Non-coding 2	6762		5762
Coding (dN) 1	15720	2000	13720
Coding (dN) 2	15724		13724
*Coding (*ω) 1	14439	3600	10839
*Coding (*ω) 2	14442		10842
Nuclear			
Coding (dN) 1	46791	10000	7358
Coding (dN) 2	46746		7349
*Coding (*ω) 1	12643	5000	7643
*Coding (*ω) 2	12576		7576

Appendix S7. Results of the Coevol analyses. The tables show the covariances, correlation coefficients (Correl. Coeff.), posterior probabilities (Post. Prob.) and precisions, together with partial correlation coefficients (Partial C.C.) and their posterior probabilities, between all evaluated factors for each analysis: substitution rate (Subst. rate), rate of synonymous substitution (dS), rate of non-synonymous substitution (dN) and the ratio of non-synonymous to synonymous substitution (ω), diversification events (Diversif), body size, elevation (Elev), latitude (Lat), temperature (Temp), relative humidity (RH), net primary productivity (NPP), precipitation (Prec) and UVB radiation (UVB). The tables also show the results when controlling for temperature.

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Covariances	**Subst. rate**	**Diversif**	**Body size**	**Elev**	**Lat**	**Temp**	**HR**	**NPP**	**Prec**	**UVB**
Subst. rate	0.45	0.06	-0.03	-0.31	-0.12	0.07	0.00	0.06	-0.01	0.00
Diversif	0.06	0.08	-0.01	-0.01	-0.06	0.00	0.00	-0.01	0.01	0.00
Body size	-0.03	-0.01	0.05	0.03	0.02	0.00	0.00	0.00	0.01	0.00
Elev	-0.31	-0.01	0.03	1.46	0.26	-0.12	-0.03	-0.12	-0.16	0.02
Lat	-0.12	-0.06	0.02	0.26	4.13	-0.04	0.00	0.28	-0.19	0.03
Temp	0.07	0.00	0.00	-0.12	-0.04	0.03	0.00	0.03	0.04	-0.01
HR	0.00	0.00	0.00	-0.03	0.00	0.00	0.01	-0.01	0.03	0.00
NPP	0.06	-0.01	0.00	-0.12	0.28	0.03	-0.01	0.43	-0.02	0.02
Prec	-0.01	0.01	0.01	-0.16	-0.19	0.04	0.03	-0.02	0.39	-0.02
UVB	0.00	0.00	0.00	0.02	0.03	-0.01	0.00	0.02	-0.02	0.02
Correl. Coeff.	**Subst. rate**	**Diversif**	**Body size**	**Elev**	**Lat**	**Temp**	**HR**	**NPP**	**Prec**	**UVB**
Subst. rate	1.00	0.31	-0.19	-0.38	-0.09	0.56	0.00	0.14	-0.03	0.01
Diversif	0.31	1.00	-0.11	-0.04	-0.10	0.09	0.01	-0.04	0.03	0.06
Body size	-0.19	-0.11	1.00	0.11	0.04	-0.12	0.14	0.01	0.09	0.04
Elev	-0.38	-0.04	0.11	1.00	0.10	-0.55	-0.26	-0.15	-0.22	0.10
Lat	-0.09	-0.10	0.04	0.10	1.00	-0.11	0.01	0.21	-0.15	0.10
Temp	0.56	0.09	-0.12	-0.55	-0.11	1.00	0.17	0.26	0.32	-0.24
HR	0.00	0.01	0.14	-0.26	0.01	0.17	1.00	-0.14	0.53	-0.24
NPP	0.14	-0.04	0.01	-0.15	0.21	0.26	-0.14	1.00	-0.05	0.23
Prec	-0.03	0.03	0.09	-0.22	-0.15	0.32	0.53	-0.05	1.00	-0.27
UVB	0.01	0.06	0.04	0.10	0.10	-0.24	-0.24	0.23	-0.27	1.00
Post. Prob.	**Subst. rate**	**Diversif**	**Body size**	**Elev**	**Lat**	**Temp**	**HR**	**NPP**	**Prec**	**UVB**
Subst. rate	-	1.00	0.08	0.00	0.28	1.00	0.49	0.82	0.41	0.53
Diversif	1.00	-	0.14	0.34	0.16	0.81	0.53	0.35	0.62	0.74
Body size	0.08	0.14	-	0.87	0.66	0.12	0.91	0.52	0.81	0.66
Elev	0.00	0.34	0.87	-	0.84	0.00	0.00	0.08	0.02	0.84
Lat	0.28	0.16	0.66	0.84	-	0.14	0.54	0.98	0.06	0.84
Temp	1.00	0.81	0.12	0.00	0.14	-	0.96	0.99	1.00	0.01
HR	0.49	0.53	0.91	0.00	0.54	0.96	-	0.08	1.00	0.01
NPP	0.82	0.35	0.52	0.08	0.98	0.99	0.08	-	0.29	0.99
Prec	0.41	0.62	0.81	0.02	0.06	1.00	1.00	0.29	-	0.00
UVB	0.53	0.74	0.66	0.84	0.84	0.01	0.01	0.99	0.00	-

Precisions	Subst. rate	Diversif	Body size	Elev	Lat	Temp	HR	NPP	Prec	UVB
Subst. rate	5.84	-3.22	1.18	0.32	0.04	-12.00	-0.73	0.25	1.41	-2.72
Diversif	-3.22	16.00	1.38	-0.31	0.15	3.63	-0.71	0.36	-0.83	-2.49
Body size	1.18	1.38	26.70	-0.48	0.00	0.86	-9.48	-0.46	-0.50	-3.11
Elev	0.32	-0.31	-0.48	1.22	-0.05	3.43	3.44	0.10	-0.07	0.51
Lat	0.04	0.15	0.00	-0.05	0.31	0.23	-1.17	-0.25	0.20	-0.06
Temp	-12.00	3.63	0.86	3.43	0.23	84.90	8.54	-5.05	-6.81	22.10
HR	-0.73	-0.71	-9.48	3.44	-1.17	8.54	181.00	3.74	-14.20	12.10
NPP	0.25	0.36	-0.46	0.10	-0.25	-5.05	3.74	3.50	0.05	-4.42
Prec	1.41	-0.83	-0.50	-0.07	0.20	-6.81	-14.20	0.05	5.05	1.34
UVB	-2.72	-2.49	-3.11	0.51	-0.06	22.10	12.10	-4.42	1.34	76.40
Partial C.C.	**Subst. rate**	**Diversif**	**Body size**	**Elev**	**Lat**	**Temp**	**HR**	**NPP**	**Prec**	**UVB**
Subst. rate	-1.00	0.33	-0.09	-0.12	-0.03	0.53	0.02	-0.06	-0.25	0.13
Diversif	0.33	-1.00	-0.07	0.07	-0.07	-0.09	0.01	-0.05	0.09	0.07
Body size	-0.09	-0.07	-1.00	0.08	0.00	-0.02	0.14	0.05	0.04	0.07
Elev	-0.12	0.07	0.08	-1.00	0.08	-0.34	-0.23	-0.05	0.03	-0.05
Lat	-0.03	-0.07	0.00	0.08	-1.00	-0.05	0.15	0.23	-0.15	0.01
Temp	0.53	-0.09	-0.02	-0.34	-0.05	-1.00	-0.07	0.29	0.32	-0.27
HR	0.02	0.01	0.14	-0.23	0.15	-0.07	-1.00	-0.15	0.47	-0.10
NPP	-0.06	-0.05	0.05	-0.05	0.23	0.29	-0.15	-1.00	-0.01	0.27
Prec	-0.25	0.09	0.04	0.03	-0.15	0.32	0.47	-0.01	-1.00	-0.07
UVB	0.13	0.07	0.07	-0.05	0.01	-0.27	-0.10	0.27	-0.07	-1.00
Post. Probab.	**Subst. rate**	**Diversif**	**Body size**	**Elev**	**Lat**	**Temp**	**HR**	**NPP**	**Prec**	**UVB**
Subst. rate	-	0.99	0.28	0.23	0.44	1.00	0.55	0.38	0.07	0.79
Diversif	0.99	-	0.26	0.74	0.27	0.22	0.55	0.33	0.80	0.76
Body size	0.28	0.26	-	0.80	0.5	0.42	0.91	0.68	0.67	0.76
Elev	0.23	0.74	0.80	-	0.79	0.00	0.01	0.31	0.6	0.29
Lat	0.44	0.27	0.5	0.79	-	0.36	0.94	0.99	0.07	0.55
Temp	1.00	0.22	0.42	0.00	0.36	-	0.29	0.99	1.00	0.01
HR	0.55	0.55	0.91	0.01	0.94	0.29	-	0.07	1.00	0.15
NPP	0.38	0.33	0.68	0.31	0.99	0.99	0.07	-	0.47	1.00
Prec	0.07	0.80	0.67	0.60	0.07	1.00	1.00	0.47	-	0.25
UVB	0.79	0.76	0.76	0.29	0.55	0.01	0.15	1.00	0.25	-

MITOCHONDRIAL NON-CODING GENES: ANALYSIS 1 (Controlling for Temperature)									
Covariances	**Subst. rate**	**Diversif**	**Body Size**	**Elev**	**Lat**	**HR**	**NPP**	**Prec**	**UVB**
Subst. rate	0.30	0.05	-0.02	-0.06	-0.03	-0.01	0.00	-0.09	0.01
Diversif	0.05	0.08	-0.01	0.00	-0.05	0.00	-0.01	0.00	0.00
Body Size	-0.02	-0.01	0.05	0.01	0.01	0.00	0.01	0.02	0.00
Elev	-0.06	0.00	0.01	1.01	0.10	-0.02	0.00	-0.03	0.00
Lat	-0.03	-0.05	0.01	0.10	4.03	0.01	0.32	-0.14	0.02
HR	-0.01	0.00	0.00	-0.02	0.01	0.01	-0.01	0.03	0.00
NPP	0.00	-0.01	0.01	0.00	0.32	-0.01	0.40	-0.06	0.03
Prec	-0.09	0.00	0.02	-0.03	-0.14	0.03	-0.06	0.34	-0.02
UVB	0.01	0.00	0.00	0.00	0.02	0.00	0.03	-0.02	0.02
Correl. Coeff.	**Subst. rate**	**Diversif**	**Body Size**	**Elev**	**Lat**	**HR**	**NPP**	**Prec**	**UVB**
Subst. rate	1.00	0.32	-0.15	-0.10	-0.03	-0.12	-0.01	-0.27	0.18
Diversif	0.32	1.00	-0.10	0.01	-0.09	-0.01	-0.07	0.00	0.09
Body Size	-0.15	-0.10	1.00	0.05	0.03	0.16	0.04	0.14	0.02
Elev	-0.10	0.01	0.05	1.00	0.05	-0.20	0.00	-0.05	-0.03
Lat	-0.03	-0.09	0.03	0.05	1.00	0.03	0.25	-0.12	0.08
HR	-0.12	-0.01	0.16	-0.20	0.03	1.00	-0.20	0.51	-0.21
NPP	-0.01	-0.07	0.04	0.00	0.25	-0.20	1.00	-0.15	0.31
Prec	-0.27	0.00	0.14	-0.05	-0.12	0.51	-0.15	1.00	-0.21
UVB	0.18	0.09	0.02	-0.03	0.08	-0.21	0.31	-0.21	1.00
Post. Prob.	**Subst. rate**	**Diversif**	**Body Size**	**Elev**	**Lat**	**HR**	**NPP**	**Prec**	**UVB**
Subst. rate	-	1.00	0.15	0.24	0.42	0.22	0.48	0.05	0.88
Diversif	1.00	-	0.16	0.54	0.18	0.48	0.26	0.50	0.82
Body Size	0.15	0.16	-	0.71	0.61	0.94	0.65	0.92	0.56
Elev	0.24	0.54	0.71	-	0.69	0.02	0.50	0.32	0.38
Lat	0.42	0.18	0.61	0.69	-	0.61	0.99	0.12	0.78
HR	0.22	0.48	0.94	0.02	0.61	-	0.03	1.00	0.02
NPP	0.48	0.26	0.65	0.50	0.99	0.03	-	0.06	1.00
Prec	0.05	0.50	0.92	0.32	0.12	1.00	0.06	-	0.02
UVB	0.88	0.82	0.56	0.38	0.78	0.02	1.00	0.02	-

MITOHONDRIAL NON-CODING GENES: ANALYSIS 2

Covariances	Subst. rate	Diversif	Body size	Elev	Lat	Temp	HR	NPP	Prec	UVB
Subst. rate	0.45	0.06	-0.03	-0.31	-0.12	0.07	0.00	0.06	-0.01	0.00
Diversif	0.06	0.08	-0.01	-0.02	-0.06	0.00	0.00	-0.01	0.01	0.00
Body size	-0.03	-0.01	0.05	0.03	0.02	0.00	0.00	0.00	0.01	0.00
Elev	-0.31	-0.02	0.03	1.47	0.26	-0.12	-0.03	-0.12	-0.16	0.02
Lat	-0.12	-0.06	0.02	0.26	4.15	-0.04	0.00	0.28	-0.19	0.03
Temp	0.07	0.00	0.00	-0.12	-0.04	0.03	0.00	0.03	0.04	-0.01
HR	0.00	0.00	0.00	-0.03	0.00	0.00	0.01	-0.01	0.03	0.00
NPP	0.06	-0.01	0.00	-0.12	0.28	0.03	-0.01	0.43	-0.02	0.02
Prec	-0.01	0.01	0.01	-0.16	-0.19	0.04	0.03	-0.02	0.39	-0.02
UVB	0.00	0.00	0.00	0.02	0.03	-0.01	0.00	0.02	-0.02	0.02

Correl. Coeff.	Subst. rate	Diversif	Body size	Elev	Lat	Temp	HR	NPP	Prec	UVB
Subst. rate	1.00	0.31	-0.19	-0.38	-0.09	0.56	0.00	0.14	-0.03	0.00
Diversif	0.31	1.00	-0.11	-0.04	-0.10	0.09	0.01	-0.04	0.03	0.06
Body size	-0.19	-0.11	1.00	0.12	0.04	-0.12	0.14	0.01	0.09	0.04
Elev	-0.38	-0.04	0.12	1.00	0.11	-0.55	-0.26	-0.15	-0.22	0.11
Lat	-0.09	-0.10	0.04	0.11	1.00	-0.12	0.01	0.21	-0.15	0.10
Temp	0.56	0.09	-0.12	-0.55	-0.12	1.00	0.17	0.26	0.32	-0.24
HR	0.00	0.01	0.14	-0.26	0.01	0.17	1.00	-0.14	0.53	-0.24
NPP	0.14	-0.04	0.01	-0.15	0.21	0.26	-0.14	1.00	-0.05	0.23
Prec	-0.03	0.03	0.09	-0.22	-0.15	0.32	0.53	-0.05	1.00	-0.27
UVB	0.00	0.06	0.04	0.11	0.10	-0.24	-0.24	0.23	-0.27	1.00

Post. Prob.	Subst. rate	Diversif	Body size	Elev	Lat	Temp	HR	NPP	Prec	UVB
Subst. rate	-	1.00	0.07	0.00	0.27	1.00	0.49	0.81	0.41	0.52
Diversif	1.00	-	0.13	0.33	0.15	0.81	0.55	0.33	0.62	0.73
Body size	0.07	0.13	-	0.87	0.67	0.12	0.90	0.52	0.81	0.67
Elev	0.00	0.33	0.87	-	0.85	0.00	0.01	0.07	0.02	0.85
Lat	0.27	0.15	0.67	0.85	-	0.13	0.52	0.98	0.06	0.84
Temp	1.00	0.81	0.12	0.00	0.13	-	0.95	0.99	1.00	0.01
HR	0.49	0.55	0.90	0.01	0.52	0.95	-	0.09	1.00	0.01
NPP	0.81	0.33	0.52	0.07	0.98	0.99	0.09	-	0.30	0.99
Prec	0.41	0.62	0.81	0.02	0.06	1.00	1.00	0.30	-	0.00
UVB	0.52	0.73	0.67	0.85	0.84	0.01	0.01	0.99	0.00	

