

Effects of age on thermoregulatory responses during cold exposure in a nonhuman primate, Microcebus murinus.

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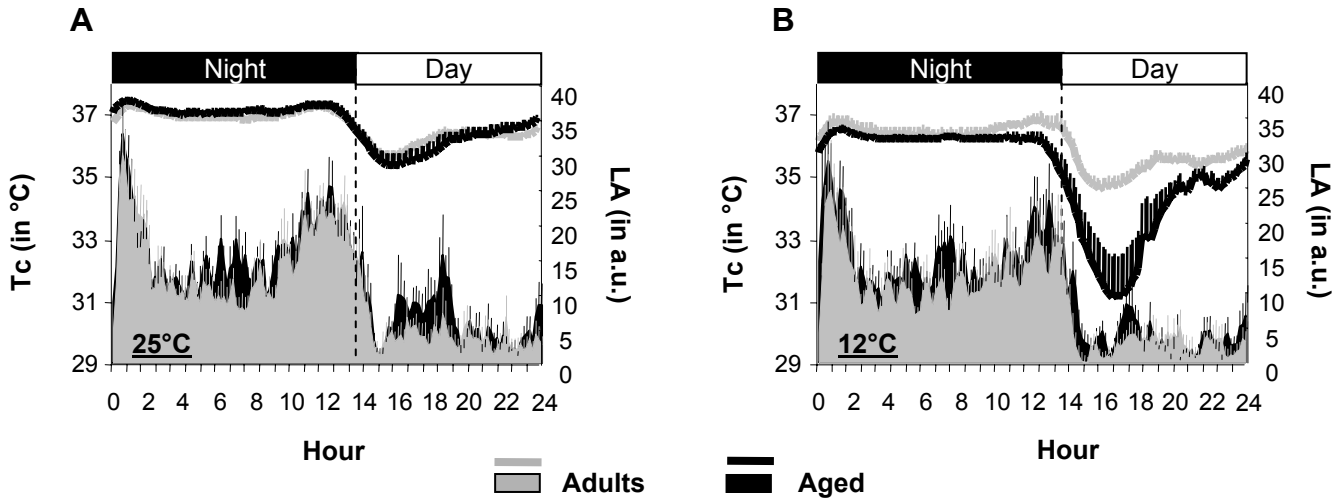

A
Night
Day
Tc (in °C)
LA (in a.u.)
25°C
Hour
B
Night
Day
Tc (in °C)
LA (in a.u.)
12°C
Hour
Adults
Aged

Figure 1.

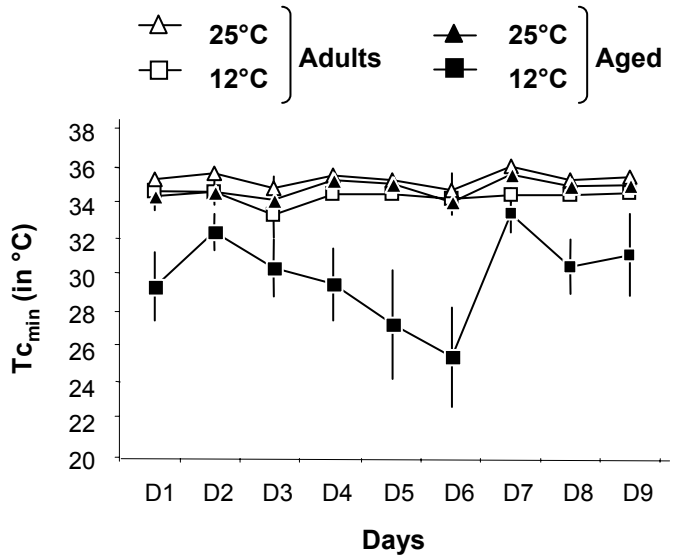

25°C
12°C
Adults
25°C
12°C
Aged
38
36
34
32
30
28
26
24
22
20
Tc_min (in °C)
D1
D2
D3
D4
D5
D6
D7
D8
D9
Days

Figure 2.

