

Supplementary information – Additional file 1

Mixed-species groups in bats: non-random roost associations and roost selection in Neotropical understory bats

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Table S1: Number of roosts and observations of bat species in roosts in different habitats (forest vs disturbed)

			Natural roost (forest habitat)	Artificial roost (forest habitat)	Artificial roost (disturbed habitat)
Total n roosts / n controls			89 / 520	21 / 585	23 / 658
Species	Diet	Abbreviation	% roost / % controls		
<i>Saccopteryx bilineata</i>	Insects	S.bil	22 / 9	0 / 0	0 / 0
<i>Peropteryx kappleri</i>	Insects	P.kap	6 / 5	0 / 0	0 / 0
<i>Trachops cirrhosis</i>	Insects / vertebrates	T.cir	6 / 3	52 / 11	0 / 0
<i>Micronycteris microtis</i>	Insects	M.mic	25 / 11	62 / 9	35 / 5
<i>M. hirsuta</i>	Insects	M.hir	8 / 2	10 / <1	0 / 0
<i>Glossophaga sp.</i>	Nectar / fruits	G.sp.	30 / 13	76 / 21	87 / 40
<i>G. soricina</i>	Nectar / fruits	G.sor	0 / 0	0 / 0	39 / 2
<i>G. commissarisi</i>	Nectar / fruits	G.com	30 / 13	76 / 21	61 / 5
<i>Hylonycteris underwoodi</i>	Nectar	H.und	8 / 2	0 / 0	0 / 0
<i>Carollia castanea</i>	Fruits	C.cast	26 / 15	10 / <1	4 / <1
<i>C. perspicillata</i>	Fruits	C.per	22 / 13	95 / 24	83 / 14
<i>C. sowelli</i>	Fruits	C.sow	20 / 9	81 / 26	43 / 4
<i>C. perspicillata/sowellii</i>	Fruits	C.per/C.sow	36 / 24	100 / 60	96 / 60
<i>Desmodus rotundus</i>	Blood	D.rot	8 / 12	14 / 1	0 / 0

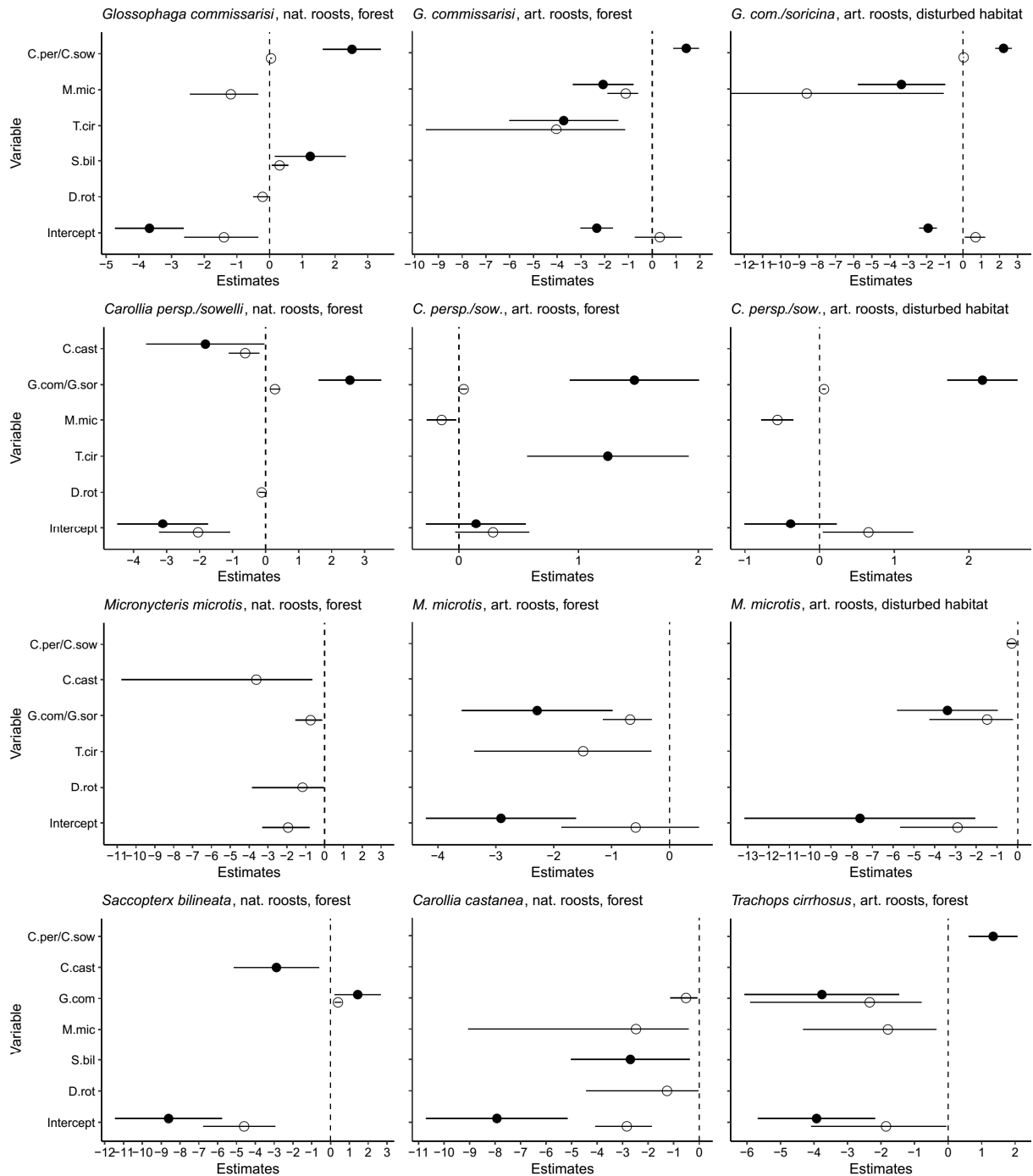


Fig. S1: GLMM beta parameter estimates for the effect of the presence (black circles) or abundance (open circles) of selected other bat species on the incidence of a focal bat species in natural and in artificial roosts in the forest habitat and artificial roosts in the disturbed habitat. The data for the sibling species *Carollia perspicillata* and *C. sowelli* were pooled. The plots only show those species for which a significant positive or negative effect of co-occurrence was detected. Models without any significant effects are not presented. For species abbreviations see the text and table S1. The error bars are 95% credible intervals.