Precisions	Subst. rate	Diversif	Body size	Elev	Lat	Temp	HR	NPP	Prec	UVB
Subst. rate	5.83	-3.18	1.18	0.33	0.04	-11.90	-0.70	0.26	1.41	-2.65
Diversif	-3.18	15.90	1.38	-0.30	0.15	3.54	-0.76	0.39	-0.83	-2.49
Body size	1.18	1.38	26.70	-0.48	-0.01	0.87	-9.31	-0.45	-0.52	-3.00
Elev	0.33	-0.30	-0.48	1.22	-0.05	3.41	3.46	0.11	-0.07	0.49
Lat	0.04	0.15	-0.01	-0.05	0.31	0.25	-1.16	-0.25	0.19	-0.05
Temp	-11.90	3.54	0.87	3.41	0.25	85.00	8.61	-5.12	-6.83	22.10
HR	-0.70	-0.76	-9.31	3.46	-1.16	8.61	181.00	3.70	-14.20	12.10
NPP	0.26	0.39	-0.45	0.11	-0.25	-5.12	3.70	3.51	0.05	-4.45
Prec	1.41	-0.83	-0.52	-0.07	0.19	-6.83	-14.20	0.05	5.03	1.30
UVB	-2.65	-2.49	-3.00	0.49	-0.05	22.10	12.10	-4.45	1.30	76.30
Partial C.C.	**Subst. rate**	**Diversif**	**Body size**	**Elev**	**Lat**	**Temp**	**HR**	**NPP**	**Prec**	**UVB**
Subst. rate	-1.00	0.33	-0.09	-0.12	-0.03	0.52	0.02	-0.06	-0.26	0.12
Diversif	0.33	-1.00	-0.07	0.07	-0.07	-0.09	0.01	-0.05	0.09	0.07
Body size	-0.09	-0.07	-1.00	0.08	0.00	-0.02	0.13	0.05	0.05	0.07
Elev	-0.12	0.07	0.08	-1.00	0.08	-0.34	-0.23	-0.05	0.03	-0.05
Lat	-0.03	-0.07	0.00	0.08	-1.00	-0.05	0.15	0.23	-0.15	0.01
Temp	0.52	-0.09	-0.02	-0.34	-0.05	-1.00	-0.07	0.29	0.33	-0.27
HR	0.02	0.01	0.13	-0.23	0.15	-0.07	-1.00	-0.15	0.47	-0.10
NPP	-0.06	-0.05	0.05	-0.05	0.23	0.29	-0.15	-1.00	-0.01	0.27
Prec	-0.26	0.09	0.05	0.03	-0.15	0.33	0.47	-0.01	-1.00	-0.07
UVB	0.12	0.07	0.07	-0.05	0.01	-0.27	-0.10	0.27	-0.07	-1.00
Post. Probab.	**Subst. rate**	**Diversif**	**Body size**	**Elev**	**Lat**	**Temp**	**HR**	**NPP**	**Prec**	**UVB**
Subst. rate	-	1	0.27	0.22	0.43	1.00	0.54	0.37	0.06	0.79
Diversif	1	-	0.26	0.73	0.28	0.22	0.56	0.32	0.80	0.75
Body size	0.27	0.26	-	0.80	0.51	0.43	0.91	0.68	0.68	0.74
Elev	0.22	0.73	0.80	-	0.78	0.01	0.01	0.31	0.61	0.31
Lat	0.43	0.28	0.51	0.78	-	0.35	0.94	0.99	0.068	0.54
Temp	1.00	0.22	0.43	0.01	0.35	-	0.28	0.99	1.00	0.01
HR	0.54	0.56	0.91	0.01	0.94	0.28	-	0.07	1.00	0.15
NPP	0.37	0.32	0.68	0.31	0.99	0.99	0.07	-	0.46	1.00
Prec	0.06	0.80	0.68	0.61	0.07	1.00	1.00	0.46	-	0.26
UVB	0.79	0.75	0.74	0.31	0.54	0.01	0.15	1.00	0.26	-

MITOCHONDRIAL NON-CODING GENES: ANALYSIS 2 (Controlling for Temperature)									
Covariances	**Subst. rate**	**Diversif**	**Body Size**	**Elev**	**Lat**	**HR**	**NPP**	**Prec**	**UVB**
Subst. rate	0.30	0.05	-0.02	-0.06	-0.04	-0.01	-0.01	-0.09	0.01
Diversif	0.05	0.08	-0.01	0.00	-0.05	0.00	-0.01	0.00	0.00
Body Size	-0.02	-0.01	0.05	0.01	0.01	0.00	0.01	0.02	0.00
Elev	-0.06	0.00	0.01	1.01	0.10	-0.02	0.00	-0.03	0.00
Lat	-0.04	-0.05	0.01	0.10	4.04	0.01	0.32	-0.14	0.02
HR	-0.01	0.00	0.00	-0.02	0.01	0.01	-0.01	0.03	0.00
NPP	-0.01	-0.01	0.01	0.00	0.32	-0.01	0.40	-0.06	0.03
Prec	-0.09	0.00	0.02	-0.03	-0.14	0.03	-0.06	0.35	-0.02
UVB	0.01	0.00	0.00	0.00	0.02	0.00	0.03	-0.02	0.02
Correl. Coeff.	**Subst. rate**	**Diversif**	**Body Size**	**Elev**	**Lat**	**HR**	**NPP**	**Prec**	**UVB**
Subst. rate	1.00	0.32	-0.15	-0.11	-0.03	-0.12	-0.01	-0.27	0.17
Diversif	0.32	1.00	-0.10	0.01	-0.09	-0.01	-0.07	0.00	0.09
Body Size	-0.15	-0.10	1.00	0.06	0.03	0.16	0.04	0.14	0.02
Elev	-0.11	0.01	0.06	1.00	0.05	-0.20	0.00	-0.05	-0.03
Lat	-0.03	-0.09	0.03	0.05	1.00	0.03	0.25	-0.12	0.07
HR	-0.12	-0.01	0.16	-0.20	0.03	1.00	-0.19	0.51	-0.21
NPP	-0.01	-0.07	0.04	0.00	0.25	-0.19	1.00	-0.15	0.31
Prec	-0.27	0.00	0.14	-0.05	-0.12	0.51	-0.15	1.00	-0.20
UVB	0.17	0.09	0.02	-0.03	0.07	-0.21	0.31	-0.20	1.00
Post. Prob.	**Subst. rate**	**Diversif**	**Body Size**	**Elev**	**Lat**	**HR**	**NPP**	**Prec**	**UVB**
Subst. rate	-	1.00	0.15	0.24	0.42	0.23	0.47	0.05	0.87
Diversif	1.00	-	0.15	0.54	0.18	0.48	0.24	0.50	0.81
Body Size	0.15	0.15	-	0.71	0.62	0.94	0.66	0.91	0.56
Elev	0.24	0.54	0.71	-	0.69	0.02	0.49	0.33	0.38
Lat	0.42	0.18	0.62	0.69	-	0.60	0.99	0.12	0.77
HR	0.23	0.48	0.94	0.02	0.60	-	0.02	1.00	0.02
NPP	0.47	0.24	0.66	0.49	0.99	0.02	-	0.07	1.00
Prec	0.05	0.50	0.91	0.33	0.12	1.00	0.07	-	0.02
UVB	0.87	0.81	0.56	0.38	0.77	0.02	1.00	0.02	-

MITOCHONDRIAL CODING-GENE: dN ANALYSIS 1

Covariances	dS	dN	Diversif	Body Size	Elev	Lat	Temp	HR	NPP	Prec	UVB
dS	0.25	0.14	0.03	-0.02	-0.16	-0.11	0.05	0.00	-0.03	-0.01	-0.02
dN	0.14	0.34	0.03	0.00	-0.20	0.11	0.05	0.01	0.04	0.04	-0.01
Diversif	0.03	0.03	0.09	-0.01	-0.02	-0.06	0.01	0.00	-0.01	0.01	0.00
Body Size	-0.02	0.00	-0.01	0.04	0.03	0.03	0.00	0.00	0.01	0.01	0.00
Elev	-0.16	-0.20	-0.02	0.03	1.35	0.27	-0.11	-0.03	-0.11	-0.18	0.02
Lat	-0.11	0.11	-0.06	0.03	0.27	3.88	-0.05	0.00	0.24	-0.22	0.04
Temp	0.05	0.05	0.01	0.00	-0.11	-0.05	0.03	0.00	0.03	0.05	-0.01
HR	0.00	0.01	0.00	0.00	-0.03	0.00	0.00	0.01	-0.01	0.03	0.00
NPP	-0.03	0.04	-0.01	0.01	-0.11	0.24	0.03	-0.01	0.41	-0.02	0.02
Prec	-0.01	0.04	0.01	0.01	-0.18	-0.22	0.05	0.03	-0.02	0.38	-0.02
UVB	-0.02	-0.01	0.00	0.00	0.02	0.04	-0.01	0.00	0.02	-0.02	0.02

Correl. Coeff.	dS	dN	Diversif	Body Size	Elev	Lat	Temp	HR	NPP	Prec	UVB
dS	1.00	0.50	0.24	-0.21	-0.28	-0.11	0.58	0.10	-0.08	-0.01	-0.26
dN	0.50	1.00	0.16	0.00	-0.32	0.09	0.50	0.19	0.11	0.12	-0.16
Diversif	0.24	0.16	1.00	-0.11	-0.05	-0.11	0.11	0.02	-0.03	0.06	0.04
Body Size	-0.21	0.00	-0.11	1.00	0.11	0.08	-0.09	0.09	0.04	0.06	0.07
Elev	-0.28	-0.32	-0.05	0.11	1.00	0.12	-0.55	-0.30	-0.14	-0.25	0.12
Lat	-0.11	0.09	-0.11	0.08	0.12	1.00	-0.14	0.01	0.19	-0.18	0.14
Temp	0.58	0.50	0.11	-0.09	-0.55	-0.14	1.00	0.27	0.22	0.42	-0.32
HR	0.10	0.19	0.02	0.09	-0.30	0.01	0.27	1.00	-0.11	0.53	-0.25
NPP	-0.08	0.11	-0.03	0.04	-0.14	0.19	0.22	-0.11	1.00	-0.04	0.21
Prec	-0.01	0.12	0.06	0.06	-0.25	-0.18	0.42	0.53	-0.04	1.00	-0.28
UVB	-0.26	-0.16	0.04	0.07	0.12	0.14	-0.32	-0.25	0.21	-0.28	1.00

Post. Prob.	dS	dN	Diversif	Body Size	Elev	Lat	Temp	HR	NPP	Prec	UVB
dS	-	0.98	0.97	0.06	0.03	0.25	1.00	0.73	0.32	0.46	0.04
dN	0.98	-	0.86	0.51	0.05	0.65	0.99	0.81	0.69	0.70	0.22
Diversif	0.97	0.86	-	0.15	0.30	0.14	0.86	0.58	0.38	0.71	0.64
Body Size	0.06	0.51	0.15	-	0.85	0.77	0.19	0.80	0.66	0.70	0.73
Elev	0.03	0.05	0.30	0.85	-	0.87	0.00	0.00	0.09	0.01	0.88
Lat	0.25	0.65	0.14	0.77	0.87	-	0.09	0.52	0.97	0.04	0.91
Temp	1.00	0.99	0.86	0.19	0.00	0.09	-	0.99	0.98	1.00	0.00
HR	0.73	0.81	0.58	0.80	0.00	0.52	0.99	-	0.16	1.00	0.01
NPP	0.32	0.69	0.38	0.66	0.09	0.97	0.98	0.16	-	0.35	0.98
Prec	0.46	0.70	0.71	0.70	0.01	0.04	1.00	1.00	0.35	-	0.00
UVB	0.04	0.22	0.64	0.73	0.88	0.91	0.00	0.01	0.98	0.00	-

Precisions	dS	dN	Diversif	Body Size	Elev	Lat	Temp	HR	NPP	Prec	UVB
dS	18.30	-5.81	-3.44	5.02	-0.46	0.16	-27.00	-4.56	2.35	4.47	4.23
dN	-5.81	20.40	-2.13	-3.62	0.59	-0.54	-13.10	-5.53	-0.40	-0.03	0.62
Diversif	-3.44	-2.13	15.70	1.47	-0.13	0.28	6.06	1.98	-0.09	-1.35	-5.00
Body Size	5.02	-3.62	1.47	31.40	-0.83	0.01	-1.87	-8.30	0.10	0.19	-1.80
Elev	-0.46	0.59	-0.13	-0.83	1.45	-0.08	4.94	3.77	0.06	-0.26	0.94
Lat	0.16	-0.54	0.28	0.01	-0.08	0.40	0.66	-1.15	-0.22	0.23	-0.26
Temp	-27.00	-13.10	6.06	-1.87	4.94	0.66	148.00	19.20	-9.44	-14.80	14.90
HR	-4.56	-5.53	1.98	-8.30	3.77	-1.15	19.20	222.00	2.97	-17.10	12.60
NPP	2.35	-0.40	-0.09	0.10	0.06	-0.22	-9.44	2.97	4.35	0.76	-3.85
Prec	4.47	-0.03	-1.35	0.19	-0.26	0.23	-14.80	-17.10	0.76	6.92	2.99
UVB	4.23	0.62	-5.00	-1.80	0.94	-0.26	14.90	12.60	-3.85	2.99	89.70

Partial C.C.	dS	dN	Diversif	Body Size	Elev	Lat	Temp	HR	NPP	Prec	UVB
dS	-1.00	0.31	0.20	-0.20	0.09	-0.06	0.52	0.07	-0.27	-0.40	-0.10
dN	0.31	-1.00	0.12	0.15	-0.11	0.22	0.22	0.08	0.04	-0.01	-0.01
Diversif	0.20	0.12	-1.00	-0.07	0.03	-0.11	-0.12	-0.03	0.01	0.12	0.13
Body Size	-0.20	0.15	-0.07	-1.00	0.12	0.00	0.03	0.10	0.00	-0.01	0.04
Elev	0.09	-0.11	0.03	0.12	-1.00	0.11	-0.34	-0.21	-0.03	0.08	-0.08
Lat	-0.06	0.22	-0.11	0.00	0.11	-1.00	-0.08	0.13	0.17	-0.14	0.04
Temp	0.52	0.22	-0.12	0.03	-0.34	-0.08	-1.00	-0.10	0.37	0.45	-0.14
HR	0.07	0.08	-0.03	0.10	-0.21	0.13	-0.10	-1.00	-0.10	0.43	-0.09
NPP	-0.27	0.04	0.01	0.00	-0.03	0.17	0.37	-0.10	-1.00	-0.13	0.20
Prec	-0.40	-0.01	0.12	-0.01	0.08	-0.14	0.45	0.43	-0.13	-1.00	-0.12
UVB	-0.10	-0.01	0.13	0.04	-0.08	0.04	-0.14	-0.09	0.20	-0.12	-1.00

Post. Prob.	dS	dN	Diversif	Body Size	Elev	Lat	Temp	HR	NPP	Prec	UVB
dS	-	0.89	0.89	0.13	0.68	0.38	0.99	0.64	0.10	0.02	0.30
dN	0.89	-	0.73	0.75	0.32	0.80	0.82	0.62	0.57	0.48	0.49
Diversif	0.89	0.73	-	0.29	0.59	0.19	0.21	0.41	0.52	0.84	0.87
Body Size	0.13	0.75	0.29	-	0.84	0.51	0.57	0.80	0.49	0.48	0.62
Elev	0.68	0.32	0.59	0.84	-	0.81	0.02	0.05	0.42	0.73	0.24
Lat	0.38	0.80	0.19	0.51	0.81	-	0.32	0.83	0.89	0.17	0.64
Temp	0.99	0.82	0.21	0.57	0.02	0.32	-	0.26	0.98	1.00	0.19
HR	0.64	0.62	0.41	0.80	0.05	0.83	0.26	-	0.22	1.00	0.22
NPP	0.10	0.57	0.52	0.49	0.42	0.89	0.98	0.22	-	0.18	0.94
Prec	0.02	0.48	0.84	0.48	0.73	0.17	1.00	1.00	0.18	-	0.19
UVB	0.30	0.49	0.87	0.62	0.24	0.64	0.19	0.22	0.94	0.19	-