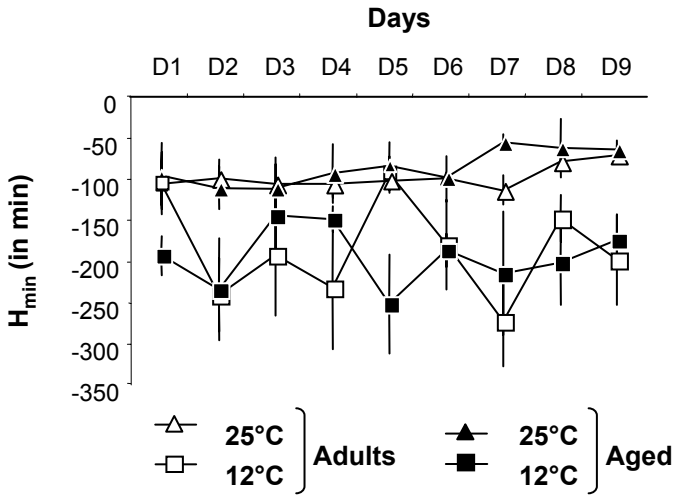

Days
D1
D2
D3
D4
D5
D6
D7
D8
D9
0
-50
-100
-150
-200
-250
-300
-350
H_{min} (in min)
25°C
12°C
Adults
25°C
12°C
Aged

Figure 3.

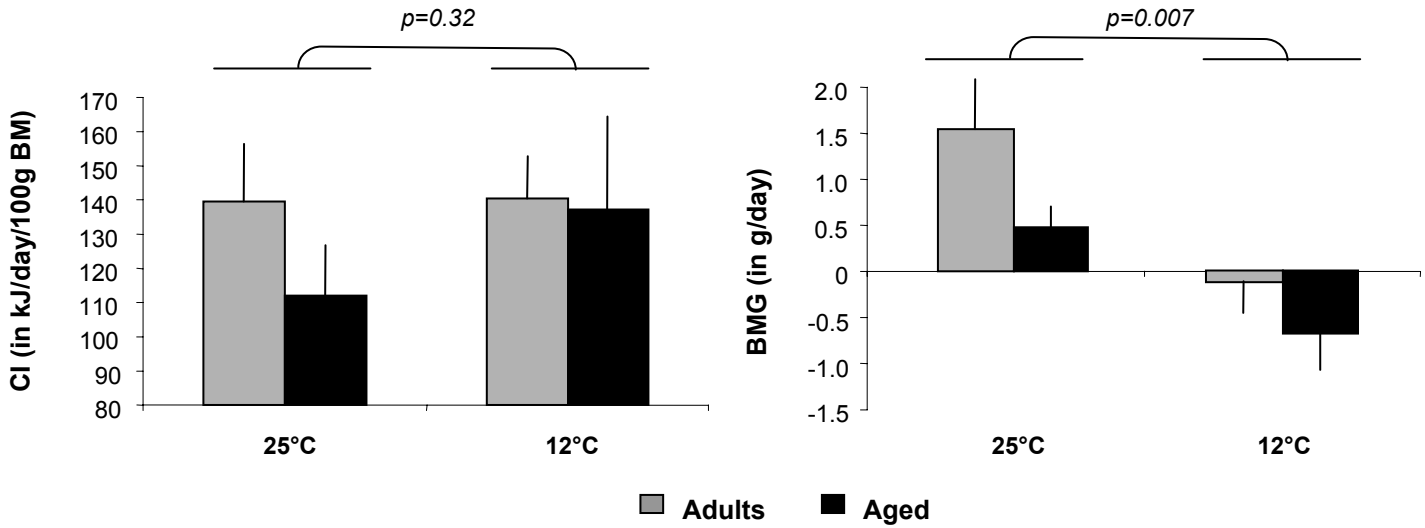

p=0.32
CI (in kJ/day/100g BM)
170
160
150
140
130
120
110
100
90
80
25°C
12°C
p=0.007
BMG (in g/day)
2.0
1.5
1.0
0.5
0
-0.5
-1.0
-1.5
25°C
12°C
Adults
Aged

Figure 4.

