## SUPPLEMENTARY MATERIAL

Niche Shift as a Driver of Invasion Success: Case Study of Large Hairy Armadillos (*Chaetophractus villosus*) in a Sub-Antarctic Ecosystem.

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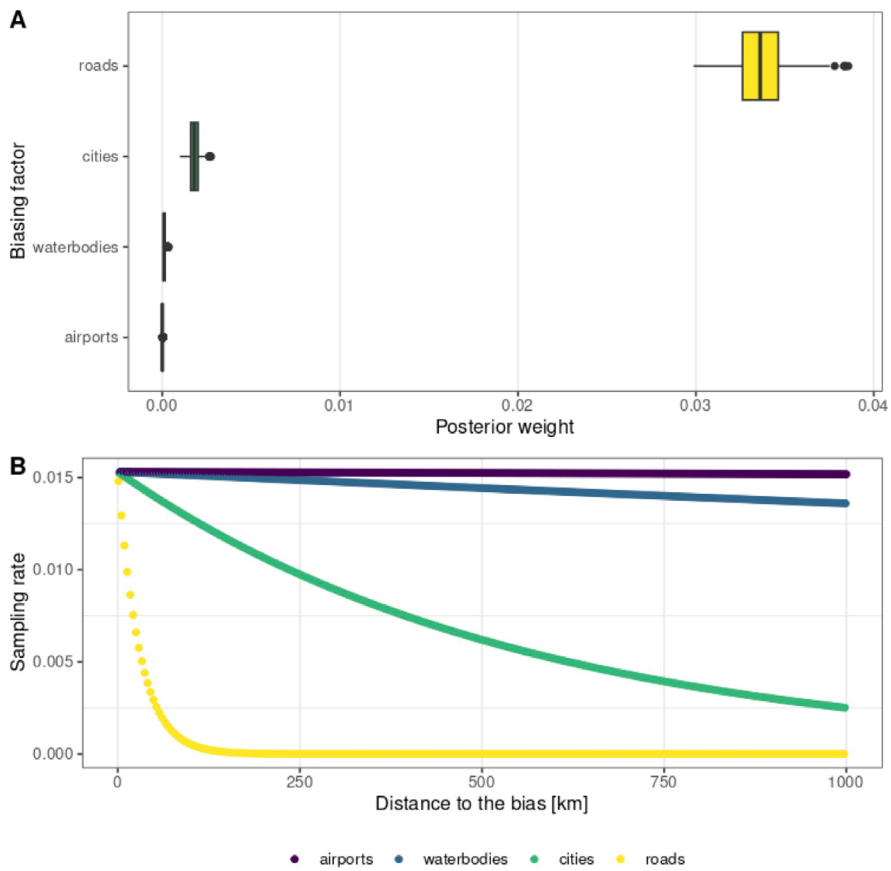


**Figure S1.** (A) Relative importance of bias factors estimated using the sampbias R package. The result shows that proximity to roads is the most influential factor driving spatial sampling bias in the occurrence data. (B) Estimated sampling rate as a function of distance from bias factors. The sampling rate decreases as the distance from roads increases, indicating a declining probability of sampling with increasing remoteness from accessible areas. / (A) Importancia relativa de los factores de sesgo estimados mediante el paquete de R sampbias. El resultado muestra que la proximidad a las carreteras es el factor más influyente en el sesgo de muestreo espacial de los datos de ocurrencia. (B) Tasa de muestreo estimada en función de la distancia a los factores de sesgo. La tasa de muestreo disminuye a medida que aumenta la distancia a las carreteras, lo que indica una probabilidad de muestreo decreciente a medida que aumenta la lejanía de las zonas accesibles.

**Table S1.** Description of the bioclimatic variables used for the comparison of niches in the environmental climate space. Variables with the symbol * were those used as predictors in the species distribution model. / Descripción de las variables bioclimáticas utilizadas para la comparación de nichos en el espacio climático ambiental. Las variables marcadas con el símbolo * fueron utilizadas como predictores en el modelo de distribución de especies.

| Variable | Description |
|---|---|
| BIO1* | Average annual temperature (°C) |
| BIO2* | Average diurnal temperature range (monthly mean of max temp - min temp) (°C) |
| BIO3* | Isothermality (BIO2/BIO7) (* 100) (%) |
| BIO4* | Seasonality of temperature (standard deviation *100) (°C) |
| BIO5 | Maximum temperature of the warmest month (°C) |
| BIO6 | Minimum temperature of the coldest month (°C) |
| BIO7 | Annual temperature range (BIO5-BIO6) (°C) |
| BIO8 | Average temperature of the wettest quarter (°C) |
| BIO9 | Average temperature of the driest quarter (°C) |
| BIO10 | Average temperature of the warmest quarter (°C) |
| BIO11 | Average temperature of the coldest quarter (°C) |
| BIO12* | Annual precipitation (mm) |
| BIO13 | Precipitation of the wettest month (mm) |
| BIO14 | Precipitation of the driest month (mm) |
| BIO15* | Precipitation seasonality (coefficient of variation) (%) |
| BIO16 | Precipitation during the wettest quarter (mm) |
| BIO17 | Precipitation in the driest quarter (mm) |
| BIO18 | Precipitation in the warmest quarter (mm) |
| BIO19 | Precipitation in the coldest quarter |
| NPP | Net primary productivity ( g C $m^{-2}$ $yr^{-1}$) |
| GSP | Growing season precipitation (mm $yr^{-1}$) |