MITOCHONDRIAL CODING-GENE: dN ANALYSIS 1 (Controlling for Temperature)

Covariances	dS	dN	Diversif	Body Size	Elev	Lat	HR	NPP	Prec	UVB
dS	0.16	0.06	0.02	-0.02	0.02	-0.03	0.00	-0.07	-0.08	-0.01
dN	0.06	0.25	0.02	0.01	-0.03	0.18	0.00	0.00	-0.03	0.00
Diversif	0.02	0.02	0.08	-0.01	0.00	-0.05	0.00	-0.01	0.00	0.00
Body Size	-0.02	0.01	-0.01	0.04	0.01	0.03	0.00	0.01	0.01	0.00
Elev	0.02	-0.03	0.00	0.01	0.94	0.09	-0.02	-0.01	-0.01	-0.01
Lat	-0.03	0.18	-0.05	0.03	0.09	3.76	0.01	0.28	-0.15	0.03
HR	0.00	0.00	0.00	0.00	-0.02	0.01	0.01	-0.01	0.02	0.00
NPP	-0.07	0.00	-0.01	0.01	-0.01	0.28	-0.01	0.38	-0.05	0.02
Prec	-0.08	-0.03	0.00	0.01	-0.01	-0.15	0.02	-0.05	0.31	-0.01
UVB	-0.01	0.00	0.00	0.00	-0.01	0.03	0.00	0.02	-0.01	0.02

Correl. Coeff.	dS	dN	Diversif	Body Size	Elev	Lat	HR	NPP	Prec	UVB
dS	1.00	0.30	0.22	-0.20	0.05	-0.03	-0.07	-0.26	-0.35	-0.10
dN	0.30	1.00	0.13	0.06	-0.07	0.19	0.07	-0.01	-0.11	0.00
Diversif	0.22	0.13	1.00	-0.10	0.01	-0.10	-0.01	-0.06	0.01	0.08
Body Size	-0.20	0.06	-0.10	1.00	0.07	0.06	0.12	0.07	0.11	0.04
Elev	0.05	-0.07	0.01	0.07	1.00	0.05	-0.18	-0.02	-0.02	-0.06
Lat	-0.03	0.19	-0.10	0.06	0.05	1.00	0.05	0.23	-0.13	0.10
HR	-0.07	0.07	-0.01	0.12	-0.18	0.05	1.00	-0.18	0.47	-0.18
NPP	-0.26	-0.01	-0.06	0.07	-0.02	0.23	-0.18	1.00	-0.15	0.30
Prec	-0.35	-0.11	0.01	0.11	-0.02	-0.13	0.47	-0.15	1.00	-0.17
UVB	-0.10	0.00	0.08	0.04	-0.06	0.10	-0.18	0.30	-0.17	1.00

Post. Prob.	dS	dN	Diversif	Body Size	Elev	Lat	HR	NPP	Prec	UVB
dS	-	0.86	0.95	0.09	0.62	0.43	0.34	0.08	0.03	0.27
dN	0.86	-	0.79	0.62	0.36	0.78	0.61	0.49	0.33	0.50
Diversif	0.95	0.79	-	0.17	0.55	0.17	0.46	0.28	0.55	0.77
Body Size	0.09	0.62	0.17	-	0.75	0.73	0.88	0.73	0.84	0.64
Elev	0.62	0.36	0.55	0.75	-	0.68	0.04	0.41	0.42	0.27
Lat	0.43	0.78	0.17	0.73	0.68	-	0.67	0.99	0.10	0.83
HR	0.34	0.61	0.46	0.88	0.04	0.67	-	0.04	1.00	0.04
NPP	0.08	0.49	0.28	0.73	0.41	0.99	0.04	-	0.08	1.00
Prec	0.03	0.33	0.55	0.84	0.42	0.10	1.00	0.08	-	0.05
UVB	0.27	0.50	0.77	0.64	0.27	0.83	0.04	1.00	0.05	-

MITOCHONDRIAL CODING-GENE: dN ANALYSIS 2

Covariances	dS	dN	Diversif	Body Size	Elev	Lat	Temp	HR	NPP	Prec	UVB
dS	0.25	0.14	0.04	-0.02	-0.16	-0.11	0.05	0.00	-0.02	-0.01	-0.02
dN	0.14	0.32	0.03	0.00	-0.20	0.11	0.05	0.01	0.04	0.04	-0.01
Diversif	0.04	0.03	0.09	-0.01	-0.02	-0.07	0.01	0.00	-0.01	0.01	0.00
Body Size	-0.02	0.00	-0.01	0.04	0.03	0.03	0.00	0.00	0.01	0.01	0.00
Elev	-0.16	-0.20	-0.02	0.03	1.36	0.28	-0.11	-0.03	-0.11	-0.17	0.02
Lat	-0.11	0.11	-0.07	0.03	0.28	3.90	-0.05	0.00	0.24	-0.22	0.04
Temp	0.05	0.05	0.01	0.00	-0.11	-0.05	0.03	0.00	0.03	0.05	-0.01
HR	0.00	0.01	0.00	0.00	-0.03	0.00	0.00	0.01	-0.01	0.03	0.00
NPP	-0.02	0.04	-0.01	0.01	-0.11	0.24	0.03	-0.01	0.41	-0.02	0.02
Prec	-0.01	0.04	0.01	0.01	-0.17	-0.22	0.05	0.03	-0.02	0.38	-0.02
UVB	-0.02	-0.01	0.00	0.00	0.02	0.04	-0.01	0.00	0.02	-0.02	0.02
Correl. Coeff.	**dS**	**dN**	**Diversif**	**Body Size**	**Elev**	**Lat**	**Temp**	**HR**	**NPP**	**Prec**	**UVB**
dS	1.00	0.50	0.24	-0.21	-0.29	-0.11	0.58	0.10	-0.07	-0.02	-0.26
dN	0.50	1.00	0.17	0.00	-0.33	0.09	0.50	0.19	0.12	0.12	-0.16
Diversif	0.24	0.17	1.00	-0.11	-0.05	-0.11	0.11	0.02	-0.03	0.06	0.03
Body Size	-0.21	0.00	-0.11	1.00	0.11	0.08	-0.09	0.09	0.04	0.06	0.06
Elev	-0.29	-0.33	-0.05	0.11	1.00	0.12	-0.55	-0.29	-0.14	-0.24	0.12
Lat	-0.11	0.09	-0.11	0.08	0.12	1.00	-0.14	0.01	0.19	-0.18	0.14
Temp	0.58	0.50	0.11	-0.09	-0.55	-0.14	1.00	0.27	0.22	0.42	-0.32
HR	0.10	0.19	0.02	0.09	-0.29	0.01	0.27	1.00	-0.11	0.52	-0.25
NPP	-0.07	0.12	-0.03	0.04	-0.14	0.19	0.22	-0.11	1.00	-0.04	0.21
Prec	-0.02	0.12	0.06	0.06	-0.24	-0.18	0.42	0.52	-0.04	1.00	-0.28
UVB	-0.26	-0.16	0.03	0.06	0.12	0.14	-0.32	-0.25	0.21	-0.28	1.00
Post. Prob.	**dS**	**dN**	**Diversif**	**Body Size**	**Elev**	**Lat**	**Temp**	**HR**	**NPP**	**Prec**	**UVB**
dS	-	0.98	0.98	0.06	0.03	0.25	1.00	0.73	0.34	0.45	0.04
dN	0.98	-	0.87	0.49	0.05	0.65	0.99	0.81	0.70	0.70	0.22
Diversif	0.98	0.87	-	0.15	0.30	0.14	0.86	0.59	0.38	0.71	0.63
Body Size	0.06	0.49	0.15	-	0.85	0.77	0.19	0.80	0.66	0.71	0.73
Elev	0.03	0.05	0.30	0.85	-	0.87	0.00	0.00	0.09	0.01	0.88
Lat	0.25	0.65	0.14	0.77	0.87	-	0.09	0.53	0.96	0.04	0.91
Temp	1.00	0.99	0.86	0.19	0.00	0.09	-	1.00	0.98	1.00	0.00
HR	0.73	0.81	0.59	0.80	0.00	0.53	1.00	-	0.15	1.00	0.01
NPP	0.34	0.70	0.38	0.66	0.09	0.96	0.98	0.15	-	0.35	0.98
Prec	0.45	0.70	0.71	0.71	0.01	0.04	1.00	1.00	0.35	-	0.00
UVB	0.04	0.22	0.63	0.73	0.88	0.91	0.00	0.01	0.98	0.00	-

Precisions	dS	dN	Diversif	Body Size	Elev	Lat	Temp	HR	NPP	Prec	UVB
dS	18.70	-6.07	-3.56	4.98	-0.48	0.17	-27.70	-4.66	2.30	4.56	4.41
dN	-6.07	35.40	-2.25	-3.59	0.63	-0.55	-14.70	-5.63	-0.37	0.01	0.48
Diversif	-3.56	-2.25	15.80	1.48	-0.12	0.28	6.53	2.04	-0.08	-1.39	-4.91
Body Size	4.98	-3.59	1.48	31.30	-0.82	0.01	-1.97	-8.32	0.05	0.20	-1.59
Elev	-0.48	0.63	-0.12	-0.82	1.44	-0.08	4.92	3.76	0.07	-0.27	0.92
Lat	0.17	-0.55	0.28	0.01	-0.08	0.40	0.65	-1.15	-0.22	0.23	-0.26
Temp	-27.70	-14.70	6.53	-1.97	4.92	0.65	150.00	19.80	-9.36	-15.00	14.60
HR	-4.66	-5.63	2.04	-8.32	3.76	-1.15	19.80	220.00	2.96	-17.10	12.80
NPP	2.30	-0.37	-0.08	0.05	0.07	-0.22	-9.36	2.96	4.32	0.75	-3.85
Prec	4.56	0.01	-1.39	0.20	-0.27	0.23	-15.00	-17.10	0.75	6.94	3.02
UVB	4.41	0.48	-4.91	-1.59	0.92	-0.26	14.60	12.80	-3.85	3.02	89.40
Partial C.C.	**dS**	**dN**	**Diversif**	**Body Size**	**Elev**	**Lat**	**Temp**	**HR**	**NPP**	**Prec**	**UVB**
dS	-1.00	0.31	0.21	-0.19	0.09	-0.07	0.52	0.08	-0.26	-0.40	-0.10
dN	0.31	-1.00	0.12	0.14	-0.11	0.22	0.22	0.08	0.04	-0.01	-0.01
Diversif	0.21	0.12	-1.00	-0.07	0.03	-0.11	-0.12	-0.03	0.01	0.13	0.13
Body Size	-0.19	0.14	-0.07	-1.00	0.12	0.00	0.03	0.10	0.00	-0.01	0.03
Elev	0.09	-0.11	0.03	0.12	-1.00	0.11	-0.34	-0.21	-0.03	0.08	-0.08
Lat	-0.07	0.22	-0.11	0.00	0.11	-1.00	-0.08	0.13	0.17	-0.14	0.04
Temp	0.52	0.22	-0.12	0.03	-0.34	-0.08	-1.00	-0.10	0.36	0.46	-0.13
HR	0.08	0.08	-0.03	0.10	-0.21	0.13	-0.10	-1.00	-0.10	0.44	-0.09
NPP	-0.26	0.04	0.01	0.00	-0.03	0.17	0.36	-0.10	-1.00	-0.13	0.20
Prec	-0.40	-0.01	0.13	-0.01	0.08	-0.14	0.46	0.44	-0.13	-1.00	-0.12
UVB	-0.10	-0.01	0.13	0.03	-0.08	0.04	-0.13	-0.09	0.20	-0.12	-1.00
Post. Prob.	**dS**	**dN**	**Diversif**	**Body Size**	**Elev**	**Lat**	**Temp**	**HR**	**NPP**	**Prec**	**UVB**
dS	-	0.88	0.90	0.15	0.68	0.37	0.99	0.65	0.10	0.02	0.30
dN	0.88	-	0.74	0.74	0.32	0.80	0.82	0.62	0.57	0.47	0.49
Diversif	0.90	0.74	-	0.29	0.58	0.20	0.20	0.40	0.53	0.84	0.86
Body Size	0.15	0.74	0.29	-	0.84	0.51	0.57	0.80	0.51	0.48	0.61
Elev	0.68	0.32	0.58	0.84	-	0.81	0.02	0.04	0.41	0.73	0.24
Lat	0.37	0.80	0.20	0.51	0.81	-	0.32	0.84	0.88	0.16	0.64
Temp	0.99	0.82	0.20	0.57	0.02	0.32	-	0.26	0.98	1.00	0.20
HR	0.65	0.62	0.40	0.80	0.04	0.84	0.26	-	0.22	1.00	0.21
NPP	0.10	0.57	0.53	0.51	0.41	0.88	0.98	0.22	-	0.18	0.94
Prec	0.02	0.47	0.84	0.48	0.73	0.16	1.00	1.00	0.18	-	0.19
UVB	0.30	0.49	0.86	0.61	0.24	0.64	0.20	0.21	0.94	0.19	-

MITOCHONDRIAL CODING-GENE: dN ANALYSIS 2 (Controlling for Temperature)										
Covariances	**dS**	**dN**	**Diversif**	**Body Size**	**Elev**	**Lat**	**HR**	**NPP**	**Prec**	**UVB**
dS	0.16	0.06	0.03	-0.02	0.02	-0.03	0.00	-0.06	-0.08	-0.01
dN	0.06	0.23	0.02	0.00	-0.03	0.18	0.00	0.00	-0.03	0.00
Diversif	0.03	0.02	0.08	-0.01	0.00	-0.06	0.00	-0.01	0.00	0.00
Body Size	-0.02	0.00	-0.01	0.04	0.01	0.03	0.00	0.01	0.01	0.00
Elev	0.02	-0.03	0.00	0.01	0.94	0.10	-0.02	-0.02	-0.01	-0.01
Lat	-0.03	0.18	-0.06	0.03	0.10	3.78	0.01	0.28	-0.15	0.03
HR	0.00	0.00	0.00	0.00	-0.02	0.01	0.01	-0.01	0.02	0.00
NPP	-0.06	0.00	-0.01	0.01	-0.02	0.28	-0.01	0.38	-0.05	0.02
Prec	-0.08	-0.03	0.00	0.01	-0.01	-0.15	0.02	-0.05	0.31	-0.01
UVB	-0.01	0.00	0.00	0.00	-0.01	0.03	0.00	0.02	-0.01	0.02
Correl. Coeff.	**dS**	**dN**	**Diversif**	**Body Size**	**Elev**	**Lat**	**HR**	**NPP**	**Prec**	**UVB**
dS	1.00	0.30	0.22	-0.20	0.05	-0.03	-0.07	-0.25	-0.35	-0.10
dN	0.30	1.00	0.13	0.05	-0.07	0.19	0.07	0.00	-0.11	0.00
Diversif	0.22	0.13	1.00	-0.10	0.01	-0.10	-0.01	-0.06	0.01	0.08
Body Size	-0.20	0.05	-0.10	1.00	0.07	0.06	0.12	0.07	0.11	0.04
Elev	0.05	-0.07	0.01	0.07	1.00	0.05	-0.18	-0.03	-0.02	-0.06
Lat	-0.03	0.19	-0.10	0.06	0.05	1.00	0.05	0.23	-0.13	0.10
HR	-0.07	0.07	-0.01	0.12	-0.18	0.05	1.00	-0.18	0.47	-0.19
NPP	-0.25	0.00	-0.06	0.07	-0.03	0.23	-0.18	1.00	-0.15	0.30
Prec	-0.35	-0.11	0.01	0.11	-0.02	-0.13	0.47	-0.15	1.00	-0.17
UVB	-0.10	0.00	0.08	0.04	-0.06	0.10	-0.19	0.30	-0.17	1.00
Post. Prob.	**dS**	**dN**	**Diversif**	**Body Size**	**Elev**	**Lat**	**HR**	**NPP**	**Prec**	**UVB**
dS	-	0.86	0.95	0.10	0.61	0.43	0.34	0.09	0.02	0.27
dN	0.86	-	0.79	0.61	0.37	0.78	0.62	0.49	0.32	0.50
Diversif	0.95	0.79	-	0.17	0.54	0.17	0.46	0.28	0.55	0.76
Body Size	0.10	0.61	0.17	-	0.75	0.73	0.87	0.73	0.84	0.63
Elev	0.61	0.37	0.54	0.75	-	0.69	0.04	0.41	0.43	0.27
Lat	0.43	0.78	0.17	0.73	0.69	-	0.67	0.99	0.10	0.84
HR	0.34	0.62	0.46	0.87	0.04	0.67	-	0.04	1.00	0.04
NPP	0.09	0.49	0.28	0.73	0.41	0.99	0.04	-	0.07	1.00
Prec	0.02	0.32	0.55	0.84	0.43	0.10	1.00	0.07	-	0.05
UVB	0.27	0.50	0.76	0.63	0.27	0.84	0.04	1.00	0.05	-