Table S2: Roost variables used for modelling species-specific roost selection, their mean and range (in parentheses) in roosts occupied by each of six focal bat species, and the percentage of roosts occupied by each bat species that were in standing (not fallen) trees. For species abbreviations see the text and table S1.

Species	Roosts (n)	Roost volume (m ³)	Size of the entrance (m ²)	Distance of the roosting site from the entrance (m)	Distance of the roosting site above the ground (m)	Vegetation density (scale 0-10)	Canopy height (m)	Roosts in standing trees (%)
G.com	24	6.7 (0.4-32.6)	0.7 (0.1-3.0)	3.5 (1.0-11.2)	4.8 (0.6-17.0)	4.1 (2-8)	34.8 (20-45)	88
C.per	18	9.6 (1.2-32.6)	0.9 (0.1-3.0)	3.7 (1.0-10.3)	5.7 (2.2-12.3)	4.1 (2-6)	38.6 (25-45)	100
C.sow	18	3.5 (0.4-18.8)	0.4 (0.1-1.5)	3.1 (1.0-10.3)	3.8 (0.6-12.3)	4.3 (2-8)	32.3 (20-45)	78
C.cast	18	1.3 (0.1-4.5)	0.9 (0.1-2.9)	1.2 (0.2-5.7)	2.4 (0.5-6.0)	4.4 (3-6)	30.6 (20-40)	61
M.mic	16	2.9 (0.1-18.8)	0.6 (0.1-5.0)	3.3 (0.5-9.0)	1.1 (0.3-5.0)	4.8 (4-7)	28.1 (15-35)	19
S.bil	11	11.6 (0.2-32.6)	1.3 (0.1-3.0)	2.5 (0.3-4.8)	4.8 (3.0-7.5)	3.9 (2-5)	36.4 (20-45)	100

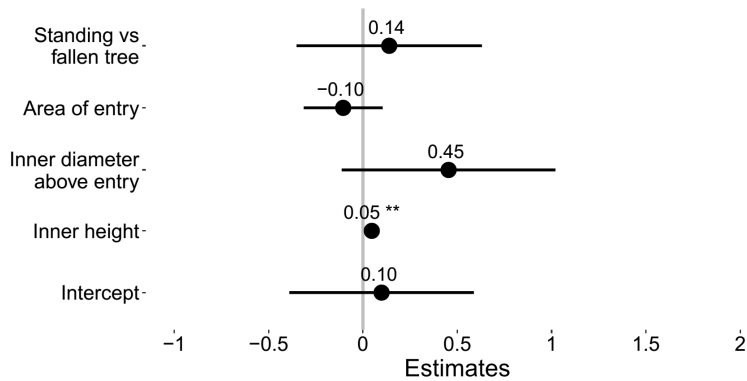


Fig. S2: Results of GLM on the effect of roost parameters on the total number of bat species using natural roosts (not necessarily simultaneously). The numbers next to the points representing beta parameter estimates are p-values and the asterisks indicate a significant effect (** p<0.001)

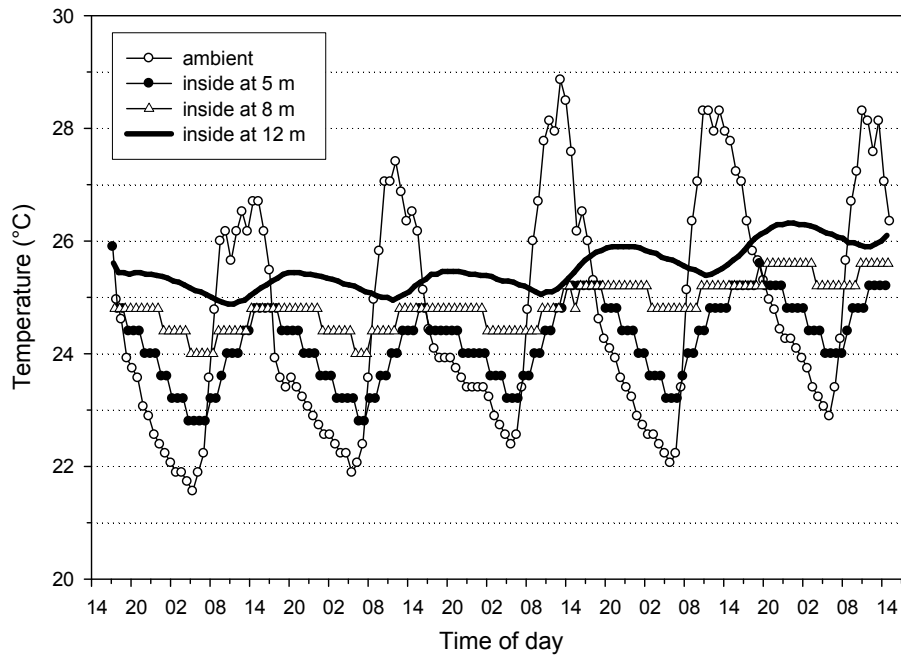


Fig. S3: Temperature during five days at three different heights inside a bat roost in a large hollow tree