**Table S2A.** Descriptive statistics of bioclimatic variables on the native distribution of *Chaetophractus villosus*. SD = standard deviation; CV = coefficient of variation (%). Variables with the symbol * were used as predictors in the species distribution model. Observed number (total number of observations for native distribution): 276686. / Estadísticas descriptivas de las variables bioclimáticas en la distribución nativa de *Chaetophractus villosus*. SD = desviación estándar; CV = coeficiente de variación (%). Las variables marcadas con el símbolo * fueron utilizadas como predictores en el modelo de distribución de especies. Número observado (total de observaciones para distribución nativa): 276686.

| Variable | Min | Max | Mean | Median | Std.Dev | Variance | CV |
|---|---|---|---|---|---|---|---|
| bio1* | -14.97 | 26.65 | 15.11669 | 15.732 | 7.312919 | 5.347878 | 0.4837645 |
| bio2* | 1.3 | 18.89 | 9.776596 | 9.7 | 2.394785 | 4.751284 | 0.2449508 |
| bio3 | 0.191 | 0.800 | 4.8142 | 0.441 | 0.1039249 | 6.459121 | 0.2158677 |
| bio4* | 32.40 | 791.9 | 393.0163 | 418.73999 | 152.1284 | 1.120189 | 0.3870791 |
| bio5 | -7.814 | 34.158 | 25.73239 | 28.742001 | 7.056164 | 1.894040 | 0.2742133 |
| bio6 | -26.87 | 21.506 | 4.966847 | 4.39 | 8.094418 | 4.760516 | 1.6296894 |
| bio7 | 5.623 | 33.764 | 20.76554 | 21.58 | 5.209083 | 8.279260 | 0.2508523 |
| bio8 | -22.9 | 28.65 | 16.68548 | 20.950001 | 9.639588 | 1.435876 | 0.5777231 |
| bio9 | -15.0 | 25.394 | 12.87782 | 13.082 | 6.705637 | 5.363848 | 0.5207122 |
| bio10 | -9.69 | 28.65 | 19.87016 | 22.15 | 6.892956 | 9.313305 | 0.3468998 |
| bio11 | -22.9 | 25.058 | 9.906996 | 9.375658 | 8.036866 | 1.133749 | 0.8112314 |
| bio12* | 2.916 | 6553.5 | 1102.576 | 896.7260 | 1058.39 | 5.734997 | 0.959924 |
| bio13 | 0.6 | 1231.8 | 169.4213 | 147.1900 | 137.6241 | 1.080038 | 0.812318 |
| bio14 | 0.0 | 765.70 | 35.6555 | 16.75200 | 68.99649 | 2.314304 | 1.935087 |
| bio15* | 7.8 | 149.75 | 57.61113 | 55.54399 | 28.7737 | 4.978944 | 0.499447 |
| bio16 | 1.5 | 3386.5 | 457.2207 | 398.4220 | 378.9296 | 6.551961 | 0.828767 |
| bio17 | 0.0 | 2564.3 | 123.9606 | 60.52 | 231.5998 | 2.713455 | 1.868334 |
| bio18 | 0.2 | 3232.7 | 337.7675 | 331.3320 | 305.1771 | 9.292165 | 0.903512 |
| bio19 | 0.6 | 2661.4 | 200.0405 | 85.75199 | 336.7119 | 4.496557 | 1.683218 |
| gsp* | 2.124 | 42949 | 1164961 | 906.4339 | 62381830 | 3.891493 | 5.354844 |
| npp* | 5.62 | 2456.2 | 1130.941 | 1153.900 | 557.2087 | 3.104816 | 0.492694 |