MITOCHONDRIAL CODING-GENE: ω ANALYSIS 1

Covariances	dS	ω	Diversif	Body Size	Elev	Lat	Temp	HR	NPP	Prec	UVB
dS	0.27	0.00	0.03	-0.02	-0.17	-0.07	0.05	0.00	-0.02	-0.01	-0.02
ω	0.00	0.04	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00
Diversif	0.03	0.00	0.09	-0.01	-0.02	-0.07	0.01	0.00	-0.01	0.01	0.00
Body Size	-0.02	0.00	-0.01	0.04	0.03	0.03	0.00	0.00	0.01	0.01	0.00
Elev	-0.17	0.00	-0.02	0.03	1.33	0.28	-0.11	-0.03	-0.10	-0.17	0.02
Lat	-0.07	0.02	-0.07	0.03	0.28	3.85	-0.05	0.00	0.24	-0.22	0.04
Temp	0.05	0.00	0.01	0.00	-0.11	-0.05	0.03	0.00	0.02	0.05	-0.01
HR	0.00	0.00	0.00	0.00	-0.03	0.00	0.00	0.01	-0.01	0.03	0.00
NPP	-0.02	0.00	-0.01	0.01	-0.10	0.24	0.02	-0.01	0.40	-0.02	0.02
Prec	-0.01	0.00	0.01	0.01	-0.17	-0.22	0.05	0.03	-0.02	0.37	-0.02
UVB	-0.02	0.00	0.00	0.00	0.02	0.04	-0.01	0.00	0.02	-0.02	0.02
Correl. Coeff.	**dS**	**ω**	**Diversif**	**Body Size**	**Elev**	**Lat**	**Temp**	**HR**	**NPP**	**Prec**	**UVB**
dS	1.00	-0.03	0.23	-0.20	-0.29	-0.07	0.57	0.10	-0.06	-0.02	-0.25
ω	-0.03	1.00	0.01	0.08	0.02	0.03	-0.03	0.03	-0.01	0.02	0.01
Diversif	0.23	0.01	1.00	-0.11	-0.05	-0.12	0.11	0.02	-0.03	0.06	0.04
Body Size	-0.20	0.08	-0.11	1.00	0.11	0.08	-0.10	0.09	0.04	0.05	0.07
Elev	-0.29	0.02	-0.05	0.11	1.00	0.12	-0.55	-0.30	-0.14	-0.25	0.12
Lat	-0.07	0.03	-0.12	0.08	0.12	1.00	-0.15	0.00	0.19	-0.18	0.14
Temp	0.57	-0.03	0.11	-0.10	-0.55	-0.15	1.00	0.27	0.22	0.41	-0.31
HR	0.10	0.03	0.02	0.09	-0.30	0.00	0.27	1.00	-0.11	0.53	-0.25
NPP	-0.06	-0.01	-0.03	0.04	-0.14	0.19	0.22	-0.11	1.00	-0.05	0.21
Prec	-0.02	0.02	0.06	0.05	-0.25	-0.18	0.41	0.53	-0.05	1.00	-0.28
UVB	-0.25	0.01	0.04	0.07	0.12	0.14	-0.31	-0.25	0.21	-0.28	1.00
Post. Prob.	**dS**	**ω**	**Diversif**	**Body Size**	**Elev**	**Lat**	**Temp**	**HR**	**NPP**	**Prec**	**UVB**
dS	-	0.46	0.97	0.08	0.02	0.32	1.00	0.73	0.35	0.45	0.05
ω	0.46	-	0.51	0.62	0.52	0.54	0.48	0.54	0.48	0.53	0.51
Diversif	0.97	0.51	-	0.14	0.30	0.13	0.86	0.58	0.38	0.71	0.64
Body Size	0.08	0.62	0.14	-	0.85	0.77	0.18	0.80	0.65	0.70	0.73
Elev	0.02	0.52	0.30	0.85	-	0.88	0.00	0.00	0.09	0.01	0.87
Lat	0.32	0.54	0.13	0.77	0.88	-	0.09	0.50	0.97	0.04	0.91
Temp	1.00	0.48	0.86	0.18	0.00	0.09	-	0.99	0.98	1.00	0.00
HR	0.73	0.54	0.58	0.80	0.00	0.50	0.99	-	0.15	1.00	0.01
NPP	0.35	0.48	0.38	0.65	0.09	0.97	0.98	0.15	-	0.34	0.98
Prec	0.45	0.53	0.71	0.70	0.01	0.04	1.00	1.00	0.34	-	0.00
UVB	0.05	0.51	0.64	0.73	0.87	0.91	0.00	0.01	0.98	0.00	-

Precisions	dS	ω	Diversif	Body Size	Elev	Lat	Temp	HR	NPP	Prec	UVB
dS	14.70	0.46	-3.51	2.58	-0.12	-0.12	-26.50	-5.14	2.01	3.94	3.38
ω	0.46	3280.00	-5.22	-18.90	-0.88	-0.37	15.10	-14.70	2.15	-0.78	1.09
Diversif	-3.51	-5.22	16.50	1.41	-0.09	0.24	3.54	0.97	-0.11	-1.15	-4.58
Body Size	2.58	-18.90	1.41	33.20	-0.61	-0.11	-2.68	-8.34	-0.19	0.04	-2.04
Elev	-0.12	-0.88	-0.09	-0.61	1.52	-0.06	4.90	3.85	0.10	-0.23	0.94
Lat	-0.12	-0.37	0.24	-0.11	-0.06	0.40	0.51	-1.29	-0.25	0.19	-0.25
Temp	-26.50	15.10	3.54	-2.68	4.90	0.51	139.00	14.10	-9.05	-13.70	15.80
HR	-5.14	-14.70	0.97	-8.34	3.85	-1.29	14.10	236.00	2.92	-16.50	13.20
NPP	2.01	2.15	-0.11	-0.19	0.10	-0.25	-9.05	2.92	4.56	0.72	-3.84
Prec	3.94	-0.78	-1.15	0.04	-0.23	0.19	-13.70	-16.50	0.72	7.22	2.61
UVB	3.38	1.09	-4.58	-2.04	0.94	-0.25	15.80	13.20	-3.84	2.61	94.40
Partial C.C.	**dS**	**ω**	**Diversif**	**Body Size**	**Elev**	**Lat**	**Temp**	**HR**	**NPP**	**Prec**	**UVB**
dS	-1.00	-0.01	0.22	-0.12	0.03	0.05	0.58	0.09	-0.25	-0.38	-0.09
ω	-0.01	-1.00	0.03	0.11	0.01	0.03	-0.02	0.03	-0.02	0.02	0.01
Diversif	0.22	0.03	-1.00	-0.06	0.02	-0.09	-0.07	-0.01	0.01	0.10	0.12
Body Size	-0.12	0.11	-0.06	-1.00	0.09	0.03	0.04	0.10	0.02	0.00	0.04
Elev	0.03	0.01	0.02	0.09	-1.00	0.08	-0.34	-0.21	-0.04	0.07	-0.08
Lat	0.05	0.03	-0.09	0.03	0.08	-1.00	-0.07	0.14	0.19	-0.12	0.04
Temp	0.58	-0.02	-0.07	0.04	-0.34	-0.07	-1.00	-0.08	0.36	0.43	-0.14
HR	0.09	0.03	-0.01	0.10	-0.21	0.14	-0.08	-1.00	-0.09	0.41	-0.09
NPP	-0.25	-0.02	0.01	0.02	-0.04	0.19	0.36	-0.09	-1.00	-0.12	0.19
Prec	-0.38	0.02	0.10	0.00	0.07	-0.12	0.43	0.41	-0.12	-1.00	-0.10
UVB	-0.09	0.01	0.12	0.04	-0.08	0.04	-0.14	-0.09	0.19	-0.10	-1.00
Post. Prob.	**dS**	**ω**	**Diversif**	**Body Size**	**Elev**	**Lat**	**Temp**	**HR**	**NPP**	**Prec**	**UVB**
dS	-	0.49	0.91	0.26	0.56	0.59	1.00	0.67	0.11	0.02	0.31
ω	0.49	-	0.55	0.63	0.51	0.55	0.47	0.54	0.48	0.52	0.51
Diversif	0.91	0.55	-	0.32	0.56	0.24	0.33	0.46	0.53	0.77	0.82
Body Size	0.26	0.63	0.32	-	0.75	0.60	0.58	0.77	0.56	0.50	0.62
Elev	0.56	0.51	0.56	0.75	-	0.74	0.02	0.07	0.38	0.69	0.26
Lat	0.59	0.55	0.24	0.60	0.74	-	0.34	0.85	0.91	0.21	0.63
Temp	1.00	0.47	0.33	0.58	0.02	0.34	-	0.32	0.98	0.99	0.18
HR	0.67	0.54	0.46	0.77	0.07	0.85	0.32	-	0.25	0.99	0.24
NPP	0.11	0.48	0.53	0.56	0.38	0.91	0.98	0.25	-	0.21	0.91
Prec	0.02	0.52	0.77	0.50	0.69	0.21	0.99	0.99	0.21	-	0.24
UVB	0.31	0.51	0.82	0.62	0.26	0.63	0.18	0.24	0.91	0.24	-

MITOCHONDRIAL CODING-GENE: ω ANALYSIS 1 (Controlling for Temperature)										
Covariances	**dS**	**ω**	**Diversif**	**Body Size**	**Elev**	**Lat**	**HR**	**NPP**	**Prec**	**UVB**
dS	0.18	0.00	0.02	-0.02	0.01	0.01	0.00	-0.06	-0.08	0.00
ω	0.00	0.03	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00
Diversif	0.02	0.00	0.08	-0.01	0.00	-0.06	0.00	-0.01	0.00	0.00
Body Size	-0.02	0.00	-0.01	0.04	0.01	0.03	0.00	0.01	0.01	0.00
Elev	0.01	0.00	0.00	0.01	0.92	0.10	-0.02	-0.02	-0.01	-0.01
Lat	0.01	0.02	-0.06	0.03	0.10	3.72	0.01	0.28	-0.15	0.03
HR	0.00	0.00	0.00	0.00	-0.02	0.01	0.01	-0.01	0.02	0.00
NPP	-0.06	0.00	-0.01	0.01	-0.02	0.28	-0.01	0.38	-0.05	0.02
Prec	-0.08	0.00	0.00	0.01	-0.01	-0.15	0.02	-0.05	0.31	-0.01
UVB	0.00	0.00	0.00	0.00	-0.01	0.03	0.00	0.02	-0.01	0.02
Correl. Coeff.	**dS**	**ω**	**Diversif**	**Body Size**	**Elev**	**Lat**	**HR**	**NPP**	**Prec**	**UVB**
dS	1.00	-0.02	0.21	-0.17	0.03	0.01	-0.07	-0.24	-0.35	-0.09
ω	-0.02	1.00	0.01	0.09	0.00	0.03	0.04	-0.01	0.03	0.00
Diversif	0.21	0.01	1.00	-0.10	0.01	-0.10	-0.01	-0.06	0.01	0.08
Body Size	-0.17	0.09	-0.10	1.00	0.07	0.06	0.12	0.06	0.11	0.04
Elev	0.03	0.00	0.01	0.07	1.00	0.05	-0.19	-0.03	-0.02	-0.06
Lat	0.01	0.03	-0.10	0.06	0.05	1.00	0.04	0.23	-0.14	0.10
HR	-0.07	0.04	-0.01	0.12	-0.19	0.04	1.00	-0.18	0.47	-0.19
NPP	-0.24	-0.01	-0.06	0.06	-0.03	0.23	-0.18	1.00	-0.15	0.30
Prec	-0.35	0.03	0.01	0.11	-0.02	-0.14	0.47	-0.15	1.00	-0.18
UVB	-0.09	0.00	0.08	0.04	-0.06	0.10	-0.19	0.30	-0.18	1.00
Post. Prob.	**dS**	**ω**	**Diversif**	**Body Size**	**Elev**	**Lat**	**HR**	**NPP**	**Prec**	**UVB**
dS	-	0.47	0.94	0.13	0.57	0.52	0.35	0.10	0.02	0.29
ω	0.47	-	0.52	0.63	0.51	0.54	0.55	0.49	0.55	0.50
Diversif	0.94	0.52	-	0.17	0.53	0.16	0.46	0.29	0.54	0.77
Body Size	0.13	0.63	0.17	-	0.73	0.74	0.87	0.73	0.84	0.64
Elev	0.57	0.51	0.53	0.73	-	0.69	0.04	0.40	0.41	0.27
Lat	0.52	0.54	0.16	0.74	0.69	-	0.66	0.99	0.10	0.83
HR	0.35	0.55	0.46	0.87	0.04	0.66	-	0.04	1.00	0.04
NPP	0.10	0.49	0.29	0.73	0.40	0.99	0.04	-	0.07	1.00
Prec	0.02	0.55	0.54	0.84	0.41	0.10	1.00	0.07	-	0.04
UVB	0.29	0.50	0.77	0.64	0.27	0.83	0.04	1.00	0.04	-