Table 1. Rhythm parameters (means values ± SEM) of core temperature (Tc) and locomotor activity (LA) determined from profiles of Tc and LA registered in adult and aged mouse lemurs under short photoperiod during the 9 days of exposures to 25 °C and to 12 °C. Parameters abbreviations are described in the text.

Ta	Parameters	Adults	Aged
25°C	**Tc_{night} (°C)**	37.1 ± 0.0	37.0 ± 0.0
	Tc_{day} (°C)	36.2 ± 0.1	35.9 ± 0.1
	Tc_{min} (°C)	35.4 ± 0.1	34.8 ± 0.2
	H_{decr} (min)	62 ± 6	86 ± 4
	H_{min} (min)	-98 ± 5	-86 ± 7
	F_{torp} (%)	3 ± 3	11 ± 7
	LA_{night} (a.u.)	1400 ± 69	1454 ± 66
	LA_{day} (a.u.)	330 ± 23	416 ± 30
12°C	**Tc_{night} (°C)**	36.7 ± 0.0	36.1 ± 0.1
	Tc_{day} (°C)	35.5 ± 0.1	32.9 ± 0.5
	Tc_{min} (°C)	34.3 ± 0.1	29.4 ± 0.9
	H_{decr} (min)	48 ± 5	55 ± 6
	H_{min} (min)	-186 ± 21	-196 ± 12
	F_{torp} (%)	11 ± 4	67 ± 13
	LA_{night} (a.u.)	1274 ± 62	1486 ± 69
	LA_{day} (a.u.)	250 ± 15	355 ± 30

Table 2. Table of χ^2 and p values after performing Linear Mixed Effects Models on Tc and LA rhythms testing the effects of age, Ta and duration of Ta exposures. Parameters abbreviations are described in the text. Tests of effects resulted from comparisons of more complex models with the most parsimonious model (i.e. the model including significant effects only). Effects included in significant interactions were not tested.

Parameters / Effects	Tc_{night}			Tc_{day}			Tc_{min}			H_{decr}			H_{min}			LA_{night}			LA_{day}		
	ddl	χ^2	*p*	ddl	χ^2	*p*	ddl	χ^2	*p*	ddl	χ^2	*p*	ddl	χ^2	*p*	ddl	χ^2	*p*	ddl	χ^2	*p*
Age		-			-			-		1	1.3	*0.26*	1	0	*1*	1	0.1	*0.81*		-	
Ta		-			-			-		1	3.5	*0.06*	1	13.4	*0.00*	1	0.2	*0.64*		-	
Duration		-			-			-		8	9.2	*0.33*	8	7.1	*0.53*	8	34.2	*0.00*		-	
Age*Ta		-			-			-			-		1	0.2	*0.65*		-			-	
Duration*Age		-			-			-			-			-		8	7.8	*0.45*		-	
Duration*Ta		-			-			-			-		8	7.0	*0.54*	8	14.5	*0.07*		-	
Duration*Age*Ta	8	18.6	*0.02*	8	19.1	*0.01*	8	18.7	*0.02*		-			-			-		8	15.9	*0.04*

Table 3. IGF-1 blood levels (mean + SEM, ng/ml in 100g BM) in adult and aged mouse lemurs at 25 °C, after 2 days and after 9 days of exposure to 12 °C. Linear Mixed Effects Models were performed to test the effects of age and ambient temperature (Ta) on the modulation of IGF-1 blood levels..

	25°C	12°C		LME		
		Day 2	Day 9	age effect	Ta effect	age*Ta effect
Adults	592 ± 99	444 ± 42	537 ± 48	$\chi^2_{(1)}$ =1.25; *p=0.26*	$\chi^2_{(2)}$ =8.04; *p=0.02*	$\chi^2_{(2)}$ =0.04; *p=0.98*
Aged	721 ± 144	505 ± 122	671 ± 125			