**Table S2B.** Descriptive statistics of bioclimatic variables in Tierra del Fuego, the invaded distribution of *Chaetophractus villosus*. SD = standard deviation; CV = coefficient of variation (%). Variables marked with the symbol * were used as predictors in the species distribution model. Observed number (total number of observations for Tierra del Fuego): 4033. / Estadística descriptiva de las variables bioclimáticas en Tierra del Fuego, la distribución invadida de *Chaetophractus villosus*. SD = desviación estándar; CV = coeficiente de variación (%). Las variables marcadas con el símbolo * fueron utilizadas como predictores en el modelo de distribución de especies. *Número observado (total de observaciones para Tierra del Fuego): 4033.*

| Variable | Min | Max | Mean | Median | Std.Dev | Variance | CV |
|---|---|---|---|---|---|---|---|
| bio1* | -7.0740 | 7.3980 | 4.519923 | 5.0065 | 2.074798 | 4.304788 | 0.459034 |
| bio2* | 1.9720 | 7.0400 | 5.128476 | 5.3320 | 1.166858 | 1.361559 | 0.227525 |
| bio3 | 0.2944 | 0.4198 | 0.36705 | 0.3687 | 2.712098 | 7.355476 | 0.073887 |
| bio4* | 149.1842 | 410.62 | 299.0379 | 309.4479 | 4.944638 | 2.444945 | 0.165351 |
| bio5 | -2.3340 | 15.034 | 11.20288 | 11.7860 | 2.519942 | 6.350109 | 0.224937 |
| bio6 | -12.5260 | 3.3250 | -2.63726 | -2.5420 | 2.467524 | 6.088676 | -0.93563 |
| bio7 | 6.3000 | 18.340 | 1.384015 | 14.4720 | 2.485684 | 6.178626 | 0.179599 |
| bio8 | -4.5860 | 11.394 | 7.251131 | 8.0140 | 2.902173 | 8.422609 | 0.400237 |
| bio9 | -9.4620 | 7.1045 | 2.283696 | 2.4820 | 2.402273 | 5.770913 | 1.051923 |
| bio10 | -4.5860 | 11.4350 | 8.243051 | 8.7540 | 2.243719 | 5.034276 | 0.272195 |
| bio12* | 270.1809 | 5454.36 | 1.122596 | 774.8200 | 9.503793 | 9.032208 | 0.846590 |
| bio13 | 29.1181 | 560.576 | 1.213969 | 87.4000 | 9.760459 | 9.526655 | 0.804012 |
| bio14 | 14.4347 | 377.120 | 7.246318 | 46.0480 | 6.765955 | 4.577815 | 0.933709 |
| bio15* | 10.8800 | 28.1520 | 1.756066 | 18.3611 | 3.761092 | 1.414581 | 0.214177 |
| bio16 | 79.4045 | 1555.65 | 3.311852 | 235.8359 | 2.708998 | 7.338669 | 0.817970 |
| bio17 | 50.4142 | 1187.42 | 2.318864 | 150.1840 | 2.105494 | 4.433104 | 0.907985 |
| bio18 | 77.8772 | 1555.65 | 3.234380 | 231.2640 | 2.665809 | 7.106538 | 0.824210 |
| bio19 | 64.2411 | 1187.428 | 2.471826 | 166.9360 | 2.090400 | 4.369774 | 0.845690 |
| gsp* | 253.7640 | 429496700 | 2.615297 | 602.7160 | 8.242345 | 6.793626 | 3.151590 |
| npp* | 315.279 | 1090.772 | 8.067257 | 831.9920 | 1.565738 | 2.451536 | 0.194085 |

**Table S3.** Overlap and niche dynamics indices of *Chaetophractus villosus* in native and invasive areas. H70, H85 and H100 correspond to 70%, 85% and 100% of the available environmental space used in the COUE analysis and to the 70%, 85% and 100% quantile to delineate the boundary of the kernel density estimate used in the n-dimensional Hypervolume analysis, respectively. / Índices de solapamiento y dinámicas de nicho de *Chaetophractus villosus* en áreas nativas e invasoras. H70, H85 y H100 corresponden al 70%, 85% y 100% del espacio ambiental disponible utilizado en el análisis COUE, y al percentil 70%, 85% y 100% para delinear los límites de la estimación de densidad kernel utilizada en el análisis de hipervolumen n-dimensional, respectivamente.

| **Index** | $H_{70}$ | $H_{85}$ | $H_{100}$ | **Type** | **Framework** |
|---|---|---|---|---|---|
| Schoener's *D* | 0.5 | | | Overlap | COUE |
| Unfilling (%) | 33.5 | 39.9 | 43.5 | Niche dynamic | |
| Expansion (%) | 0 | 0 | 0 | | |
| Stability (%) | 100 | 100 | 100 | | |
| Jaccard | 0.001 | 0.001 | 0.001 | Overlap | *n-dimensional* hypervolume |
| Sorensen | 0.003 | 0.003 | 0.002 | | |
| Unique fraction of introduced niche (%) | 2.9 | 2.1 | 1.4 | | |
| Unique fraction of native niche (%) | 99.9 | 99.9 | 99.9 | | |