MITOCHONDRIAL CODING-GENE: ω ANALYSIS 2

Covariances	dS	ω	Diversif	Body Size	Elev	Lat	Temp	HR	NPP	Prec	UVB
dS	0.27	0.00	0.04	-0.02	-0.17	-0.07	0.05	0.00	-0.02	-0.01	-0.02
ω	0.00	0.04	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00
Diversif	0.04	0.00	0.09	-0.01	-0.02	-0.07	0.01	0.00	-0.01	0.01	0.00
Body Size	-0.02	0.00	-0.01	0.04	0.03	0.03	0.00	0.00	0.01	0.01	0.00
Elev	-0.17	0.00	-0.02	0.03	1.34	0.28	-0.11	-0.03	-0.10	-0.17	0.02
Lat	-0.07	0.02	-0.07	0.03	0.28	3.84	-0.05	0.00	0.24	-0.22	0.04
Temp	0.05	0.00	0.01	0.00	-0.11	-0.05	0.03	0.00	0.02	0.05	-0.01
HR	0.00	0.00	0.00	0.00	-0.03	0.00	0.00	0.01	-0.01	0.03	0.00
NPP	-0.02	0.00	-0.01	0.01	-0.10	0.24	0.02	-0.01	0.40	-0.02	0.02
Prec	-0.01	0.00	0.01	0.01	-0.17	-0.22	0.05	0.03	-0.02	0.38	-0.02
UVB	-0.02	0.00	0.00	0.00	0.02	0.04	-0.01	0.00	0.02	-0.02	0.02
Correl. Coeff.	**dS**	**ω**	**Diversif**	**Body Size**	**Elev**	**Lat**	**Temp**	**HR**	**NPP**	**Prec**	**UVB**
dS	1.00	-0.03	0.23	-0.20	-0.29	-0.07	0.56	0.09	-0.06	-0.03	-0.25
ω	-0.03	1.00	0.01	0.08	0.00	0.02	-0.01	0.04	-0.01	0.04	0.00
Diversif	0.23	0.01	1.00	-0.11	-0.05	-0.12	0.11	0.02	-0.03	0.05	0.04
Body Size	-0.20	0.08	-0.11	1.00	0.11	0.08	-0.09	0.09	0.04	0.06	0.06
Elev	-0.29	0.00	-0.05	0.11	1.00	0.13	-0.55	-0.29	-0.14	-0.24	0.13
Lat	-0.07	0.02	-0.12	0.08	0.13	1.00	-0.14	0.00	0.19	-0.18	0.14
Temp	0.56	-0.01	0.11	-0.09	-0.55	-0.14	1.00	0.27	0.22	0.41	-0.32
HR	0.09	0.04	0.02	0.09	-0.29	0.00	0.27	1.00	-0.11	0.53	-0.26
NPP	-0.06	-0.01	-0.03	0.04	-0.14	0.19	0.22	-0.11	1.00	-0.04	0.21
Prec	-0.03	0.04	0.05	0.06	-0.24	-0.18	0.41	0.53	-0.04	1.00	-0.28
UVB	-0.25	0.00	0.04	0.06	0.13	0.14	-0.32	-0.26	0.21	-0.28	1.00
Post. Prob.	**dS**	**ω**	**Diversif**	**Body Size**	**Elev**	**Lat**	**Temp**	**HR**	**NPP**	**Prec**	**UVB**
dS	-	0.47	0.97	0.08	0.02	0.33	1.00	0.72	0.36	0.41	0.05
ω	0.47	-	0.51	0.62	0.50	0.54	0.50	0.55	0.49	0.54	0.50
Diversif	0.97	0.51	-	0.15	0.31	0.13	0.85	0.56	0.38	0.69	0.64
Body Size	0.08	0.62	0.15	-	0.85	0.77	0.18	0.80	0.65	0.71	0.72
Elev	0.02	0.50	0.31	0.85	-	0.88	0.00	0.00	0.09	0.01	0.89
Lat	0.33	0.54	0.13	0.77	0.88	-	0.09	0.51	0.97	0.04	0.91
Temp	1.00	0.50	0.85	0.18	0.00	0.09	-	1.00	0.98	1.00	0.00
HR	0.72	0.55	0.56	0.80	0.00	0.51	1.00	-	0.15	1.00	0.01
NPP	0.36	0.49	0.38	0.65	0.09	0.97	0.98	0.15	-	0.34	0.98
Prec	0.41	0.54	0.69	0.71	0.01	0.04	1.00	1.00	0.34	-	0.00
UVB	0.05	0.50	0.64	0.72	0.89	0.91	0.00	0.01	0.98	0.00	-

Precisions	dS	ω	Diversif	Body Size	Elev	Lat	Temp	HR	NPP	Prec	UVB
dS	14.50	1.53	-3.57	2.75	-0.14	-0.13	-26.20	-5.48	1.92	4.02	3.54
ω	1.53	3560.00	-3.18	-19.90	0.17	-0.36	3.02	-16.30	1.79	-2.69	-1.32
Diversif	-3.57	-3.18	16.60	1.27	-0.10	0.24	3.86	1.16	-0.14	-1.21	-4.64
Body Size	2.75	-19.90	1.27	33.10	-0.64	-0.12	-2.94	-8.60	-0.18	0.08	-2.02
Elev	-0.14	0.17	-0.10	-0.64	1.52	-0.06	4.92	3.82	0.11	-0.23	0.90
Lat	-0.13	-0.36	0.24	-0.12	-0.06	0.40	0.51	-1.26	-0.26	0.19	-0.28
Temp	-26.20	3.02	3.86	-2.94	4.92	0.51	138.00	14.50	-8.84	-13.70	15.70
HR	-5.48	-16.30	1.16	-8.60	3.82	-1.26	14.50	234.00	2.90	-16.40	12.70
NPP	1.92	1.79	-0.14	-0.18	0.11	-0.26	-8.84	2.90	4.54	0.69	-3.87
Prec	4.02	-2.69	-1.21	0.08	-0.23	0.19	-13.70	-16.40	0.69	7.25	2.75
UVB	3.54	-1.32	-4.64	-2.02	0.90	-0.28	15.70	12.70	-3.87	2.75	94.50
Partial C.C.	**dS**	**ω**	**Diversif**	**Body Size**	**Elev**	**Lat**	**Temp**	**HR**	**NPP**	**Prec**	**UVB**
dS	-1.00	-0.01	0.23	-0.12	0.03	0.05	0.58	0.09	-0.24	-0.39	-0.09
ω	-0.01	-1.00	0.02	0.10	0.00	0.03	-0.01	0.03	-0.02	0.03	0.01
Diversif	0.23	0.02	-1.00	-0.06	0.02	-0.09	-0.07	-0.02	0.01	0.11	0.12
Body Size	-0.12	0.10	-0.06	-1.00	0.09	0.03	0.04	0.10	0.02	0.00	0.04
Elev	0.03	0.00	0.02	0.09	-1.00	0.08	-0.35	-0.21	-0.04	0.07	-0.08
Lat	0.05	0.03	-0.09	0.03	0.08	-1.00	-0.07	0.14	0.19	-0.12	0.05
Temp	0.58	-0.01	-0.07	0.04	-0.35	-0.07	-1.00	-0.08	0.35	0.43	-0.14
HR	0.09	0.03	-0.02	0.10	-0.21	0.14	-0.08	-1.00	-0.09	0.41	-0.09
NPP	-0.24	-0.02	0.01	0.02	-0.04	0.19	0.35	-0.09	-1.00	-0.12	0.19
Prec	-0.39	0.03	0.11	0.00	0.07	-0.12	0.43	0.41	-0.12	-1.00	-0.10
UVB	-0.09	0.01	0.12	0.04	-0.08	0.05	-0.14	-0.09	0.19	-0.10	-1.00
Post. Prob.	**dS**	**ω**	**Diversif**	**Body Size**	**Elev**	**Lat**	**Temp**	**HR**	**NPP**	**Prec**	**UVB**
dS	-	0.50	0.92	0.24	0.56	0.60	1.00	0.69	0.12	0.02	0.31
ω	0.50	-	0.53	0.62	0.50	0.54	0.49	0.54	0.48	0.53	0.51
Diversif	0.92	0.53	-	0.33	0.56	0.24	0.30	0.45	0.53	0.79	0.82
Body Size	0.24	0.62	0.33	-	0.76	0.61	0.60	0.77	0.55	0.50	0.62
Elev	0.56	0.50	0.56	0.76	-	0.74	0.02	0.07	0.38	0.69	0.27
Lat	0.60	0.54	0.24	0.61	0.74	-	0.34	0.84	0.91	0.21	0.64
Temp	1.00	0.49	0.30	0.60	0.02	0.34	-	0.30	0.98	0.99	0.18
HR	0.69	0.54	0.45	0.77	0.07	0.84	0.30	-	0.25	0.99	0.25
NPP	0.12	0.48	0.53	0.55	0.38	0.91	0.98	0.25	-	0.22	0.91
Prec	0.02	0.53	0.79	0.50	0.69	0.21	0.99	0.99	0.22	-	0.23
UVB	0.31	0.51	0.82	0.62	0.27	0.64	0.18	0.25	0.91	0.23	-

MITOCHONDRIAL CODING-GENE: ω ANALYSIS 2 (Controlling for Temperature)										
Covariances	**dS**	**ω**	**Diversif**	**Body Size**	**Elev**	**Lat**	**HR**	**NPP**	**Prec**	**UVB**
dS	0.18	0.00	0.03	-0.02	0.01	0.01	0.00	-0.06	-0.08	0.00
ω	0.00	0.04	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00
Diversif	0.03	0.00	0.08	-0.01	0.00	-0.06	0.00	-0.01	0.00	0.00
Body Size	-0.02	0.00	-0.01	0.04	0.01	0.03	0.00	0.01	0.01	0.00
Elev	0.01	0.00	0.00	0.01	0.92	0.10	-0.02	-0.01	-0.01	-0.01
Lat	0.01	0.02	-0.06	0.03	0.10	3.72	0.01	0.27	-0.15	0.03
HR	0.00	0.00	0.00	0.00	-0.02	0.01	0.01	-0.01	0.02	0.00
NPP	-0.06	0.00	-0.01	0.01	-0.01	0.27	-0.01	0.38	-0.05	0.02
Prec	-0.08	0.00	0.00	0.01	-0.01	-0.15	0.02	-0.05	0.31	-0.01
UVB	0.00	0.00	0.00	0.00	-0.01	0.03	0.00	0.02	-0.01	0.02
Correl. Coeff.	**dS**	**ω**	**Diversif**	**Body Size**	**Elev**	**Lat**	**HR**	**NPP**	**Prec**	**UVB**
dS	1.00	-0.03	0.21	-0.18	0.03	0.02	-0.07	-0.23	-0.36	-0.08
ω	-0.03	1.00	0.01	0.08	0.00	0.03	0.05	-0.01	0.04	0.00
Diversif	0.21	0.01	1.00	-0.10	0.01	-0.10	-0.01	-0.06	0.01	0.08
Body Size	-0.18	0.08	-0.10	1.00	0.07	0.07	0.12	0.06	0.11	0.04
Elev	0.03	0.00	0.01	0.07	1.00	0.06	-0.18	-0.02	-0.02	-0.06
Lat	0.02	0.03	-0.10	0.07	0.06	1.00	0.04	0.23	-0.14	0.10
HR	-0.07	0.05	-0.01	0.12	-0.18	0.04	1.00	-0.18	0.47	-0.19
NPP	-0.23	-0.01	-0.06	0.06	-0.02	0.23	-0.18	1.00	-0.15	0.30
Prec	-0.36	0.04	0.01	0.11	-0.02	-0.14	0.47	-0.15	1.00	-0.18
UVB	-0.08	0.00	0.08	0.04	-0.06	0.10	-0.19	0.30	-0.18	1.00
Post. Prob.	**dS**	**ω**	**Diversif**	**Body Size**	**Elev**	**Lat**	**HR**	**NPP**	**Prec**	**UVB**
dS	-	0.46	0.95	0.11	0.57	0.53	0.34	0.11	0.02	0.30
ω	0.46	-	0.51	0.62	0.49	0.54	0.56	0.49	0.55	0.50
Diversif	0.95	0.51	-	0.17	0.54	0.17	0.45	0.29	0.53	0.77
Body Size	0.11	0.62	0.17	-	0.74	0.74	0.87	0.73	0.84	0.63
Elev	0.57	0.49	0.54	0.74	-	0.70	0.04	0.41	0.41	0.27
Lat	0.53	0.54	0.17	0.74	0.70	-	0.65	0.99	0.09	0.83
HR	0.34	0.56	0.45	0.87	0.04	0.65	-	0.04	1.00	0.04
NPP	0.11	0.49	0.29	0.73	0.41	0.99	0.04	-	0.07	1.00
Prec	0.02	0.55	0.53	0.84	0.41	0.09	1.00	0.07	-	0.05
UVB	0.30	0.50	0.77	0.63	0.27	0.83	0.04	1.00	0.05	-

NUCLEAR CODING-GENES: dN ANALYSIS 1

Covariances	dS	dN	Diversif	Body Size	Elev	Lat	Temp	HR	NPP	Prec	UVB
dS	0.13	0.05	0.01	-0.01	-0.21	-0.11	0.04	0.01	0.06	0.06	-0.01
dN	0.05	0.22	0.01	-0.01	0.02	-0.09	0.00	0.00	0.01	-0.06	0.01
Diversif	0.01	0.01	0.10	0.00	-0.02	-0.05	0.01	0.00	0.00	0.00	0.00
Body Size	-0.01	-0.01	0.00	0.06	0.04	0.06	0.00	0.01	-0.01	0.02	0.00
Elev	-0.21	0.02	-0.02	0.04	1.68	0.39	-0.13	-0.04	-0.10	-0.17	0.03
Lat	-0.11	-0.09	-0.05	0.06	0.39	5.00	-0.05	0.01	0.13	-0.20	0.08
Temp	0.04	0.00	0.01	0.00	-0.13	-0.05	0.04	0.01	0.04	0.05	-0.01
HR	0.01	0.00	0.00	0.01	-0.04	0.01	0.01	0.01	0.00	0.04	0.00
NPP	0.06	0.01	0.00	-0.01	-0.10	0.13	0.04	0.00	0.31	0.06	0.02
Prec	0.06	-0.06	0.00	0.02	-0.17	-0.20	0.05	0.04	0.06	0.47	-0.03
UVB	-0.01	0.01	0.00	0.00	0.03	0.08	-0.01	0.00	0.02	-0.03	0.03
Correl. Coeff.	**dS**	**dN**	**Diversif**	**Body Size**	**Elev**	**Lat**	**Temp**	**HR**	**NPP**	**Prec**	**UVB**
dS	1.00	0.12	0.04	-0.14	-0.49	-0.15	0.59	0.27	0.31	0.26	-0.19
dN	0.12	1.00	0.02	-0.12	0.04	-0.06	-0.07	-0.11	0.00	-0.21	0.06
Diversif	0.04	0.02	1.00	-0.06	-0.04	-0.07	0.10	0.00	0.01	0.00	0.07
Body Size	-0.14	-0.12	-0.06	1.00	0.12	0.10	-0.11	0.17	-0.05	0.10	0.06
Elev	-0.49	0.04	-0.04	0.12	1.00	0.13	-0.52	-0.28	-0.14	-0.20	0.15
Lat	-0.15	-0.06	-0.07	0.10	0.13	1.00	-0.13	0.02	0.10	-0.13	0.22
Temp	0.59	-0.07	0.10	-0.11	-0.52	-0.13	1.00	0.22	0.33	0.38	-0.29
HR	0.27	-0.11	0.00	0.17	-0.28	0.02	0.22	1.00	0.04	0.53	-0.23
NPP	0.31	0.00	0.01	-0.05	-0.14	0.10	0.33	0.04	1.00	0.15	0.19
Prec	0.26	-0.21	0.00	0.10	-0.20	-0.13	0.38	0.53	0.15	1.00	-0.29
UVB	-0.19	0.06	0.07	0.06	0.15	0.22	-0.29	-0.23	0.19	-0.29	1.00
Post. Prob.	**dS**	**dN**	**Diversif**	**Body Size**	**Elev**	**Lat**	**Temp**	**HR**	**NPP**	**Prec**	**UVB**
dS	-	0.64	0.60	0.25	0.01	0.25	1.00	0.87	0.92	0.86	0.19
dN	0.64	-	0.56	0.30	0.55	0.41	0.40	0.35	0.49	0.23	0.59
Diversif	0.60	0.56	-	0.30	0.34	0.26	0.83	0.50	0.55	0.50	0.73
Body Size	0.25	0.30	0.30	-	0.86	0.82	0.17	0.94	0.32	0.82	0.71
Elev	0.01	0.55	0.34	0.86	-	0.89	0.00	0.01	0.11	0.04	0.91
Lat	0.25	0.41	0.26	0.82	0.89	-	0.12	0.57	0.83	0.12	0.98
Temp	1.00	0.40	0.83	0.17	0.00	0.12	-	0.98	1.00	1.00	0.00
HR	0.87	0.35	0.50	0.94	0.01	0.57	0.98	-	0.65	1.00	0.02
NPP	0.92	0.49	0.55	0.32	0.11	0.83	1.00	0.65	-	0.91	0.96
Prec	0.86	0.23	0.50	0.82	0.04	0.12	1.00	1.00	0.91	-	0.00
UVB	0.19	0.59	0.73	0.71	0.91	0.98	0.00	0.02	0.96	0.00	-

Precisions	dS	dN	Diversif	Body Size	Elev	Lat	Temp	HR	NPP	Prec	UVB
dS	63.40	-1.06	1.56	3.68	3.07	0.38	-34.90	-18.40	-4.89	-0.68	3.68
dN	-1.06	1390.00	-0.11	4.83	-0.63	0.34	12.30	2.71	0.02	4.92	-6.32
Diversif	1.56	-0.11	13.20	1.00	-0.02	0.15	-4.14	-1.18	0.28	0.13	-3.38
Body Size	3.68	4.83	1.00	25.70	-0.39	-0.08	0.01	-10.30	0.25	-0.31	-3.02
Elev	3.07	-0.63	-0.02	-0.39	1.43	-0.04	2.09	2.33	-0.28	-0.26	0.76
Lat	0.38	0.34	0.15	-0.08	-0.04	0.33	-0.21	-1.03	-0.17	0.21	-0.56
Temp	-34.90	12.30	-4.14	0.01	2.09	-0.21	92.00	17.60	-3.72	-3.77	15.90
HR	-18.40	2.71	-1.18	-10.30	2.33	-1.03	17.60	180.00	2.48	-12.40	9.67
NPP	-4.89	0.02	0.28	0.25	-0.28	-0.17	-3.72	2.48	6.56	-0.55	-6.08
Prec	-0.68	4.92	0.13	-0.31	-0.26	0.21	-3.77	-12.40	-0.55	5.41	2.33
UVB	3.68	-6.32	-3.38	-3.02	0.76	-0.56	15.90	9.67	-6.08	2.33	76.20
Partial C.C.	**dS**	**dN**	**Diversif**	**Body Size**	**Elev**	**Lat**	**Temp**	**HR**	**NPP**	**Prec**	**UVB**
dS	-1.00	0.20	-0.05	-0.08	-0.30	-0.09	0.43	0.17	0.22	0.03	-0.05
dN	0.20	-1.00	0.02	-0.10	0.09	-0.09	-0.11	0.00	0.01	-0.21	0.03
Diversif	-0.05	0.02	-1.00	-0.05	0.01	-0.07	0.12	0.03	-0.03	-0.02	0.11
Body Size	-0.08	-0.10	-0.05	-1.00	0.07	0.03	-0.01	0.15	-0.03	0.03	0.07
Elev	-0.30	0.09	0.01	0.07	-1.00	0.06	-0.21	-0.16	0.09	0.10	-0.07
Lat	-0.09	-0.09	-0.07	0.03	0.06	-1.00	0.03	0.14	0.11	-0.16	0.12
Temp	0.43	-0.11	0.12	-0.01	-0.21	0.03	-1.00	-0.13	0.18	0.18	-0.20
HR	0.17	0.00	0.03	0.15	-0.16	0.14	-0.13	-1.00	-0.06	0.41	-0.09
NPP	0.22	0.01	-0.03	-0.03	0.09	0.11	0.18	-0.06	-1.00	0.09	0.28
Prec	0.03	-0.21	-0.02	0.03	0.10	-0.16	0.18	0.41	0.09	-1.00	-0.12
UVB	-0.05	0.03	0.11	0.07	-0.07	0.12	-0.20	-0.09	0.28	-0.12	-1.00
Post. Prob.	**dS**	**dN**	**Diversif**	**Body Size**	**Elev**	**Lat**	**Temp**	**HR**	**NPP**	**Prec**	**UVB**
dS	-	0.73	0.40	0.39	0.13	0.38	0.95	0.73	0.77	0.54	0.43
dN	0.73	-	0.55	0.36	0.63	0.38	0.34	0.50	0.51	0.23	0.54
Diversif	0.40	0.55	-	0.34	0.52	0.29	0.80	0.58	0.39	0.45	0.81
Body Size	0.39	0.36	0.34	-	0.68	0.60	0.48	0.85	0.43	0.60	0.69
Elev	0.13	0.63	0.52	0.68	-	0.65	0.15	0.17	0.70	0.72	0.32
Lat	0.38	0.38	0.29	0.60	0.65	-	0.57	0.82	0.77	0.16	0.79
Temp	0.95	0.34	0.80	0.48	0.15	0.57	-	0.23	0.81	0.84	0.13
HR	0.73	0.50	0.58	0.85	0.17	0.82	0.23	-	0.35	0.98	0.27
NPP	0.77	0.51	0.39	0.43	0.70	0.77	0.81	0.35	-	0.73	0.96
Prec	0.54	0.23	0.45	0.60	0.72	0.16	0.84	0.98	0.73	-	0.21
UVB	0.43	0.54	0.81	0.69	0.32	0.79	0.13	0.27	0.96	0.21	-

NUCLEAR CODING-GENES: dN ANALYSIS 1 (Controlling for Temperature)										
Covariances	**dS**	**dN**	**Diversif**	**Body Size**	**Elev**	**Lat**	**HR**	**NPP**	**Prec**	**UVB**
dS	0.08	0.04	0.00	-0.01	-0.08	-0.06	0.01	0.02	0.01	0.00
dN	0.04	0.20	0.01	-0.02	0.00	-0.10	0.00	0.01	-0.06	0.00
Diversif	0.00	0.01	0.10	0.00	0.00	-0.04	0.00	0.00	-0.01	0.00
Body Size	-0.01	-0.02	0.00	0.06	0.02	0.05	0.01	0.00	0.02	0.00
Elev	-0.08	0.00	0.00	0.02	1.21	0.19	-0.02	0.03	0.00	0.00
Lat	-0.06	-0.10	-0.04	0.05	0.19	4.86	0.01	0.18	-0.13	0.06
HR	0.01	0.00	0.00	0.01	-0.02	0.01	0.01	0.00	0.03	0.00
NPP	0.02	0.01	0.00	0.00	0.03	0.18	0.00	0.27	0.01	0.03
Prec	0.01	-0.06	-0.01	0.02	0.00	-0.13	0.03	0.01	0.40	-0.02
UVB	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.03	-0.02	0.02
Correl. Coeff.	**dS**	**dN**	**Diversif**	**Body Size**	**Elev**	**Lat**	**HR**	**NPP**	**Prec**	**UVB**
dS	1.00	0.20	-0.03	-0.09	-0.28	-0.09	0.18	0.15	0.05	-0.02
dN	0.20	1.00	0.03	-0.14	0.01	-0.08	-0.10	0.03	-0.21	0.05
Diversif	-0.03	0.03	1.00	-0.05	0.01	-0.06	-0.02	-0.02	-0.04	0.10
Body Size	-0.09	-0.14	-0.05	1.00	0.07	0.09	0.20	-0.02	0.16	0.03
Elev	-0.28	0.01	0.01	0.07	1.00	0.08	-0.20	0.04	0.00	0.00
Lat	-0.09	-0.08	-0.06	0.09	0.08	1.00	0.05	0.15	-0.09	0.19
HR	0.18	-0.10	-0.02	0.20	-0.20	0.05	1.00	-0.03	0.50	-0.17
NPP	0.15	0.03	-0.02	-0.02	0.04	0.15	-0.03	1.00	0.03	0.32
Prec	0.05	-0.21	-0.04	0.16	0.00	-0.09	0.50	0.03	1.00	-0.20
UVB	-0.02	0.05	0.10	0.03	0.00	0.19	-0.17	0.32	-0.20	1.00
Post. Prob.	**dS**	**dN**	**Diversif**	**Body Size**	**Elev**	**Lat**	**HR**	**NPP**	**Prec**	**UVB**
dS	-	0.71	0.43	0.36	0.12	0.36	0.73	0.70	0.57	0.47
dN	0.71	-	0.58	0.29	0.51	0.39	0.36	0.54	0.24	0.57
Diversif	0.43	0.58	-	0.33	0.54	0.30	0.42	0.42	0.35	0.83
Body Size	0.36	0.29	0.33	-	0.74	0.79	0.96	0.44	0.92	0.63
Elev	0.12	0.51	0.54	0.74	-	0.77	0.04	0.66	0.49	0.48
Lat	0.36	0.39	0.30	0.79	0.77	-	0.68	0.92	0.21	0.96
HR	0.73	0.36	0.42	0.96	0.04	0.68	-	0.38	1.00	0.06
NPP	0.70	0.54	0.42	0.44	0.66	0.92	0.38	-	0.60	1.00
Prec	0.57	0.24	0.35	0.92	0.49	0.21	1.00	0.60	-	0.03
UVB	0.47	0.57	0.83	0.63	0.48	0.96	0.06	1.00	0.03	-

NUCLEAR CODING-GENES: dN ANALYSIS 2

Covariances	dS	dN	Diversif	Body Size	Elev	Lat	Temp	HR	NPP	Prec	UVB
dS	0.13	0.04	0.00	-0.01	-0.22	-0.12	0.04	0.01	0.06	0.06	-0.01
dN	0.04	0.22	0.01	-0.01	0.01	-0.10	0.00	0.00	0.00	-0.07	0.00
Diversif	0.00	0.01	0.10	0.00	-0.02	-0.05	0.01	0.00	0.00	0.00	0.00
Body Size	-0.01	-0.01	0.00	0.06	0.04	0.06	-0.01	0.01	-0.01	0.02	0.00
Elev	-0.22	0.01	-0.02	0.04	1.68	0.39	-0.13	-0.04	-0.10	-0.18	0.03
Lat	-0.12	-0.10	-0.05	0.06	0.39	5.01	-0.05	0.01	0.13	-0.21	0.08
Temp	0.04	0.00	0.01	-0.01	-0.13	-0.05	0.04	0.01	0.04	0.05	-0.01
HR	0.01	0.00	0.00	0.01	-0.04	0.01	0.01	0.01	0.00	0.04	0.00
NPP	0.06	0.00	0.00	-0.01	-0.10	0.13	0.04	0.00	0.31	0.06	0.02
Prec	0.06	-0.07	0.00	0.02	-0.18	-0.21	0.05	0.04	0.06	0.47	-0.03
UVB	-0.01	0.00	0.00	0.00	0.03	0.08	-0.01	0.00	0.02	-0.03	0.03
Correl. Coeff.	**dS**	**dN**	**Diversif**	**Body Size**	**Elev**	**Lat**	**Temp**	**HR**	**NPP**	**Prec**	**UVB**
dS	1.00	0.13	0.04	-0.14	-0.50	-0.15	0.59	0.27	0.31	0.26	-0.19
dN	0.13	1.00	0.03	-0.12	0.04	-0.07	-0.06	-0.10	0.01	-0.20	0.05
Diversif	0.04	0.03	1.00	-0.06	-0.04	-0.07	0.10	0.00	0.01	0.00	0.07
Body Size	-0.14	-0.12	-0.06	1.00	0.11	0.10	-0.11	0.17	-0.05	0.10	0.06
Elev	-0.50	0.04	-0.04	0.11	1.00	0.13	-0.52	-0.29	-0.14	-0.20	0.15
Lat	-0.15	-0.07	-0.07	0.10	0.13	1.00	-0.13	0.02	0.10	-0.14	0.22
Temp	0.59	-0.06	0.10	-0.11	-0.52	-0.13	1.00	0.23	0.33	0.38	-0.29
HR	0.27	-0.10	0.00	0.17	-0.29	0.02	0.23	1.00	0.04	0.53	-0.22
NPP	0.31	0.01	0.01	-0.05	-0.14	0.10	0.33	0.04	1.00	0.15	0.20
Prec	0.26	-0.20	0.00	0.10	-0.20	-0.14	0.38	0.53	0.15	1.00	-0.29
UVB	-0.19	0.05	0.07	0.06	0.15	0.22	-0.29	-0.22	0.20	-0.29	1.00
Post. Prob.	**dS**	**dN**	**Diversif**	**Body Size**	**Elev**	**Lat**	**Temp**	**HR**	**NPP**	**Prec**	**UVB**
dS	-	0.66	0.60	0.25	0.01	0.24	1.00	0.87	0.91	0.86	0.19
dN	0.66	-	0.56	0.30	0.55	0.41	0.42	0.36	0.51	0.24	0.57
Diversif	0.60	0.56	-	0.30	0.36	0.26	0.83	0.50	0.54	0.51	0.73
Body Size	0.25	0.30	0.30	-	0.85	0.82	0.16	0.94	0.33	0.82	0.72
Elev	0.01	0.55	0.36	0.85	-	0.88	0.00	0.00	0.11	0.04	0.90
Lat	0.24	0.41	0.26	0.82	0.88	-	0.12	0.58	0.82	0.11	0.97
Temp	1.00	0.42	0.83	0.16	0.00	0.12	-	0.98	1.00	1.00	0.01
HR	0.87	0.36	0.50	0.94	0.00	0.58	0.98	-	0.64	1.00	0.02
NPP	0.91	0.51	0.54	0.33	0.11	0.82	1.00	0.64	-	0.91	0.96
Prec	0.86	0.24	0.51	0.82	0.04	0.11	1.00	1.00	0.91	-	0.00
UVB	0.19	0.57	0.73	0.72	0.90	0.97	0.01	0.02	0.96	0.00	-

Precisions	dS	dN	Diversif	Body Size	Elev	Lat	Temp	HR	NPP	Prec	UVB
dS	60.00	-4.10	1.40	3.60	3.01	0.39	-34.50	-17.80	-4.74	-0.70	3.97
dN	-4.10	1520.00	-1.34	4.99	-0.71	0.23	9.32	4.63	-1.17	3.78	-1.95
Diversif	1.40	-1.34	13.20	0.98	-0.03	0.15	-4.03	-1.10	0.30	0.09	-3.36
Body Size	3.60	4.99	0.98	25.30	-0.37	-0.07	-0.10	-10.30	0.25	-0.27	-2.90
Elev	3.01	-0.71	-0.03	-0.37	1.42	-0.04	2.05	2.40	-0.28	-0.27	0.73
Lat	0.39	0.23	0.15	-0.07	-0.04	0.33	-0.23	-1.04	-0.16	0.21	-0.53
Temp	-34.50	9.32	-4.03	-0.10	2.05	-0.23	91.60	17.50	-3.61	-3.83	15.80
HR	-17.80	4.63	-1.10	-10.30	2.40	-1.04	17.50	179.00	2.67	-12.40	9.99
NPP	-4.74	-1.17	0.30	0.25	-0.28	-0.16	-3.61	2.67	6.47	-0.59	-6.06
Prec	-0.70	3.78	0.09	-0.27	-0.27	0.21	-3.83	-12.40	-0.59	5.42	2.29
UVB	3.97	-1.95	-3.36	-2.90	0.73	-0.53	15.80	9.99	-6.06	2.29	75.90
Partial C.C.	**dS**	**dN**	**Diversif**	**Body Size**	**Elev**	**Lat**	**Temp**	**HR**	**NPP**	**Prec**	**UVB**
dS	-1.00	0.20	-0.05	-0.08	-0.30	-0.09	0.43	0.17	0.22	0.03	-0.05
dN	0.20	-1.00	0.03	-0.10	0.09	-0.09	-0.10	0.00	0.01	-0.21	0.02
Diversif	-0.05	0.03	-1.00	-0.05	0.01	-0.07	0.12	0.02	-0.04	-0.01	0.11
Body Size	-0.08	-0.10	-0.05	-1.00	0.07	0.03	0.00	0.15	-0.02	0.03	0.07
Elev	-0.30	0.09	0.01	0.07	-1.00	0.06	-0.21	-0.16	0.09	0.10	-0.07
Lat	-0.09	-0.09	-0.07	0.03	0.06	-1.00	0.04	0.14	0.11	-0.16	0.11
Temp	0.43	-0.10	0.12	0.00	-0.21	0.04	-1.00	-0.13	0.17	0.18	-0.20
HR	0.17	0.00	0.02	0.15	-0.16	0.14	-0.13	-1.00	-0.07	0.41	-0.09
NPP	0.22	0.01	-0.04	-0.02	0.09	0.11	0.17	-0.07	-1.00	0.10	0.28
Prec	0.03	-0.21	-0.01	0.03	0.10	-0.16	0.18	0.41	0.10	-1.00	-0.12
UVB	-0.05	0.02	0.11	0.07	-0.07	0.11	-0.20	-0.09	0.28	-0.12	-1.00
Post. Prob.	**dS**	**dN**	**Diversif**	**Body Size**	**Elev**	**Lat**	**Temp**	**HR**	**NPP**	**Prec**	**UVB**
dS	-	0.74	0.41	0.39	0.12	0.37	0.95	0.73	0.77	0.53	0.42
dN	0.74	-	0.56	0.36	0.64	0.38	0.35	0.50	0.51	0.24	0.53
Diversif	0.41	0.56	-	0.33	0.54	0.29	0.80	0.57	0.38	0.46	0.80
Body Size	0.39	0.36	0.33	-	0.68	0.59	0.48	0.85	0.43	0.59	0.69
Elev	0.12	0.64	0.54	0.68	-	0.66	0.15	0.16	0.70	0.74	0.32
Lat	0.37	0.38	0.29	0.59	0.66	-	0.58	0.83	0.77	0.16	0.78
Temp	0.95	0.35	0.80	0.48	0.15	0.58	-	0.22	0.82	0.84	0.13
HR	0.73	0.50	0.57	0.85	0.16	0.83	0.22	-	0.34	0.98	0.27
NPP	0.77	0.51	0.38	0.43	0.70	0.77	0.82	0.34	-	0.74	0.95
Prec	0.53	0.24	0.46	0.59	0.74	0.16	0.84	0.98	0.74	-	0.22
UVB	0.42	0.53	0.80	0.69	0.32	0.78	0.13	0.27	0.95	0.22	-

NUCLEAR CODING-GENES: dN ANALYSIS 2 (Controlling for Temperature)										
Covariances	**dS**	**dN**	**Diversif**	**Body Size**	**Elev**	**Lat**	**HR**	**NPP**	**Prec**	**UVB**
dS	0.08	0.05	0.00	-0.01	-0.08	-0.06	0.01	0.02	0.01	0.00
dN	0.05	0.21	0.01	-0.02	0.00	-0.10	0.00	0.00	-0.06	0.00
Diversif	0.00	0.01	0.10	0.00	0.00	-0.04	0.00	0.00	-0.01	0.00
Body Size	-0.01	-0.02	0.00	0.06	0.02	0.05	0.01	0.00	0.02	0.00
Elev	-0.08	0.00	0.00	0.02	1.21	0.19	-0.02	0.02	0.00	0.00
Lat	-0.06	-0.10	-0.04	0.05	0.19	4.87	0.01	0.18	-0.13	0.06
HR	0.01	0.00	0.00	0.01	-0.02	0.01	0.01	0.00	0.03	0.00
NPP	0.02	0.00	0.00	0.00	0.02	0.18	0.00	0.27	0.01	0.03
Prec	0.01	-0.06	-0.01	0.02	0.00	-0.13	0.03	0.01	0.40	-0.02
UVB	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.03	-0.02	0.02
Correl. Coeff.	**dS**	**dN**	**Diversif**	**Body Size**	**Elev**	**Lat**	**HR**	**NPP**	**Prec**	**UVB**
dS	1.00	0.20	-0.03	-0.10	-0.28	-0.10	0.17	0.15	0.05	-0.02
dN	0.20	1.00	0.03	-0.13	0.01	-0.07	-0.09	0.04	-0.20	0.04
Diversif	-0.03	0.03	1.00	-0.05	0.01	-0.06	-0.02	-0.02	-0.04	0.10
Body Size	-0.10	-0.13	-0.05	1.00	0.07	0.09	0.20	-0.02	0.16	0.04
Elev	-0.28	0.01	0.01	0.07	1.00	0.08	-0.21	0.04	0.00	-0.01
Lat	-0.10	-0.07	-0.06	0.09	0.08	1.00	0.05	0.15	-0.10	0.19
HR	0.17	-0.09	-0.02	0.20	-0.21	0.05	1.00	-0.04	0.50	-0.17
NPP	0.15	0.04	-0.02	-0.02	0.04	0.15	-0.04	1.00	0.03	0.32
Prec	0.05	-0.20	-0.04	0.16	0.00	-0.10	0.50	0.03	1.00	-0.20
UVB	-0.02	0.04	0.10	0.04	-0.01	0.19	-0.17	0.32	-0.20	1.00
Post. Prob.	**dS**	**dN**	**Diversif**	**Body Size**	**Elev**	**Lat**	**HR**	**NPP**	**Prec**	**UVB**
dS	-	0.72	0.43	0.35	0.11	0.35	0.73	0.70	0.57	0.46
dN	0.72	-	0.58	0.29	0.51	0.39	0.36	0.54	0.25	0.55
Diversif	0.43	0.58	-	0.33	0.55	0.30	0.42	0.41	0.35	0.83
Body Size	0.35	0.29	0.33	-	0.73	0.79	0.96	0.45	0.91	0.63
Elev	0.11	0.51	0.55	0.73	-	0.76	0.03	0.65	0.48	0.48
Lat	0.35	0.39	0.30	0.79	0.76	-	0.67	0.92	0.19	0.96
HR	0.73	0.36	0.42	0.96	0.03	0.67	-	0.37	1.00	0.06
NPP	0.70	0.54	0.41	0.45	0.65	0.92	0.37	-	0.60	1.00
Prec	0.57	0.25	0.35	0.91	0.48	0.19	1.00	0.60	-	0.03
UVB	0.46	0.55	0.83	0.63	0.48	0.96	0.06	1.00	0.03	-

NUCLEAR CODING-GENES: ω ANALYSIS 1

Covariances	**dS**	**ω**	**Diversif**	**Body Size**	**Elev**	**Lat**	**Temp**	**HR**	**NPP**	**Prec**	**UVB**
dS	0.43	0.04	0.02	-0.01	-0.24	-0.18	0.05	0.01	0.04	0.02	-0.01
ω	0.04	0.28	0.01	-0.01	0.20	-0.01	-0.04	-0.01	-0.05	-0.13	0.01
Diversif	0.02	0.01	0.11	0.00	-0.02	-0.05	0.01	0.00	0.00	0.00	0.00
Body Size	-0.01	-0.01	0.00	0.07	0.04	0.06	0.00	0.01	-0.01	0.02	0.01
Elev	-0.24	0.20	-0.02	0.04	1.62	0.37	-0.13	-0.04	-0.10	-0.17	0.03
Lat	-0.18	-0.01	-0.05	0.06	0.37	4.81	-0.05	0.00	0.12	-0.19	0.07
Temp	0.05	-0.04	0.01	0.00	-0.13	-0.05	0.04	0.00	0.04	0.05	-0.01
HR	0.01	-0.01	0.00	0.01	-0.04	0.00	0.00	0.01	0.00	0.04	0.00
NPP	0.04	-0.05	0.00	-0.01	-0.10	0.12	0.04	0.00	0.29	0.05	0.02
Prec	0.02	-0.13	0.00	0.02	-0.17	-0.19	0.05	0.04	0.05	0.44	-0.03
UVB	-0.01	0.01	0.00	0.01	0.03	0.07	-0.01	0.00	0.02	-0.03	0.03
Correl. Coeff.	**dS**	**ω**	**Diversif**	**Body Size**	**Elev**	**Lat**	**Temp**	**HR**	**NPP**	**Prec**	**UVB**
dS	1.00	-0.10	0.06	-0.15	-0.38	-0.19	0.46	0.19	0.19	0.10	-0.17
ω	-0.10	1.00	0.03	-0.05	0.34	-0.01	-0.42	-0.28	-0.20	-0.41	0.16
Diversif	0.06	0.03	1.00	-0.06	-0.04	-0.07	0.11	0.00	0.01	0.00	0.06
Body Size	-0.15	-0.05	-0.06	1.00	0.11	0.10	-0.11	0.17	-0.06	0.10	0.06
Elev	-0.38	0.34	-0.04	0.11	1.00	0.13	-0.52	-0.29	-0.14	-0.20	0.15
Lat	-0.19	-0.01	-0.07	0.10	0.13	1.00	-0.13	0.02	0.10	-0.13	0.21
Temp	0.46	-0.42	0.11	-0.11	-0.52	-0.13	1.00	0.22	0.34	0.37	-0.29
HR	0.19	-0.28	0.00	0.17	-0.29	0.02	0.22	1.00	0.03	0.54	-0.22
NPP	0.19	-0.20	0.01	-0.06	-0.14	0.10	0.34	0.03	1.00	0.14	0.19
Prec	0.10	-0.41	0.00	0.10	-0.20	-0.13	0.37	0.54	0.14	1.00	-0.29
UVB	-0.17	0.16	0.06	0.06	0.15	0.21	-0.29	-0.22	0.19	-0.29	1.00
Post. Prob.	**dS**	**ω**	**Diversif**	**Body Size**	**Elev**	**Lat**	**Temp**	**HR**	**NPP**	**Prec**	**UVB**
dS	-	0.37	0.67	0.23	0.03	0.20	0.98	0.79	0.79	0.67	0.21
ω	0.37	-	0.56	0.40	0.92	0.48	0.04	0.14	0.18	0.06	0.76
Diversif	0.67	0.56	-	0.28	0.35	0.25	0.83	0.51	0.55	0.50	0.72
Body Size	0.23	0.40	0.28	-	0.85	0.81	0.16	0.93	0.29	0.81	0.70
Elev	0.03	0.92	0.35	0.85	-	0.88	0.00	0.01	0.10	0.04	0.90
Lat	0.20	0.48	0.25	0.81	0.88	-	0.13	0.56	0.81	0.12	0.97
Temp	0.98	0.04	0.83	0.16	0.00	0.13	-	0.98	1.00	1.00	0.01
HR	0.79	0.14	0.51	0.93	0.01	0.56	0.98	-	0.63	1.00	0.03
NPP	0.79	0.18	0.55	0.29	0.10	0.81	1.00	0.63	-	0.90	0.96
Prec	0.67	0.06	0.50	0.81	0.04	0.12	1.00	1.00	0.90	-	0.01
UVB	0.21	0.76	0.72	0.70	0.90	0.97	0.01	0.03	0.96	0.01	-

Precisions	dS	ω	Diversif	Body Size	Elev	Lat	Temp	HR	NPP	Prec	UVB
dS	-	0.37	0.67	0.23	0.03	0.20	0.98	0.79	0.79	0.67	0.21
ω	0.37	-	0.56	0.40	0.92	0.48	0.04	0.14	0.18	0.06	0.76
Diversif	0.67	0.56	-	0.28	0.35	0.25	0.83	0.51	0.55	0.50	0.72
Body Size	0.23	0.40	0.28	-	0.85	0.81	0.16	0.93	0.29	0.81	0.70
Elev	0.03	0.92	0.35	0.85	-	0.88	0.00	0.01	0.10	0.04	0.90
Lat	0.20	0.48	0.25	0.81	0.88	-	0.13	0.56	0.81	0.12	0.97
Temp	0.98	0.04	0.83	0.16	0.00	0.13	-	0.98	1.00	1.00	0.01
HR	0.79	0.14	0.51	0.93	0.01	0.56	0.98	-	0.63	1.00	0.03
NPP	0.79	0.18	0.55	0.29	0.10	0.81	1.00	0.63	-	0.90	0.96
Prec	0.67	0.06	0.50	0.81	0.04	0.12	1.00	1.00	0.90	-	0.01
UVB	0.21	0.76	0.72	0.70	0.90	0.97	0.01	0.03	0.96	0.01	-
Partial C.C.	**dS**	**ω**	**Diversif**	**Body Size**	**Elev**	**Lat**	**Temp**	**HR**	**NPP**	**Prec**	**UVB**
dS	-1.00	0.17	-0.01	-0.10	-0.19	-0.16	0.36	0.20	0.13	-0.12	-0.05
ω	0.17	-1.00	0.06	-0.07	0.23	-0.09	-0.30	-0.05	-0.09	-0.28	0.05
Diversif	-0.01	0.06	-1.00	-0.05	0.01	-0.07	0.12	0.02	-0.04	0.00	0.11
Body Size	-0.10	-0.07	-0.05	-1.00	0.09	0.03	-0.02	0.15	-0.05	0.02	0.07
Elev	-0.19	0.23	0.01	0.09	-1.00	0.08	-0.25	-0.18	0.06	0.12	-0.07
Lat	-0.16	-0.09	-0.07	0.03	0.08	-1.00	0.02	0.15	0.10	-0.18	0.11
Temp	0.36	-0.30	0.12	-0.02	-0.25	0.02	-1.00	-0.13	0.23	0.16	-0.20
HR	0.20	-0.05	0.02	0.15	-0.18	0.15	-0.13	-1.00	-0.07	0.42	-0.08
NPP	0.13	-0.09	-0.04	-0.05	0.06	0.10	0.23	-0.07	-1.00	0.08	0.28
Prec	-0.12	-0.28	0.00	0.02	0.12	-0.18	0.16	0.42	0.08	-1.00	-0.12
UVB	-0.05	0.05	0.11	0.07	-0.07	0.11	-0.20	-0.08	0.28	-0.12	-1.00
Post. Prob.	**dS**	**ω**	**Diversif**	**Body Size**	**Elev**	**Lat**	**Temp**	**HR**	**NPP**	**Prec**	**UVB**
dS	-	0.73	0.49	0.34	0.22	0.26	0.93	0.78	0.68	0.31	0.41
ω	0.73	-	0.62	0.40	0.79	0.37	0.13	0.43	0.38	0.16	0.56
Diversif	0.49	0.62	-	0.33	0.54	0.29	0.81	0.57	0.39	0.50	0.82
Body Size	0.34	0.40	0.33	-	0.75	0.59	0.44	0.87	0.36	0.57	0.71
Elev	0.22	0.79	0.54	0.75	-	0.70	0.11	0.13	0.66	0.78	0.31
Lat	0.26	0.37	0.29	0.59	0.70	-	0.55	0.84	0.77	0.12	0.80
Temp	0.93	0.13	0.81	0.44	0.11	0.55	-	0.21	0.89	0.82	0.12
HR	0.78	0.43	0.57	0.87	0.13	0.84	0.21	-	0.33	0.99	0.28
NPP	0.68	0.38	0.39	0.36	0.66	0.77	0.89	0.33	-	0.70	0.97
Prec	0.31	0.16	0.50	0.57	0.78	0.12	0.82	0.99	0.70	-	0.21
UVB	0.41	0.56	0.82	0.71	0.31	0.80	0.12	0.28	0.97	0.21	-

NUCLEAR CODING-GENES: ω ANALYSIS 1 (Controlling for Temperature)										
Covariances	**dS**	**ω**	**Diversif**	**Body Size**	**Elev**	**Lat**	**HR**	**NPP**	**Prec**	**UVB**
dS	0.33	0.07	0.01	-0.01	-0.09	-0.13	0.00	0.00	-0.03	0.00
ω	0.07	0.22	0.01	-0.01	0.07	-0.07	-0.01	-0.01	-0.08	0.00
Diversif	0.01	0.01	0.10	0.00	0.00	-0.04	0.00	-0.01	-0.01	0.00
Body Size	-0.01	-0.01	0.00	0.06	0.02	0.05	0.01	0.00	0.02	0.00
Elev	-0.09	0.07	0.00	0.02	1.16	0.18	-0.02	0.02	0.00	0.00
Lat	-0.13	-0.07	-0.04	0.05	0.18	4.66	0.01	0.17	-0.12	0.06
HR	0.00	-0.01	0.00	0.01	-0.02	0.01	0.01	0.00	0.03	0.00
NPP	0.00	-0.01	-0.01	0.00	0.02	0.17	0.00	0.26	0.01	0.02
Prec	-0.03	-0.08	-0.01	0.02	0.00	-0.12	0.03	0.01	0.38	-0.02
UVB	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.02	-0.02	0.02
Correl. Coeff.	**dS**	**ω**	**Diversif**	**Body Size**	**Elev**	**Lat**	**HR**	**NPP**	**Prec**	**UVB**
dS	1.00	0.13	0.02	-0.11	-0.19	-0.15	0.11	0.04	-0.08	-0.04
ω	0.13	1.00	0.08	-0.12	0.16	-0.07	-0.21	-0.07	-0.31	0.05
Diversif	0.02	0.08	1.00	-0.05	0.01	-0.06	-0.02	-0.02	-0.04	0.10
Body Size	-0.11	-0.12	-0.05	1.00	0.06	0.09	0.20	-0.02	0.16	0.03
Elev	-0.19	0.16	0.01	0.06	1.00	0.08	-0.20	0.04	0.00	-0.01
Lat	-0.15	-0.07	-0.06	0.09	0.08	1.00	0.05	0.15	-0.09	0.19
HR	0.11	-0.21	-0.02	0.20	-0.20	0.05	1.00	-0.04	0.50	-0.17
NPP	0.04	-0.07	-0.02	-0.02	0.04	0.15	-0.04	1.00	0.02	0.32
Prec	-0.08	-0.31	-0.04	0.16	0.00	-0.09	0.50	0.02	1.00	-0.20
UVB	-0.04	0.05	0.10	0.03	-0.01	0.19	-0.17	0.32	-0.20	1.00
Post. Prob.	**dS**	**ω**	**Diversif**	**Body Size**	**Elev**	**Lat**	**HR**	**NPP**	**Prec**	**UVB**
dS	-	0.66	0.55	0.31	0.18	0.26	0.66	0.55	0.37	0.43
ω	0.66	-	0.67	0.30	0.73	0.38	0.22	0.40	0.13	0.57
Diversif	0.55	0.67	-	0.31	0.55	0.29	0.42	0.42	0.35	0.82
Body Size	0.31	0.30	0.31	-	0.72	0.78	0.96	0.41	0.91	0.60
Elev	0.18	0.73	0.55	0.72	-	0.75	0.03	0.66	0.49	0.49
Lat	0.26	0.38	0.29	0.78	0.75	-	0.67	0.92	0.21	0.95
HR	0.66	0.22	0.42	0.96	0.03	0.67	-	0.34	1.00	0.07
NPP	0.55	0.40	0.42	0.41	0.66	0.92	0.34	-	0.56	1.00
Prec	0.37	0.13	0.35	0.91	0.49	0.21	1.00	0.56	-	0.04
UVB	0.43	0.57	0.82	0.60	0.49	0.95	0.07	1.00	0.04	-

NUCLEAR CODING-GENES: ω ANALYSIS 2

Covariances	**dS**	**ω**	**Diversif**	**Body Size**	**Elev**	**Lat**	**Temp**	**HR**	**NPP**	**Prec**	**UVB**
dS	0.35	0.03	0.01	-0.02	-0.24	-0.22	0.05	0.01	0.05	0.04	-0.01
ω	0.03	0.30	0.01	-0.01	0.21	-0.03	-0.04	-0.02	-0.05	-0.13	0.01
Diversif	0.01	0.01	0.11	0.00	-0.02	-0.05	0.01	0.00	0.01	0.00	0.01
Body Size	-0.02	-0.01	0.00	0.06	0.04	0.06	0.00	0.00	-0.01	0.02	0.00
Elev	-0.24	0.21	-0.02	0.04	1.62	0.37	-0.13	-0.04	-0.10	-0.17	0.03
Lat	-0.22	-0.03	-0.05	0.06	0.37	4.83	-0.05	0.00	0.13	-0.19	0.07
Temp	0.05	-0.04	0.01	0.00	-0.13	-0.05	0.04	0.01	0.04	0.05	-0.01
HR	0.01	-0.02	0.00	0.00	-0.04	0.00	0.01	0.01	0.00	0.04	0.00
NPP	0.05	-0.05	0.01	-0.01	-0.10	0.13	0.04	0.00	0.30	0.05	0.02
Prec	0.04	-0.13	0.00	0.02	-0.17	-0.19	0.05	0.04	0.05	0.45	-0.03
UVB	-0.01	0.01	0.01	0.00	0.03	0.07	-0.01	0.00	0.02	-0.03	0.03
Correl. Coeff.	**dS**	**ω**	**Diversif**	**Body Size**	**Elev**	**Lat**	**Temp**	**HR**	**NPP**	**Prec**	**UVB**
dS	1.00	-0.08	0.07	-0.16	-0.38	-0.20	0.46	0.20	0.19	0.11	-0.17
ω	-0.08	1.00	0.02	-0.07	0.34	-0.02	-0.42	-0.28	-0.20	-0.41	0.16
Diversif	0.07	0.02	1.00	-0.06	-0.04	-0.07	0.10	0.00	0.01	0.00	0.07
Body Size	-0.16	-0.07	-0.06	1.00	0.12	0.10	-0.11	0.17	-0.06	0.10	0.06
Elev	-0.38	0.34	-0.04	0.12	1.00	0.13	-0.52	-0.29	-0.15	-0.20	0.15
Lat	-0.20	-0.02	-0.07	0.10	0.13	1.00	-0.13	0.02	0.10	-0.13	0.21
Temp	0.46	-0.42	0.10	-0.11	-0.52	-0.13	1.00	0.22	0.34	0.37	-0.28
HR	0.20	-0.28	0.00	0.17	-0.29	0.02	0.22	1.00	0.03	0.54	-0.23
NPP	0.19	-0.20	0.01	-0.06	-0.15	0.10	0.34	0.03	1.00	0.14	0.19
Prec	0.11	-0.41	0.00	0.10	-0.20	-0.13	0.37	0.54	0.14	1.00	-0.29
UVB	-0.17	0.16	0.07	0.06	0.15	0.21	-0.28	-0.23	0.19	-0.29	1.00
Post. Prob.	**dS**	**ω**	**Diversif**	**Body Size**	**Elev**	**Lat**	**Temp**	**HR**	**NPP**	**Prec**	**UVB**
dS	-	0.40	0.68	0.20	0.03	0.19	0.98	0.80	0.79	0.68	0.21
ω	0.40	-	0.55	0.38	0.93	0.46	0.04	0.13	0.19	0.05	0.76
Diversif	0.68	0.55	-	0.29	0.34	0.25	0.81	0.50	0.55	0.50	0.73
Body Size	0.20	0.38	0.29	-	0.85	0.82	0.16	0.94	0.31	0.81	0.70
Elev	0.03	0.93	0.34	0.85	-	0.88	0.00	0.00	0.10	0.04	0.90
Lat	0.19	0.46	0.25	0.82	0.88	-	0.12	0.57	0.81	0.13	0.97
Temp	0.98	0.04	0.81	0.16	0.00	0.12	-	0.98	1.00	1.00	0.01
HR	0.80	0.13	0.50	0.94	0.00	0.57	0.98	-	0.63	1.00	0.02
NPP	0.79	0.19	0.55	0.31	0.10	0.81	1.00	0.63	-	0.90	0.96
Prec	0.68	0.05	0.50	0.81	0.04	0.13	1.00	1.00	0.90	-	0.01
UVB	0.21	0.76	0.73	0.70	0.90	0.97	0.01	0.02	0.96	0.01	-

Precisions	dS	ω	Diversif	Body Size	Elev	Lat	Temp	HR	NPP	Prec	UVB
dS	19.20	-2.44	0.22	2.62	1.11	0.39	-15.10	-11.30	-1.87	1.09	2.34
ω	-2.44	55.00	-0.89	1.65	-1.50	0.25	15.20	4.92	1.12	3.69	-2.93
Diversif	0.22	-0.89	12.90	0.87	-0.03	0.14	-3.82	-0.98	0.34	-0.04	-3.41
Body Size	2.62	1.65	0.87	25.10	-0.54	-0.07	1.09	-10.70	0.57	-0.11	-2.85
Elev	1.11	-1.50	-0.03	-0.54	1.40	-0.05	2.52	2.70	-0.20	-0.38	0.77
Lat	0.39	0.25	0.14	-0.07	-0.05	0.33	-0.10	-1.09	-0.15	0.27	-0.54
Temp	-15.10	15.20	-3.82	1.09	2.52	-0.10	88.80	17.50	-4.98	-3.44	15.70
HR	-11.30	4.92	-0.98	-10.70	2.70	-1.09	17.50	185.00	2.44	-13.80	9.12
NPP	-1.87	1.12	0.34	0.57	-0.20	-0.15	-4.98	2.44	6.33	-0.47	-6.33
Prec	1.09	3.69	-0.04	-0.11	-0.38	0.27	-3.44	-13.80	-0.47	5.93	2.42
UVB	2.34	-2.93	-3.41	-2.85	0.77	-0.54	15.70	9.12	-6.33	2.42	76.30
Partial C.C.	**dS**	**ω**	**Diversif**	**Body Size**	**Elev**	**Lat**	**Temp**	**HR**	**NPP**	**Prec**	**UVB**
dS	-1.00	0.19	0.00	-0.11	-0.19	-0.16	0.35	0.20	0.14	-0.12	-0.06
ω	0.19	-1.00	0.06	-0.08	0.24	-0.10	-0.29	-0.06	-0.09	-0.29	0.05
Diversif	0.00	0.06	-1.00	-0.05	0.01	-0.07	0.11	0.02	-0.04	0.00	0.11
Body Size	-0.11	-0.08	-0.05	-1.00	0.09	0.03	-0.02	0.16	-0.05	0.02	0.07
Elev	-0.19	0.24	0.01	0.09	-1.00	0.08	-0.25	-0.18	0.06	0.13	-0.07
Lat	-0.16	-0.10	-0.07	0.03	0.08	-1.00	0.02	0.14	0.11	-0.18	0.11
Temp	0.35	-0.29	0.11	-0.02	-0.25	0.02	-1.00	-0.13	0.23	0.16	-0.20
HR	0.20	-0.06	0.02	0.16	-0.18	0.14	-0.13	-1.00	-0.07	0.42	-0.08
NPP	0.14	-0.09	-0.04	-0.05	0.06	0.11	0.23	-0.07	-1.00	0.08	0.29
Prec	-0.12	-0.29	0.00	0.02	0.13	-0.18	0.16	0.42	0.08	-1.00	-0.12
UVB	-0.06	0.05	0.11	0.07	-0.07	0.11	-0.20	-0.08	0.29	-0.12	-1.00
Post. Prob.	**dS**	**ω**	**Diversif**	**Body Size**	**Elev**	**Lat**	**Temp**	**HR**	**NPP**	**Prec**	**UVB**
dS	-	0.75	0.50	0.33	0.21	0.27	0.92	0.79	0.69	0.32	0.39
ω	0.75	-	0.61	0.38	0.81	0.36	0.14	0.42	0.37	0.15	0.57
Diversif	0.50	0.61	-	0.35	0.54	0.29	0.79	0.56	0.37	0.51	0.82
Body Size	0.33	0.38	0.35	-	0.74	0.58	0.43	0.87	0.37	0.55	0.70
Elev	0.21	0.81	0.54	0.74	-	0.71	0.11	0.13	0.65	0.79	0.30
Lat	0.27	0.36	0.29	0.58	0.71	-	0.53	0.84	0.77	0.11	0.79
Temp	0.92	0.14	0.79	0.43	0.11	0.53	-	0.21	0.89	0.82	0.12
HR	0.79	0.42	0.56	0.87	0.13	0.84	0.21	-	0.33	0.99	0.28
NPP	0.69	0.37	0.37	0.37	0.65	0.77	0.89	0.33	-	0.71	0.98
Prec	0.32	0.15	0.51	0.55	0.79	0.11	0.82	0.99	0.71	-	0.21
UVB	0.39	0.57	0.82	0.70	0.30	0.79	0.12	0.28	0.98	0.21	-

NUCLEAR CODING-GENES: ω ANALYSIS 2 (Controlling for Temperature)										
Covariances	**dS**	**ω**	**Diversif**	**Body Size**	**Elev**	**Lat**	**HR**	**NPP**	**Prec**	**UVB**
dS	0.28	0.07	0.00	-0.01	-0.09	-0.15	0.00	0.01	-0.02	0.00
ω	0.07	0.24	0.01	-0.02	0.07	-0.09	-0.01	-0.01	-0.08	0.00
Diversif	0.00	0.01	0.10	0.00	0.00	-0.04	0.00	0.00	-0.01	0.00
Body Size	-0.01	-0.02	0.00	0.06	0.02	0.05	0.01	0.00	0.02	0.00
Elev	-0.09	0.07	0.00	0.02	1.16	0.18	-0.02	0.02	0.00	0.00
Lat	-0.15	-0.09	-0.04	0.05	0.18	4.68	0.01	0.17	-0.12	0.06
HR	0.00	-0.01	0.00	0.01	-0.02	0.01	0.01	0.00	0.03	0.00
NPP	0.01	-0.01	0.00	0.00	0.02	0.17	0.00	0.26	0.01	0.02
Prec	-0.02	-0.08	-0.01	0.02	0.00	-0.12	0.03	0.01	0.38	-0.02
UVB	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.02	-0.02	0.02
Correl. Coeff.	**dS**	**ω**	**Diversif**	**Body Size**	**Elev**	**Lat**	**HR**	**NPP**	**Prec**	**UVB**
dS	1.00	0.14	0.02	-0.13	-0.19	-0.16	0.11	0.05	-0.08	-0.05
ω	0.14	1.00	0.07	-0.13	0.16	-0.09	-0.22	-0.06	-0.31	0.05
Diversif	0.02	0.07	1.00	-0.05	0.01	-0.06	-0.03	-0.02	-0.04	0.10
Body Size	-0.13	-0.13	-0.05	1.00	0.07	0.09	0.20	-0.02	0.16	0.03
Elev	-0.19	0.16	0.01	0.07	1.00	0.07	-0.20	0.04	0.00	-0.01
Lat	-0.16	-0.09	-0.06	0.09	0.07	1.00	0.05	0.16	-0.09	0.19
HR	0.11	-0.22	-0.03	0.20	-0.20	0.05	1.00	-0.05	0.50	-0.17
NPP	0.05	-0.06	-0.02	-0.02	0.04	0.16	-0.05	1.00	0.02	0.32
Prec	-0.08	-0.31	-0.04	0.16	0.00	-0.09	0.50	0.02	1.00	-0.20
UVB	-0.05	0.05	0.10	0.03	-0.01	0.19	-0.17	0.32	-0.20	1.00
Post. Prob.	**dS**	**ω**	**Diversif**	**Body Size**	**Elev**	**Lat**	**HR**	**NPP**	**Prec**	**UVB**
dS	-	0.69	0.56	0.28	0.19	0.26	0.66	0.56	0.39	0.41
ω	0.69	-	0.67	0.29	0.74	0.36	0.21	0.40	0.12	0.58
Diversif	0.56	0.67	-	0.32	0.55	0.29	0.41	0.42	0.35	0.83
Body Size	0.28	0.29	0.32	-	0.73	0.79	0.97	0.43	0.91	0.60
Elev	0.19	0.74	0.55	0.73	-	0.75	0.03	0.65	0.49	0.49
Lat	0.26	0.36	0.29	0.79	0.75	-	0.68	0.92	0.22	0.95
HR	0.66	0.21	0.41	0.97	0.03	0.68	-	0.34	1.00	0.06
NPP	0.56	0.40	0.42	0.43	0.65	0.92	0.34	-	0.57	1.00
Prec	0.39	0.12	0.35	0.91	0.49	0.22	1.00	0.57	-	0.04
UVB	0.41	0.58	0.83	0.60	0.49	0.95	0.06	1.00	0.04	-

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